



Mn/DOT Name: 090

NGS Name: 090

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DI3798](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	7	131 N	43 W	461000.36	960721.94	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1950	2021	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE)	BENCH MARK DISK	BOISDE

Description: (2012)

Stamping: 090

9.0 MILES SOUTH OF FERGUS FALLS, 7.2 MILES SOUTH ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, THEN 0.95 MILE WEST ON COUNTY ROAD 112, 49.6 FEET NORTH OF COUNTY ROAD 112, 40.5 FEET EAST OF 175TH AVENUE, 87.1 FEET EAST OF A TELEPHONE PEDESTAL, 2.4 FEET WEST OF A CARBONITE WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1133.908	.016	2/1				VERTICAL ADJUSTMENT	2007	00000425-15	
1133.928	.016	2/1				VERTICAL CONTROL SURVEY	2005	VFAUN	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1133.859	.262		1046.379	.197	2011	GPS - OPUS	2022	GPSBM	
1133.899	.262		1046.419	.197	2011	GPS - RTRN	2021	RTRN2021	
1133.758	.262		1046.445	.197	1996	GPS - RTRN	2009	RTRN2009	

Geoid Separations(ft): GEOID18 = -87.480 12B = -87.437 09 = -87.310 03 = -87.313

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 10 00.36386	96 07 21.93924	397098.077	122284.400	.131	3	GPS - OPUS	2022	GPSBM
46 10 00.36418	96 07 21.93795	397098.167	122284.432	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 10 00.36462	96 07 21.93963	397098.050	122284.477	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2150226.497	759155.729	849504.876	16789067.654	.131	3	GPS - OPUS	2022	GPSBM
2150226.589	759155.759	849504.968	16789067.683	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2150226.472	759155.806	849504.852	16789067.732	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/090-DI3798-3N-22JUN2021.jpg	N	Jun 22, 2021
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/090-DI3798-2-22JUN2021.jpg		Jun 22, 2021
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/090-DI3798-1-22JUN2021.jpg		Jun 22, 2021

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 1 ERS

NGS Name: 1 ERS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096242/
USGS Quad: FOXHOME

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	30	133 N	44 W	461749.00	961609.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1950	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	USGS

Description: (2012) Stamping: 1 ERS 1950

2.4 MILES EAST OF FOXHOME, NEAR THE QUARTER CORNER BETWEEN SECTION 30 AND SECTION 31, 32.0 FEET NORTH OF AN EAST-WEST TOWNSHIP ROAD.

Station Notes

PULLED THE TIES, THEY FALL IN A DITCH BOTTOM.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1051.481	.033	3				VERTICAL CONTROL SURVEY	1973	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.350 12B = -88.330 09 = -88.228 03 = -88.189

* No Horizontal Positions in the Database *



Mn/DOT Name: 10 ERS

NGS Name: 10 ERS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096132/
USGS Quad: LAWNDAL

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	29	136 N	44 W	463334.00	961537.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1950	2023	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	USGS

Description: (2012) Stamping: 10 ERS 1950

6.0 MILES NORTHEAST OF ROTHSA, IN THE NORTHWEST CORNER OF A SCHOOLYARD, 222.0 FEET NORTH AND 46.0 FEET EAST OF TRUNK HIGHWAY 108 AT A CROSSROAD, 2.0 FEET SOUTH AND 17.0 FEET EAST OF A CORNER FENCE POST.

Station Notes

PULLED THE TIES, FALLS INTO A FIELD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1266.123	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.687 12B = -87.670 09 = -87.569 03 = -87.483

* No Horizontal Positions in the Database *



Mn/DOT Name: 10 WGW

NGS Name: 10 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	5	135 N	42 W	463233.61	960037.99		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1973	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 6 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (2012)

Stamping: 10 WGW 1973

4.0 MILES SOUTHEAST OF PELICAN RAPIDS, 5.1 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, THEN 1.15 MILES SOUTHWEST ON 230TH AVENUE/CROSS POINT ROAD, 37.0 FEET SOUTH ON CROSS POINT ROAD, 41.0 FEET EAST ON 230TH AVENUE, 2.0 FEET NORTH OF A POWER POLE GUY WIRE, 2.0 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1376.159	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1377.048	.262		1289.358	.197	2011	GPS - RTRN	2023	RTRN2023	

Geoid Separations(ft): GEOID18 = -87.690 12B = -87.674 09 = -87.575 03 = -87.424

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 32 33.60761	96 00 37.98621	426040.453	259253.169	.131	3	GPS - RTRN	2023	RTRN2023

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2181695.123	895547.407	883138.180	16924993.735	.131	3	GPS - RTRN	2023	RTRN2023

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/10_WGW-3S-31JUL2023.jpg	S	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/10_WGW-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/10_WGW-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 1028

NGS Name: 1028

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096223/
USGS Quad: STONY LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	31	131 N	44 W	460631.00	961443.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	1973	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON POST

Disk Type
SEE DESCRIPTION

Mon. Agency
USGS

Description:

Stamping: 1028

39.0 FEET NORTH AND 38.0 FEET WEST OF THE CROSSROADS.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1026.973	.033	3				VERTICAL CONTROL SURVEY	1973 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.205 12B = -87.162 09 = -87.067 03 = -87.027

* No Horizontal Positions in the Database *



Mn/DOT Name: 1044

NGS Name: 1044

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096224/
USGS Quad: ORWELL LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	17	131 N	44 W	460908.00	961442.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2008)

Stamping: 1044

IN WESTERN, AT THE JUNCTION OF 130TH STREET AND COUNTY ROAD 7, 25.0 FEET NORTH AND 25.0 FEET EAST OF THE CENTER OF THE CROSSROADS.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1042.153	.033	3				VERTICAL CONTROL SURVEY	1973 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.520 12B = -87.444 09 = -87.369 03 = -87.362

* No Horizontal Positions in the Database *



Mn/DOT Name: 1049

NGS Name: 1049

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096224/
USGS Quad: ORWELL LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	31	132 N	44 W	461144.00	961444.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2008)

Stamping: 1049

4.4 MILES NORTHWEST OF WESTERN, AT THE JUNCTION OF COUNTY ROAD 5 AND COUNTY ROAD 2, 15.0 FEET NORTH
AND 35.0 FEET WEST OF THE CENTER OF A TEE-ROAD SOUTH.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1047.153	.033	3				VERTICAL CONTROL SURVEY	1973 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.890 12B = -87.831 09 = -87.749 03 = -87.729

* No Horizontal Positions in the Database *



Mn/DOT Name: 1061

NGS Name: 1061

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096224/
USGS Quad: ORWELL LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	20	132 N	44 W	461330.00	961332.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2008)

Stamping: 1061

5.4 MILES SOUTHEAST OF FOXHOME, AT THE NORTH JUNCTION OF COUNTY ROAD 114 AND 125TH AVENUE, 20.0 FEET WEST AND 25.0 FEET NORTH OF THE CENTER OF THE CROSSROADS, IN THE SOUTHEAST CORNER OF A SCHOOL LOT.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1059.886	.033	3				VERTICAL CONTROL SURVEY	1973	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.048 12B = -88.028 09 = -87.916 03 = -87.874

* No Horizontal Positions in the Database *



Mn/DOT Name: 1088

NGS Name: 1088

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096224/
USGS Quad: ORWELL LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	23	132 N	44 W	461329.00	960948.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2008)

Stamping: 1088

5.1 MILES NORTHWEST OF WESTERN, AT THE SOUTHWEST JUNCTION OF A TEE-ROAD FROM COUNTY ROAD 114, 30.0 FEET WEST AND 20.0 FEET NORTH OF THE CENTER OF THE CROSSROADS.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1087.032	.033	3				VERTICAL CONTROL SURVEY	1973	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.992 12B = -87.976 09 = -87.848 03 = -87.808

* No Horizontal Positions in the Database *



Mn/DOT Name: 1094

NGS Name: 1094

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	15	132 N	44 W	461512.00	961216.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description:

Stamping: 1094

7.1 MILES NORTHWEST OF WESTERN, AT THE JUNCTION OF 200TH STREET AND 135TH AVENUE, 30.0 FEET SOUTH BY 25.0 FEET EAST OF THE SOUTHWEST CORNER OF SECTION 10.

Station Notes

PULLED THE TIES, THEY FALL IN A DITCH BOTTOM.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.169 12B = -88.163 09 = -88.041 03 = -87.992



Mn/DOT Name: 11 DEM

NGS Name: 11 DEM

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096223/
USGS Quad: STONY LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	32	131 N	44 W	460631.00	961442.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

COPPER CLAD ROD (NO SLEEVE)

Disk Type

SURVEY DISK

Mon. Agency

USGS

Description: (2012)

Stamping: 11 DEM 1973

8.6 MILES NORTHWEST OF WENDELL, 65.0 FEET NORTH AND 43.0 FEET WEST OF THE JUNCTION OF COUNTY ROAD 28 AND COUNTY ROAD 7, 1.0 FOOT WEST OF A WITNESS POST.

Station Notes

PULLED THE TIES, THEY FALL IN A NEW DITCH WORK.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1026.720	.033	3				VERTICAL CONTROL SURVEY	1973 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.205 12B = -87.162 09 = -87.067 03 = -87.027

* No Horizontal Positions in the Database *



Mn/DOT Name: 11 ERS

NGS Name: 11 ERS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096132/
USGS Quad: LAWNDALE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	19	136 N	44 W	463512.00	961539.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1950	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	USGS

Description: (2012) Stamping: 11 ERS 1950

7.8 MILES NORTH-NORTHEAST OF ROTHSA Y, 1.9 MILES NORTH ALONG 110TH AVENUE FROM THE JUNCTION OF 110TH AVENUE AND TRUNK HIGHWAY 108, THEN 30.0 FEET WEST OF 110TH AVENUE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1233.672	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.513 12B = -87.503 09 = -87.392 03 = -87.306

* No Horizontal Positions in the Database *



Mn/DOT Name: 11 WGW

NGS Name: 11 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096121/
USGS Quad: CORMORANT

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	20	137 N	42 W	463937.50	960121.71		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1973	2014	DESTROYED	Horz=NO Vert=NO	YES	4824	FLUSH	SEE DESCRIPTION

Monument Type

BRIDGE WING WALL

Disk Type

SURVEY DISK

Mon. Agency

USGS

Description: (2012)

Stamping: 11 WGW 1973

IN DUNVILLA, IN THE BRIDGE WINGWALL OF OLD TRUNK HIGHWAY 39 BRIDGE NUMBER 4824, 0.25 MILE NORTHEAST ALONG OLD TRUNK HIGHWAY 59 FROM THE JUNCTION OF OLD TRUNK HIGHWAY 59 AND NEW TRUNK HIGHWAY 59 IN DUNVILLA, TO TRUNK HIGHWAY 59 MILEPOINT, 247.60, THEN 103.2 FEET NORTH OF DUNVILLA DRIVE, THEN 15.5 FEET EAST OF OLD TRUNK HIGHWAY 59.

Station Notes

THE OLD BRIDGE WAS REPLACED.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1320.811	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1321.605	.262		1234.548	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.316 12B = -87.303 09 = -87.191 03 = -87.057

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method
46 39 37.50254	96 01 21.70544	423150.394	302210.724	.131	3	GPS - RTRN

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Project Info		
X	Y	X	Y	Acc	Order	Determination Method
2179601.015	938545.724	881730.431	16968033.910	.131	3	GPS - RTRN

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/11_WGW-3N-12AUG2009.jpg	N	Aug 12, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/11_WGW-2-12AUG2009.jpg		Aug 12, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/11_WGW-1-12AUG2009.jpg		Aug 12, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 1111

NGS Name: 1111

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	11	133 N	44 W	462114.00	961037.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1970	2009	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON POST

Disk Type
BENCH MARK DISK

Mon. Agency
USGS

Description: (2012)

Stamping: 1111

2.5 MILES SOUTHWEST OF ELIZABETH, 2.4 MILES SOUTHEAST ALONG COUNTY ROAD 52 FROM THE JUNCTION OF COUNTY ROAD 52 AND COUNTY ROAD 10, (THE JUNCTION IS 3.3 MILES WEST OF ELIZABETH), 60.0 FEET WEST OF THE STATION, 60.0 FEET NORTH OF THE NORTHERN PACIFIC RAILROAD.

Station Notes

THE SET DATE IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1109.850	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.310 12B = -88.304 09 = -88.192 03 = -88.140

* No Horizontal Positions in the Database *



Mn/DOT Name: 1114

NGS Name: 1114

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096224/
USGS Quad: ORWELL LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	19	131 N	43 W	460816.00	960827.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description:

Stamping: 1114

2.9 MILES WEST OF SQUIER, AT THE JUNCTION OF 120TH STREET AND 150TH AVENUE, 35.0 FEET NORTH AND 20.0 FEET EAST OF THE CENTER OF THE CROSSROADS.

Station Notes

FOUND THE MARK LOOSE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1112.737	.033	3				VERTICAL CONTROL SURVEY	1973 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.260 12B = -87.228 09 = -87.086 03 = -87.090

* No Horizontal Positions in the Database *



Mn/DOT Name: 1126

NGS Name: 1126

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096224/
USGS Quad: ORWELL LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	23	131 N	44 W	461118.00	960831.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description:

Stamping: 1126

3.2 MILES NORTHEAST OF WESTERN, 30.0 FEET WEST AND 30.0 FEET SOUTH OF THE INTERSECTION OF 155TH STREET AND 165TH AVENUE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1124.611	.033	3				VERTICAL CONTROL SURVEY	1973 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.703 12B = -87.651 09 = -87.539 03 = -87.539

* No Horizontal Positions in the Database *



Mn/DOT Name: 1146

NGS Name: 1146

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096222/
USGS Quad: WENDELL

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	34	131 N	43 W	460722.00	960338.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description:

Stamping: 1146

IN SQUIER, 30.0 FEET SOUTH AND 20.0 FEET WEST OF THE JUNCTION OF 110TH STREET AND COUNTY ROAD 25.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1144.755	.033	3				VERTICAL CONTROL SURVEY	1973 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.152 12B = -87.119 09 = -86.988 03 = -86.975

* No Horizontal Positions in the Database *



Mn/DOT Name: 1161

NGS Name: 1161

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096241/
USGS Quad: ROTH SAY

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	30	134 N	44 W	462353.00	961537.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1970	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2009)

Stamping: 1161

5.4 MILES SOUTHEAST OF ROTH SAY, 1.0 MILE EAST ALONG 300TH STREET FROM THE JUNCTION OF 300TH STREET AND COUNTY ROAD 11 IN ROTH SAY, 45.0 FEET WEST AND 25.0 FEET SOUTH OF NORTHEAST CORNER OF SECTION 30.

Station Notes

THE SET DATE IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1159.460	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.333 12B = -88.333 09 = -88.222 03 = -88.166

* No Horizontal Positions in the Database *



Mn/DOT Name: 1170 MINN

NGS Name: 1170 MINN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	24	132 N	43 W	461405.00	960215.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1170 MINN

3.8 MILES SOUTHEAST OF FERGUS FALLS, 2.2 MILES SOUTH ALONG COUNTY ROAD 82 FROM THE JUNCTION OF COUNTY ROAD 82 AND TRUNK HIGHWAY 210 IN FERGUS FALLS.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1168.377	.033	3				VERTICAL CONTROL SURVEY	1973 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.943 12B = -87.939 09 = -87.818 03 = -87.749

* No Horizontal Positions in the Database *



Mn/DOT Name: 1171

NGS Name: 1171

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	32	132 N	43 W	461235.00	960645.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description:

Stamping: 1171

6.0 MILES NORTHWEST OF SQUIER, AT THE JUNCTION OF COUNTY ROAD 2 AND 180TH AVENUE, 150.0 FEET SOUTHWEST OF A SCHOOLHOUSE AT A TEE-ROAD NORTH, 60.0 FEET NORTHWEST OF THE RESIDENCE OF CA LITTON.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1169.446	.033	3				VERTICAL CONTROL SURVEY	1973 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.838 12B = -87.815 09 = -87.684 03 = -87.651

* No Horizontal Positions in the Database *



Mn/DOT Name: 1191

NGS Name: 1191

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	16	133 N	44 W	461933.00	961304.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1970	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON POST

Disk Type
BENCH MARK DISK

Mon. Agency
USGS

Description: (2012)

Stamping: 1191

5.4 MILES WEST OF FERGUS FALLS, 3.6 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, THEN 1.5 MILES NORTH ON COUNTY ROAD 21, 1.0 MILE WEST ON COUNTY ROAD 11, THEN 1.0 MILE NORTH ON 130TH AVENUE, 30.0 FEET WEST 130TH AVENUE.

Station Notes

THE SET DATE IS UNKNOWN. PULLED THE TIES, THEY FALL IN A DITCH BOTTOM.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1189.755	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.340 12B = -88.323 09 = -88.225 03 = -88.182

* No Horizontal Positions in the Database *



Mn/DOT Name: 1192

NGS Name: 1192

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	14	131 N	43 W	460958.00	960335.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON POST	SEE DESCRIPTION	USGS

Description: Stamping: 1192

2.2 MILES NORTHEAST OF SQUIER, 15.0 FEET EAST AND 30.0 FEET SOUTH OF THE JUNCTION OF 140TH STREET AND COUNTY ROAD 25.

Station Notes

DISTURBED 10-73. PULLED THE TIES, THEY FALL IN A DITCH BOTTOM.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1190.883	.033	3				VERTICAL CONTROL SURVEY	1973 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.405 12B = -87.385 09 = -87.250 03 = -87.231

* No Horizontal Positions in the Database *



Mn/DOT Name: 12 DEM

NGS Name: 12 DEM

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096231/
USGS Quad: CAMPBELL NE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	31	132 N	44 W	461207.00	961553.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (2012)

Stamping: 12 DEM 1973

9.1 MILES SOUTHEAST OF FOXHOME, 5.5 MILES SOUTH ALONG COUNTY ROAD 19 FROM THE JUNCTION OF COUNTY ROAD 19 AND TRUNK HIGHWAY 210, THEN 2.0 MILES EAST ON T-297, THEN 197.0 FEET SOUTH ON 105TH AVENUE, THEN 154.0 FEET EAST, 1.0 FOOT SOUTHWEST OF A WITNESS POST, 2.0 FEET SOUTH OF A LIGHT POLE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1038.049	.033	3				VERTICAL CONTROL SURVEY	1973 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.953 12B = -87.900 09 = -87.818 03 = -87.789

* No Horizontal Positions in the Database *



Mn/DOT Name: 12 ERS

NGS Name: 12 ERS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096132/
USGS Quad: LAWNDAL

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	7	136 N	44 W	463633.00	961541.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1950	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	USGS

Description: (2012) Stamping: 12 ERS 1950

9.3 MILES NORTHEAST OF ROTHSA, 187.0 FEET SOUTH AND 33.0 FEET WEST OF COUNTY ROAD 30 AT A CROSSROAD, 3.0 FEET EAST OF THE SOUTHEAST CORNER OF THE HAPPY KNOLL SCHOOL YARD.

Station Notes

THE TIES FALL IN A FIELD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1238.711	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.392 12B = -87.385 09 = -87.270 03 = -87.191

* No Horizontal Positions in the Database *



Mn/DOT Name: 12 WGW

NGS Name: 12 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2055](#)
NGS Quad / Sta Num : 46095434/
USGS Quad: LAKE FRANKLIN

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	15	137 N	42 W	464035.99	955746.57	2	3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2022	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER IS STEEL ROD

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (2014)

Stamping: 12 WGW 1973

10.3 MILES NORTH OF PELICAN RAPIDS, 10.3 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE NORTH JUNCTION OF TRUNK HIGHWAYS 59 AND 108 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 250.95, 112.0 FEET SOUTHWEST OF COUNTY ROAD 31, 95.8 FEET NORTHWEST OF TRUNK HIGHWAY 59/TRUNK HIGHWAY 34, 1.0 FOOT EAST OF A WITNESS POST.

Station Notes

THE ROD DEPTH IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>	
1421.598	.016	2/1						VERTICAL ADJUSTMENT	2019	00000941	

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>				<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>	
1420.611	.033	3						VERTICAL CONTROL SURVEY	1974	USGS-VERT	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>	
1421.703	.262			1334.482	.197	2011		GPS - RTRN	2022	RTRN2022	
1421.552	.262			1334.341	.197	2011		GPS - RTRN	2014	RTRN2014	
1421.585	.262			1334.617	.197	1996		GPS - RTRN	2009	RTRN2009	

Geoid Separations(ft): GEOID18 = -87.221 12B = -87.208 09 = -87.116 03 = -86.968

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>				<u>Otter Tail County</u>				<u>Determination Method</u>		<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>	
46 40 35.98740	95 57 46.56750			438175.763	308083.703	.131	3	GPS - RTRN	2022	RTRN2022	
46 40 35.98710	95 57 46.56831			438175.706	308083.673	.131	3	GPS - RTRN	2014	RTRN2014	

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Determination Method</u>		<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>	
46 40 35.98581	95 57 46.56853			438175.691	308083.542	.131	3	GPS - RTRN	2009	RTRN2009	

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Determination Method</u>		<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>	
2194730.662	944138.863			896952.315	16973385.787	.131	3	GPS - RTRN	2022	RTRN2022	
2194730.605	944138.834			896952.257	16973385.759	.131	3	GPS - RTRN	2014	RTRN2014	

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Determination Method</u>		<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>	
2194730.587	944138.704			896952.237	16973385.629	.131	3	GPS - RTRN	2009	RTRN2009	



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/12_WGW-DQ2055-3SW-12OCT2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/12_WGW-DQ2055-2-12OCT2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/12_WGW-DQ2055-1-12OCT2022.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
SW	Oct 12, 2022
	Oct 12, 2022
	Oct 12, 2022



Mn/DOT Name: 1229

NGS Name: 1229

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	16	131 N	42 W	460906.64	955726.38		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	GOOD	Horz=YES Vert=YES	NO		PROJECTS 8 IN.	MARKER W/BAR MAGNET

Monument Type

IRON POST

Disk Type

PIPE CAP

Mon. Agency

USGS

Description: (2012)

Stamping: 1229

2.5 MILES SOUTHWEST OF DALTON, 3.4 MILES SOUTHWEST ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND COUNTY ROAD 82 IN DALTON, THEN 1.1 MILES NORTH-NORTHWEST ON VEITENHEIMER ROAD, 0.2 MILE EAST OF THE NORTH END OF TEN MILE LAKE, 1000.0 FEET NORTHWEST OF THE S. FOSSEN'S HOUSE, 47.0 FEET WEST OF VEITENHEIMER ROAD, 15.0 FEET SOUTH OF AN ENTRANCE, 4.0 FEET ON THE WEST SIDE OF A ROAD, 3.0 FEET INSIDE OF A FENCE, ON A SUMMIT, 2.0 FEET SOUTH OF WOODEN POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1227.327	.033	3				VERTICAL CONTROL SURVEY	1971	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1228.065	.262		1140.995	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.247 12B = -87.250 09 = -87.109 03 = -87.070

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 09 06.64010	95 57 26.38088	439001.075	116670.496	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2192012.714	752767.998	891200.373	16782022.770	.131	3	GPS - RTRN	2009	RTRN2009



Mn/DOT Name: 1230

NGS Name: 1230

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096132/
USGS Quad: LAWNDAL

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	7	136 N	44 W	463633.00	961539.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1930	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2010)

Stamping: 1230

7.4 MILES SOUTHEAST BARNESVILLE, 7.9 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 34 EAST OF BARNESVILLE, THEN 2.6 MILES EAST ON TRUNK HIGHWAY 108, THEN 3.4 MILES NORTH ON 110TH AVENUE, AT SCHOOL DISTRICT NUMBER 201, AT E1/4 SECTION 7.

Station Notes

THE SET DATE IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1227.826	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.392 12B = -87.385 09 = -87.270 03 = -87.191

* No Horizontal Positions in the Database *



Mn/DOT Name: 1231

NGS Name: 1231

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	31	134 N	43 W	462210.00	960744.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1970	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2012)

Stamping: 1231

0.5 MILE SOUTH OF ELIZABETH, 1.2 MILES SOUTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 10, 20.0 FEET NORTH AND 30.0 FEET WEST OF CROSSROADS.

Station Notes

THE SET DATE IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1229.414	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.268 12B = -88.264 09 = -88.146 03 = -88.074

* No Horizontal Positions in the Database *



Mn/DOT Name: 1236

NGS Name: 1236

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	30	131 N	42 W	460748.00	955952.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	1972	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON POST

Disk Type
SEE DESCRIPTION

Mon. Agency
USGS

Description: (2012)

Stamping: 1236

5.0 MILES SOUTHWEST OF DALTON, 5.8 MILES SOUTHWEST ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND COUNTY ROAD 82 IN DALTON, 150.0 FEET EAST OF THE E.T. REESBURG'S LANE, ON THE SOUTH SIDE OF A ROAD, 2.0 FEET NORTH OF A FENCE LINE.

Station Notes

THE REFERENCE LATITUDE, LONGITUDE AND SECTION, TOWNSHIP AND RANGE ARE APPROXIMATE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1233.534	.033	3				VERTICAL CONTROL SURVEY	1971	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.162 12B = -87.142 09 = -87.018 03 = -86.998

* No Horizontal Positions in the Database *



Mn/DOT Name: 1249

NGS Name: 1249

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096132/
USGS Quad: LAWNDAL

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	30	136 N	44 W	463331.00	961537.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1930	2023	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2012)

Stamping: 1249

9.3 MILES SOUTHEAST OF BARNESVILLE, 7.9 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 34 EAST OF BARNESVILLE, THEN 2.6 MILES EAST ON TRUNK HIGHWAY 108, THEN 30.0 FEET NORTH TRUNK HIGHWAY 108, THEN 40.0 FEET WEST OF 110TH AVENUE, THEN 200.0 FEET SOUTHWEST OF SCHOOL DISTRICT NUMBER 59.

Station Notes

THE SET DATE IS UNKNOWN. PULLED THE TIES, THEY FALL IN A DITCH BOTTOM.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1247.097	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.690 12B = -87.677 09 = -87.575 03 = -87.490

* No Horizontal Positions in the Database *



Mn/DOT Name: 1256

NGS Name: 1256

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	35	132 N	43 W	461153.00	960225.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1256

6.1 MILES SOUTHEAST OF FERGUS FALLS, 4.9 MILES SOUTHEAST ALONG COUNTY ROAD 25 FROM THE JUNCTION OF COUNTY ROAD 25 AND COUNTY ROAD 82 AND TRUNK HIGHWAY 210 IN FERGUS FALLS, THEN 0.4 MILE EAST ON 170TH STREET, THEN 0.9 MILE SOUTH ON 215TH AVENUE, 15.0 FEET NORTH OF A ROAD, NEAR A FENCE LINE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1254.847	.033	3				VERTICAL CONTROL SURVEY	1973 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.661 12B = -87.644 09 = -87.523 03 = -87.483

* No Horizontal Positions in the Database *



Mn/DOT Name: 1257 RESET

NGS Name: 1257 RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0483](#) [Get Map](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	33	133 N	42 W	461728.86	955837.67	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1973	2015	POOR	Horz=NO Vert=NO	YES		PROJECTS 8 IN.	MARKER IS STEEL ROD

Monument Type	Disk Type	Mon. Agency
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	PIPE CAP	USGS

Description: (1973)

Stamping: 1257 RESET 1973

4.8 MILES EAST OF FERGUS FALLS, 4.25 MILES EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 82 IN THE SOUTHEAST PART OF FERGUS FALLS, TO TRUNK HIGHWAY 210 MILEPOINT 32.50, THEN 0.5 MILE NORTH ON AURDAL RIVER ROAD, 48.0 FEET EAST OF AURDAL RIVER ROAD, 29.0 FEET NORTH OF 225TH STREET, 0.8 FOOT SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1255.814	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1255.020	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1255.020	.016	2				VERTICAL CONTROL SURVEY	1976	L23961
1255.011	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1255.670	.262		1167.514	.197	2011	GPS - RTRN	2015	RTRN2015
1255.670	.262		1167.514	.197	2011	GPS - RTRN	2015	RTRN2015
1255.568	.262		1167.652	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.140 12B = -88.153 09 = -88.031 03 = -87.916

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 28.86301	95 58 37.67320	434149.185	167564.727	.131	3	GPS - RTRN	2015	RTRN2015
46 17 28.86301	95 58 37.67320	434149.185	167564.727	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 28.86436	95 58 37.67396	434149.132	167564.864	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2188104.337	803736.472	888093.049	16833062.711	.131	3	GPS - RTRN	2015	RTRN2015
2188104.337	803736.472	888093.049	16833062.711	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2188104.287	803736.609	888093.001	16833062.850	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/1257_RESET-RO0483-3N-09SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/1257_RESET-RO0483-2-09SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/1257_RESET-RO0483-1-09SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Sep 9, 2015
	Sep 9, 2015
	Sep 9, 2015



Mn/DOT Name: 1259

NGS Name: 1259

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	33	132 N	42 W	461144.00	955840.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	1973	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON POST	SEE DESCRIPTION	USGS

Description: (2012)

Stamping: 1259

3.3 MILES NORTHWEST OF DALTON, 3.2 MILES WEST ALONG COUNTY ROAD 82 FROM THE JUNCTION OF COUNTY ROAD 82 AND COUNTY ROAD 5, THEN 0.2 MILE NORTH ON 245TH STREET, 3.0 FEET EAST OF THE LANE TO HANS RYNN'S HOUSE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1256.736	.033	3				VERTICAL CONTROL SURVEY	1971 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.572 12B = -87.575 09 = -87.441 03 = -87.388

* No Horizontal Positions in the Database *



Mn/DOT Name: 1265

NGS Name: 1265

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095333/
USGS Quad: FOURMILE LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	31	131 N	41 W	460631.00	955337.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON POST	SEE DESCRIPTION	USGS

Description:

Stamping: 1265

4.0 MILES NORTHWEST OF ASHBY, 2.9 MILES WEST ALONG COUNTY ROAD 56 FROM THE JUNCTION OF COUNTY ROAD 56 AND COUNTY ROAD 82 IN ASHBY, 2.0 FEET WEST OF A FENCE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1262.921	.033	3				VERTICAL CONTROL SURVEY	1971	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.077 12B = -87.060 09 = -86.936 03 = -86.922

* No Horizontal Positions in the Database *



Mn/DOT Name: 1281 MINN

NGS Name: 1281 MINN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	25	135 N	44 W	462817.00	961034.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1970	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2012)

Stamping: 1281 MINN

3.7 MILES SOUTHWEST OF ERHARD, 2.7 MILES WEST ALONG COUNTY ROAD 24 (MAIN STREET) FROM THE JUNCTION OF COUNTY ROAD 24 (MAIN STREET) AND TRUNK HIGHWAY 59 (FERGUS AVENUE), THEN 1.0 MILE SOUTH ON 160TH AVENUE, THEN 0.9 MILE WEST ON 350TH STREET, 30.0 FEET NORTH OF 350TH STREET, NEAR A SLOUGH.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1279.358	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.097 12B = -88.087 09 = -87.972 03 = -87.880

* No Horizontal Positions in the Database *



Mn/DOT Name: 1282 MINN

NGS Name: 1282 MINN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095331/
USGS Quad: STALKER LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	27	132 N	41 W	461302.00	954939.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	1973	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1282 MINN

12.9 MILES NORTH OF ASHBY, 10.7 MILES NORTH ALONG COUNTY ROAD 10/COUNTY ROAD 47, THEN 2.4 MILES EAST ON COUNTY ROAD 119, THEN 800.0 FEET SOUTHEAST OF THE G. KRILVANG'S HOUSE, 20.0 FEET NORTH OF A ROAD

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1280.135	.033	3				VERTICAL CONTROL SURVEY	1971 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.513 12B = -87.536 09 = -87.415 03 = -87.326

* No Horizontal Positions in the Database *



Mn/DOT Name: 1295

NGS Name: 1295

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	30	132 N	42 W	461312.00	960101.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	1973	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1295

5.8 MILES NORTHEAST OF DALTON, 7.1 MILES NORTHEAST ALONG COUNTY ROAD 82 FROM THE JUNCTION OF COUNTY ROAD 82 AND COUNTY ROAD 35 IN DALTON, THEN 0.2 MILE EAST ON 225TH AVENUE, THEN 0.1 MILE EAST ON CEDAR PARK LOOP/SWAN VIEW ACRES, 120.0 FEET NORTH OF A MAILBOX NEAR THE FORKS OF A ROAD TO JS TORGENSEN'S, 10.0 FEET EAST OF A ROAD.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.821 12B = -87.815 09 = -87.690 03 = -87.624



Mn/DOT Name: 1296

NGS Name: 1296

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	9	135 N	43 W	463118.00	960617.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1930	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2010)

Stamping: 1296

3.1 MILES SOUTH OF PELICAN RAPIDS, 3.4 MILES SOUTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 IN PELICAN RAPIDS, THEN 0.9 MILE WEST ON COUNTY ROAD 28, AT A PUBLIC ROAD CROSSING, IN THE SOUTHWEST CORNER OF A ROAD CROSSING, IN THE SOUTHWEST CORNER NEAR A FENCE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1294.600	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.812 12B = -87.808 09 = -87.684 03 = -87.569

* No Horizontal Positions in the Database *



Mn/DOT Name: 13 WHV

NGS Name: 13 WHV

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096241/
USGS Quad: ROTHSA

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	19	135 N	44 W	462956.00	961539.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1950	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	USGS

Description: (2012) Stamping: 13 WHV 1950

1.6 MILES NORTHEAST OF ROTHSA, 1.2 MILES NORTH ALONG COUNTY ROAD 11 FROM THE JUNCTION OF COUNTY ROAD 11 AND INTERSTATE HIGHWAY 94, THEN 0.9 MILE EAST ON 370TH STREET, 509.0 FEET SOUTH AND 30.0 FEET WEST OF THE CROSSROADS.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1285.102	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.051 12B = -88.038 09 = -87.943 03 = -87.861

* No Horizontal Positions in the Database *



Mn/DOT Name: 1300 MINN

NGS Name: 1300 MINN

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	7	133 N	42 W	462118.00	960146.00		

NGS ACRN:
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

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<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1970	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2012)

Stamping: 1300 MINN

4.2 MILES NORTHEAST OF FERGUS FALLS, 4.6 MILES NORTH ALONG COUNTY ROAD 111 FROM THE JUNCTION OF COUNTY ROAD 111 AND COUNTY ROAD 1 (FIR AVENUE), 150.0 FEET NORTHEAST OF HOLDHUSENS HOUSE, 20.0 FEET EAST OF COUNTY ROAD 111.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1298.521	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.218 12B = -88.218 09 = -88.103 03 = -87.992

* No Horizontal Positions in the Database *



Mn/DOT Name: 1308

NGS Name: 1308

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	5	133 N	43 W	462209.00	960801.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1970	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON POST	BENCH MARK DISK	USGS

Description: (2012)

Stamping: 1308

5.0 MILES NORTH-NORTHWEST OF FERGUS FALLS, 2.1 MILES NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94 NORTH OF FERGUS FALLS, THEN 0.4 MILE WEST ON 280TH STREET, 30.0 FEET NORTH AND 25.0 FEET EAST OF FORKS IN A ROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1306.841	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.268 12B = -88.264 09 = -88.149 03 = -88.077

* No Horizontal Positions in the Database *



Mn/DOT Name: 1309

NGS Name: 1309

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	27	136 N	43 W	463401.00	960501.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1930	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2012)

Stamping: 1309

IN PELICAN RAPIDS, 0.2 MILE SOUTH ALONG TRUNK HIGHWAY 52 (SOUTH BROADWAY) FROM THE JUNCTION OF TRUNK HIGHWAY 52 AND TRUNK HIGHWAY 108, IN THE SOUTHEAST CORNER OF GREAT NORTHERN RAILROAD LAND RESERVE, AT THE CORNER OF BROADWAY STREET (TRUNK HIGHWAY 59) AND DEPOT STREET.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1306.700	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.611 12B = -87.602 09 = -87.487 03 = -87.355

* No Horizontal Positions in the Database *



Mn/DOT Name: 1312

NGS Name: 1312

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096132/
USGS Quad: LAWNDAL

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	18	135 N	44 W	463053.00	961539.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1930	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2012)

Stamping: 1312

11.5 MILES SOUTHEAST OF BARNESVILLE, 7.9 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 34 EAST OF BARNESVILLE, THEN 2.6 MILES EAST ON TRUNK HIGHWAY 108, THEN 3.0 MILES SOUTH ON 110TH AVENUE, 20.0 FEET WEST 110TH AVENUE, 20.0 FEET SOUTH COUNTY ROAD 28.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1309.561	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.969 12B = -87.949 09 = -87.861 03 = -87.779

* No Horizontal Positions in the Database *



Mn/DOT Name: 1313

NGS Name: 1313

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	21	132 N	42 W	461421.98	955823.79		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2009	2009	DESTROYED	Horz=NO Vert=NO	YES		PROJECTS 3 IN.	MARKER W/BAR MAGNET

Monument Type

PIPE (<10 FT)

Disk Type

PIPE CAP

Mon. Agency

MNDT

Description: (2012)

Stamping: 1313

5.6 MILES SOUTHEAST OF FERGUS FALLS, 3.25 MILES EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 82 (IN THE SOUTHEAST PART OF FERGUS FALLS), TO TRUNK HIGHWAY 210 MILEPOINT 31.55, THENCE 2.85 MILES SOUTH AND EAST ALONG COUNTY ROAD 33, 0.05 MILE WEST ALONG 248TH AVENUE, 164.7 FEET WEST OF COUNTY ROAD 33, 39.2 FEET NORTH OF 248TH AVENUE (1113 TOWNSHIP ROAD), 34.6 FEET WEST OF 190TH STREET (1114TH TOWNSHIP ROAD), 3.8 FEET NORTHEAST OF CABLE BOX NUMBER 206 (OR NUMBER 20 6), 3.0 FEET NORTH OF CABLE BOX NUMBER 24 A (OR NUMBER 244), 5.7 FEET NORTHEAST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1312.248	.262		1224.545	.197	1996	GPS - RTRN	2009	RTRN2009	

Geoid Separations(ft): GEOID18 = -87.907 12B = -87.907 09 = -87.792 03 = -87.700

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 14 21.98209	95 58 23.78527	435063.081	148629.229	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2188667.469	784789.828	888357.712	16814103.417	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/1313-3W-17AUG2009.jpg	W	Aug 17, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/1313-2-17AUG2009.jpg		Aug 17, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/1313-1-17AUG2009.jpg		Aug 17, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 1313 Q220

NGS Name: 1313 Q220

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095344/
USGS Quad: HEILBERGER LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	26	134 N	42 W	462319.00	955623.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			MARKER IS STEEL ROD

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1313 MINN

9.0 MILES EAST-NORTHEAST OF ELIZABETH, 7.0 MILES EAST ALONG COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND TRUNK HIGHWAY 59, THEN 2.1 MILES EAST ON COUNTY ROAD 1, THEN 1.4 MILES NORTH ON COUNTY ROAD 43, 0.4 MILE NORTHEAST OF WEGLAND, THEN 0.1 MILE EAST ON BRIDGEVIEW DRIVE, 60.0 FEET NORTH OF THE NORTH END OF WEGLAND BRIDGE OVER THE OTTERTAIL RIVER IN FORKS OF A ROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1311.201	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.100 12B = -88.100 09 = -87.989 03 = -87.848

* No Horizontal Positions in the Database *



Mn/DOT Name: 1313 Q221

NGS Name: 1313 Q221

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	24	133 N	43 W	461848.00	960156.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2008)

Stamping: 1313 MINN

3.2 MILES NORTHEAST OF FERGUS FALLS, 1.41 MILES NORTH ALONG COUNTY ROAD 1 FROM THE JUNCTION OF EAST LINCOLN AVENUE AND COUNTY ROAD 1 (FIR AVENUE), 1.70 MILES NORTH ON COUNTY ROAD 111, 150.0 FEET WEST OF A SCHOOLHOUSE.

Station Notes

THE SCHOOLHOUSE HAS BEEN REMOVED, THE AREA IS NOW A GRAVEL PIT.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1311.169	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.225 12B = -88.222 09 = -88.113 03 = -88.012

* No Horizontal Positions in the Database *



Mn/DOT Name: 1316 1973

NGS Name: 1316 1973

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095341/
USGS Quad: PHELPS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	23	134 N	41 W	462353.10	954821.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1911	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON POST

Disk Type
SEE DESCRIPTION

Mon. Agency
USGS

Description: (2008)

Stamping: 1316 1973

1.2 MILES SOUTHEAST OF MAINE, 1.0 MILE SOUTH ALONG COUNTY ROAD 45 FROM THE JUNCTION OF COUNTY ROAD 45 AND COUNTY ROAD 74 IN MAINE, THEN 0.5 MILE EAST ON 300TH STREET, THEN 151.0 FEET NORTH ON 328TH STREET.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.021 12B = -88.018 09 = -87.897 03 = -87.752



Mn/DOT Name: 1318

NGS Name: 1318

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095331/
USGS Quad: STALKER LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	12	131 N	41 W	461047.00	954716.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON POST

Disk Type
SEE DESCRIPTION

Mon. Agency
USGS

Description: (2012)

Stamping: 1318

6.8 MILES NORTHEAST OF ASHBY, 1.0 MILE NORTH ALONG COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND COUNTY ROAD 82, THEN 5.9 MILES NORTH ALONG COUNTY ROAD 47, THEN 0.1 MILE EAST ON COUNTY ROAD 12 (355TH AVENUE).

Station Notes

30.0 FEET NORTH OF A CIRCULAR MAILBOX.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1315.978	.033	3				VERTICAL CONTROL SURVEY	1971 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.228 12B = -87.237 09 = -87.129 03 = -87.073

* No Horizontal Positions in the Database *



Mn/DOT Name: 1319

NGS Name: 1319

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	17	136 N	42 W	463600.00	960019.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			MARKER IS STEEL ROD

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description:

Stamping: 1319

4.2 MILES NORTHEAST OF PELICAN RAPIDS, 2.6 MILES EAST ALONG COUNTY ROAD 4 FROM THE JUNCTION OF COUNTY ROAD 4 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, ON THE SOUTHEAST CORNER OF A TEE-ROAD SOUTH.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1317.599	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.487 12B = -87.477 09 = -87.365 03 = -87.214

* No Horizontal Positions in the Database *



Mn/DOT Name: 1320

NGS Name: 1320

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	11	136 N	44 W	463619.00	961037.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1930	1973	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON POST

Disk Type
BENCH MARK DISK

Mon. Agency
USGS

Description: (2012)

Stamping: 1320

7.7 MILES NORTHWEST OF PELICAN RAPIDS, 4.4 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 (1ST AVENUE) AND TRUNK HIGHWAY 59 (NORTH BROADWAY), THEN 2.2 MILES NORTH ON TRUNK HIGHWAY 30, THEN 0.05 MILE NORTH ON 150TH AVENUE, 20.0 FEET WEST OF 150TH AVENUE, 20.0 FEET SOUTH OF 443RD AVENUE.

Station Notes

THE SET DATE IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1318.400	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.454 12B = -87.437 09 = -87.319 03 = -87.228

* No Horizontal Positions in the Database *



Mn/DOT Name: 1321

NGS Name: 1321

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095344/
USGS Quad: HEILBERGER LAKE
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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	31	134 N	41 W	462252.00	955409.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			MARKER IS STEEL ROD

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON POST	SEE DESCRIPTION	USGS

Description: (2010)

Stamping: 1321

4.6 MILES SOUTHWEST OF MAINE, 0.9 MILE NORTH ALONG WATER STREET ROAD FROM THE JUNCTION OF WATER STREET ROAD AND COUNTY ROAD 1/RESORT ROAD IN MAINE, ON THE EAST SIDE OF A ROAD, AT A TEE-ROAD IN BETWEEN TWO LAKES.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1319.587	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.090 12B = -88.097 09 = -87.982 03 = -87.831

* No Horizontal Positions in the Database *



Mn/DOT Name: 1322

NGS Name: 1322

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	8	135 N	42 W	463113.00	955933.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	NOT FOUND	Horz=? Vert=YES	NO			MARKER IS STEEL ROD

Monument Type
IRON POST

Disk Type
SEE DESCRIPTION

Mon. Agency
USGS

Description: (2012)

Stamping: 1322

5.5 MILES SOUTHEAST OF PELICAN RAPIDS, 5.0 MILES EAST ALONG COUNTY ROAD 3 FROM THE JUNCTION OF COUNTY ROAD 3 AND TRUNK HIGHWAY 53 IN PELICAN RAPIDS, ON THE SOUTH END OF LAKE LIDA, 150.0 FEET WEST OF FORKS OF A ROAD, NEAR THE CH BAKKEN'S MAILBOX.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1319.899	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.766 12B = -87.746 09 = -87.647 03 = -87.503

* No Horizontal Positions in the Database *



Mn/DOT Name: 1322 MINN

NGS Name: 1322 MINN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	21	135 N	43 W	462909.00	960649.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1970	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2008)

Stamping: 1322 MINN

0.7 MILE WEST OF ERHARD, 0.7 MILE WEST ALONG COUNTY ROAD 24 (MAIN STREET) FROM THE JUNCTION OF COUNTY ROAD 24 (MAIN STREET) AND TRUNK HIGHWAY 59 (FERGUS AVENUE), 200.0 FEET NORTH OF A SCHOOLHOUSE (DISTRICT 36).

Station Notes

THE SET DATE IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1320.657	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.982 12B = -87.969 09 = -87.861 03 = -87.756

* No Horizontal Positions in the Database *



Mn/DOT Name: 1324

NGS Name: 1324

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	14	136 N	42 W	463600.00	955609.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	NOT FOUND	Horz=? Vert=YES	NO			MARKER IS STEEL ROD

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1324

7.1 MILES NORTHEAST OF PELICAN RAPIDS, 6.1 MILES EAST ALONG COUNTY ROAD 4 FROM THE JUNCTION OF COUNTY ROAD 4 AND TRUNK HIGHWAY 59, THEN 144.0 FEET SOUTH ON 275TH AVENUE, 530.0 FEET NORTHWEST OF THE OLD LIDA POST OFFICE, AT A TEE-ROAD SOUTH, NEAR A SIGNPOST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1321.799	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.359 12B = -87.346 09 = -87.247 03 = -87.090

* No Horizontal Positions in the Database *



Mn/DOT Name: 1326

NGS Name: 1326

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095332/
USGS Quad: ASHBY

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	29	131 N	41 W	460722.00	955114.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON POST

Disk Type
SEE DESCRIPTION

Mon. Agency
USGS

Description: (2012)

Stamping: 1326

3.0 MILES NORTHWEST OF ASHBY, 2.3 MILES NORTHWEST ALONG COUNTY ROAD 82 FROM THE JUNCTION OF COUNTY ROAD 82 AND COUNTY ROAD 4 IN ASHBY, THEN 0.4 MILE NORTH ON COUNTY ROAD 117, THEN 141.0 FEET WEST ON 110TH STREET, 60.0 FEET NORTHWEST OF AL ANDERSON'S MAILBOX, 3.0 FEET EAST OF A FENCE.

Station Notes

FALLS INTO A FIELD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1324.256	.033	3				VERTICAL CONTROL SURVEY	1971 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.093 12B = -87.093 09 = -86.968 03 = -86.945

* No Horizontal Positions in the Database *



Mn/DOT Name: 1326 1973

NGS Name: 1326 1973

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	21	133 N	42 W	461931.00	955837.80		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	1973	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE POST (PREFABRICATED)	SEE DESCRIPTION	USGS

Description: (2012)

Stamping: 1326 1973

5.6 MILES NORTHEAST OF FERGUS FALLS, 3.8 MILES EAST ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND COUNTY ROAD 111, THEN 1.5 MILES EAST ON COUNTY ROAD 18, THEN 217.0 FEET SOUTH ON AURDAL RIVER ROAD.

Station Notes

TOWNSHIP 133N, RANGE 42W, NORTHEAST CORNER OF THE NORTHWEST QUARTER OF SECTION 21, 15.0 FEET WEST BY 45.0 FEET SOUTH OF THE CROSSROADS, 70.0 FEET NORTHEAST OF A WHITE CHURCH.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1325.083	.033	3				VERTICAL CONTROL SURVEY		1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.186 12B = -88.189 09 = -88.074 03 = -87.953

* No Horizontal Positions in the Database *



Mn/DOT Name: 1327

NGS Name: 1327

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096121/
USGS Quad: CORMORANT

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	1	137 N	43 W	464234.00	960349.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1930	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2010)

Stamping: 1327

1.4 MILES SOUTH OF CORMORANT, 1.5 MILES SOUTH ALONG COUNTY ROAD 5 FROM THE JUNCTION OF COUNTY ROAD 5 AND COUNTY ROAD 11 IN CORMORANT, AT A 90 DEGREE TURN IN COUNTY ROAD 9, 40.0 FEET WEST OF COUNTY ROAD 9, 10.0 FEET NORTH OF COUNTY ROAD 9, AT THE CHAS BOSEER'S MAILBOX.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1325.601	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.198 12B = -87.175 09 = -87.063 03 = -86.962

* No Horizontal Positions in the Database *



Mn/DOT Name: 1329 1973

NGS Name: 1329 1973

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	4	133 N	42 W	462209.10	955803.46		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	1973	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE POST (PREFABRICATED)	SURVEY DISK	USGS

Description: (2012)

Stamping: 1329 1973

7.8 MILES NORTHEAST OF FERGUS FALLS, 4.2 MILES NORTH ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND COUNTY ROAD 18, THEN 46.0 FEET SOUTH ON BREKKE LAKE ROAD.

Station Notes

TOWNSHIP 133N, RANGE 42W SECTION 4, 20.0 FEET EAST BY 30.0 FEET NORTH OF A FORK, IN A ROAD NEAR A FENCE LINE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1327.291	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.149 12B = -88.149 09 = -88.038 03 = -87.907

* No Horizontal Positions in the Database *



Mn/DOT Name: 1330

NGS Name: 1330

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095434/
USGS Quad: LAKE FRANKLIN

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	35	137 N	42 W	463747.00	955656.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	NOT FOUND	Horz=? Vert=YES	NO			MARKER IS STEEL ROD

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1330

7.6 MILES NORTHEAST OF PELICAN RAPIDS, 2.5 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108, THEN 4.1 MILES EAST ON COUNTY ROAD 4, THEN 1.8 MILES NORTHEAST ALONG COUNTY ROAD 31, THEN 0.6 MILE EAST ON 460TH STREET, 450.0 FEET EAST OF A TEE-ROAD NORTH, ON THE NORTH SIDE OF A ROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1327.999	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.326 12B = -87.303 09 = -87.214 03 = -87.060

* No Horizontal Positions in the Database *



Mn/DOT Name: 1332

NGS Name: 1332

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095341/
USGS Quad: PHELPS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	1	134 N	41 W	462628.90	954650.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1963	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	USGS

Description: (2012)

Stamping: 1332

4.6 MILES SOUTHWEST OF BASSWOOD, 4.6 MILES WEST ON COUNTY ROAD 32 (340TH STREET) FROM THE JUNCTION OF COUNTY ROAD 32 (340TH STREET) AND COUNTY ROAD 14 IN BASSWOOD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1330.115	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.936 12B = -87.933 09 = -87.802 03 = -87.664

* No Horizontal Positions in the Database *



Mn/DOT Name: 1336

NGS Name: 1336

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	7	135 N	40 W	463130.00	954632.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			MARKER IS STEEL ROD

Monument Type
IRON POST

Disk Type
SEE DESCRIPTION

Mon. Agency
USGS

Description: (2012)

Stamping: 1336

3.4 MILES SOUTHWEST OF DENT, 2.9 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35, THEN 2.4 MILES SOUTH ON BEAVER DAM ROAD, 1000.0 FEET SOUTHEAST OF NORTHWEST CORNER OF SECTION 7, 15.0 FEET EAST OF A ROAD, 10.0 FEET NORTH OF A DRIVE LEADING TO THE H WISHNACH'S HOUSE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1333.800	.033	3				VERTICAL CONTROL SURVEY		1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.451 12B = -87.444 09 = -87.316 03 = -87.201

* No Horizontal Positions in the Database *



Mn/DOT Name: 1337

NGS Name: 1337

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095341/
USGS Quad: PHELPS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	3	134 N	41 W	462718.50	955032.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1963	2009	NOT FOUND	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	USGS

Description:

Stamping: 1337

4.0 MILES NORTHWEST OF MAINE, 0.5 MILE NORTH ON COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND COUNTY ROAD 115 IN MAINE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1336.864	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.894 12B = -87.890 09 = -87.769 03 = -87.618

* No Horizontal Positions in the Database *



Mn/DOT Name: 1338 MIN

NGS Name: 1338 MIN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	24	134 N	44 W	462355.00	960918.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1969	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2012)

Stamping: 1338 MINN

1.4 MILES NORTHWEST OF ELIZABETH, 1.5 MILES WEST ALONG COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND TRUNK HIGHWAY 59 IN ELIZABETH, THEN 1.0 MILE NORTH ON 160TH AVENUE, 20.0 FEET WEST OF FORKS IN A ROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1336.956	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.235 12B = -88.231 09 = -88.120 03 = -88.044

* No Horizontal Positions in the Database *



Mn/DOT Name: 1338 MINN

NGS Name: 1338 MINN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	7	135 N	43 W	463146.00	960917.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1970	1973	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2012)

Stamping: 1338 MINN

4.0 MILES NORTHWEST OF ERHARD, 2.6 MILES NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 (FERGUS AVENUE) AND COUNTY ROAD 24 (MAIN STREET) IN ERHARD, THEN 3.2 MILES WEST ON COUNTY ROAD 28, THEN 0.5 MILE NORTH ON 160TH AVENUE, 15.0 FEET NORTH AND 30.0 FEET WEST OF A FORK IN A ROAD, AT THE EDGE OF THE O. ZIMMERMAN'S FARM.

Station Notes

THE SET DATE IS UNKNOWN.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.815 12B = -87.798 09 = -87.693 03 = -87.595



Mn/DOT Name: 1339

NGS Name: 1339

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096121/
USGS Quad: CORMORANT

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	36	137 N	43 W	463840.00	960245.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1930	2014	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON POST	BENCH MARK DISK	USGS

Description: (2012)

Stamping: 1339

4.9 MILES NORTH OF PELICAN RAPIDS, 5.6 MILES NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 IN PELICAN RAPIDS, AT THE SOUTHWEST CORNER OF THE CROSSROADS.

Station Notes

THE SET DATE IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1337.399	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.372 12B = -87.352 09 = -87.247 03 = -87.116

* No Horizontal Positions in the Database *



Mn/DOT Name: 1339 MINN

NGS Name: 1339

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	35	133 N	42 W	461722.00	955606.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	1973	DESTROYED	Horz=NO Vert=NO	NO			MARKER IS STEEL ROD

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1339

3.2 MILES WEST OF UNDERWOOD, 3.0 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35, THEN 0.5 MILE NORTH ON 265TH AVENUE, THEN 140.9 FEET EAST ON 225TH STREET, 50.0 FEET NORTH OF A RAILROAD, IN THE SOUTHEAST CORNER OF A TEE-ROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1337.596	.033	3				VERTICAL CONTROL SURVEY		1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.077 12B = -88.097 09 = -87.979 03 = -87.844

* No Horizontal Positions in the Database *



Mn/DOT Name: 1341 1973

NGS Name: 1341 1973

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	34	134 N	41 W	462208.00	954759.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1910	2005	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON POST	BENCH MARK DISK	USGS

Description: (2012)

Stamping: 1341 1973

3.1 MILES SOUTH-SOUTHWEST OF MAINE, 3.8 MILES SOUTH ALONG COUNTY ROAD 45 FROM THE JUNCTION OF COUNTY ROAD 45 AND COUNTY ROAD 74, THEN 0.4 MILE EAST ON COUNTY ROAD 1.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1339.873	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.025 12B = -88.028 09 = -87.910 03 = -87.759

* No Horizontal Positions in the Database *



Mn/DOT Name: 1342

NGS Name: 1342

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096121/
USGS Quad: CORMORANT

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	7	137 N	42 W	464117.00	960249.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1930	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2012)

Stamping: 1342

3.0 MILES SOUTH OF CORMORANT, 0.8 MILE SOUTH ON COUNTY ROAD 5 FROM THE JUNCTION OF COUNTY ROAD 5 AND COUNTY ROAD 11 IN CORMORANT, THEN 2.2 MILES SOUTH AND SOUTHWEST ALONG COUNTY ROAD 9, THEN 1.6 MILES SOUTHEAST AND EAST ON SHORE DRIVE, NORTH OF SHORE DRIVE, ON THE EAST SIDE OF 215TH AVENUE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1340.001	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.234 12B = -87.228 09 = -87.109 03 = -86.988

* No Horizontal Positions in the Database *



Mn/DOT Name: 1342 MINN

NGS Name: 1342 MINN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	36	133 N	41 W	461718.00	954757.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			MARKER IS STEEL ROD

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1342 MINN

3.6 MILES EAST OF UNDERWOOD, 3.7 MILES EAST ALONG COUNTY ROAD 122 FROM THE JUNCTION OF COUNTY ROAD 122 AND COUNTY ROAD 35, 45.0 FEET SOUTH OF A RAILROAD, ON THE RIGHT-OF-WAY, 15.0 FEET EAST OF A TEE-ROAD NORTH.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1340.152	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.848 12B = -87.861 09 = -87.756 03 = -87.624

* No Horizontal Positions in the Database *



Mn/DOT Name: 1343

NGS Name: 1343

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	32	133 N	41 W	461709.00	955214.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			MARKER IS STEEL ROD

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1343

IN UNDERWOOD, 0.4 MILE NORTHEAST ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 210, THEN 233.0 FEET EAST ON CENTENNIAL AVENUE EAST, 40.0 FEET WEST OF THE RAILROAD STATION, 20.0 FEET SOUTH OF THE RAILROAD TRACKS, IN A SMALL GRASS PARK.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1341.221	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.972 12B = -87.999 09 = -87.884 03 = -87.739

* No Horizontal Positions in the Database *



Mn/DOT Name: 1345

NGS Name: 1345

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	14	132 N	42 W	461421.00	955502.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1345

3.8 MILES SOUTHWEST OF UNDERWOOD, 3.5 MILES SOUTHWEST ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 210, THEN 1.1 MILES WEST ON COUNTY HIGHWAY 40, 700.0 FEET SOUTHEAST OF P JOHNSON'S HOUSE, 30.0 FEET WEST AND 10.0 FEET NORTH OF A CORNER NEAR A FENCE LINE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1342.950	.033	3				VERTICAL CONTROL SURVEY	1971 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.825 12B = -87.834 09 = -87.723 03 = -87.621

* No Horizontal Positions in the Database *



Mn/DOT Name: 1345 MINN

NGS Name: 1345

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095423/
USGS Quad: DENT

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	2	135 N	40 W	463140.00	954112.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1345

2.2 MILES SOUTHEAST OF DENT, 1.5 MILES EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35, THEN 2.0 MILES SOUTH ON 385TH AVENUE/COZY COVE ROAD, NEAR THE SOUTH CORNER OF SECTION 2, AT THE SOUTHEAST CORNER OF THE CROSSING OF A PUBLIC HIGHWAY.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1343.301	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.536 12B = -87.529 09 = -87.405 03 = -87.293

* No Horizontal Positions in the Database *



Mn/DOT Name: 1345 MINNE

NGS Name: 1345 MINNE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	14	134 N	43 W	462448.58	960359.19		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1345 MINN

3.8 MILES NORTHEAST OF ELIZABETH, 2.9 MILES EAST ALONG COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND TRUNK HIGHWAY 59, THEN 3.1 MILES NORTH ON COUNTY ROAD 27, THEN 243.0 FEET EAST ON WEST JEWETT DRIVE, AT THE EAST JUNCTION OF WEST JEWETT DRIVE AND COUNTY ROAD 27, 35.0 FEET NORTHEAST OF THE B. LANGER'S MAILBOX.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1343.514	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.156 12B = -88.163 09 = -88.028 03 = -87.926

* No Horizontal Positions in the Database *



Mn/DOT Name: 1347 MINN

NGS Name: 1347

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	20	133 N	41 W	461907.00	955220.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1347

2.3 MILES NORTH OF UNDERWOOD, 3.0 MILES NORTH ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 210 IN UNDERWOOD, 75.0 FEET NORTHWEST OF A SCHOOLHOUSE, IN THE SOUTHEAST CORNER OF THE C.A. WEAVER'S FARM.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1345.840	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.064 12B = -88.084 09 = -87.969 03 = -87.815

* No Horizontal Positions in the Database *



Mn/DOT Name: 1348 MINN

NGS Name: 1348 MINN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095341/
USGS Quad: PHELPS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	13	135 N	41 W	462956.00	954804.00			1911	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION
<u>Monument Type</u>				<u>Disk Type</u>				<u>Mon. Agency</u>							
IRON POST				SEE DESCRIPTION				USGS							

Description: (2012)

Stamping: 1348 MINN

5.5 MILES SOUTHWEST OF DENT, 6.8 MILES SOUTHWEST ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 108, ON THE SOUTHEAST SIDE OF STAR LAKE, 200.0 FEET NORTH OF THE SOUTHWEST CORNER OF SECTION 13, IN THE SOUTH ROAD DITCH OF COUNTY ROAD 35.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1346.402	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.654 12B = -87.634 09 = -87.526 03 = -87.398

* No Horizontal Positions in the Database *



Mn/DOT Name: 1349

NGS Name: 1349

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095341/
USGS Quad: PHELPS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	21	134 N	41 W	462353.00	955148.00			1910	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION
<u>Monument Type</u>				<u>Disk Type</u>				<u>Mon. Agency</u>							
IRON POST				SEE DESCRIPTION				USGS							

Description: (2008)

Stamping: 1349

2.4 MILES SOUTHWEST OF MAINE, 1.2 MILES SOUTH ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND COUNTY ROAD 74 IN MAINE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1347.422	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.041 12B = -88.041 09 = -87.930 03 = -87.775

* No Horizontal Positions in the Database *



Mn/DOT Name: 1350

NGS Name: 1350

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	35	136 N	44 W	463330.00	961054.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1930	2023	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON POST

Disk Type
BENCH MARK DISK

Mon. Agency
USGS

Description: (2012)

Stamping: 1350

4.4 MILES WEST OF PELICAN RAPIDS, 5.3 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 (1ST AVENUE) AND TRUNK HIGHWAY 59 (NORTH BROADWAY), THEN 0.3 MILE SOUTH ON 147TH AVENUE, 20.0 FEET WEST 147TH AVENUE, 20.0 FEET SOUTH 410TH STREET.

Station Notes

THE SET DATE IS UNKNOWN. PULLED THE TIES, THEY FALL IN A DITCH BOTTOM.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1347.701	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.684 12B = -87.667 09 = -87.559 03 = -87.464

* No Horizontal Positions in the Database *



Mn/DOT Name: 1352

NGS Name: 1352

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	12	136 N	43 W	463602.00	960306.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1930	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON POST

Disk Type
BENCH MARK DISK

Mon. Agency
USGS

Description: (2012)

Stamping: 1352

2.2 MILES NORTHEAST OF PELICAN RAPIDS, 2.2 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 IN PELICAN RAPIDS, THEN 0.3 MILE EAST ON COUNTY ROAD 4, AT THE NORTHEAST CORNER OF THE CROSSROADS.

Station Notes

THE SET DATE IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1350.201	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.497 12B = -87.487 09 = -87.372 03 = -87.234

* No Horizontal Positions in the Database *



Mn/DOT Name: 1354 MINN

NGS Name: 1354 MINN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	23	134 N	43 W	462356.00	960304.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1970	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2012)

Stamping: 1354 MINN

3.9 MILES NORTHEAST OF ELIZABETH, 2.9 MILES EAST ALONG COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND TRUNK HIGHWAY 59 IN ELIZABETH, THEN 2.0 MILES NORTH ON COUNTY ROAD 27, THEN 0.9 MILE EAST ON COUNTY ROAD 22, 55.0 FEET NORTH OF COUNTY ROAD 22, 10.0 FEET WEST OF 210TH AVENUE, AT THE EDGE OF THE C. F. LADWIGS FARM.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1352.376	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.172 12B = -88.176 09 = -88.048 03 = -87.939

* No Horizontal Positions in the Database *



Mn/DOT Name: 1357

NGS Name: 1357

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	26	133 N	40 W	461840.00	954055.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	NOT FOUND	Horz=NO Vert=NO	NO			MARKER IS STEEL ROD

Monument Type

IRON POST

Disk Type

SURVEY DISK

Mon. Agency

USGS

Description: (2012)

Stamping: 1357

2.6 MILES NORTHEAST OF BATTLE LAKE, 2.2 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND COUNTY ROAD 83 (HOLDT STREET WEST), THEN 1.7 MILES EAST ON COUNTY ROAD 16, ON THE SOUTH SIDE OF THE ROAD AT A TEE-ROAD NORTH.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1356.096	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.644 12B = -87.647 09 = -87.529 03 = -87.437

* No Horizontal Positions in the Database *



Mn/DOT Name: 1358

NGS Name: 1358

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095331/
USGS Quad: STALKER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	7	131 N	41 W	461011.00	955226.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	1973	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1358

2.0 MILES EAST OF DALTON, 2.0 MILES EAST ALONG COUNTY ROAD 12 (EAST MAIN STREET) FROM THE JUNCTION OF COUNTY ROAD 12 AND COUNTY ROAD 35, THEN 0.2 MILE SOUTH ON COUNTY ROAD 117, 100.0 FEET NORTHEAST OF THE SYNOD CHURCH.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1356.247	.033	3				VERTICAL CONTROL SURVEY	1971 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.293 12B = -87.306 09 = -87.175 03 = -87.129

* No Horizontal Positions in the Database *



Mn/DOT Name: 1361 1973

NGS Name: 1361 1973

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	23	134 N	41 W	462352.43	954840.30		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1933	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON POST	SEE DESCRIPTION	USGS

Description: (2008)

Stamping: 1361

1.2 MILES SOUTHEAST OF MAINE, 1.0 MILE SOUTH ALONG COUNTY ROAD 45 FROM THE JUNCTION OF COUNTY ROAD 45
AND COUNTY ROAD 74 IN MAINE, THEN 0.3 MILE EAST ON 300TH STREET.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1359.902	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.021 12B = -88.018 09 = -87.897 03 = -87.752

* No Horizontal Positions in the Database *



Mn/DOT Name: 1361 MINN

NGS Name: 1361 MINN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	11	134 N	43 W	462615.00	960338.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1933	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description:

Stamping: 1361 MINN

3.75 MILES SOUTH OF ERHARD, 4.5 MILES SOUTH AND WEST ALONG COUNTY ROAD 27 FROM THE JUNCTION OF COUNTY ROAD 27 AND COUNTY ROAD 24 IN ERHARD, 60.0 FEET SOUTHWEST OF A SCHOOLHOUSE, 20.0 FEET EAST OF COUNTY ROAD 27.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1359.896	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.090 12B = -88.090 09 = -87.962 03 = -87.851

* No Horizontal Positions in the Database *



Mn/DOT Name: 1363 MINN

NGS Name: 1363 MINN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095344/
USGS Quad: HEILBERGER LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	31	135 N	41 W	462740.00	955307.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	NOT FOUND	Horz=? Vert=YES	YES			MARKER IS STEEL ROD

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1363 MINN

10.3 MILES EAST-SOUTHEAST OF ERHARD, 10.0 MILES EAST ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND TRUNK HIGHWAY 59 IN ERHARD, THEN 1.0 MILE SOUTH OF 285TH AVENUE, 0.5 MILE EAST OF A ROAD, 555.0 FEET NORTH OF THE SOUTHWEST CORNER OF THE SOUTHEAST CORNER OF SECTION 31.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1361.277	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.887 12B = -87.880 09 = -87.762 03 = -87.615

* No Horizontal Positions in the Database *



Mn/DOT Name: 1364

NGS Name: 1364

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	34	136 N	40 W	463320.00	954255.00		

NGS ACRN:
NGS Quad / Sta Num : 46095423/
USGS Quad: DENT

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<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2023	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON POST

Disk Type
SEE DESCRIPTION

Mon. Agency
USGS

Description: (2012)

Stamping: 1364

IN DENT, 0.2 MILE SOUTHEAST ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 108, THEN 348.0 FEET NORTHEAST ON ELM STREET, 1000.0 FEET NORTH OF THE STATION, AT THE JUNCTION OF RAILWAY AVENUE AND ELM STREET, AT THE RAILROAD CROSSING, ON THE EAST SIDE OF A TRACK.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1362.199	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.355 12B = -87.339 09 = -87.228 03 = -87.119

* No Horizontal Positions in the Database *



Mn/DOT Name: 1364 MINN

NGS Name: 1364

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095423/
USGS Quad: DENT

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	9	136 N	40 W	463601.00	954348.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type
IRON POST

Disk Type
SEE DESCRIPTION

Mon. Agency
USGS

Description: (2012)

Stamping: 1364

7.0 MILES WEST OF PERHAM, 7.1 MILES WEST ALONG COUNTY ROAD 34 FROM THE JUNCTION OF COUNTY ROAD 34 AND COUNTY ROAD 80, THEN 0.3 MILE NORTH ON COUNTY ROAD 35 (370TH AVENUE).

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1362.399	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.201 12B = -87.172 09 = -87.086 03 = -86.981

* No Horizontal Positions in the Database *



Mn/DOT Name: 1366

NGS Name: 1366

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096121/
USGS Quad: CORMORANT

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	20	137 N	42 W	463943.00	960112.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1930	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2012)

Stamping: 1366

6.6 MILES NORTH-NORTHEAST PELICAN RAPIDS, 7.3 MILES NORTH-NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 IN PELICAN RAPIDS, 0.25 MILE EAST OF THE WEST QUARTER CORNER OF SECTION 20, THEN 105.0 FEET SOUTHEAST ONTO OLD 59 ROAD, THEN 161.0 FEET NORTHEAST ON OLD 59 ROAD, AT THE SOUTHWEST CORNER OF A TEE-ROAD SOUTH.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1364.499	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.310 12B = -87.296 09 = -87.185 03 = -87.050

* No Horizontal Positions in the Database *



Mn/DOT Name: 1366 1973

NGS Name: 1366 1973

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	15	134 N	41 W	462545.64	954948.15		

NGS ACRN:
NGS Quad / Sta Num : 46095341/
USGS Quad: PHELPS

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<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	1973	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON ROD

Disk Type

SURVEY DISK

Mon. Agency

USGS

Description: (2012)

Stamping: 1366 1973

10.2 MILES SOUTHWEST OF DENT, 11.1 MILES SOUTHWEST ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 108 IN DENT, THEN 1.7 MILES SOUTH ON COUNTY ROAD 115, THEN 0.1 MILE EAST ON 321ST STREET/SUNSET DRIVE, 0.5 MILE WEST OF THE NORTHWEST CORNER OF SECTION 15, AT THE FOOT OF A GUIDE-BOARD POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1364.272	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.969 12B = -87.972 09 = -87.844 03 = -87.697

* No Horizontal Positions in the Database *



Mn/DOT Name: 1366 MINN

NGS Name: 1366

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095431/
USGS Quad: VERGAS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	32	137 N	40 W	463809.00	954526.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1366

2.7 MILES SOUTHEAST OF VERGAS, 2.7 MILES EAST ALONG COUNTY ROAD 36 FROM THE JUNCTION OF COUNTY ROAD 36 AND COUNTY ROAD 35 IN VERGAS, 40.0 FEET EAST OF AN OVERHEAD RAILROAD BRIDGE, NEAR LAKE SYBIL.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1364.400	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.113 12B = -87.106 09 = -87.011 03 = -86.880

* No Horizontal Positions in the Database *



Mn/DOT Name: 1367 USGS

NGS Name: 1367

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0517](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	1	132 N	40 W	461616.40	953853.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1912	2009	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
IRON POST	PIPE CAP	USGS

Description: (2012)

Stamping: MINN 1367

1.0 MILE WEST OF CLITHERAL, 3.15 MILES EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 IN BATTLE LAKE, AT TRUNK HIGHWAY 210 MILEPOINT 48.70, 63.8 FEET NORTH OF TRUNK HIGHWAY 210, 45.0 FEET SOUTH OF AN OLD RAILROAD GRADE, AT A ROAD CROSSING, 15.0 FEET EAST OF SOUTHPOINT ROAD.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1365.952	.016	2/0					VERTICAL ADJUSTMENT	1991	00000025

NGVD29				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1365.145	.033	3					VERTICAL CONTROL SURVEY	1974	USGS-VERT
1365.145	.007	1					VERTICAL CONTROL SURVEY	1941	Q460953
1365.145	.007	1					VERTICAL CONTROL SURVEY	1935	L40 MINN

Geoid Separations(ft): GEOID18 = -87.355 12B = -87.359 09 = -87.241 03 = -87.185

* No Horizontal Positions in the Database *

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/1367-RO0517-3N-18NOV2004.jpg	N	Nov 18, 2004
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/1367-RO0517-2-18NOV2004.jpg		Nov 18, 2004
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/1367-RO0517-1-18NOV2004.jpg		Nov 18, 2004

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 1372

NGS Name: 1372

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095344/
USGS Quad: HEILBERGER LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	14	134 N	42 W	462505.00	955553.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1372

9.8 MILES NORTHEAST OF ELIZABETH, 7.0 MILES EAST ALONG COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND TRUNK HIGHWAY 59 IN ELIZABETH, THEN 2.1 MILES EAST ON COUNTY ROAD 1 (250TH AVENUE), THEN 2.0 MILES NORTH ON COUNTY ROAD 43, THEN 1.2 MILES EAST ON 300TH STREET, THEN 1.5 MILES NORTH ON 27TH AVENUE, THEN 0.9 MILE WEST ON 315TH STREET, IN THE SOUTHEAST CORNER OF SECTION 14.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1370.302	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.025 12B = -88.028 09 = -87.910 03 = -87.766

* No Horizontal Positions in the Database *



Mn/DOT Name: 1378

NGS Name: 1378

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	11	137 N	40 W	464153.00	954120.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2009	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1378

2.1 MILES SOUTH-SOUTHEAST OF FRAZEE, 1.9 MILES SOUTHEAST ALONG TRUNK HIGHWAY 10 FROM THE JUNCTION OF TRUNK HIGHWAY 10 AND COUNTY ROAD 134 IN FRAZEE, THEN 0.3 MILE SOUTHWEST ON BLACK DIAMOND ROAD, NEAR THE EAST CORNER OF SECTION 11, AT THE CROSSROADS.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1376.201	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.303 12B = -87.303 09 = -87.201 03 = -87.070

* No Horizontal Positions in the Database *



Mn/DOT Name: 1381

NGS Name: 1381

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095331/
USGS Quad: STALKER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	25	132 N	41 W	461325.00	954644.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1381

9.7 MILES SOUTHEAST OF UNDERWOOD, 6.2 MILES EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35, THEN 4.2 MILES SOUTH ON COUNTY ROAD 47, 60.0 FEET EAST OF A SIGN AT FORKS OF A ROAD READING "BATTLE LAKE 7.0 MILES FERGUS FALLS 17.0 MILES", ON THE EAST SIDE OF A NORTH-SOUTH ROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1378.773	.033	3				VERTICAL CONTROL SURVEY	1971 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.421 12B = -87.444 09 = -87.336 03 = -87.244

* No Horizontal Positions in the Database *



Mn/DOT Name: 1388 MINN

NGS Name: 1388

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	15	136 N	41 W	463601.00	955037.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2009	NOT FOUND	Horz=? Vert=YES	NO			MARKER IS STEEL ROD

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1403

6.8 MILES NORTHWEST OF DENT, 4.2 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 IN DENT, THEN 3.1 MILES NORTH ON COUNTY ROAD 85, THEN 0.4 MILE WEST ON EAST LOONEY LANE, THEN 1.5 MILES WEST ON 440TH STREET/PAUL M OSBORN ROAD, AT THE NORTHWEST CORNER OF A GRAVEYARD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1385.899	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.093 12B = -87.096 09 = -86.985 03 = -86.837

* No Horizontal Positions in the Database *



Mn/DOT Name: 1390

NGS Name: 1390

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095431/
USGS Quad: VERGAS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	34	137 N	41 W	463807.00	955007.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2009	NOT FOUND	Horz=? Vert=YES	NO			MARKER IS STEEL ROD

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1390

2.0 MILES SOUTHWEST OF VERGAS, 1.5 MILES SOUTHWEST ALONG COUNTY ROAD 41/COUNTY ROAD 4 FROM THE JUNCTION OF COUNTY ROAD 41/COUNTY ROAD 4 AND COUNTY ROAD 35, ON THE WEST SIDE OF A ROAD FORK.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1386.900	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.070 12B = -87.070 09 = -86.965 03 = -86.814

* No Horizontal Positions in the Database *



Mn/DOT Name: 1394

NGS Name: 1394

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	23	137 N	40 W	463940.00	954218.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type
IRON POST

Disk Type
SEE DESCRIPTION

Mon. Agency
USGS

Description: (2012)

Stamping: 1394

4.8 MILES EAST-NORTHEAST OF VERGAS, 4.5 MILES EAST ALONG TRUNK HIGHWAY 228 FROM THE JUNCTION OF TRUNK HIGHWAY 228 AND COUNTY ROAD 4, THEN 128.0 FEET NORTH ON COUNTY ROAD 36.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1391.999	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.247 12B = -87.244 09 = -87.139 03 = -87.011

* No Horizontal Positions in the Database *



Mn/DOT Name: 1394 MINN

NGS Name: 1394

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	18	135 N	41 W	463049.00	955315.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2009	NOT FOUND	Horz=? Vert=YES	NO			MARKER IS STEEL ROD

Monument Type
IRON POST

Disk Type
SEE DESCRIPTION

Mon. Agency
USGS

Description: (2012)

Stamping: 1394

8.5 MILES SOUTHWEST OF DENT, 6.6 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35, THEN 0.6 MILE SOUTH ON COUNTY ROAD 41, THEN 2.3 MILES WEST ON 380TH STREET.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1392.399	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.624 12B = -87.608 09 = -87.506 03 = -87.359

* No Horizontal Positions in the Database *



Mn/DOT Name: 1398

NGS Name: 1398

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096124/
USGS Quad: ROLLAG

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	17	137 N	43 W	464117.00	960752.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1930	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2012)

Stamping: 1398

14.0 MILES WEST OF BARNESVILLE, 13.7 MILES WEST ALONG TRUNK HIGHWAY 34 FROM THE JUNCTION OF TRUNK HIGHWAY 34 AND TRUNK HIGHWAY 9 IN BARNESVILLE, THEN 1.9 MILES NORTH ON COUNTY ROAD 23, 20.0 FEET WEST OF COUNTY ROAD 23, 60.0 FEET NORTH OF A TEE ROAD WEST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1396.100	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.237 12B = -87.208 09 = -87.103 03 = -87.011

* No Horizontal Positions in the Database *



Mn/DOT Name: 1399

NGS Name: 1399

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095431/
USGS Quad: VERGAS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	10	137 N	41 W	464122.00	955012.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2009	NOT FOUND	Horz=? Vert=YES	NO			MARKER IS STEEL ROD

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2012)

Stamping: 1399

2.7 MILES NORTHWEST OF VERGAS, 3.2 MILES NORTHWEST ALONG COUNTY ROAD 17 FROM THE JUNCTION OF COUNTY ROAD 17 AND COUNTY ROAD 4 IN VERGAS, THEN 279.0 FEET EAST ON VERGAS TRIAL, 100.0 FEET WEST OF A PUBLIC ROAD CROSSING.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1397.599	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.116 12B = -87.106 09 = -87.024 03 = -86.870

* No Horizontal Positions in the Database *



Mn/DOT Name: 14 LNB

NGS Name: 14 LNB

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095332/
USGS Quad: ASHBY

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	6	130 N	40 W	460627.00	954502.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1967	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CULVERT - ANY SIZE, ANY TYPE	SURVEY DISK	USGS

Description: (1967)

Stamping: 14 LNB 1967

3.3 MILES NORTHEAST OF ASHBY, 3.0 MILES EAST ALONG 100TH STREET/TOWNSHIP 105 FROM THE JUNCTION OF 100TH STREET/TOWNSHIP 105 AND COUNTY ROAD 10 IN ASHBY, 355.0 FEET WEST AND 41.0 FEET NORTH OF TRUNK HIGHWAY 78 AT A TEE-ROAD NORTH, 37.0 FEET SOUTH OF COUNTY ROAD, IN THE TOP OF THE NORTH END OF A CONCRETE CULVERT.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1216.950	.033	3				VERTICAL CONTROL SURVEY	1967 USGS-VERT

Geoid Separations(ft): GEOID18 = -86.945 12B = -86.958 09 = -86.831 03 = -86.794

* No Horizontal Positions in the Database *



Mn/DOT Name: 14 WGW

NGS Name: 14 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	17	135 N	44 W	463004.07	961424.95		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type

COPPER CLAD ROD (NO SLEEVE)

Disk Type

SURVEY DISK

Mon. Agency

USGS

Description: (2008)

Stamping: 14 WGW 1973

2.0 MILES NORTH OF ROTHSA, 1.25 MILES NORTH ALONG COUNTY ROAD 11 FROM THE JUNCTION OF COUNTY ROAD 11 AND INTERSTATE HIGHWAY 94, THEN 2.0 MILES EAST ON 370TH STREET, THEN 235.0 FEET NORTH ON 120TH AVENUE, 67.0 FEET NORTH OF AN ENTRANCE TO FIRE NUMBER 37021, 42.0 FEET WEST OF 120TH AVENUE, 3.0 FEET SOUTH AND 1.0 FOOT EAST OF THE NORTHEAST CORNER OF A CEMETERY FENCE, 1.0 FOOT EAST OF A WITNESS POST, 1.0 FOOT SOUTH OF A WHITE WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1326.185	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.031 12B = -88.015 09 = -87.916 03 = -87.834

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/14_WGW-3W-18AUG2009.jpg	W	Aug 18, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/14_WGW-2-18AUG2009.jpg		Aug 18, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/14_WGW-1-18AUG2009.jpg		Aug 18, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 14 WHV

NGS Name: 14 WHV

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096241/
USGS Quad: ROTHSA

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	31	134 N	44 W	462809.00	961548.00			1950	1951	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION
<u>Monument Type</u>			<u>Disk Type</u>			<u>Mon. Agency</u>									
CONCRETE POST (PREFABRICATED)			SEE DESCRIPTION			USGS									

Description: (2010)

Stamping: 14 WHV 1950

1.0 MILE EAST OF ROTHSA, 845.0 FEET SOUTH AND 20.0 FEET WEST OF THE CENTER OF A ROAD CROSSROAD, 2.0 FEET EAST OF A FENCE, ON THE TOP OF A SMALL HILL, IN A CONCRETE POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1279.758	.033	3				VERTICAL CONTROL SURVEY	1973 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.179 12B = -88.172 09 = -88.067 03 = -87.989

* No Horizontal Positions in the Database *



Mn/DOT Name: 1403

NGS Name: 1403

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	28	136 N	41 W	463352.00	955153.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2009	NOT FOUND	Horz=? Vert=YES	NO			MARKER IS STEEL ROD

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description:

Stamping: 1403

7.0 MILES SOUTHWEST OF VERGAS, 1.7 MILES SOUTH ALONG HAT 6 ROAD FROM THE JUNCTION OF HAT 6 ROAD AND COUNTY ROAD 4 IN VERGAS, THEN 1.0 MILE SOUTH ON 280TH AVENUE, THEN 2.2 MILES SOUTHWEST ON EAST ROSEWOOD DRIVE/COUNTY ROAD 41, AT THE JUNCTION OF EAST ROSEWOOD DRIVE/COUNTY ROAD 41 AND 415TH STREET, ON THE EAST SIDE OF A ROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1401.201	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.247 12B = -87.267 09 = -87.159 03 = -86.981

* No Horizontal Positions in the Database *



Mn/DOT Name: 1415

NGS Name: 1415

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095344/
USGS Quad: HEILBERGER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	26	135 N	42 W	462905.00	955537.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2009	DESTROYED	Horz=NO Vert=NO	NO			MARKER IS STEEL ROD

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description:

Stamping: 1415

3.8 MILES NORTHEAST OF EDWARDS, 3.0 MILES EAST ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND COUNTY ROAD 3 IN EDWARDS, THEN 190.0 FEET SOUTH ON 270TH AVENUE, 30.0 FEET SOUTH OF THE NORTHEAST CORNER OF SECTION 26.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1413.422	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.815 12B = -87.798 09 = -87.703 03 = -87.552

* No Horizontal Positions in the Database *



Mn/DOT Name: 1428

NGS Name: 1428

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096124/
USGS Quad: ROLLAG

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	13	137 N	44 W	464113.00	961024.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1912	2008	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2007)

Stamping:

4.8 MILES SOUTHEAST OF ROLLAG, 1.7 FEET SOUTH ALONG TRUNK HIGHWAY 32 SOUTH (270TH STREET SOUTH) FROM THE JUNCTION OF TRUNK HIGHWAY 32 SOUTH (270TH STREET SOUTH) AND 103RD AVENUE SOUTH IN ROLLAG, THEN 3.0 MILES EAST ALONG 120TH AVENUE SOUTH, THEN 2.1 MILES SOUTH ALONG COUNTY ROAD 128 (155TH AVENUE), 35.0 FEET WEST OF JOHN THOMPSON'S MAILBOX.

Station Notes

THE LATITUDE AND LONGITUDE PUT THE MARK 100.0 FEET EAST OF COUNTY ROAD 128 AND IN OTTERTAIL COUNTY, IN A FARM FIELD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1426.201	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.228 12B = -87.191 09 = -87.096 03 = -87.018

* No Horizontal Positions in the Database *



Mn/DOT Name: 1431 MINN

NGS Name: 1431 MINN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	34	135 N	43 W	462814.00	960419.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1970	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2010)

Stamping: 1431 MINN

1.5 MILES SOUTHEAST ERHARD, 1.2 MILES EAST ALONG COUNTY ROAD 24 (MAIN STREET) FROM THE JUNCTION OF COUNTY ROAD 24 (MAIN STREET) AND TRUNK HIGHWAY 59 (FERGUS AVENUE), THEN 1.0 MILE SOUTH ON 200TH AVENUE, 10.0 FEET SOUTH OF THE P. GANENS MAILBOX.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1429.722	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.985 12B = -87.976 09 = -87.874 03 = -87.756

* No Horizontal Positions in the Database *



Mn/DOT Name: 1432

NGS Name: 1432

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095434/
USGS Quad: LAKE FRANKLIN

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	30	137 N	41 W	463849.00	955504.40			1911	2009	GOOD	Horz=NO Vert=YES	YES		PROJECTS 7 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	PIPE CAP	USGS

Description: (1994)

Stamping: MINN 1432

5.1 MILES SOUTHEAST OF DUNVILLA, 2.3 MILES SOUTH ALONG COUNTY ROAD 31 FROM THE JUNCTION OF COUNTY ROAD 31 AND TRUNK HIGHWAY 59 TO TRUNK HIGHWAY 59 MILEPOINT 250.95, THEN 2.05 MILES EAST ON 470TH STREET, THEN 0.2 MILE NORTH ON 275TH AVENUE, 34.2 FEET EAST OF THE NORTH POST GATE.

Station Notes

84.9 FEET EAST OF SOMETHING (CHECK THIS OUT).

Leveling-Derived Orthometric Heights (Feet)

<u>NGVD29</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Orthometric Height</u>								
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1430.201	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.224 12B = -87.191 09 = -87.129 03 = -86.975

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/1432-3E-05AUG2009.jpg	E	Aug 5, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/1432-2-05AUG2009.jpg		Aug 5, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/1432-1-05AUG2009.jpg		Aug 5, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 1435

NGS Name: 1435

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095434/
USGS Quad: LAKE FRANKLIN

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	18	137 N	41 W	464109.00	955510.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2009	NOT FOUND	Horz=? Vert=YES	NO			MARKER IS STEEL ROD

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON POST	SEE DESCRIPTION	USGS

Description:

Stamping: 1435

0.2 MILE SOUTH OF A SCHOOLHOUSE, ON THE SHORE OF SCHOOL LAKE, ON THE WEST SIDE OF A ROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1432.901	.033	3				VERTICAL CONTROL SURVEY		1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.165 12B = -87.159 09 = -87.067 03 = -86.909

* No Horizontal Positions in the Database *



Mn/DOT Name: 1439

NGS Name: 1439

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095344/
USGS Quad: HEILBERGER LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	20	135 N	42 W	462907.00	955323.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	1973	DESTROYED	Horz=NO Vert=NO	YES			MARKER IS STEEL ROD

Monument Type
IRON POST

Disk Type
SEE DESCRIPTION

Mon. Agency
USGS

Description:

Stamping: 1439

30.0 FEET NORTH AND 30.0 FEET EAST OF THE CENTER OF THE CROSSROADS (COUNTY ROAD 24 AND COUNTY ROAD 3).

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1437.225	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.782 12B = -87.766 09 = -87.664 03 = -87.516

* No Horizontal Positions in the Database *



Mn/DOT Name: 1449

NGS Name: 1449

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	32	135 N	42 W	462722.00	960033.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1970	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2010)

Stamping: 1449

4.5 MILES SOUTHEAST ERHARD, 3.2 MILES EAST ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND TRUNK HIGHWAY 59 IN ERHARD, THEN 2.0 MILES SOUTH ON COUNTY ROAD 27, 20.0 FEET NORTH ON 340TH STREET, 25.0 FEET EAST ON COUNTY ROAD 27.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1447.231	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.972 12B = -87.969 09 = -87.861 03 = -87.726

* No Horizontal Positions in the Database *



Mn/DOT Name: 1481

NGS Name: 1481

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	26	136 N	42 W	463334.00	955605.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2023	NOT FOUND	Horz=NO Vert=NO	NO			MARKER IS STEEL ROD

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description:

Stamping: 1481

0.25 MILE NORTH OF THE SOUTH CORNER OF SECTION 26, 800.0 FEET SOUTH OF BP PIERCE'S HOUSE, ON THE EAST SIDE OF A ROAD, NEAR A GATE TO A PASTURE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1479.400	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.474 12B = -87.470 09 = -87.369 03 = -87.198

* No Horizontal Positions in the Database *



Mn/DOT Name: 15 LNB

NGS Name: 15 LNB

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095324/
USGS Quad: EAGLE LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	28	131 N	40 W	460806.00	954325.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1967	2009	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	USGS

Description: (1967)

Stamping: 15 LNB 1967

3.0 MILES NORTH AND 4.3 MILES EAST OF ASHBY, 0.3 MILE EAST OF A SECTION CORNER, 25.0 FEET SOUTH AND 42.0 FEET WEST OF A ROAD AT A DRIVEWAY NORTHWEST, 1.4 FEET EAST OF A FENCE, 1.4 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1322.153	.033	3				VERTICAL CONTROL SURVEY	1967 USGS-VERT

Geoid Separations(ft): GEOID18 = -86.985 12B = -86.978 09 = -86.886 03 = -86.857

* No Horizontal Positions in the Database *



Mn/DOT Name: 15 WGW

NGS Name: 15 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	13	135 N	44 W	463001.21	961036.23			1973	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (2008)

Stamping: 15 WGW 1973

3.8 MILES NORTHWEST OF ERHARD, 3.75 MILES WEST ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND TRUNK HIGHWAY 59 IN ERHARD, TO TRUNK HIGHWAY 59 MILEPOINT 234.5, THEN 1.0 MILE NORTH ON 150TH AVENUE, 60.0 FEET NORTH OF 370TH STREET, 39.2 FEET EAST OF 150TH AVENUE, 2.0 FEET NORTHWEST OF A POWER POLE, 1.4 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NGVD29</u>			<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1326.155	.033	3							VERTICAL CONTROL SURVEY		1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.985 12B = -87.962 09 = -87.864 03 = -87.772

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/15_WGW-3E-18AUG2009.jpg	E	Aug 18, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/15_WGW-2-18AUG2009.jpg		Aug 18, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/15_WGW-1-18AUG2009.jpg		Aug 18, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 15 WHV

NGS Name: 15 WHV

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096241/
USGS Quad: ROTHSA

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	20	134 N	44 W	462433.00	961535.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1950	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	USGS

Description: (1950) Stamping: 15 WHV 1950

4.6 MILES SOUTHEAST OF ROTHSA, 0.2 MILE SOUTH ALONG 110TH AVENUE FROM THE JUNCTION OF 110TH AVENUE AND 310TH STREET IN ROTHSA, 37.0 FEET SOUTH AND 24.0 FEET EAST OF A TOWNSHIP ROAD AT A CROSSED FENCE.

Leveling-Derived Orthometric Heights (Feet)

<u>NGVD29</u>			<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Year</u>	<u>Reference</u>					
1136.507	.033	3				1973	USGS-VERT					

Geoid Separations(ft): GEOID18 = -88.317 12B = -88.320 09 = -88.205 03 = -88.143

* No Horizontal Positions in the Database *



Mn/DOT Name: 16 LNB

NGS Name: 16 LNB

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DK7872 NGS Quad / Sta Num : 46095324/ USGS Quad: EAGLE LAKE Get Map
NW	25	131 N	40 W	460807.72	953957.41	2	3	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1967	2019	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	USGS

Description: (2005)

Stamping: 16 LNB 1967

9.15 MILES SOUTH OF BATTLE LAKE, 9.5 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE TO TRUNK HIGHWAY 78 MILEPOINT 11.95, THENCE 2.0 MILES EAST ALONG COUNTY ROAD 38, 77.0 FEET SOUTH AND 43.0 FEET EAST OF THE JUNCTION OF COUNTY ROAD 38 (EAST-WEST) COUNTY ROAD 81 (NORTH) AND A TOWNSHIP ROAD (SOUTH), 66.4 FEET SOUTH OF COUNTY ROAD 38, 41.5 FEET EAST OF 395TH AVENUE, 2.2 FEET SOUTHWEST OF A FENCE CORNER POST, 1.6 FEET WEST OF A FENCE, 1.0 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1360.919	.016	2/1					VERTICAL ADJUSTMENT	2009	00000591
1360.890	.016	2/1					VERTICAL CONTROL SURVEY	2006	VPEAK

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1360.168	.033	3					VERTICAL CONTROL SURVEY	1967	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1360.850	.262			1273.971	.197	2011	GPS - OPUS	2020	GPSBM
1360.870	.262			1273.990	.197	2011	GPS - OPUS	2020	GPSBM
1360.821	.262			1274.059	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -86.880 12B = -86.860 09 = -86.778 03 = -86.762

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>				<u>Otter Tail County</u>			<u>Project Info</u>		
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>		<u>Year</u>	<u>Reference</u>	
<u>Latitude</u>	<u>Longitude</u>					<u>Acc</u> <u>Order</u> <u>Determination Method</u>			
46 08 07.71659	95 39 57.41446			512859.072	110612.517	.131 3 GPS - OPUS	2020	GPSBM	
46 08 07.71662	95 39 57.41435			512859.080	110612.520	.131 3 GPS - OPUS	2020	GPSBM	

<u>NAD83(1996)</u>				<u>Otter Tail County</u>			<u>Project Info</u>		
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>		<u>Year</u>	<u>Reference</u>	
<u>Latitude</u>	<u>Longitude</u>					<u>Acc</u> <u>Order</u> <u>Determination Method</u>			
46 08 07.71743	95 39 57.41447			512859.071	110612.602	.131 3 GPS - RTRN	2009	RTRN2009	

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>			<u>Project Info</u>		
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>		<u>Year</u>	<u>Reference</u>	
<u>X</u>	<u>Y</u>					<u>Acc</u> <u>Order</u> <u>Determination Method</u>			
2265735.832	745344.611			964816.605	16773442.012	.131 3 GPS - OPUS	2020	GPSBM	
2265735.840	745344.614			964816.613	16773442.015	.131 3 GPS - OPUS	2020	GPSBM	

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>			<u>Project Info</u>		
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>		<u>Year</u>	<u>Reference</u>	
<u>X</u>	<u>Y</u>					<u>Acc</u> <u>Order</u> <u>Determination Method</u>			
2265735.833	745344.696			964816.608	16773442.097	.131 3 GPS - RTRN	2009	RTRN2009	



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/16_LNB-DK7872-3S-29JUL2009.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/16_LNB-DK7872-2-29JUL2009.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/16_LNB-DK7872-1-23DEC2019.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Jul 29, 2009
	Jul 29, 2009
	Dec 23, 2019



Mn/DOT Name: 16 WGW

NGS Name: 16 WGW

County: OTTER TAIL, MN (Sheet 1)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	20	135 N	43 W	463001.03	960811.05		C

NGS ACRN: [DR5753](#)
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

[Get Map](#)

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1973	2018	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (2008)

Stamping: 16 WGW 1973

2.1 MILES NORTHWEST OF ERHARD, 2.3 MILES WEST ALONG 370TH STREET FROM THE JUNCTION 370TH STREET AND TRUNK HIGHWAY 59 IN ERHARD, 38.0 FEET SOUTH OF 370TH STREET, 15.8 FEET EAST OF AN EXTENDED DRIVEWAY NUMBER 17005, 10.0 FEET SOUTHEAST OF A POWER POLE NUMBER 644 WITH A GUYWIRE, 1.0 FOOT NORTH OF A WITNESS POST. THE ROD DEPTH IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Year	Reference
1338.357	.033	3				1974	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Year	Reference
1339.223	.131		1251.480	.066	1996	2021	HOTTE
1339.256			1251.330	.019	2011	2020	GPS3384
1339.256			1251.330	.019	2011	2020	HOTTE

Geoid Separations(ft): GEOID18 = -87.939 12B = -87.923 09 = -87.815 03 = -87.716

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 30 01.02623	96 08 11.05371	394286.554	243937.980	.013		ADJUSTMENT	2020	GPS3384
46 30 01.02623	96 08 11.05371	394286.554	243937.980	.013	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 30 01.02590	96 08 11.05420	394286.520	243937.947	.033	C	GPS - STATIC	2021	HOTTE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2149667.245	880824.483	850868.500	16910777.483	.013		ADJUSTMENT	2020	GPS3384
2149667.245	880824.483	850868.500	16910777.483	.013	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2149667.210	880824.451	850868.465	16910777.450	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/16_WGW-DR5753-3S-30SEP2014.jpg	S	Sep 30, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/16_WGW-DR5753-2-30SEP2014.jpg		Sep 30, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/16_WGW-DR5753-1-30SEP2014.jpg		Sep 30, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 17 WGW

NGS Name: 17 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	19	135 N	42 W	462956.90	960139.80			1973	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (2000)

Stamping: 17 WGW 1973

1.0 MILE NORTH AND 3.0 MILES EAST OF ERHARD, 1.1 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 24 IN ERHARD, TO TRUNK HIGHWAY 59 MILEPOINT 235.6, THEN 2.95 MILES EAST ON 370TH STREET, 56.0 FEET EAST OF EXTENDED TWELVE LAKE ROAD, 43.0 FEET SOUTH OF 370TH STREET, 30.5 FEET EAST OF A WOODED ENTRANCE, 1.4 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1365.539	.033	3					VERTICAL CONTROL SURVEY		1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.864 12B = -87.844 09 = -87.746 03 = -87.611

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/17_WGW-3S-19AUG2009.jpg	S	Aug 19, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/17_WGW-2-19AUG2009.jpg		Aug 19, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/17_WGW-1-19AUG2009.jpg		Aug 19, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 18 WGW

NGS Name: 18 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095344/
USGS Quad: HEILBERGER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	26	135 N	42 W	462904.00	955536.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

COPPER CLAD ROD (NO SLEEVE)

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2000)

Stamping: 18 WGW 1973

8.0 MILES EAST OF ERHARD, 8.3 MILES EAST ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND TRUNK HIGHWAY 59 IN ERHARD, 177.0 FEET SOUTH AND 31.0 FEET WEST OF COUNTY ROAD 24 AT A DRIVE SOUTH, 1.0 FOOT NORTH OF A POWER POLE AND A WITNESS SIGN.

Station Notes

PULLED THE TIES, NEW POWER POLE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1414.827	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.818 12B = -87.802 09 = -87.707 03 = -87.552

* No Horizontal Positions in the Database *



Mn/DOT Name: 19 WGW

NGS Name: 19 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095344/
USGS Quad: HEILBERGER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	29	135 N	41 W	462841.61	955250.52		3	1973	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (1973)

Stamping: 19 WGW 1973

10.5 MILES EAST OF ERHARD, 10.85 MILES EAST ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND TRUNK HIGHWAY 59 IN ERHARD, TO TRUNK HIGHWAY 59 MILEPOINT 234.5, 116.0 FEET NORTH AND 66.0 FEET WEST OF COUNTY ROAD 24 AT A DRIVE SOUTH, 115.0 FEET SOUTHEAST OF THE SOUTHEAST CORNER OF THE EDWIN L FIELD HOME, 5.0 FEET EAST OF A FENCE, AT HOUSE NUMBER 29173.

Leveling-Derived Orthometric Heights (Feet)

<u>NGVD29</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1374.814	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1375.378	.262		1287.835	.197	1996	GPS - RTRN	2009 RTRN2009

Geoid Separations(ft): GEOID18 = -87.812 12B = -87.798 09 = -87.687 03 = -87.542

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 28 41.61179	95 52 50.51536	458670.646	235654.783	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2213878.764	871352.081	914942.480	16900282.131	.131	3	GPS - RTRN	2009 RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/19_WGW-3N-19AUG2009.jpg	N	Aug 19, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/19_WGW-2-19AUG2009.jpg		Aug 19, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/19_WGW-1-19AUG2009.jpg		Aug 19, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 2 ERS

NGS Name: 2 ERS

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	20	133 N	44 W	461933.00	961533.00		

NGS ACRN:
NGS Quad / Sta Num : 46096242/
USGS Quad: FOXHOME

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1950	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	USGS

Description: (1950) Stamping: 2 ERS 1950

10.5 MILES SOUTH AND 1.5 MILES EAST OF ROTHSA, 31.0 FEET EAST OF COUNTY ROAD 11, 23.0 FEET SOUTH OF A FENCE EAST.

Station Notes

PULLED THE TIES, THEY FALL IN A DITCH BOTTOM.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1083.443	.033	3				VERTICAL CONTROL SURVEY	1973	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.376 12B = -88.356 09 = -88.261 03 = -88.225

* No Horizontal Positions in the Database *



Mn/DOT Name: 20 WGW

NGS Name: 20 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095341/
USGS Quad: PHELPS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	27	135 N	41 W	462903.95	954956.06		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (2000)

Stamping: 20 WGW 1973

1.5 MILES NORTH OF STAR LAKE, 1.85 MILES NORTHEAST AND NORTH ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND COUNTY ROAD 41 IN STAR LAKE, THEN 0.65 MILE WEST ON 360TH STREET, 61.0 FEET EAST OF A DRIVEWAY NORTH, 56.0 FEET EAST OF A FIELD ENTRANCE, 33.0 FEET SOUTH OF 360TH STREET, 3.2 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1357.474	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.759 12B = -87.743 09 = -87.631 03 = -87.490

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/20_WGW-3S-19AUG2009.jpg	S	Aug 19, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/20_WGW-2-19AUG2009.jpg		Aug 19, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/20_WGW-1-19AUG2009.jpg		Aug 19, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 21 WGW

NGS Name: 21 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	13	135 N	41 W	463022.00	954644.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2000	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

COPPER CLAD ROD (NO SLEEVE)

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2008)

Stamping: 21 WGW 1973

3.0 MILES SOUTH AND 3.0 MILES WEST OF DENT, ON THE SOUTHEAST SIDE OF STAR LAKE, 50.5 FEET NORTH AND 37.0 FEET EAST OF THE CROSSROADS, 3.0 FEET EAST OF A FENCE CORNER, 0.6 FOOT SOUTH OF A WITNESS SIGN, IN 1993 THE DEPARTMENT OF NATURAL RESOURCES (DNR) SURVEYS FOUND THE STATION DISTURBED WITH THE 6.0 INCH DIAMETER TILE BROKEN AND THE ROD PROJECTING 1.0 FOOT ABOVE THE GROUND.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1329.873	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.595 12B = -87.582 09 = -87.467 03 = -87.346

* No Horizontal Positions in the Database *



Mn/DOT Name: 22 WGW

NGS Name: 22 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095314/
USGS Quad: WALKER LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	14	135 N	40 W	462955.08	954059.84		3	1973	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (1973)

Stamping: 22 WGW 1973

4.15 MILES SOUTHEAST OF DENT, 3.95 MILES SOUTHEAST ALONG COUNTY ROAD 44 FROM THE JUNCTION OF COUNTY ROAD 44 AND COUNTY ROAD 35 IN DENT, 60.0 FEET WEST OF AN EXTENDED DRIVEWAY NUMBER 39316, 57.0 FEET NORTH OF COUNTY ROAD 44, 6.0 FEET WEST OF A POWER POLE WITH 2 GUYWIRES, 1.4 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NGVD29</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1405.876	.033	3				VERTICAL CONTROL SURVEY		1974	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1406.542	.262		1319.092	.197	1996	GPS - RTRN		2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.687 12B = -87.680 09 = -87.559 03 = -87.451

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
46 29 55.08309	95 40 59.84489	508406.355	243057.156	.131	3	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Year</u>	<u>Reference</u>
2263736.630	877831.489	964908.716	16905970.109	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/22_WGW-3N-19AUG2009.jpg	N	Aug 19, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/22_WGW-2-19AUG2009.jpg		Aug 19, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/22_WGW-1-19AUG2009.jpg		Aug 19, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 24 WGW

NGS Name: 24 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095431/
USGS Quad: VERGAS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	6	137 N	40 W	464258.00	954645.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type

COPPER CLAD ROD (NO SLEEVE)

Disk Type

SURVEY DISK

Mon. Agency

USGS

Description: (2003)

Stamping: 24 WGW 1973

0.5 MILE SOUTH AND 4.0 MILES WEST OF FRAZEE, 59.0 FEET SOUTH AND 39.0 FEET WEST OF A TEE-ROAD SOUTH, NEAR THE BECKER-OTTERTAIL COUNTY LINE, 1.0 FOOT WEST OF A WITNESS SIGN, MIDWAY BETWEEN A TELEPHONE POLE AND A POWER POLE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1393.298	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.149 12B = -87.155 09 = -87.050 03 = -86.906

* No Horizontal Positions in the Database *



Mn/DOT Name: 25 WGW

NGS Name: 25 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

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1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	9	137 N	40 W	464132.63	954353.17		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1973	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (1973)

Stamping: 25 WGW 1973

4.3 MILES NORTHEAST OF VERGAS, 3.0 MILES NORTHEAST ALONG COUNTY ROAD 4 FROM THE JUNCTION OF COUNTY ROAD 4 AND TRUNK HIGHWAY 228 TO TRUNK HIGHWAY 228 MILEPOINT 0.95, THEN 1.05 MILES EAST ON 504TH STREET, 60.2 FEET SOUTH OF 504TH STREET, 46.0 FEET WEST OF 365TH AVENUE, 20.2 FEET SOUTH OF CABLE BOX NUMBER C 11 21, 1.0 FOOT EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1395.535	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1396.077	.262		1309.089	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.218 12B = -87.211 09 = -87.116 03 = -86.988

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 41 32.63270	95 43 53.16546	496293.605	313726.854	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2252935.865	948704.486	955237.257	16977020.189	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/25_WGW-3W-05AUG2009.jpg	W	Aug 5, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/25_WGW-2-05AUG2009.jpg		Aug 5, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/25_WGW-1-05AUG2009.jpg		Aug 5, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 26 WGW

NGS Name: 26 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

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1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	22	137 N	40 W	463930.19	954315.68		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1973	2009	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (1973)

Stamping: 26 WGW 1973

4.0 MILES EAST OF VERGAS, 3.75 MILES EAST ALONG TRUNK HIGHWAY 228 FROM THE JUNCTION OF TRUNK HIGHWAY 228 AND COUNTY ROAD 4, AT TRUNK HIGHWAY 108 MILEPOINT 4.55, 75.0 FEET SOUTH OF TRUNK HIGHWAY 228, 8.0 FEET WEST OF EXTENDED 370TH AVENUE, 1.0 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference	
1388.390	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference	
1389.216	.262		1302.241	.197	1996	GPS - RTRN	2009	RTRN2009	

Geoid Separations(ft): GEOID18 = -87.208 12B = -87.205 09 = -87.100 03 = -86.972

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 39 30.19267	95 43 15.67546	498906.513	301321.488	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2255318.331	936254.399	957420.788	16964531.170	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/26_WGW-3S-05AUG2009.jpg	S	Aug 5, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/26_WGW-2-05AUG2009.jpg		Aug 5, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/26_WGW-1-05AUG2009.jpg		Aug 5, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 27 WGW

NGS Name: 27 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

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1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	34	137 N	40 W	463834.60	954351.87		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1973	2009	GOOD	Horz=NO Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (1973)

Stamping: 27 WGW 1973

3.0 MILES EAST OF VERGAS, 2.15 MILES SOUTHWEST ALONG COUNTY ROAD 36 FROM THE JUNCTION OF COUNTY ROAD 36 AND TRUNK HIGHWAY 228 TO TRUNK HIGHWAY 228 MILEPOINT 5.35, 109.5 FEET NORTH OF COUNTY ROAD 36, 103.8 FEET WEST OF BRUHN BEACH ROAD, 67.6 FEET NORTH-NORTHEAST OF A POWER POLE NUMBER LR DOT 90, 59.2 FEET NORTH OF CABLE BOX NUMBER 6 E 8, 1.0 FOOT SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference	
1373.350	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference	
1374.266	.262		1287.327	.197	1996	GPS - RTRN	2009	RTRN2009	

Geoid Separations(ft): GEOID18 = -87.168 12B = -87.168 09 = -87.063 03 = -86.939

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 38 34.60454	95 43 51.86851	496380.736	295689.893	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2252689.036	930671.229	954702.106	16958989.618	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/27_WGW-3W-05AUG2009.jpg	W	Aug 5, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/27_WGW-2-05AUG2009.jpg		Aug 5, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/27_WGW-1-05AUG2009.jpg		Aug 5, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 28 WGW

NGS Name: 28 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	6	136 N	40 W	463713.13	954546.08			1973	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (2000)

Stamping: 28 WGW 1973

3.15 MILES SOUTHEAST OF VERGAS, 1.3 MILES SOUTHWEST ALONG SYBIL LAKE ROAD FROM THE JUNCTION OF SYBIL LAKE ROAD AND COUNTY ROAD 36 IN VERGAS, 204.0 FEET NORTH OF A DRIVEWAY NUMBER 34451, 51.0 FEET WEST OF SYBIL LAKE ROAD, 13.8 FEET WEST-NORTHWEST OF CABLE BOX NUMBER 7A, 12.0 FEET NORTHWEST OF THE NORTHWEST CORNER OF CABLE BOX NUMBER UGLA RST 7 NODE 7, 0.5 FOOT EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1404.023	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.103 12B = -87.086 09 = -86.998 03 = -86.876

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/28_WGW-3NW-05AUG2009.jpg	NW	Aug 5, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/28_WGW-2-05AUG2009.jpg		Aug 5, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/28_WGW-1-05AUG2009.jpg		Aug 5, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 29 WGW

NGS Name: 29 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5754](#)
NGS Quad / Sta Num : 46095423/
USGS Quad: DENT

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1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	16	136 N	40 W	463546.00	954331.21		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1973	2018	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (2015)

Stamping: 29 WGW 1973

3.0 MILES NORTH OF DENT, 2.85 MILES NORTH-NORTHWEST ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 55 NORTH AND TRUNK HIGHWAY 108 IN DENT TO TRUNK HIGHWAY 108 MILEPOINT 31.60, NEAR THE CENTER OF SECTION 16, 121.0 FEET SOUTH OF COUNTY ROAD 34, 121.0 FEET EAST OF COUNTY ROAD 35, 0.5 FOOT NORTHWEST OF A WITNESS POST, UNKNOWN ROD DEPTH.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference	
1387.510	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference	
1388.373	.131		1301.336	.066	1996	GPS - STATIC	2021	HOTTE	
1388.399			1301.175	.020	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384	
1388.399			1301.175	.020	2011	GPS - STATIC	2020	HOTTE	
1388.199	.262		1301.201	.197	1996	GPS - RTRN	2009	RTRN2009	

Geoid Separations(ft): GEOID18 = -87.221 12B = -87.191 09 = -87.103 03 = -87.001

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 35 46.00185	95 43 31.21091	497820.303	278607.882	.013		ADJUSTMENT	2020	GPS3384
46 35 46.00185	95 43 31.21091	497820.303	278607.882	.013	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 35 46.00157	95 43 31.21144	497820.266	278607.854	.033	C	GPS - STATIC	2021	HOTTE
46 35 46.00219	95 43 31.21171	497820.247	278607.917	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2253811.924	913567.622	955552.108	16941866.814	.013		ADJUSTMENT	2020	GPS3384
2253811.924	913567.622	955552.108	16941866.814	.013	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2253811.886	913567.594	955552.070	16941866.787	.033	C	GPS - STATIC	2021	HOTTE
2253811.869	913567.657	955552.053	16941866.850	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/29_WGW-DR5754-3E-05AUG2009.jpg	E	Aug 5, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/29_WGW-DR5754-2-05AUG2009.jpg		Aug 5, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/29_WGW-DR5754-1-05AUG2009.jpg		Aug 5, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 3 ERS

NGS Name: 3 ERS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096241/
USGS Quad: ROTHSA

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	31	134 N	44 W	462255.00	961537.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1950	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	USGS

Description: (1950) Stamping: 3 ERS 1950

6.5 MILES SOUTH AND 1.0 MILE EAST OF ROTHSA, 690.0 FEET SOUTH AND 43.0 FEET WEST OF THE JUNCTION OF COUNTY ROAD 10 AND COUNTY ROAD 11.

Station Notes

PULLED THE TIES, THEY FALL IN A DITCH BOTTOM.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1146.819	.033	3				VERTICAL CONTROL SURVEY	1973	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.353 12B = -88.350 09 = -88.241 03 = -88.195

* No Horizontal Positions in the Database *



Mn/DOT Name: 30 WGW USGS

NGS Name: 30 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9325](#)
NGS Quad / Sta Num : 46095423/
USGS Quad: DENT

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	27	136 N	40 W	463324.73	954304.08	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1973	2019	GOOD	Horz=NO Vert=NO	YES		PROJECTS 1 IN.	MARKER IS STEEL ROD

Monument Type	Disk Type	Mon. Agency
COPPER CLAD ROD (NO SLEEVE)	BENCH MARK DISK	USGS

Description: (2001)

Stamping: 30 WGW 1973

IN DENT, IN THE NORTHEAST QUADRANT OF THE JUNCTION OF TRUNK HIGHWAY 108 AND A RAILROAD, AT TRUNK HIGHWAY 108 MILEPOINT 31.60, 57.0 FEET NORTH OF TRUNK HIGHWAY 108, 51.0 FEET WEST-SOUTHWEST OF COUNTY ROAD 35, 30.0 FEET EAST-NORTHEAST OF THE EAST RAIL OF THE MAIN LINE RAILROAD TRACKS, 1.3 FEET WEST OF A WITNESS POST.

Station Notes

CLAY TILE PROTECTING, THE MONUMENT IS GONE EXPOSING THE ROD. THE ROD IS BENT. (6/03/2009) THE SURVEY MARK IS ON RAILROAD PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1363.892	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1363.888	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1363.905	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1362.996	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1363.695	.262		1276.585	.197	1996	GPS - RTRN	2009	RTRN2009
1362.989	.197		1275.824	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.342 12B = -87.329 09 = -87.218 03 = -87.109

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 24.73205	95 43 04.08110	499714.780	264295.309	.131	3	GPS - RTRN	2009	RTRN2009
46 33 24.73140	95 43 04.07740	499715.039	264295.243	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 24.72869	95 43 04.07898	499714.928	264294.968	.066	2	ADJUSTMENT	1997	16997

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 33 24.87730	95 43 02.91370			.100	2	CLASSICAL SURVEY	1950	UNK



State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255440.857	899224.225	956952.606	16927496.361	.131	3	GPS - RTRN	2009	RTRN2009
2255441.114	899224.155	956952.862	16927496.286	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255440.998	899223.883	956952.743	16927496.015	.066	2	ADJUSTMENT	1997	16997

NAD27

MN State Plane - Central Zone		<u>X</u>	<u>Y</u>	Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1630844.756	571150.502			.100	2	CLASSICAL SURVEY	1950	UNK

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/30_WGW-AD9325-3N-04AUG2009.jpg	N	Aug 4, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/30_WGW-AD9325-2-04AUG2009.jpg		Aug 4, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/30_WGW-AD9325-1-04AUG2009.jpg		Aug 4, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 3032

NGS Name: 3032

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	7	136 N	44 W	463653.83	961652.12		

NGS ACRN:
NGS Quad / Sta Num : 46096132/
USGS Quad: LAWNDAL

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1999	2010	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (1999)

Stamping: 3032 1999

9.6 MILES NORTHWEST OF PELICAN RAPIDS, 7.15 MILES WEST AND SOUTH ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 WEST AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, TO TRUNK HIGHWAY 108 MILEPOINT 4.85, THENCE 3.5 MILES NORTH ALONG COUNTY ROAD 21, 3.20 MILES WEST AND NORTH ALONG COUNTY ROAD 30, 38.0 FEET EAST OF COUNTY ROAD 30, 25.0 FEET NORTH OF A FIELD ENTRANCE, 85.0 FEET SOUTHWEST OF A POWER POLE WITH A GUY WIRE, 1.8 FEET WEST OF A WITNESS POST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.355 12B = -87.342 09 = -87.234 03 = -87.162

<u>Type</u>	<u>Station Photos</u> <u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/3032-3E-18AUG2009.jpg	E	Aug 18, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/3032-2-18AUG2009.jpg		Aug 18, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/3032-1-18AUG2009.jpg		Aug 18, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 31 WGW

NGS Name: 31 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095423/
USGS Quad: DENT

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	9	135 N	40 W	463139.00	954401.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (2000)

Stamping: 31 WGW 1973

2.5 MILES SOUTH AND 1.0 MILE WEST OF DENT, 168.0 FEET SOUTH AND 100.0 FEET EAST OF COUNTY ROAD 35 AT A DRIVE EAST, 186.0 FEET NORTH AND 100.0 FEET EAST OF A ROAD TO A GRAVEL PIT, SOUTHWEST OF A POWER POLE, 1.0 FOOT WEST OF A FENCE AND A WITNESS SIGN.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1356.146	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.454 12B = -87.454 09 = -87.319 03 = -87.201

* No Horizontal Positions in the Database *



Mn/DOT Name: 32 WGW

NGS Name: 32 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095314/
USGS Quad: WALKER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	4	134 N	40 W	462719.00	954346.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2010	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (1973) Stamping: 32 WGW 1973

7.0 MILES SOUTH AND 1.0 MILE WEST OF DENT, NEAR THE QUARTER CORNER BETWEEN SECTION 4 AND SECTION 33, 50.0 FEET SOUTH AND 39.0 FEET WEST OF COUNTY ROAD 32 AT A TEE-ROAD SOUTH, 1.0 FOOT NORTH AND 4.0 FEET WEST OF A FENCE CORNER, 2.0 FEET EAST OF A WITNESS SIGN.

Station Notes

THE DISK WAS TURNED IN TO THE OFFICE.
PULLED THE ROD AND THE CAP OUT OF THE GROUND.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1341.264	.033	3				VERTICAL CONTROL SURVEY		1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.890 12B = -87.884 09 = -87.752 03 = -87.621

* No Horizontal Positions in the Database *



Mn/DOT Name: 33 WGW

NGS Name: 33 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095314/
USGS Quad: WALKER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	16	134 N	40 W	462447.86	954423.10			1973	2009	GOOD	Horz=NO Vert=YES	NO		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (1973)

Stamping: 33 WGW 1973

IN AMOR, 0.15 MILE WEST ALONG COUNTY ROAD 74 FROM THE JUNCTION OF COUNTY ROAD 74 AND COUNTY ROAD 1
IN AMOR, THEN 0.05 MILE NORTH ON AMOR TOWNSHIP DRIVE, 36.0 FEET EAST OF AMOR TOWNSHIP DRIVE, 1.0 FOOT
WEST OF A POWER POLE WITH 2 GUYWIRES, 1.0 FOOT WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1361.959	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.982 12B = -87.979 09 = -87.848 03 = -87.713

* No Horizontal Positions in the Database *



Mn/DOT Name: 338 MINN

NGS Name: 338 MINN

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	7	134 N	43 W	462626.00	960902.00		

NGS ACRN:
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1970	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON POST

Disk Type
BENCH MARK DISK

Mon. Agency
USGS

Description: (2010)

Stamping: 338 MINN

4.2 MILES NORTH ELIZABETH, 3.8 MILES NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 10 IN ELIZABETH, THEN 1.4 MILES NORTHWEST ON REED CREEK ROAD, 1600.0 FEET SOUTHEAST-OF THE NORTHWEST CORNER OF SECTION 7, 30.0 FEET WEST OF A FORK IN A ROAD, AT THE O. ZIMMERMAN'S FARM.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1336.523	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.156 12B = -88.153 09 = -88.031 03 = -87.946

* No Horizontal Positions in the Database *



Mn/DOT Name: 34 WGW

NGS Name: 34 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095341/
USGS Quad: PHELPS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	29	134 N	40 W	462326.60	954537.04		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	GOOD	Horz=NO Vert=YES	NO		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (1973)

Stamping: 34 WGW 1973

IN AMOR, 1.0 MILE WEST ALONG COUNTY ROAD 74 FROM THE JUNCTION OF COUNTY ROAD 74 AND COUNTY ROAD 1 IN AMOR, THEN 1.45 MILES SOUTH ON 350TH AVENUE, 34.5 FEET EAST OF 350TH AVENUE, 86.0 FEET NORTH OF 295TH STREET, 1.5 FEET SOUTHWEST OF A POWER POLE, 1.8 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1357.730	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1358.455	.262		1270.716	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.002 12B = -87.999 09 = -87.874 03 = -87.739

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 23 26.60124	95 45 37.04373	488991.118	203701.241	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2243598.594	838846.846	944150.634	16867301.434	.131	3	GPS - RTRN	2009	RTRN2009



Mn/DOT Name: 35 WGW

NGS Name: 35 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	7	133 N	40 W	462027.00	954530.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

COPPER CLAD ROD (NO SLEEVE)

Disk Type

SURVEY DISK

Mon. Agency

USGS

Description: (1973)

Stamping: 35 WGW 1973

2.5 MILES NORTH AND 1.5 MILES WEST OF BATTLE LAKE, 105.0 FEET NORTH AND 132.0 FEET WEST OF COUNTY ROAD 83
AT A TEE-ROAD WEST, AT A DOUBLE POLE POWER LINE, 3.0 FEET NORTH OF THE SOUTH LEG AND 9.0 FEET SOUTH OF THE
NORTH LEG OF A DOUBLE POWER POLE.

Station Notes

PULLED THE TIES, THEY FALL IN A FIELD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1350.270	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.933 12B = -87.939 09 = -87.828 03 = -87.690

* No Horizontal Positions in the Database *



Mn/DOT Name: 361 MINN

NGS Name: 361 MINN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	8	135 N	41 W	463140.00	955149.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2023	NOT FOUND	Horz=NO Vert=NO	NO			MARKER IS STEEL ROD

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description:

Stamping: 361 MINN

7.2 MILES SOUTHWEST OF DENT, AT THE JUNCTION OF COUNTY ROAD 41 AND NOOSLE ROAD, ON THE SOUTH SIDE OF A ROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1358.701	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.500 12B = -87.487 09 = -87.378 03 = -87.234

* No Horizontal Positions in the Database *



Mn/DOT Name: 4 WGW

NGS Name: 4 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	21	133 N	42 W	461932.66	955840.06		3	1973	2009	GOOD	Horz=NO Vert=YES	NO		RECESSED 4 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (1973)

Stamping: 4 WGW 1973

5.6 MILES NORTHEAST OF FERGUS FALLS, 1.45 MILES EAST ALONG COUNTY ROAD 18 FROM THE JUNCTION OF COUNTY ROAD 18 AND COUNTY ROAD 1 IN FERGUS FALLS, 50.0 FEET SOUTH OF COUNTY ROAD 18, 35.0 FEET WEST OF AURDAL RIVER ROAD, 1.5 FEET WEST OF A POWER POLE, 1.8 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NGVD29</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1325.903	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1326.572	.262		1238.620	.197	1996	GPS - RTRN	2009 RTRN2009

Geoid Separations(ft): GEOID18 = -88.186 12B = -88.192 09 = -88.074 03 = -87.953

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 19 32.66330	95 58 40.05619	434023.239	180107.163	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2188210.582	816277.430	888397.288	16845604.494	.131	3	GPS - RTRN	2009 RTRN2009



Mn/DOT Name: 5 WGW

NGS Name: 5 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	33	134 N	42 W	462211.00	955917.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

COPPER CLAD ROD (NO SLEEVE)

Disk Type

SURVEY DISK

Mon. Agency

USGS

Description: (1973)

Stamping: 5 WGW 1973

7.0 MILES EAST AND 0.5 MILE SOUTH OF ELIZABETH, 120.0 FEET NORTH AND 52.0 FEET EAST OF THE CROSSROADS OF COUNTY ROAD 1-COUNTY ROAD 10 WEST AND COUNTY ROAD 3 NORTH, 3.0 FEET NORTH OF A POWER POLE, 2.0 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1371.503	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.163 12B = -88.166 09 = -88.054 03 = -87.926

* No Horizontal Positions in the Database *



Mn/DOT Name: 5601 A

NGS Name: 5601 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DP2120](#) [Get Map](#)
NGS Quad / Sta Num : 46096242/
USGS Quad: FOXHOME

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	32	133 N	44 W	461702.80	961504.10	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2011	2013	GOOD	Horz=NO Vert=NO	YES		RECESSED 1 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2011) **Stamping:** 5601 A 2011

8.1 MILES WEST OF FERGUS FALLS, 6.3 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 17.95, 62.8 FEET SOUTH OF TRUNK HIGHWAY 210, 33.1 FEET NORTH OF THE NORTH RAIL OF A RAILROAD, 1.5 FEET EAST OF A WITNESS POST.

Station Notes

THE SURVEY MARK IS ON RAILROAD PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1058.584	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1058.597	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1058.646	.016	2/1				VERTICAL ADJUSTMENT	2015	00000821-R
1058.646	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1058.646	.016	2/1				VERTICAL CONTROL SURVEY	2013	VBREC

Geoid Separations(ft): GEOID18 = -88.313 12B = -88.291 09 = -88.192 03 = -88.146

* No Horizontal Positions in the Database *

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_A-DP2120-3S-26OCT2011.jpg	S	Oct 26, 2011
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_A-DP2120-2-26OCT2011.jpg		Oct 26, 2011
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_A-DP2120-1-26OCT2011.jpg		Oct 26, 2011

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5601 AA

NGS Name: 5601 AA

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	34	133 N	44 W	461714.00	961256.00			1969	2005	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5601 AA

6.8 MILES WEST OF FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 19.6, 76.0 FEET NORTH OF TRUNK HIGHWAY 210, 35.0 FEET EAST OF A TOWNSHIP ROAD NORTH, 5.5 FEET NORTHEAST OF A TELEPHONE POLE, THE ELEVATION IS NOT AVAILABLE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.297 12B = -88.281 09 = -88.172 03 = -88.126



Mn/DOT Name: 5601 B

NGS Name: 5601 B

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DP2116](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
SE	35	133 N	44 W	461722.50	961058.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2011	2020	GOOD	Horz=NO Vert=NO	YES		RECESSED 1 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 28 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2011) Stamping: 5601 B 2011

4.6 MILES WEST OF FERGUS FALLS, 3.0 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 21.2, 58.6 FEET SOUTH OF TRUNK HIGHWAY 210, 30.5 FEET NORTH OF THE NORTH RAIL OF A RAILROAD, 1.5 FEET WEST OF A WITNESS POST.

Station Notes

THE SURVEY MARK IS ON RAILROAD PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1147.012	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1147.015	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1147.058	.016	2/1				VERTICAL ADJUSTMENT	2015	00000821-R
1147.058	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1147.055	.016	2/1				VERTICAL CONTROL SURVEY	2013	VBREC

Geoid Separations(ft): GEOID18 = -88.277 12B = -88.264 09 = -88.153 03 = -88.100

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_B-DP2116-3S-25OCT2011.jpg	S	Oct 25, 2011
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_B-DP2116-2-25OCT2011.jpg		Oct 25, 2011
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_B-DP2116-1-25OCT2011.jpg		Oct 25, 2011

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5601 BB

NGS Name: 5601 BB

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	35	133 N	44 W	461720.00	961145.00			1969	2009	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5601 BB

5.8 MILES WEST OF FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 20.6, 119.0 FEET NORTH OF TRUNK HIGHWAY 210, 112.0 FEET EAST OF COUNTY ROAD 21, NEAR THE RIGHT-OF-WAY LINE, 67.0 FEET NORTHEAST OF A POWER POLE, THE ELEVATION IS NOT AVAILABLE.

Station Notes

THE TIES FALL IN TO A FIELD.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.287 12B = -88.268 09 = -88.163 03 = -88.110



Mn/DOT Name: 5601 C

NGS Name: 5601 C

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DP2115](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	36	133 N	44 W	461734.30	960944.50	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2011	2023	NOT FOUND	Horz=NO Vert=NO	YES		RECESSED 1 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 45 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2011) Stamping: 5601 C 2011

3.9 MILES WEST OF FERGUS FALLS, 2.0 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 22.25, 61.5 FEET NORTHWEST OF TRUNK HIGHWAY 210, 1.5 FEET NORTHEAST OF A WITNESS POST.

Station Notes

THE DITCH MAY HAVE BEEN REGRADED.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1176.878	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1176.878	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1176.917	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1176.887	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1176.917	.016	2/1				VERTICAL ADJUSTMENT	2015	00000821-R
1176.917	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1176.917	.016	2/1				VERTICAL CONTROL SURVEY	2013	VBREC

Geoid Separations(ft): GEOID18 = -88.271 12B = -88.258 09 = -88.149 03 = -88.090

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_C-DP2115-3NW-25OCT2011.jpg	NW	Oct 25, 2011
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_C-DP2115-2-25OCT2011.jpg		Oct 25, 2011
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_C-DP2115-1-25OCT2011.jpg		Oct 25, 2011

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5601 CC

NGS Name: 5601 CC

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	36	133 N	44 W	461726.00	961030.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1969	2011	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5601 CC

4.8 MILES WEST OF FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 21.6, 75.0 FEET NORTH OF TRUNK HIGHWAY 210,
666.0 FEET WEST OF A FIELD ENTRANCE NORTH, 6.5 FEET EAST OF A POWER POLE, THE ELEVATION IS NOT AVAILABLE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.274 12B = -88.261 09 = -88.153 03 = -88.094



Mn/DOT Name: 5601 D

NGS Name: 5601 D

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DP2114](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	31	133 N	43 W	461728.54	960827.11	2	C	2011	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 70 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5601 D 2011

IN FERGUS FALLS, 0.95 MILE WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 23.30, 53.2 FEET NORTHEAST OF TRUNK HIGHWAY 210, 28.7 FEET NORTHWEST OF TWO RIVER ROAD EXTENDED, 22.2 FEET NORTHWEST OF A FIELD ENTRANCE, 1.5 FEET SOUTHEAST OF A WITNESS POST.

Station Pair: SKOGEN - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1134.578	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1134.578	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1134.611	.016	2/1				VERTICAL ADJUSTMENT	2015	00000821-R
1134.611	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1134.611	.016	2/1				VERTICAL CONTROL SURVEY	2013	VBREC

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1134.578			1046.350	.017	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1134.578	.131		1046.471	.066	1996	GPS - STATIC	2024	HTH210A
1134.578			1046.350	.017	2011	GPS - STATIC	2024	HTH210A
1135.890	.262		1047.632	.197	2011	GPS - RTRN	2023	RTRN2023
1134.584	.262		1046.330	.197	2011	GPS - OPUS	2022	GPSBM
1134.460	.262		1046.205	.197	2011	GPS - OPUS	2022	GPSBM
1134.502	.262		1046.245	.197	2011	GPS - RTRN	2021	RTRN2021
1134.450	.262		1046.205	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -88.254 12B = -88.245 09 = -88.133 03 = -88.067

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>								
Geodetic Position		Otter Tail County				Project Info		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 17 28.53683	96 08 27.10471	392754.794	167710.837	.010		ADJUSTMENT	2025	GPS3793
46 17 28.53683	96 08 27.10471	392754.794	167710.837	.010	C	GPS - STATIC	2024	HTH210A
46 17 28.53657	96 08 27.10571	392754.724	167710.812	.131	3	GPS - RTRN	2023	RTRN2023
46 17 28.53683	96 08 27.10507	392754.769	167710.837	.131	3	GPS - OPUS	2022	GPSBM
46 17 28.53686	96 08 27.10540	392754.746	167710.841	.131	3	GPS - OPUS	2022	GPSBM
46 17 28.53653	96 08 27.10544	392754.743	167710.807	.131	3	GPS - RTRN	2021	RTRN2021
46 17 28.53750	96 08 27.10382	392754.857	167710.905	.131	3	GPS - RTRN	2015	RTRN2015

<u>NAD83(1996)</u>								
Geodetic Position		Otter Tail County		Project Info				
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 17 28.53653	96 08 27.10507	392754.769	167710.807	.033	C	GPS - STATIC	2024	HTH210A



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2146725.236	804648.665	846718.577	16834627.940	.010		ADJUSTMENT	2025	GPS3793
2146725.236	804648.665	846718.577	16834627.940	.010	C	GPS - STATIC	2024	HTH210A
2146725.165	804648.640	846718.506	16834627.916	.131	3	GPS - RTRN	2023	RTRN2023
2146725.211	804648.666	846718.552	16834627.941	.131	3	GPS - OPUS	2022	GPSBM
2146725.188	804648.669	846718.529	16834627.945	.131	3	GPS - OPUS	2022	GPSBM
2146725.184	804648.636	846718.525	16834627.911	.131	3	GPS - RTRN	2021	RTRN2021
2146725.300	804648.732	846718.642	16834628.005	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2146725.210	804648.635	846718.551	16834627.910	.033	C	GPS - STATIC	2024	HTH210A

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_D-DP2114-3N-21FEB2024.jpg	N	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_D-DP2114-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_D-DP2114-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5601 DD

NGS Name: 5601 DD

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	36	133 N	44 W	461736.00	960934.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1969	2011	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5601 DD

3.7 MILES WEST OF FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 22.4, 110.0 FEET NORTH OF TRUNK HIGHWAY 210, 60.0 FEET SOUTHEAST OF A TOWNSHIP ROAD NORTHEAST, 105.0 FEET SOUTHEAST OF A POWER POLE, 35.0 FEET NORTH OF A TRUNK HIGHWAY 210 POINT OF INTERSECTION, NEAR A GUARD POST, THE ELEVATION IS NOT AVAILABLE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.271 12B = -88.258 09 = -88.149 03 = -88.087



Mn/DOT Name: 5601 E

NGS Name: 5601 E

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DP2113](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	32	133 N	43 W	461722.23	960712.65	2	C	2011	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5601 E 2011

IN FERGUS FALLS, AT THE NORTHWEST JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, IN THE MEDIAN EAST OF THE TRUNK HIGHWAY 210 BRIDGES OVER INTERSTATE HIGHWAY 94, AT TRUNK HIGHWAY 210 MILEPOINT 24.30, 40.2 FEET NORTH OF EASTBOUND TRUNK HIGHWAY 210, 35.4 FEET SOUTH OF WESTBOUND TRUNK HIGHWAY 210, 28.6 FEET EAST OF THE NOSE OF A GUARD RAIL, 1.5 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1199.492	.016	2/1				VERTICAL ADJUSTMENT	2020 00000941-2
1199.492	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1199.532	.016	2/1				VERTICAL ADJUSTMENT	2015 00000821-R
1199.532	.016	2/1				VERTICAL ADJUSTMENT	2014 00000821
1199.532	.016	2/1				VERTICAL CONTROL SURVEY	2013 VBREC

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1199.492			1111.287	.012	2011	HORIZONTAL ADJUSTMENT	2025 GPS3847
1199.492			1111.287	.012	2011	GPS - STATIC	2025 HTH94B
1199.492			1111.287	.017	2011	HORIZONTAL ADJUSTMENT	2025 GPS3793
1199.492	.131		1111.409	.066	1996	GPS - STATIC	2024 HTH210A
1199.492			1111.287	.017	2011	GPS - STATIC	2024 HTH210A
1200.801	.262		1112.557	.197	2011	GPS - RTRN	2023 RTRN2023
1199.404	.262		1111.172	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -88.241 12B = -88.235 09 = -88.117 03 = -88.044

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>								
Geodetic Position		Otter Tail County		Project Info				
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 17 22.23310	96 07 12.64591	397980.568	167044.870	.007		ADJUSTMENT	2025	GPS3847
46 17 22.23310	96 07 12.64591	397980.568	167044.870	.007	C	GPS - STATIC	2025	HTH94B
46 17 22.23310	96 07 12.64591	397980.568	167044.870	.010		ADJUSTMENT	2025	GPS3793
46 17 22.23310	96 07 12.64591	397980.568	167044.870	.010	C	GPS - STATIC	2024	HTH210A
46 17 22.23237	96 07 12.64529	397980.611	167044.796	.131	3	GPS - RTRN	2023	RTRN2023
46 17 22.23242	96 07 12.64582	397980.573	167044.801	.131	3	GPS - RTRN	2015	RTRN2015

<u>NAD83(1996)</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 17 22.23256	96 07 12.64654	397980.523	167044.815	.066		NCAT	2025	HTH94B
46 17 22.23280	96 07 12.64626	397980.543	167044.839	.033	C	GPS - STATIC	2024	HTH210A



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2151937.096	803886.188	851919.804	16833783.030	.007		ADJUSTMENT	2025	GPS3847
2151937.096	803886.188	851919.804	16833783.030	.007	C	GPS - STATIC	2025	HTH94B
2151937.096	803886.188	851919.804	16833783.030	.010		ADJUSTMENT	2025	GPS3793
2151937.096	803886.188	851919.804	16833783.030	.010	C	GPS - STATIC	2024	HTH210A
2151937.137	803886.113	851919.845	16833782.954	.131	3	GPS - RTRN	2023	RTRN2023
2151937.100	803886.119	851919.808	16833782.961	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2151937.050	803886.134	851919.758	16833782.977	.066		NCAT	2025	HTH94B
2151937.070	803886.158	851919.778	16833783.001	.033	C	GPS - STATIC	2024	HTH210A

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_E-DP2113-3S-21FEB2024.jpg	S	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_E-DP2113-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_E-DP2113-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5601 EE

NGS Name: 5601 EE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	33	133 N	43 W	461700.00	960547.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1969	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5601 EE

1.0 MILE WEST OF FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 25.2, 137.0 FEET SOUTH OF EASTBOUND TRUNK HIGHWAY 210, WEST OF A TOWNSHIP ROAD SOUTH, 67.5 FEET SOUTHWEST OF A POWER POLE, THE ELEVATION IS NOT AVAILABLE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.208 12B = -88.202 09 = -88.090 03 = -88.008



Mn/DOT Name: 5601 FF

NGS Name: 5601 FF

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	33	133 N	43 W	461700.00	960530.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1969	1973	DESTROYED	Horz=NO Vert=NO	NO	NONE		SEE DESCRIPTION

Monument Type

BRIDGE ABUTMENT

Disk Type

SURVEY DISK

Mon. Agency

MNDT

Description: (1973)

Stamping:

0.7 MILE WEST OF FERGUS FALLS, IN THE SOUTHEAST CORNER OF A TRUNK HIGHWAY 210 BRIDGE, 18.0 FEET SOUTH OF TRUNK HIGHWAY 210, 130.0 FEET WEST OF 3IRD AVENUE SOUTH.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -88.205 12B = -88.202 09 = -88.087 03 = -88.005



Mn/DOT Name: 5601 GG

NGS Name: 5601 GG

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	34	133 N	43 W	461700.00	960501.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1969	1973	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1973)

Stamping:

0.4 MILE WEST OF FERGUS FALLS, 31.0 FEET SOUTH OF TRUNK HIGHWAY 210 AT EAST BROADWAY AVENUE, IN A CURB RADIUS.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.202 12B = -88.199 09 = -88.084 03 = -87.999



Mn/DOT Name: 5601 H

NGS Name: 5601 H

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DS3089](#) [Get Map](#)
NGS Quad / Sta Num : 46096242/
USGS Quad: FOXHOME

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	31	133 N	44 W	461659.69	961544.74		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2023	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 22 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2023) Stamping: 5601 H 2023

9.1 MILES WEST OF FERGUS FALLS, 6.85 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 17.4, 44.3 FEET SOUTH OF TRUNK HIGHWAY 210, 76.6 FEET WEST OF A FIELD ENTRANCE, 1.5 FEET NORTH OF A RIGHT-OF-WAY POST, 1.5 FEET NORTH OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1054.450				966.169	.018	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1054.411	.131			966.294	.066	1996	GPS - STATIC	2024	HTH210A
1054.450				966.169	.018	2011	GPS - STATIC	2024	HTH210A
1054.548	.262			966.232	.197	2011	GPS - RTRN	2023	RTRN2023

Geoid Separations(ft): GEOID18 = -88.313 03 = -88.149

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 59.69509	96 15 44.73690	362001.121	164977.462	.010		ADJUSTMENT	2025	GPS3793
46 16 59.69509	96 15 44.73690	362001.121	164977.462	.010	C	GPS - STATIC	2024	HTH210A
46 16 59.69491	96 15 44.73731	362001.092	164977.444	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 59.69479	96 15 44.73730	362001.092	164977.432	.033	C	GPS - STATIC	2024	HTH210A

State Plane and UTM Coordinates (Feet)

NAD83(2011)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2115930.332	802485.234	815880.271	16832949.680	.010		ADJUSTMENT	2025	GPS3793
2115930.332	802485.234	815880.271	16832949.680	.010	C	GPS - STATIC	2024	HTH210A
2115930.303	802485.216	815880.242	16832949.663	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2115930.304	802485.204	815880.242	16832949.651	.033	C	GPS - STATIC	2024	HTH210A

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_H-3S-21FEB2024.jpg	S	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_H-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_H-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5601 J

NGS Name: 5601 J

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DS3090](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SE	32	133 N	44 W	461706.38	961433.35		C	2023	2023	GOOD	Horz=YES Vert=YES	NO		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 33 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2023) Stamping: 5601 J 2023

8.1 MILES WEST OF FERGUS FALLS, 5.9 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 18.35, 49.7 FEET NORTH OF TRUNK HIGHWAY 210, 2.4 FEET EAST OF A NORTH SOUTH FENCE LINE EXTENDED.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1063.184			974.893	.017	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1063.154	.131		975.011	.066	1996	GPS - STATIC	2024	HTH210A
1063.184			974.893	.017	2011	GPS - STATIC	2024	HTH210A
1063.154	.262		974.844	.197	2011	GPS - RTRN	2023	RTRN2023

Geoid Separations(ft): GEOID18 = -88.310 03 = -88.143

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>								
<u>Geodetic Position</u>		<u>Otter Tail County</u>				<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 17 06.37548	96 14 33.34793	367019.753	165620.252	.010		ADJUSTMENT	2025	GPS3793
46 17 06.37548	96 14 33.34793	367019.753	165620.252	.010	C	GPS - STATIC	2024	HTH210A
46 17 06.37500	96 14 33.34800	367019.747	165620.203	.131	3	GPS - RTRN	2023	RTRN2023

<u>NAD83(1996)</u>								
Geodetic Position		Otter Tail County				Project Info		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 17 06.37519	96 14 33.34829	367019.727	165620.223	.033	C	GPS - STATIC	2024	HTH210A

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>								
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2120959.332	803034.961	820919.577	16833420.254	.010		ADJUSTMENT	2025	GPS3793
2120959.332	803034.961	820919.577	16833420.254	.010	C	GPS - STATIC	2024	HTH210A
2120959.326	803034.912	820919.570	16833420.205	.131	3	GPS - RTRN	2023	RTRN2023

<u>NAD83(1996)</u>								
MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2120959.306	803034.932	820919.551	16833420.225	.033	C	GPS - STATIC	2024	HTH210A

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_J-3N-21FEB2024.jpg	N	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_J-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_J-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5601 K

NGS Name: 5601 K

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DS3091](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	34	133 N	44 W	461717.65	961205.20		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2023	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 28 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2023) Stamping: 5601 K 2023

6.3 MILES WEST OF FERGUS FALLS, 3.95 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 HIGHWAY IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 20.35, 56.4 FEET SOUTH OF TRUNK HIGHWAY 210, 84.8 FEET EAST OF 138TH AVENUE, 30.5 FEET NORTHEAST OF A POWER POLE, 1.5 FEET SOUTH OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1112.052				1023.784	.021	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1112.012	.131			1023.905	.066	1996	GPS - STATIC	2024	HTH210A
1112.052				1023.784	.021	2011	GPS - STATIC	2024	HTH210A
1111.960	.262			1023.669	.197	2011	GPS - RTRN	2023	RTRN2023

Geoid Separations(ft): GEOID18 = -88.291 03 = -88.113

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 17.65443	96 12 05.19997	377431.867	166696.395	.013		ADJUSTMENT	2025	GPS3793
46 17 17.65443	96 12 05.19997	377431.867	166696.395	.013	C	GPS - STATIC	2024	HTH210A
46 17 17.65422	96 12 05.20002	377431.863	166696.373	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 17.65414	96 12 05.20035	377431.840	166696.365	.033	C	GPS - STATIC	2024	HTH210A

State Plane and UTM Coordinates (Feet)

NAD83(2011)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2131388.194	803918.098	831365.610	16834139.139	.013		ADJUSTMENT	2025	GPS3793
2131388.194	803918.098	831365.610	16834139.139	.013	C	GPS - STATIC	2024	HTH210A
2131388.190	803918.077	831365.606	16834139.118	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2131388.167	803918.069	831365.582	16834139.111	.033	C	GPS - STATIC	2024	HTH210A

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_K-3S-21FEB2024.jpg	S	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_K-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_K-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5601 L

NGS Name: 5601 L

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DS3092](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	35	133 N	44 W	461724.15	961052.66		C	2023	2023	GOOD	Horz=YES Vert=YES	NO		RECESSED 5 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 34 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2023) Stamping: 5601 L 2023

5.3 MILES WEST OF FERGUS FALLS, 2.95 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 21.3, 71.1 FEET NORTH OF TRUNK HIGHWAY 210, 27.1 FEET WEST OF DRIVEWAY NUMBER 14721, 3.9 FEET EAST OF CABLE BOX NUMBER 91 D 7, 3.8 FEET SOUTH OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1147.908				1059.657	.017	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1147.859	.131			1059.778	.066	1996	GPS - STATIC	2024	HTH210A
1147.908				1059.657	.017	2011	GPS - STATIC	2024	HTH210A
1147.977	.262			1059.699	.197	2011	GPS - RTRN	2023	RTRN2023

Geoid Separations(ft): GEOID18 = -88.277 03 = -88.100

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 17 24.15355	96 10 52.65490	382530.628	167324.216	.010				ADJUSTMENT	2025	GPS3793
46 17 24.15355	96 10 52.65490	382530.628	167324.216	.010	C			GPS - STATIC	2024	HTH210A
46 17 24.15263	96 10 52.65541	382530.592	167324.123	.131	3			GPS - RTRN	2023	RTRN2023

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 17 24.15325	96 10 52.65528	382530.602	167324.186	.033	C			GPS - STATIC	2024	HTH210A

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2136497.024	804451.372	836484.367	16834591.969	.010				ADJUSTMENT	2025	GPS3793
2136497.024	804451.372	836484.367	16834591.969	.010	C			GPS - STATIC	2024	HTH210A
2136496.986	804451.280	836484.327	16834591.877	.131	3			GPS - RTRN	2023	RTRN2023

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2136496.996	804451.343	836484.339	16834591.940	.033	C			GPS - STATIC	2024	HTH210A

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_L-3N-21FEB2024.jpg	N	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_L-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_L-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5601 M

NGS Name: 5601 M

County: OTTER TAIL, MN (Sheet 1)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	36	133 N	44 W	461730.65	960959.09		C

NGS ACRN:	DS3093	Get Map
NGS Quad / Sta Num :	46096213/	
USGS Quad:	CARLISLE	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2023	2023	GOOD	Horz=YES Vert=YES	NO		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 43 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2023)

Stamping: 5601 M 2023

4.0 MILES WEST OF FERGUS FALLS, 2.20 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 22.0, 67.8 FEET NORTH OF TRUNK HIGHWAY 210, 132.9 FEET EAST OF COUNTY ROAD 86 EXTENDED, 18.9 FEET EAST OF A POWER POLE WITH TWO GUY WIRES, 2.2 FEET SOUTH OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1172.701			1084.453	.017	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1172.645	.131		1084.575	.066	1996	GPS - STATIC	2024	HTH210A
1172.701			1084.453	.017	2011	GPS - STATIC	2024	HTH210A
1172.839	.262		1084.568	.197	2011	GPS - RTRN	2023	RTRN2023

Geoid Separations(ft): GEOID18 = -88.274 03 = -88.090

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>									
Geodetic Position		Otter Tail County		Project Info					
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 17 30.65125	96 09 59.08626	386296.418	167960.727	.010		ADJUSTMENT	2025	GPS3793	
46 17 30.65125	96 09 59.08626	386296.418	167960.727	.010	C	GPS - STATIC	2024	HTH210A	
46 17 30.65052	96 09 59.08580	386296.450	167960.653	.131	3	GPS - RTRN	2023	RTRN2023	

<u>NAD83(1996)</u>									
Geodetic Position		Otter Tail County				Project Info			
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 17 30.65096	96 09 59.08664	386296.391	167960.698	.033	C	GPS - STATIC	2024	HTH210A	

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>									
MN State Plane - Central Zone		UTM - Zone 15				Project Info			
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
2140273.448	805018.000	840270.818	16835099.175	.010		ADJUSTMENT	2025	GPS3793	
2140273.448	805018.000	840270.818	16835099.175	.010	C	GPS - STATIC	2024	HTH210A	
2140273.478	805017.925	840270.848	16835099.100	.131	3	GPS - RTRN	2023	RTRN2023	

<u>NAD83(1996)</u>									
MN State Plane - Central Zone		UTM - Zone 15						Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
2140273.420	805017.972	840270.791	16835099.147	.033	C	GPS - STATIC	2024	HTH210A	

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_M-3N-21FEB2024.jpg	N	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_M-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5601_M-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 A

NGS Name: 5602 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	2	132 N	43 W	461610.00	960318.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1965	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1965)

Stamping: 5602 A

IN FERGUS FALLS, 104.0 FEET RIGHT OF TRUNK HIGHWAY 210, AT TRUNK HIGHWAY 210 STATION 41+50, 200.0 FEET EAST OF THE JUNCTION OF TRUNK HIGHWAY 59 (OLD TRUNK HIGHWAY 52) AND TRUNK HIGHWAY 210.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1205.395	.033	3				VERTICAL CONTROL SURVEY	1965	CS5602

Geoid Separations(ft): GEOID18 = -88.133 12B = -88.136 09 = -88.018 03 = -87.930

* No Horizontal Positions in the Database *



Mn/DOT Name: 5602 AA

NGS Name: 5602 AA

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4334](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	5	132 N	40 W	461626.26	954433.58	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2015	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 39 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5602 AA 2015

1.4 MILES WEST-SOUTHWEST OF BATTLE LAKE, 1.4 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 IN BATTLE LAKE, AT TRUNK HIGHWAY 210 MILEPOINT 44.2, 72.8 FEET SOUTH-SOUTHEAST OF TRUNK HIGHWAY 210, 82.7 FEET WEST-SOUTHWEST OF A RIGHT-OF-WAY POST, 1.5 FEET NORTH-NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1394.955	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941	
1394.945	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911	
1394.945	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1394.955			1307.228	.020	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793	
1394.955	.131		1307.356	.066	1996	GPS - STATIC	2024	HTH210A	
1394.955			1307.228	.020	2011	GPS - STATIC	2024	HTH210A	
1394.955	.262		1307.327	.197	2011	GPS - RTRN	2023	RTRN2023	
1394.800	.262		1307.166	.197	2011	GPS - RTRN	2015	RTRN2015	

Geoid Separations(ft): GEOID18 = -87.624 12B = -87.634 09 = -87.536 03 = -87.434

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 16 26.26357	95 44 33.57824	493426.101	161115.587	.010		ADJUSTMENT	2025	GPS3793
46 16 26.26357	95 44 33.57824	493426.101	161115.587	.010	C	GPS - STATIC	2024	HTH210A
46 16 26.26366	95 44 33.57715	493426.178	161115.596	.131	3	GPS - RTRN	2023	RTRN2023
46 16 26.26330	95 44 33.57852	493426.082	161115.559	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 16 26.26324	95 44 33.57860	493426.076	161115.553	.033	C	GPS - STATIC	2024	HTH210A

State Plane and UTM Coordinates (Feet)

NAD83(2011)		UTM - Zone 15		Determination Method			Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order		Year	Reference
2247243.831	796191.994	947122.466	16824584.549	.010		ADJUSTMENT	2025	GPS3793
2247243.831	796191.994	947122.466	16824584.549	.010	C	GPS - STATIC	2024	HTH210A
2247243.908	796192.002	947122.542	16824584.555	.131	3	GPS - RTRN	2023	RTRN2023
2247243.811	796191.967	947122.445	16824584.522	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)		UTM - Zone 15		Determination Method			Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order		Year	Reference
2247243.805	796191.961	947122.439	16824584.516	.033	C	GPS - STATIC	2024	HTH210A



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AA-DQ4334-3S-21FEB2024.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AA-DQ4334-2-21FEB2024.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AA-DQ4334-1-21FEB2024.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Feb 21, 2024
	Feb 21, 2024
	Feb 21, 2024



Mn/DOT Name: 5602 AB

NGS Name: 5602 AB

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0482](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	33	133 N	42 W	461702.28	955832.15	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2015	GOOD	Horz=YES Vert=NO	YES		FLUSH	NO MAG MATERIAL

Monument Type

CULVERT - ANY SIZE, ANY TYPE

Disk Type

VERTICAL CONTROL DISK

Mon. Agency

MNDT

Description: (1975)

Stamping: 5602 AB 1975

4.25 MILES EAST OF FERGUS FALLS, 4.25 MILES EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 82 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 32.5, 250.0 FEET SOUTHEAST OF TRUNK HIGHWAY 210, 50.0 FEET NORTHEAST OF AURDAL RIVER ROAD, 22.0 FEET SOUTHEAST OF NORTH WALL LAKE DRIVE (OLD TRUNK HIGHWAY 210), IN THE SOUTHEAST CORNER OF THE HEADWALL OF NORTH WALL LAKE DRIVE (COUNTY ROAD 210).

Station Notes

THE SURVEY MARK IS A BOX CULVERT AND UNSUITABLE FOR MNDOT GEODETIC SURVEYS.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1261.556	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1261.569	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1261.543	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1261.569	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1261.569	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFGUS
1261.585	.016	2				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1260.791	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1260.791	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1261.494	.262		1173.361	.197	2011	GPS - RTRN	2015	RTRN2015
1261.494	.262		1173.361	.197	2011	GPS - RTRN	2015	RTRN2015
1261.448	.262		1173.551	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.120 12B = -88.133 09 = -88.008 03 = -87.897

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 02.28119	95 58 32.14862	434528.348	164870.526	.131	3	GPS - RTRN	2015	RTRN2015
46 17 02.28119	95 58 32.14862	434528.348	164870.526	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 02.28203	95 58 32.14877	434528.338	164870.611	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2188433.516	801036.072	888379.701	16830356.581	.131	3	GPS - RTRN	2015	RTRN2015
2188433.516	801036.072	888379.701	16830356.581	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2188433.508	801036.157	888379.693	16830356.667	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AB-RO0482-3SE-09SEP2015.jpg	SE	Sep 9, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AB-RO0482-2-09SEP2015.jpg		Sep 9, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AB-RO0482-1-09SEP2015.jpg		Sep 9, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 AC

NGS Name: 5602 AC

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0490](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	34	133 N	42 W	461710.55	955751.17	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2015	GOOD	Horz=NO Vert=NO	YES		FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
CULVERT - ANY SIZE, ANY TYPE	VERTICAL CONTROL DISK	MNDT

Description: (2005)

Stamping: 5602 AC 1975

4.5 MILES WEST OF UNDERWOOD, 4.5 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN UNDERWOOD TO TRUNK HIGHWAY 210 MILEPOINT 32.9, THEN 0.05 MILE SOUTH ON 249TH AVENUE, THEN 0.2 MILE EAST ON NORTH WALL LAKE ROAD, 240.0 FEET EAST OF A 60.0 INCH DIAMETER CULVERT UNDER NORTH WALL LAKE ROAD, 20.0 FEET SOUTHWEST OF NORTH WALL LAKE ROAD, IN THE SOUTHEAST CORNER OF A BOX CULVERT UNDER NORTH WALL LAKE ROAD.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1250.775	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1250.782	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1250.759	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1250.782	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1250.782	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFGUS
1250.782	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1249.991	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1249.991	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1250.723	.262		1162.593	.197	2011	GPS - RTRN	2015	RTRN2015
1250.723	.262		1162.593	.197	2011	GPS - RTRN	2015	RTRN2015
1250.631	.262		1162.747	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.113 12B = -88.130 09 = -88.005 03 = -87.884

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 10.54927	95 57 51.17163	437409.075	165698.926	.131	3	GPS - RTRN	2015	RTRN2015
46 17 10.54927	95 57 51.17163	437409.075	165698.926	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 10.55051	95 57 51.17222	437409.034	165699.052	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2191328.700	801810.900	891287.674	16831085.900	.131	3	GPS - RTRN	2015	RTRN2015
2191328.700	801810.900	891287.674	16831085.900	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2191328.662	801811.026	891287.638	16831086.027	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AC-RO0490-3S-09SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AC-RO0490-2-09SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AC-RO0490-1-09SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Sep 9, 2015
	Sep 9, 2015
	Sep 9, 2015



Mn/DOT Name: 5602 AD

NGS Name: 5602 AD

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R00491](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	34	133 N	42 W	461700.05	955719.86	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2015	GOOD	Horz=NO Vert=NO	YES		FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
CULVERT - ANY SIZE, ANY TYPE	VERTICAL CONTROL DISK	MNDT

Description: (1975)

Stamping: 5602 AD 1975

4.1 MILES WEST OF UNDERWOOD, IN THE NORTHEAST CORNER OF A HEADWALL OF A BOX CULVERT UNDER OLD TRUNK HIGHWAY 210, 4.0 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN UNDERWOOD, THEN 0.1 MILE SOUTH ON ELKS POINT ROAD, 185.0 FEET EAST OF ELK POINT ROAD, 23.2 FEET NORTH OF OLD TRUNK HIGHWAY 210.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1287.616	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1287.616	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1287.602	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1287.629	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1286.838	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1286.838	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1287.543	.262		1199.433	.197	2011	GPS - RTRN	2015	RTRN2015
1287.543	.262		1199.433	.197	2011	GPS - RTRN	2015	RTRN2015
1287.402	.262		1199.542	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.090 12B = -88.110 09 = -87.985 03 = -87.864

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 00.04514	95 57 19.85865	439605.104	164628.021	.131	3	GPS - RTRN	2015	RTRN2015
46 17 00.04514	95 57 19.85865	439605.104	164628.021	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 00.04546	95 57 19.86124	439604.922	164628.054	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2193504.239	800699.673	893446.106	16829940.149	.131	3	GPS - RTRN	2015	RTRN2015
2193504.239	800699.673	893446.106	16829940.149	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2193504.058	800699.709	893445.926	16829940.188	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AD-RO0491-3N-09SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AD-RO0491-2-09SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AD-RO0491-1-09SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Sep 9, 2015
	Sep 9, 2015
	Sep 9, 2015



Mn/DOT Name: 5602 AE

NGS Name: 5602 AE

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	36	133 N	42 W	461700.00	955531.00	2	

NGS ACRN: [RO0488](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	SURVEY DISK	MNDT

Description: (1975)

Stamping: 5602 AE

2.45 MILES WEST OF UNDERWOOD, AT TRUNK HIGHWAY 210 MILEPOINT 35.15, 2.45 MILES WEST ON TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35, 11.8 MILES WEST OF THE JUNCTION OF TRUNK HIGHWAY 26 AND TRUNK HIGHWAY 210 AT BATTLE LAKE, 7.05 MILES EAST ON TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 210 AT FERGUS FALLS, 52.0 FEET SOUTH OF TRUNK HIGHWAY 210, 100.0 FEET NORTH OF THE NORTHWEST SHORE OF A SMALL LAKE, IN THE SOUTHEAST CORNER OF A CONCRETE BOX CULVERT UNDER TRUNK HIGHWAY 210.

Station Notes

NEW BOX CULVERT.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1322.694	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1321.910	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Geoid Separations(ft): GEOID18 = -88.044 12B = -88.071 09 = -87.949 03 = -87.815

* No Horizontal Positions in the Database *



Mn/DOT Name: 5602 AF

NGS Name: 5602 AF

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0486](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	31	133 N	41 W	461658.14	955414.94	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2015	GOOD	Horz=NO Vert=YES	YES		PROJECTS 2 IN.	MARKER IS STEEL ROD

Monument Type	Disk Type	Mon. Agency
COPPER CLAD ROD (NO SLEEVE) (DEPTH 10 FT)	VERTICAL CONTROL DISK	MNDT

Description: (1975) **Stamping:** 5602 AF 1975

1.5 MILES WEST OF UNDERWOOD, 1.5 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN UNDERWOOD, AT TRUNK HIGHWAY 210 MILEPOINT 36.05, 85.0 FEET NORTH OF TRUNK HIGHWAY 210, 17.5 FEET EAST OF A FIELD ROAD NORTH, 4.5 FEET EAST-SOUTHEAST OF A POWER POLE WITH A GUY WIRE, 0.5 FOOT SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1378.091	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1378.081	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1378.085	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1378.071	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1377.287	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1377.287	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1377.957	.262		1289.919	.197	2011	GPS - RTRN	2015	RTRN2015
1377.957	.262		1289.919	.197	2011	GPS - RTRN	2015	RTRN2015
1377.796	.262		1290.014	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.008 12B = -88.038 09 = -87.920 03 = -87.782

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 58.14399	95 54 14.94065	452592.921	164400.417	.131	3	GPS - RTRN	2015	RTRN2015
46 16 58.14399	95 54 14.94065	452592.921	164400.417	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 58.14312	95 54 14.94193	452592.831	164400.329	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2206483.891	800231.731	906420.709	16829267.439	.131	3	GPS - RTRN	2015	RTRN2015
2206483.891	800231.731	906420.709	16829267.439	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2206483.800	800231.644	906420.617	16829267.354	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AF-RO0486-3N-09SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AF-RO0486-2-09SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AF-RO0486-1-09SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Sep 9, 2015
	Sep 9, 2015
	Sep 9, 2015



Mn/DOT Name: 5602 AG

NGS Name: 5602 AG

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0485](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NW	6	132 N	41 W	461655.48	955308.48	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2015	GOOD	Horz=NO Vert=YES	YES		PROJECTS 2 IN.	MARKER IS STEEL ROD

Monument Type	Disk Type	Mon. Agency
COPPER CLAD ROD (NO SLEEVE) (DEPTH 3 FT)	VERTICAL CONTROL DISK	MNDT

Description: (1975) **Stamping:** 5602 AG 1975

0.5 MILE SOUTHWEST OF UNDERWOOD, 0.55 MILE WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN UNDERWOOD, AT TRUNK HIGHWAY 210 MILEPOINT 37.0, 104.5 FEET SOUTH OF TRUNK HIGHWAY 210, 67.0 FEET EAST OF WILSON ROAD, 44.5 FEET EAST-NORTHEAST OF A TELEPHONE CABLE MARKER, 1.0 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1336.625	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1336.615	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1336.618	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1336.602	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1335.811	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1335.811	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1336.618	.262		1248.610	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -87.985 12B = -88.012 09 = -87.890 03 = -87.752

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 55.48342	95 53 08.47819	457260.587	164120.362	.131	3	GPS - RTRN	2015	RTRN2015

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2211144.952	799865.358	911076.761	16828827.506	.131	3	GPS - RTRN	2015	RTRN2015

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AG-RO0485-3S-09SEP2015.jpg	S	Sep 9, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AG-RO0485-2-09SEP2015.jpg		Sep 9, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AG-RO0485-1-09SEP2015.jpg		Sep 9, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 AH

NGS Name: 5602 AH

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0494](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
SE	32	133 N	41 W	461700.00	955219.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	2006	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1975) **Stamping:** 5602 AH 1975

AT UNDERWOOD, IN THE TOP OF THE SOUTHEAST CORNER OF THE BASE OF THE SOUTHEAST LEG OF A WATER TANK, 1.0 BLOCK NORTH ON COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 210 IN UNDERWOOD, TO TRUNK HIGHWAY 210 MILEPOINT 37.55, THEN GO 0.10 MILE EAST ON SOUTHERN AVENUE WEST TO THE WATER TANK, ON SOUTHERN AVENUE 42.2 FEET NORTH OF SOUTHERN AVENUE WEST, 114.0 FEET WEST OF A NORTH-SOUTH STREET, 112.5 FEET NORTH OF THE NORTHWEST CORNER OF A SCHOOL.

Station Notes

KADRMAS, LEE, AND JACKSON INC REPORTS THAT ENTIRE WATER TANK HAS BEEN REMOVED AS OF 1-25-2006.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1356.661	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1355.870	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Geoid Separations(ft): GEOID18 = -87.966 12B = -87.992 09 = -87.877 03 = -87.736

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AH-RO0494-3N-10MAY2005.jpg	N	May 10, 2005
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AH-RO0494-2-10MAY2005.jpg		May 10, 2005
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AH-RO0494-1-10MAY2005.jpg		May 10, 2005

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 AJ

NGS Name: 5602 AJ

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0500](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

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1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	4	132 N	41 W	461625.06	955029.69	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER IS STEEL ROD

Monument Type	Disk Type	Mon. Agency
COPPER CLAD ROD (NO SLEEVE) (DEPTH 64 FT)	VERTICAL CONTROL DISK	MNDT

Description: (1975)

Stamping: 5602 AJ 1975

1.7 MILES SOUTHEAST OF UNDERWOOD, 1.7 MILES SOUTHEAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN UNDERWOOD, AT TRUNK HIGHWAY 210 MILEPOINT 39.15, 101.0 FEET NORTH OF TRUNK HIGHWAY 210, 101.0 FEET EAST OF A RIGHT-OF-WAY POST, 46.6 FEET NORTH-NORTHWEST OF THE NORTH END OF A 30.0 INCH DIAMETER PIPE UNDER TRUNK HIGHWAY 210, 2.9 FEET SOUTHEAST OF A POWER POLE, 0.8 FOOT SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1322.563	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1322.553	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1322.553	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1322.553	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1321.762	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1321.762	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1322.481	.262		1234.610	.197	2011	GPS - RTRN	2023	RTRN2023
1322.337	.262		1234.443	.197	2011	GPS - RTRN	2015	RTRN2015
1322.337	.262		1234.443	.197	2011	GPS - RTRN	2015	RTRN2015
1322.369	.262		1234.715	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.874 12B = -87.894 09 = -87.785 03 = -87.651

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 25.06021	95 50 29.68570	468409.268	161017.542	.131	3	GPS - RTRN	2023	RTRN2023
46 16 25.06073	95 50 29.68439	468409.360	161017.594	.131	3	GPS - RTRN	2015	RTRN2015
46 16 25.06073	95 50 29.68439	468409.360	161017.594	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 25.06040	95 50 29.68519	468409.304	161017.561	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2222232.802	796557.105	922114.135	16825343.945	.131	3	GPS - RTRN	2023	RTRN2023
2222232.895	796557.156	922114.229	16825343.994	.131	3	GPS - RTRN	2015	RTRN2015
2222232.895	796557.156	922114.229	16825343.994	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2222232.839	796557.124	922114.172	16825343.962	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AJ-RO0500-3N-09OCT2023.jpg	N	Oct 9, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AJ-RO0500-2-09OCT2023.jpg		Oct 9, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AJ-RO0500-1-09OCT2023.jpg		Oct 9, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 AK

NGS Name: 5602 AK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0502](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NE	10	132 N	41 W	461600.24	954843.18	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER IS STEEL ROD

Monument Type	Disk Type	Mon. Agency
COPPER CLAD ROD (NO SLEEVE) (DEPTH 32 FT)	VERTICAL CONTROL DISK	MNDT

Description: (1975) Stamping: 5602 AK 1975

3.1 MILES SOUTHEAST OF UNDERWOOD, 3.35 MILES SOUTHEAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN UNDERWOOD, AT TRUNK HIGHWAY 210 MILEPOINT 40.75, 157.5 FEET SOUTH OF TRUNK HIGHWAY 210, 43.0 FEET NORTH-NORTHWEST OF A RIGHT-OF-WAY POST, 42.0 FEET WEST OF OAKDALE ROAD, 2.0 FEET NORTH OF A POWER POLE, 0.7 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1382.356	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1382.350	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1382.350	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1382.350	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1381.569	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1381.569	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1382.271	.262		1294.499	.197	2011	GPS - RTRN	2023	RTRN2023
1382.245	.262		1294.459	.197	2011	GPS - RTRN	2015	RTRN2015
1382.245	.262		1294.459	.197	2011	GPS - RTRN	2015	RTRN2015
1381.854	.262		1294.289	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.772 12B = -87.785 09 = -87.687 03 = -87.565

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 00.24373	95 48 43.17707	475888.539	158493.033	.131	3	GPS - RTRN	2023	RTRN2023
46 16 00.24369	95 48 43.17820	475888.460	158493.029	.131	3	GPS - RTRN	2015	RTRN2015
46 16 00.24369	95 48 43.17820	475888.460	158493.029	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 00.24419	95 48 43.17822	475888.458	158493.080	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2229663.061	793894.910	929503.449	16822564.279	.131	3	GPS - RTRN	2023	RTRN2023
2229662.982	793894.908	929503.370	16822564.278	.131	3	GPS - RTRN	2015	RTRN2015
2229662.982	793894.908	929503.370	16822564.278	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2229662.981	793894.958	929503.370	16822564.329	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AK-RO0502-3S-12OCT2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AK-RO0502-2-12OCT2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AK-RO0502-1-12OCT2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Oct 12, 2023
	Oct 12, 2023
	Oct 12, 2023



Mn/DOT Name: 5602 AL

NGS Name: 5602 AL

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0504](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	6	132 N	40 W	461601.97	954610.31	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER IS STEEL ROD

Monument Type	Disk Type	Mon. Agency
COPPER CLAD ROD (NO SLEEVE) (DEPTH 16 FT)	VERTICAL CONTROL DISK	MNDT

Description: (1975)

Stamping: 5602 AL 1975

2.8 MILES SOUTHWEST OF BATTLE LAKE, 2.9 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 IN BATTLE LAKE, AT TRUNK HIGHWAY 210 MILEPOINT 42.85, 73.5 FEET SOUTH OF TRUNK HIGHWAY 210, 120.0 FEET WEST OF A RIGHT-OF-WAY POST, 1.9 FEET NORTHWEST OF A POWER POLE WITH A GUY WIRE, 0.5 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1340.758	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1340.755	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1340.755	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1340.755	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1339.978	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1339.978	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1340.581	.262		1252.917	.197	2011	GPS - RTRN	2023	RTRN2023
1340.640	.262		1252.970	.197	2011	GPS - RTRN	2015	RTRN2015
1340.640	.262		1252.970	.197	2011	GPS - RTRN	2015	RTRN2015
1340.542	.262		1253.078	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.661 12B = -87.674 09 = -87.579 03 = -87.464

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 01.97107	95 46 10.31485	486628.682	158657.965	.131	3	GPS - RTRN	2023	RTRN2023
46 16 01.97116	95 46 10.31597	486628.604	158657.974	.131	3	GPS - RTRN	2015	RTRN2015
46 16 01.97116	95 46 10.31597	486628.604	158657.974	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 01.97192	95 46 10.31537	486628.646	158658.051	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2240402.984	793860.963	940244.144	16822361.082	.131	3	GPS - RTRN	2023	RTRN2023
2240402.906	793860.974	940244.066	16822361.093	.131	3	GPS - RTRN	2015	RTRN2015
2240402.906	793860.974	940244.066	16822361.093	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2240402.950	793861.050	940244.111	16822361.169	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AL-RO0504-3S-12OCT2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AL-RO0504-2-12OCT2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AL-RO0504-1-12OCT2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Oct 12, 2023
	Oct 12, 2023
	Oct 12, 2023



Mn/DOT Name: 5602 AM

NGS Name: 5602 AM

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0509](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	5	132 N	40 W	461627.26	954351.57	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER IS STEEL ROD

Monument Type	Disk Type	Mon. Agency
COPPER CLAD ROD (NO SLEEVE) (DEPTH 24 FT)	VERTICAL CONTROL DISK	MNDT

Description: (2005)

Stamping: 5602 AM 1975

1.0 MILE SOUTHWEST OF BATTLE LAKE, 0.85 MILE WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, 111.5 FEET SOUTH OF TRUNK HIGHWAY 210 AT MILEPOINT 44.75, 92.0 FEET WEST OF 365TH AVENUE, 87.3 FEET NORTHWEST OF A RIGHT-OF-WAY POST, 55.9 FEET SOUTHWEST OF A POWER POLE, 50.1 FEET SOUTHEAST OF A RIGHT-OF-WAY POST, 3.8 FEET NORTHWEST OF A RIGHT-OF-WAY POST, 0.7 FOOT NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1393.242	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1393.226	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1393.226	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1393.226	.016	2/1				VERTICAL ADJUSTMENT	2009	00000591
1393.226	.016	2/1				VERTICAL CONTROL SURVEY	2005	VBAT1
1393.226	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1392.448	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1392.448	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1393.242			1305.595	.008	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1393.242	.131		1305.772	.066	1996	GPS - STATIC	2024	HTH210A
1393.242			1305.595	.008	2011	GPS - STATIC	2024	HTH210A
1393.117	.262		1305.519	.197	2011	GPS - RTRN	2023	RTRN2023
1393.196	.262		1305.598	.197	2011	GPS - OPUS	2020	GPSBM
1392.970	.262		1305.365	.197	2011	GPS - RTRN	2015	RTRN2015
1392.970	.262		1305.365	.197	2011	GPS - RTRN	2015	RTRN2015
			1305.595	.008	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1393.009	.262		1305.601	.197	1996	GPS - RTRN	2009	RTRN2009
			1305.706	.009	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1393.239	.131		1305.772	.066	1996	HORIZONTAL ADJUSTMENT	2005	GPS2135
1393.239	.131		1305.772	.066	1996	GPS - STATIC	2005	HBATT

Geoid Separations(ft): GEOID18 = -87.598 12B = -87.605 09 = -87.503 03 = -87.408

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 27.25811	95 43 51.56917	496377.269	161215.589	.007		ADJUSTMENT	2025	GPS3793
46 16 27.25811	95 43 51.56917	496377.269	161215.589	.007	C	GPS - STATIC	2024	HTH210A
46 16 27.25793	95 43 51.56975	496377.228	161215.571	.131	3	GPS - RTRN	2023	RTRN2023
46 16 27.25784	95 43 51.56987	496377.220	161215.561	.131	3	GPS - OPUS	2020	GPSBM
46 16 27.25716	95 43 51.57077	496377.157	161215.493	.131	3	GPS - RTRN	2015	RTRN2015
46 16 27.25716	95 43 51.57077	496377.157	161215.493	.131	3	GPS - RTRN	2015	RTRN2015
46 16 27.25811	95 43 51.56917	496377.269	161215.589	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 27.25801	95 43 51.57007	496377.206	161215.579	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 27.25764	95 43 51.56981	496377.224	161215.541	.033	C	GPS - STATIC	2024	HTH210A
46 16 27.25824	95 43 51.57083	496377.152	161215.602	.131	3	GPS - RTRN	2009	RTRN2009
46 16 27.25764	95 43 51.56981	496377.224	161215.541	.033	C	ADJUSTMENT	2005	GPS2135
46 16 27.25764	95 43 51.56981	496377.224	161215.541	.033	C	GPS - STATIC	2005	HBATT

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2250195.951	796237.329	950075.595	16824583.356	.007		ADJUSTMENT	2025	GPS3793
2250195.951	796237.329	950075.595	16824583.356	.007	C	GPS - STATIC	2024	HTH210A
2250195.910	796237.312	950075.554	16824583.339	.131	3	GPS - RTRN	2023	RTRN2023
2250195.902	796237.303	950075.545	16824583.330	.131	3	GPS - OPUS	2020	GPSBM
2250195.837	796237.235	950075.479	16824583.263	.131	3	GPS - RTRN	2015	RTRN2015
2250195.837	796237.235	950075.479	16824583.263	.131	3	GPS - RTRN	2015	RTRN2015
2250195.951	796237.329	950075.595	16824583.356	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2250195.888	796237.321	950075.532	16824583.348	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2250195.905	796237.283	950075.549	16824583.310	.033	C	GPS - STATIC	2024	HTH210A
2250195.835	796237.345	950075.479	16824583.373	.131	3	GPS - RTRN	2009	RTRN2009
2250195.905	796237.283	950075.549	16824583.310	.033	C	ADJUSTMENT	2005	GPS2135
2250195.905	796237.283	950075.549	16824583.310	.033	C	GPS - STATIC	2005	HBATT

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AM-RO0509-3S-21FEB2024.jpg	S	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AM-RO0509-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_AM-RO0509-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 B

NGS Name: 5602 B

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	2	132 N	43 W	461618.00	960242.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1965	2005	DESTROYED	Horz=NO Vert=NO	NO	4997	FLUSH	STEEL SPIKE ADJ TO MON

Monument Type

BRIDGE ABUTMENT

Disk Type

SURVEY DISK

Mon. Agency

MNDT

Description: (1980)

Stamping: 5602 B 1975

0.5 MILE EAST ON TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 59 AT THE SOUTH EDGE OF FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 28.9, 18.3 FEET SOUTH OF TRUNK HIGHWAY 210, IN THE SOUTHEAST CORNER OF TRUNK HIGHWAY 210 BRIDGE NUMBER 4997 OVER A RAILROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1229.938	.033	3				VERTICAL CONTROL SURVEY	1965 CS5602

Geoid Separations(ft): GEOID18 = -88.136 12B = -88.140 09 = -88.021 03 = -87.930

* No Horizontal Positions in the Database *



Mn/DOT Name: 5602 C

NGS Name: 5602 C

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DK2684](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	1	132 N	43 W	461629.97	960115.35	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2015	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (2005)

Stamping: 5602 C 1975

2.7 MILES SOUTHEAST OF FERGUS FALLS, 1.75 MILES EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 82 IN FERGUS FALLS, 150.0 FEET EAST OF THE EAST EDGE OF A SMALL POND, 146.5 FEET NORTHEAST OF TRUNK HIGHWAY 210 MILEPOST 30, 73.0 FEET NORTH OF TRUNK HIGHWAY 210, 0.2 FOOT SOUTH OF A FIBERGLASS CABLE WARNING POST, 0.5 FOOT WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Year	Reference
1301.310	.016	2/1				2019	00000941
1301.333	.016	2/1				2017	00000911
1301.316	.016	2/1				2016	VOTTE
1301.333	.016	2/1				2008	00000425-25
1301.339	.016	2/1				2006	VFGUS

NGVD29			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Year	Reference
1300.545	.033	3				1965	CS5602

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Year	Reference
1301.238	.262		1213.105	.197	2011	2015	RTRN2015
1301.238	.262		1213.105	.197	2011	2015	RTRN2015
1301.277	.262		1213.357	.197	1996	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.126 12B = -88.130 09 = -88.018 03 = -87.920

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position		Otter Tail County		Project Info	
		Latitude	Longitude	X	Y	Year	Reference
46 16 29.97398	96 01 15.34863			423053.073	161638.396	2015	RTRN2015
46 16 29.97398	96 01 15.34863			423053.073	161638.396	2015	RTRN2015

NAD83(1996)		Geodetic Position		Otter Tail County		Project Info	
		Latitude	Longitude	X	Y	Year	Reference
46 16 29.97490	96 01 15.35087			423052.916	161638.489	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)		MN State Plane - Central Zone		UTM - Zone 15		Project Info	
		X	Y	X	Y	Year	Reference
2176901.911	798017.322			876798.083	16827519.032	2015	RTRN2015
2176901.911	798017.322			876798.083	16827519.032	2015	RTRN2015

NAD83(1996)		MN State Plane - Central Zone		UTM - Zone 15		Project Info	
		X	Y	X	Y	Year	Reference
2176901.755	798017.418			876797.929	16827519.131	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_C-DK2684-3N-09SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_C-DK2684-2-09SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_C-DK2684-1-09SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Sep 9, 2015
	Sep 9, 2015
	Sep 9, 2015



Mn/DOT Name: 5602 D

NGS Name: 5602 D

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R00481](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	33	133 N	42 W	461658.36	955841.50	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (2005)

Stamping: 5602 D 1975

4.7 MILES EAST OF FERGUS FALLS, 4.1 MILES EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 82 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 32.3, 75.0 FEET NORTH OF TRUNK HIGHWAY 210, 10.1 FEET EAST OF A POWER POLE, 7.2 FEET WEST OF A TELEPHONE PEDESTAL, 2.6 FEET WEST OF A RIGHT-OF-WAY POST, 1.0 FOOT SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1261.487	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1261.503	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1261.477	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1261.497	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1261.497	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFGUS
1261.497	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1260.706	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1260.706	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1261.487			1173.341	.018	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1261.487	.131		1173.469	.066	1996	GPS - STATIC	2024	HTH210A
1261.487			1173.341	.018	2011	GPS - STATIC	2024	HTH210A
1261.457	.262		1173.338	.197	2011	GPS - RTRN	2023	RTRN2023
1261.389	.262		1173.259	.197	2011	GPS - RTRN	2015	RTRN2015
1261.389	.262		1173.259	.197	2011	GPS - RTRN	2015	RTRN2015
1261.379	.262		1173.485	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.120 12B = -88.133 09 = -88.008 03 = -87.897

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 58.35911	95 58 41.49903	433870.288	164475.352	.010		ADJUSTMENT	2025	GPS3793
46 16 58.35911	95 58 41.49903	433870.288	164475.352	.010	C	GPS - STATIC	2024	HTH210A
46 16 58.35893	95 58 41.49909	433870.284	164475.334	.131	3	GPS - RTRN	2023	RTRN2023
46 16 58.35955	95 58 41.49771	433870.381	164475.397	.131	3	GPS - RTRN	2015	RTRN2015
46 16 58.35955	95 58 41.49771	433870.381	164475.397	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 58.35879	95 58 41.49939	433870.263	164475.320	.033	C	GPS - STATIC	2024	HTH210A
46 16 58.35893	95 58 41.49994	433870.224	164475.334	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2187768.343	800653.199	887708.356	16829984.122	.010		ADJUSTMENT	2025	GPS3793
2187768.343	800653.199	887708.356	16829984.122	.010	C	GPS - STATIC	2024	HTH210A
2187768.338	800653.181	887708.351	16829984.104	.131	3	GPS - RTRN	2023	RTRN2023
2187768.436	800653.242	887708.451	16829984.163	.131	3	GPS - RTRN	2015	RTRN2015
2187768.436	800653.242	887708.451	16829984.163	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2187768.317	800653.167	887708.330	16829984.090	.033	C	GPS - STATIC	2024	HTH210A
2187768.278	800653.182	887708.292	16829984.106	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_D-RO0481-3N-21FEB2024.jpg	N	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_D-RO0481-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_D-RO0481-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 E

NGS Name: 5602 E

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R00489](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	35	133 N	42 W	461657.14	955639.40	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (1975) Stamping: 5602 E 1975

6.3 MILES EAST OF FERGUS FALLS, 6.0 MILES EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 210 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 34.15, 74.0 FEET NORTH OF TRUNK HIGHWAY 210, 9.7 FEET EAST OF A POWER POLE NUMBER 10, 2.2 FEET WEST OF A RIGHT-OF-WAY MARKER, 0.5 FOOT SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1325.280	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941
1325.266	.016	2/1					VERTICAL ADJUSTMENT	2017	00000911
1325.266	.016	2/1					VERTICAL CONTROL SURVEY	2016	VOTTE
1325.266	.016	2/1					VERTICAL ADJUSTMENT	1991	00000025
NGVD29				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1324.479	.016	2/1					UNKNOWN/APPROXIMATE	1992	UNCHECKD
1324.479	.016	2					VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1325.214	.262			1237.140	.197	2011	GPS - RTRN	2023	RTRN2023
1325.184	.262			1237.091	.197	2011	GPS - RTRN	2015	RTRN2015
1325.184	.262			1237.091	.197	2011	GPS - RTRN	2015	RTRN2015
1325.115	.262			1237.274	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.074 12B = -88.094 09 = -87.969 03 = -87.841

Lat/Lon and County Coordinates (Feet)

NAD83(2011)				Otter Tail County				Project Info	
Geodetic Position									
Latitude	Longitude			X	Y	Acc	Order	Determination Method	Year
46 16 57.13861	95 56 39.40492			442445.644	164325.190	.131	3	GPS - RTRN	2023
46 16 57.13869	95 56 39.40514			442445.629	164325.199	.131	3	GPS - RTRN	2015
46 16 57.13869	95 56 39.40514			442445.629	164325.199	.131	3	GPS - RTRN	2015
NAD83(1996)				Otter Tail County				Project Info	
Geodetic Position									
Latitude	Longitude			X	Y	Acc	Order	Determination Method	Year
46 16 57.13974	95 56 39.40620			442445.555	164325.305	.131	3	GPS - RTRN	2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)				UTM - Zone 15				Project Info	
MN State Plane - Central Zone									
X	Y			X	Y	Acc	Order	Determination Method	Year
2196338.310	800344.356			896275.107	16829540.073	.131	3	GPS - RTRN	2023
2196338.295	800344.364			896275.092	16829540.081	.131	3	GPS - RTRN	2015
2196338.295	800344.364			896275.092	16829540.081	.131	3	GPS - RTRN	2015
NAD83(1996)				UTM - Zone 15				Project Info	
MN State Plane - Central Zone									
X	Y			X	Y	Acc	Order	Determination Method	Year
2196338.222	800344.472			896275.021	16829540.191	.131	3	GPS - RTRN	2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_E-RO0489-3N-09OCT2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_E-RO0489-2-09OCT2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_E-RO0489-1-09OCT2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Oct 9, 2023
	Oct 9, 2023
	Oct 9, 2023



Mn/DOT Name: 5602 G

NGS Name: 5602 G

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0498](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	5	132 N	41 W	461646.45	955147.78	2	3	1975	2015	GOOD	Horz=NO Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (1975)

Stamping: 5602 G 1975

0.5 MILE SOUTHEAST OF UNDERWOOD, 0.5 MILE EAST-SOUTHEAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN THE SOUTH SIDE OF UNDERWOOD, AT TRUNK HIGHWAY 210 MILEPOINT 38.05, 171.0 FEET EAST OF GERMAN LAKE ROAD, 73.5 FEET SOUTH OF TRUNK HIGHWAY 210, 59.2 FEET EAST OF A RIGHT-OF-WAY MONUMENT, 58.2 FEET EAST OF UNDERWOOD RM 1, 3.5 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1361.795	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1361.785	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1361.785	.016	2/1				VERTICAL CONTROL SURVEY	2016 VOTTE
1361.812	.016	2/1				VERTICAL ADJUSTMENT	2008 00000425-26
1361.812	.016	2/1				VERTICAL CONTROL SURVEY	2006 VKATC
1361.812	.016	2/1				VERTICAL ADJUSTMENT	1991 00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1361.021	.016	2/1				UNKNOWN/APPROXIMATE	1992 UNCHECKD
1361.021	.016	2				VERTICAL CONTROL SURVEY	1976 L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1361.749	.262		1273.784	.197	2011	GPS - RTRN	2015 RTRN2015
1361.749	.262		1273.784	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -87.936 12B = -87.962 09 = -87.848 03 = -87.710

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u> <u>Year</u> <u>Reference</u>
46 16 46.45249	95 51 47.77939	462927.155	163194.153	.131	3	GPS - RTRN 2015 RTRN2015
46 16 46.45249	95 51 47.77939	462927.155	163194.153	.131	3	GPS - RTRN 2015 RTRN2015

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u> <u>Year</u> <u>Reference</u>
2216792.651	798834.536	916709.088	16827707.473	.131	3	GPS - RTRN 2015 RTRN2015
2216792.651	798834.536	916709.088	16827707.473	.131	3	GPS - RTRN 2015 RTRN2015

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_G-RO0498-3S-08SEP2015.jpg	S	Sep 8, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_G-RO0498-2-08SEP2015.jpg		Sep 8, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_G-RO0498-1-08SEP2015.jpg		Sep 8, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 H

NGS Name: 5602 H

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0501](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	10	132 N	41 W	461602.27	954957.22	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (1985)

Stamping: 5602 H 1975

2.35 MILES SOUTHEAST OF UNDERWOOD, 2.2 MILES SOUTHEAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK 210 AND COUNTY ROAD 35 IN UNDERWOOD, AT TRUNK HIGHWAY 210 MILEPOINT 39.75, 213.5 FEET SOUTHWEST OF TRUNK HIGHWAY 210, 39.9 FEET EAST OF COUNTY ROAD 119, 35.0 FEET SOUTH OF 210TH STREET EXTENDED, 30.1 FEET SOUTH-SOUTHWEST OF A POWER POLE WITH THREE GUY WIRES, 11.2 FEET WEST OF A RIGHT-OF-WAY POST, 0.5 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1348.774	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1348.767	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1348.767	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1348.793	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1348.006	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1348.006	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1348.774			1260.864	.019	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1348.774	.131		1260.995	.066	1996	GPS - STATIC	2024	HTH210A
1348.774			1260.864	.019	2011	GPS - STATIC	2024	HTH210A
1348.672	.262		1260.850	.197	2011	GPS - RTRN	2023	RTRN2023
1348.619	.262		1260.778	.197	2011	GPS - RTRN	2015	RTRN2015
1348.619	.262		1260.778	.197	2011	GPS - RTRN	2015	RTRN2015
1348.514	.262		1260.906	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.821 12B = -87.841 09 = -87.736 03 = -87.608

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 02.26799	95 49 57.21726	470686.814	158705.051	.010		ADJUSTMENT	2025	GPS3793
46 16 02.26799	95 49 57.21726	470686.814	158705.051	.010	C	GPS - STATIC	2024	HTH210A
46 16 02.26810	95 49 57.21689	470686.840	158705.063	.131	3	GPS - RTRN	2023	RTRN2023
46 16 02.26872	95 49 57.21751	470686.796	158705.126	.131	3	GPS - RTRN	2015	RTRN2015
46 16 02.26872	95 49 57.21751	470686.796	158705.126	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 02.26765	95 49 57.21763	470686.788	158705.017	.033	C	GPS - STATIC	2024	HTH210A
46 16 02.26808	95 49 57.21851	470686.726	158705.061	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2224466.846	794203.158	924311.392	16822954.455	.010		ADJUSTMENT	2025	GPS3793
2224466.846	794203.158	924311.392	16822954.455	.010	C	GPS - STATIC	2024	HTH210A
2224466.872	794203.168	924311.418	16822954.466	.131	3	GPS - RTRN	2023	RTRN2023
2224466.830	794203.232	924311.377	16822954.530	.131	3	GPS - RTRN	2015	RTRN2015
2224466.830	794203.232	924311.377	16822954.530	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2224466.819	794203.124	924311.365	16822954.422	.033	C	GPS - STATIC	2024	HTH210A
2224466.758	794203.169	924311.305	16822954.468	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_H-RO0501-3S-21FEB2024.jpg	S	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_H-RO0501-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_H-RO0501-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 J

NGS Name: 5602 J

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0505](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	2	132 N	41 W	461601.99	954728.08	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (1975)

Stamping: 5602 J 1975

3.8 MILES SOUTHWEST OF BATTLE LAKE, 3.95 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 IN BATTLE LAKE, AT TRUNK HIGHWAY 210 MILEPOINT 41.8, 73.0 FEET NORTH OF TRUNK HIGHWAY 210, 42.7 FEET EAST OF A POWER POLE, 26.5 FEET WEST-SOUTHWEST OF DRIVEWAY NUMBERS 33521 AND 33525, 15.8 FEET WEST-SOUTHWEST OF A POWER POLE WITH A METER, 6.1 FEET WEST OF THE SOUTHWEST CORNER OF A METAL CABLE BOX, 0.5 FOOT SOUTH OF A WITNESS POST.

Station Pair: JONES - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1339.390	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1339.387	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1339.387	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1339.289	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1338.508	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1338.508	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1339.390			1251.625	.014	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1339.390	.131		1251.776	.066	1996	GPS - STATIC	2024	HTH210A
1339.390			1251.625	.014	2011	GPS - STATIC	2024	HTH210A
1339.423	.262		1251.704	.197	2011	GPS - RTRN	2023	RTRN2023
1339.390	.131		1251.776	.066	1996	GPS - STATIC	2021	HOTTE
1339.390			1251.625	.020	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1339.390			1251.625	.020	2011	GPS - STATIC	2020	HOTTE
1339.253	.262		1251.520	.197	2011	GPS - RTRN	2015	RTRN2015
1339.253	.262		1251.520	.197	2011	GPS - RTRN	2015	RTRN2015
1339.134	.262		1251.612	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.720 12B = -87.733 09 = -87.638 03 = -87.520

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 01.98627	95 47 28.07649	481165.235	158663.902	.010		ADJUSTMENT	2025	GPS3793
46 16 01.98627	95 47 28.07649	481165.235	158663.902	.010	C	GPS - STATIC	2024	HTH210A
46 16 01.98610	95 47 28.07553	481165.303	158663.885	.131	3	GPS - RTRN	2023	RTRN2023
46 16 01.98627	95 47 28.07649	481165.235	158663.902	.013		ADJUSTMENT	2020	GPS3384
46 16 01.98627	95 47 28.07649	481165.235	158663.902	.013	C	GPS - STATIC	2020	HOTTE
46 16 01.98639	95 47 28.07664	481165.225	158663.914	.131	3	GPS - RTRN	2015	RTRN2015
46 16 01.98639	95 47 28.07664	481165.225	158663.914	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 01.98599	95 47 28.07700	481165.199	158663.874	.033	C	GPS - STATIC	2024	HTH210A
46 16 01.98599	95 47 28.07700	481165.199	158663.874	.033	C	GPS - STATIC	2021	HOTTE
46 16 01.98613	95 47 28.07883	481165.071	158663.888	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2234941.312	793968.042	934783.519	16822554.242	.010		ADJUSTMENT	2025	GPS3793
2234941.312	793968.042	934783.519	16822554.242	.010	C	GPS - STATIC	2024	HTH210A
2234941.380	793968.024	934783.585	16822554.223	.131	3	GPS - RTRN	2023	RTRN2023
2234941.312	793968.042	934783.519	16822554.242	.013		ADJUSTMENT	2020	GPS3384
2234941.312	793968.042	934783.519	16822554.242	.013	C	GPS - STATIC	2020	HOTTE
2234941.302	793968.054	934783.508	16822554.255	.131	3	GPS - RTRN	2015	RTRN2015
2234941.302	793968.054	934783.508	16822554.255	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2234941.276	793968.014	934783.482	16822554.215	.033	C	GPS - STATIC	2024	HTH210A
2234941.276	793968.014	934783.482	16822554.215	.033	C	GPS - STATIC	2021	HOTTE
2234941.148	793968.031	934783.354	16822554.234	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_J-RO0505-3N-21FEB2024.jpg	N	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_J-RO0505-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_J-RO0505-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 K

NGS Name: 5602 K

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0510](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
SW	6	132 N	40 W	461606.00	954513.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	2010	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 4 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1975) Stamping: 5602 K 1975

2.1 MILES WEST ON TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 AT BATTLE LAKE, AT TRUNK HIGHWAY 210 MILEPOINT 43.55, 15.75 MILES EAST OF THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 210 AT FERGUS FALLS, 6.25 MILES EAST OF THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 AT UNDERWOOD, 93.0 FEET SOUTH OF TRUNK HIGHWAY 210, 33.0 FEET NORTH OF A FENCE, 53.5 FEET NORTHEAST OF A POWER POLE, 0.2 MILE WEST OF COUNTY ROAD 47 SOUTH, 0.6 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1357.658	.016	2/1					VERTICAL ADJUSTMENT	1991	00000025

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1356.880	.016	2					VERTICAL CONTROL SURVEY	1976	L23961

Geoid Separations(ft): GEOID18 = -87.624 12B = -87.634 09 = -87.536 03 = -87.431

* No Horizontal Positions in the Database *



Mn/DOT Name: 5602 KA

NGS Name: 5602 KA

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DH4059](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	4	132 N	40 W	461628.23	954252.50	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1965	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (2014) **Stamping:** 5602 KA 1985

IN BATTLE LAKE, AT THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 IN BATTLE LAKE, AT TRUNK HIGHWAY 210 MILEPOINT 75.50, 74.0 FEET SOUTH OF TRUNK HIGHWAY 210, AT TRUNK HIGHWAY 210 STATION 942+73, 176.0 FEET WEST OF TRUNK HIGHWAY 78, 4.0 FEET NORTH OF A FENCE CORNER ON THE RIGHT-OF-WAY, 0.3 FOOT NORTH OF A WITNESS POST/RIGHT-OF-WAY POST, THE DISK WAS SET IN 1965 AND THEN STAMPED WHEN USED IN 1985.

Station Pair: BATTLE LAKE - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1348.675	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1348.659	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1348.659	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1348.659	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1348.659	.016	2/1				VERTICAL CONTROL SURVEY	2012	VASHB
1348.659	.016	2/1				VERTICAL ADJUSTMENT	2009	00000591
1348.659	.016	2/1				VERTICAL CONTROL SURVEY	2006	VPEAK
1348.659	.016	2/1				VERTICAL CONTROL SURVEY	2005	VBAT1

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1347.783	.033	3				VERTICAL CONTROL SURVEY	1965	CS5602

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1348.675			1261.064	.008	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1348.675			1261.064	.008	2011	HORIZONTAL ADJUSTMENT	2024	GPS3782
1348.675	.131		1261.241	.066	1996	GPS - STATIC	2024	HTH210A
1348.675			1261.064	.008	2011	GPS - STATIC	2024	HTH210A
1348.675			1261.064	.008	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1348.675	.131		1261.241	.066	1996	GPS - STATIC	2024	HTH210B
1348.675			1261.064	.008	2011	GPS - STATIC	2024	HTH210B
1348.675	.131		1261.241	.066	1996	GPS - STATIC	2024	HTH78B
1348.675			1261.064	.008	2011	GPS - STATIC	2024	HTH78B
1348.573	.262		1261.018	.197	2011	GPS - RTRN	2023	RTRN2023
1348.527	.262		1260.965	.197	2011	GPS - RTRN	2015	RTRN2015
1348.527	.262		1260.965	.197	2011	GPS - RTRN	2015	RTRN2015
			1261.064	.008	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1348.318	.262		1260.949	.197	1996	GPS - RTRN	2009	RTRN2009
			1261.175	.009	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1348.652	.131		1261.241	.066	1996	HORIZONTAL ADJUSTMENT	2005	GPS2135
1348.652	.131		1261.241	.066	1996	GPS - STATIC	2005	HBATT

Geoid Separations(ft): GEOID18 = -87.556 12B = -87.562 09 = -87.457 03 = -87.369

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 28.23167	95 42 52.49907	500526.937	161313.897	.007		ADJUSTMENT	2025	GPS3793
46 16 28.23167	95 42 52.49907	500526.937	161313.897	.010		ADJUSTMENT	2024	GPS3782
46 16 28.23167	95 42 52.49907	500526.937	161313.897	.007	C	GPS - STATIC	2024	HTH210A
46 16 28.23167	95 42 52.49907	500526.937	161313.897	.007		ADJUSTMENT	2024	GPS3771
46 16 28.23167	95 42 52.49907	500526.937	161313.897	.010	C	GPS - STATIC	2024	HTH210B
46 16 28.23167	95 42 52.49907	500526.937	161313.897	.007	C	GPS - STATIC	2024	HTH78B
46 16 28.23155	95 42 52.49878	500526.958	161313.884	.131	3	GPS - RTRN	2023	RTRN2023
46 16 28.23183	95 42 52.49989	500526.880	161313.913	.131	3	GPS - RTRN	2015	RTRN2015
46 16 28.23183	95 42 52.49989	500526.880	161313.913	.131	3	GPS - RTRN	2015	RTRN2015
46 16 28.23167	95 42 52.49907	500526.937	161313.897	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 28.23160	95 42 52.49992	500526.878	161313.890	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 28.23123	95 42 52.49966	500526.896	161313.852	.033	C	GPS - STATIC	2024	HTH210A
46 16 28.23123	95 42 52.49966	500526.896	161313.852	.033	C	GPS - STATIC	2024	HTH210B
46 16 28.23123	95 42 52.49966	500526.896	161313.852	.033	C	GPS - STATIC	2024	HTH78B
46 16 28.23144	95 42 52.50070	500526.823	161313.873	.131	3	GPS - RTRN	2009	RTRN2009
46 16 28.23123	95 42 52.49966	500526.896	161313.852	.033	C	ADJUSTMENT	2005	GPS2135
46 16 28.23123	95 42 52.49966	500526.896	161313.852	.033	C	GPS - STATIC	2005	HBATT

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2254346.176	796258.781	954226.549	16824539.392	.007		ADJUSTMENT	2025	GPS3793
2254346.176	796258.781	954226.549	16824539.392	.010		ADJUSTMENT	2024	GPS3782
2254346.176	796258.781	954226.549	16824539.392	.007	C	GPS - STATIC	2024	HTH210A
2254346.176	796258.781	954226.549	16824539.392	.007		ADJUSTMENT	2024	GPS3771
2254346.176	796258.781	954226.549	16824539.392	.010	C	GPS - STATIC	2024	HTH210B
2254346.176	796258.781	954226.549	16824539.392	.007	C	GPS - STATIC	2024	HTH78B
2254346.196	796258.769	954226.569	16824539.379	.131	3	GPS - RTRN	2023	RTRN2023
2254346.119	796258.799	954226.492	16824539.410	.131	3	GPS - RTRN	2015	RTRN2015
2254346.119	796258.799	954226.492	16824539.410	.131	3	GPS - RTRN	2015	RTRN2015
2254346.176	796258.781	954226.549	16824539.392	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2254346.116	796258.775	954226.489	16824539.387	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2254346.134	796258.738	954226.506	16824539.349	.033	C	GPS - STATIC	2024	HTH210A
2254346.134	796258.738	954226.506	16824539.349	.033	C	GPS - STATIC	2024	HTH210B
2254346.134	796258.738	954226.506	16824539.349	.033	C	GPS - STATIC	2024	HTH78B
2254346.061	796258.760	954226.434	16824539.373	.131	3	GPS - RTRN	2009	RTRN2009
2254346.134	796258.738	954226.506	16824539.349	.033	C	ADJUSTMENT	2005	GPS2135
2254346.134	796258.738	954226.506	16824539.349	.033	C	GPS - STATIC	2005	HBATT

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_KA-DH4059-3S-20FEB2024.jpg	S	Feb 20, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_KA-DH4059-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_KA-DH4059-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 L

NGS Name: 5602 L

County: OTTER TAIL, MN (Sheet 1)

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>	NGS ACRN: DQ4356 NGS Quad / Sta Num : 46096212/ USGS Quad: FERGUS FALLS Get Map
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>	
NW	10	132 N	43 W	461552.22	960419.07	2	3	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1987	2015	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	VERTICAL CONTROL DISK	MNDT

Description: (1989) Stamping: 5602 L 1987

1.3 MILES SOUTHEAST OF FERGUS FALLS, 0.95 MILE NORTH ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 (THE JUNCTION IS 2.5 MILES SOUTH OF FERGUS FALLS), THEN 0.15 MILE NORTH ON COUNTY ROAD 25 (SOUTH CASCADE STREET), 114.0 FEET SOUTH OF DRIVEWAY NUMBER 1830, 51.0 FEET WEST OF COUNTY ROAD 25, 2.4 FEET NORTH-NORTHWEST OF A COUNTY RIGHT-OF-WAY MARKER, APPROXIMATELY 1.0 FOOT NORTH OF THE NORTH LINE OF THE SOUTHEAST 1/4 OF THE NORTHWEST 1/4 OF SECTION 10, THE ROD DEPTH IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1277.012	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1277.035	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1277.022	.016	2/1				VERTICAL CONTROL SURVEY	2016 VOTTE
<u>NGVD29</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1276.208	.033	3				VERTICAL CONTROL SURVEY	1987 CS5602

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1276.894	.262		1188.771	.197	2011	GPS - RTRN	2015 RTRN2015
1276.894	.262		1188.771	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -88.120 12B = -88.123 09 = -88.002 03 = -87.920

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u> <u>Year</u> <u>Reference</u>
46 15 52.22277	96 04 19.07298	410129.560	157867.768	.131	3	GPS - RTRN 2015 RTRN2015
46 15 52.22277	96 04 19.07298	410129.560	157867.768	.131	3	GPS - RTRN 2015 RTRN2015

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u> <u>Year</u> <u>Reference</u>
<u>X</u> <u>Y</u>						
2163912.546	794487.034	863750.076	16824192.674	.131	3	GPS - RTRN 2015 RTRN2015
2163912.546	794487.034	863750.076	16824192.674	.131	3	GPS - RTRN 2015 RTRN2015

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<u>Location:</u>	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_L-DQ4356-3W-09SEP2015.jpg	W	Sep 9, 2015
<u>Monument:</u>	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_L-DQ4356-2-09SEP2015.jpg		Sep 9, 2015
<u>Disk:</u>	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_L-DQ4356-1-09SEP2015.jpg		Sep 9, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 M

NGS Name: 5602 M

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DK2685](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	6	132 N	42 W	461633.15	960007.85	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2005	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	SURVEY DISK	MNDT

Description: (2005)

Stamping: 5602 M 2005

3.5 MILES EAST-SOUTHEAST OF FERGUS FALLS, 2.65 MILES EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 82 IN THE SOUTHEAST PART OF FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 30.9. 115.2 FEET NORTH OF TRUNK HIGHWAY 210, 96.9 FEET EAST OF A DRIVEWAY NUMBER 23363, 14.0 FEET SOUTH OF AN EAST/WEST FENCE LINE, 1.2 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1284.056	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1284.072	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1284.059	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1284.072	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1284.076	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFGUS

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1284.056			1195.920	.017	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1284.056	.131		1196.044	.066	1996	GPS - STATIC	2024	HTH210A
1284.056			1195.920	.017	2011	GPS - STATIC	2024	HTH210A
1283.990	.262		1195.874	.197	2011	GPS - RTRN	2023	RTRN2023
1284.013	.262		1195.897	.197	2011	GPS - OPUS	2022	GPSBM
1283.934	.262		1195.818	.197	2011	GPS - OPUS	2022	GPSBM
1284.056	.262		1195.939	.197	2011	GPS - RTRN	2021	RTRN2021
1283.987	.262		1195.867	.197	2011	GPS - RTRN	2015	RTRN2015
1283.987	.262		1195.867	.197	2011	GPS - RTRN	2015	RTRN2015
1283.948	.262		1196.047	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.117 12B = -88.120 09 = -88.008 03 = -87.903

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 33.15052	96 00 07.85389	427795.638	161942.524	.010		ADJUSTMENT	2025	GPS3793
46 16 33.15052	96 00 07.85389	427795.638	161942.524	.010	C	GPS - STATIC	2024	HTH210A
46 16 33.15017	96 00 07.85447	427795.597	161942.488	.131	3	GPS - RTRN	2023	RTRN2023
46 16 33.15014	96 00 07.85434	427795.606	161942.485	.131	3	GPS - OPUS	2022	GPSBM
46 16 33.15043	96 00 07.85412	427795.622	161942.515	.131	3	GPS - OPUS	2022	GPSBM
46 16 33.15012	96 00 07.85349	427795.666	161942.483	.131	3	GPS - RTRN	2021	RTRN2021
46 16 33.14984	96 00 07.85373	427795.649	161942.455	.131	3	GPS - RTRN	2015	RTRN2015
46 16 33.14984	96 00 07.85373	427795.649	161942.455	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 33.15021	96 00 07.85425	427795.613	161942.492	.033	C	GPS - STATIC	2024	HTH210A
46 16 33.15069	96 00 07.85478	427795.576	161942.541	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2181648.661	798233.578	881549.263	16827660.498	.010		ADJUSTMENT	2025	GPS3793
2181648.661	798233.578	881549.263	16827660.498	.010	C	GPS - STATIC	2024	HTH210A
2181648.619	798233.544	881549.221	16827660.464	.131	3	GPS - RTRN	2023	RTRN2023
2181648.628	798233.540	881549.230	16827660.461	.131	3	GPS - OPUS	2022	GPSBM
2181648.645	798233.569	881549.247	16827660.490	.131	3	GPS - OPUS	2022	GPSBM
2181648.688	798233.537	881549.290	16827660.457	.131	3	GPS - RTRN	2021	RTRN2021
2181648.670	798233.509	881549.272	16827660.429	.131	3	GPS - RTRN	2015	RTRN2015
2181648.670	798233.509	881549.272	16827660.429	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2181648.635	798233.547	881549.237	16827660.468	.033	C	GPS - STATIC	2024	HTH210A
2181648.599	798233.597	881549.201	16827660.518	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_M-DK2685-3N-21FEB2024.jpg	N	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_M-DK2685-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_M-DK2685-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 N

NGS Name: 5602 N

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DK2686](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	5	132 N	42 W	461633.44	955917.53	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2005	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2005)

Stamping: 5602 N 2005

4.0 MILES EAST-SOUTHEAST OF FERGUS FALLS, 3.3 MILES EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAYS 210 AND COUNTY ROAD 82 IN THE SOUTHEAST PART OF FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 31.5, 69.4 FEET NORTH OF TRUNK HIGHWAY 210, 6.7 FEET SOUTH OF A POWER POLE, 17.3 FEET NORTHWEST OF A FIELD ENTRANCE, 47.1 WEST-SOUTHWEST OF A POWER POLE WITH A METER, 1.0 FOOT SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1259.545	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1259.558	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1259.538	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1259.558	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1259.558	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFGUS

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1259.545			1171.379	.018	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1259.545	.131		1171.504	.066	1996	GPS - STATIC	2024	HTH210A
1259.545			1171.379	.018	2011	GPS - STATIC	2024	HTH210A
1259.505	.262		1171.399	.197	2011	GPS - RTRN	2023	RTRN2023
1259.404	.262		1171.290	.197	2011	GPS - RTRN	2015	RTRN2015
1259.404	.262		1171.290	.197	2011	GPS - RTRN	2015	RTRN2015
1259.440	.262		1171.553	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.107 12B = -88.113 09 = -87.995 03 = -87.887

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 33.44278	95 59 17.52796	431331.006	161959.683	.010		ADJUSTMENT	2025	GPS3793
46 16 33.44278	95 59 17.52796	431331.006	161959.683	.010	C	GPS - STATIC	2024	HTH210A
46 16 33.44238	95 59 17.52837	431330.977	161959.642	.131	3	GPS - RTRN	2023	RTRN2023
46 16 33.44273	95 59 17.52825	431330.985	161959.678	.131	3	GPS - RTRN	2015	RTRN2015
46 16 33.44273	95 59 17.52825	431330.985	161959.678	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 33.44247	95 59 17.52832	431330.981	161959.651	.033	C	GPS - STATIC	2024	HTH210A
46 16 33.44241	95 59 17.52846	431330.971	161959.646	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2185183.270	798185.295	885083.846	16827556.479	.010		ADJUSTMENT	2025	GPS3793
2185183.270	798185.295	885083.846	16827556.479	.010	C	GPS - STATIC	2024	HTH210A
2185183.240	798185.256	885083.815	16827556.440	.131	3	GPS - RTRN	2023	RTRN2023
2185183.249	798185.291	885083.825	16827556.475	.131	3	GPS - RTRN	2015	RTRN2015
2185183.249	798185.291	885083.825	16827556.475	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2185183.244	798185.265	885083.819	16827556.449	.033	C	GPS - STATIC	2024	HTH210A
2185183.234	798185.259	885083.809	16827556.443	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_N-DK2686-3N-21FEB2024.jpg	N	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_N-DK2686-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_N-DK2686-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 P

NGS Name: 5602 P

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2705](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	15	132 N	43 W	461459.89	960416.46	2	C	2015	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 22 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5602 P 2015

2.5 MILES SOUTH OF FERGUS FALLS, AT THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 (THE JUNCTION IS 2.5 MILES SOUTH OF FERGUS FALLS), AT TRUNK HIGHWAY 210 MILEPOINT 26.5, 138.5 FEET EAST OF TRUNK HIGHWAY 210, 300.0 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 190.0 FEET NORTHEAST OF A CABLE BOX, 1.5 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1260.247	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1260.267	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1260.260	.016	2/1				VERTICAL CONTROL SURVEY	2016 VOTTE
1260.260	.016	2/1				VERTICAL CONTROL SURVEY	2016 VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1260.247			1172.209	.012	2011	HORIZONTAL ADJUSTMENT	2025 GPS3847
1260.247			1172.209	.012	2011	GPS - STATIC	2025 HTH94B
1260.247			1172.209	.016	2011	HORIZONTAL ADJUSTMENT	2025 GPS3793
1260.247	.131		1172.334	.066	1996	GPS - STATIC	2024 HTH210A
1260.247			1172.209	.016	2011	GPS - STATIC	2024 HTH210A
1260.237	.262		1172.183	.197	2011	GPS - RTRN	2023 RTRN2023
1260.204	.262		1172.150	.197	2011	GPS - OPUS	2022 GPSBM
1260.244	.262		1172.189	.197	2011	GPS - RTRN	2021 RTRN2021
1260.184	.262		1172.124	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -88.054 12B = -88.058 09 = -87.930 03 = -87.854

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 14 59.89161	96 04 16.46188	410289.255	152565.473	.007		ADJUSTMENT	2025 GPS3847
46 14 59.89161	96 04 16.46188	410289.255	152565.473	.007	C	GPS - STATIC	2025 HTH94B
46 14 59.89161	96 04 16.46188	410289.255	152565.473	.010		ADJUSTMENT	2025 GPS3793
46 14 59.89161	96 04 16.46188	410289.255	152565.473	.010	C	GPS - STATIC	2024 HTH210A
46 14 59.89114	96 04 16.46171	410289.266	152565.425	.131	3	GPS - RTRN	2023 RTRN2023
46 14 59.89124	96 04 16.46256	410289.207	152565.436	.131	3	GPS - OPUS	2022 GPSBM
46 14 59.89084	96 04 16.46212	410289.237	152565.395	.131	3	GPS - RTRN	2021 RTRN2021
46 14 59.89168	96 04 16.46196	410289.249	152565.480	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 14 59.89103	96 04 16.46243	410289.216	152565.414	.066		NCAT	2025 HTH94B
46 14 59.89130	96 04 16.46226	410289.228	152565.442	.033	C	GPS - STATIC	2024 HTH210A



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2163974.059	789183.400	863728.047	16818886.788	.007		ADJUSTMENT	2025	GPS3847
2163974.059	789183.400	863728.047	16818886.788	.007	C	GPS - STATIC	2025	HTH94B
2163974.059	789183.400	863728.047	16818886.788	.010		ADJUSTMENT	2025	GPS3793
2163974.059	789183.400	863728.047	16818886.788	.010	C	GPS - STATIC	2024	HTH210A
2163974.069	789183.352	863728.057	16818886.740	.131	3	GPS - RTRN	2023	RTRN2023
2163974.010	789183.363	863727.998	16818886.752	.131	3	GPS - OPUS	2022	GPSBM
2163974.040	789183.322	863728.027	16818886.711	.131	3	GPS - RTRN	2021	RTRN2021
2163974.053	789183.407	863728.042	16818886.795	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2163974.019	789183.342	863728.006	16818886.731	.066		NCAT	2025	HTH94B
2163974.031	789183.369	863728.019	16818886.758	.033	C	GPS - STATIC	2024	HTH210A

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_P-DQ2705-3E-21FEB2024.jpg	E	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_P-DQ2705-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_P-DQ2705-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 Q

NGS Name: 5602 Q

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4355](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	10	132 N	43 W	461543.37	960413.40	2	C	2015	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 24 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5602 Q 2015

IN FERGUS FALLS, 0.95 MILE NORTH ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 (THE JUNCTION IS 2.5 MILES SOUTH OF FERGUS FALLS), AT TRUNK HIGHWAY 210 MILEPOINT 27.35, 97.4 FEET SOUTHEAST OF TRUNK HIGHWAY 210, 235.4 FEET SOUTHWEST OF COUNTY ROAD 25 EXTENDED, 3.1 FEET NORTHWEST OF A RIGHT-OF-WAY POST, 3.1 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1250.657	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1250.680	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1250.670	.016	2/1				VERTICAL CONTROL SURVEY	2016 VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1250.657			1162.563	.015	2011	HORIZONTAL ADJUSTMENT	2025 GPS3793
1250.657	.131		1162.688	.066	1996	GPS - STATIC	2024 HTH210A
1250.657			1162.563	.015	2011	GPS - STATIC	2024 HTH210A
1250.641	.262		1162.530	.197	2011	GPS - RTRN	2023 RTRN2023
1250.634	.262		1162.524	.197	2011	GPS - OPUS	2022 GPSBM
1250.667	.262		1162.557	.197	2011	GPS - OPUS	2022 GPSBM
1250.700	.262		1162.586	.197	2011	GPS - RTRN	2021 RTRN2021
1250.581	.262		1162.471	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -88.110 12B = -88.110 09 = -87.992 03 = -87.910

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u> <u>Order</u> <u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 15 43.36738	96 04 13.39781	410524.295	156968.874	.010		ADJUSTMENT	2025 GPS3793
46 15 43.36738	96 04 13.39781	410524.295	156968.874	.010	C	GPS - STATIC	2024 HTH210A
46 15 43.36730	96 04 13.39715	410524.341	156968.866	.131	3	GPS - RTRN	2023 RTRN2023
46 15 43.36672	96 04 13.39838	410524.254	156968.807	.131	3	GPS - OPUS	2022 GPSBM
46 15 43.36704	96 04 13.39795	410524.285	156968.840	.131	3	GPS - OPUS	2022 GPSBM
46 15 43.36734	96 04 13.39780	410524.295	156968.870	.131	3	GPS - RTRN	2021 RTRN2021
46 15 43.36742	96 04 13.39807	410524.276	156968.878	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u> <u>Order</u> <u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 15 43.36707	96 04 13.39817	410524.269	156968.843	.033	C	GPS - STATIC	2024 HTH210A



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2164290.524	793581.108	864113.870	16823280.574	.010		ADJUSTMENT	2025	GPS3793
2164290.524	793581.108	864113.870	16823280.574	.010	C	GPS - STATIC	2024	HTH210A
2164290.570	793581.099	864113.916	16823280.563	.131	3	GPS - RTRN	2023	RTRN2023
2164290.483	793581.042	864113.828	16823280.508	.131	3	GPS - OPUS	2022	GPSBM
2164290.514	793581.074	864113.859	16823280.539	.131	3	GPS - OPUS	2022	GPSBM
2164290.525	793581.104	864113.871	16823280.569	.131	3	GPS - RTRN	2021	RTRN2021
2164290.506	793581.113	864113.852	16823280.578	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2164290.498	793581.077	864113.844	16823280.543	.033	C	GPS - STATIC	2024	HTH210A

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_Q-DQ4355-3SE-21FEB2024.jpg	SE	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_Q-DQ4355-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_Q-DQ4355-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 R

NGS Name: 5602 R

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4349](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	2	132 N	43 W	461611.31	960316.44	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2015	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 32 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5602 R 2015

IN FERGUS FALLS, 0.05 MILE EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 82 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 28.35, 75.0 FEET SOUTH-SOUTHEAST OF TRUNK HIGHWAY 210, 175.9 FEET SOUTHEAST OF A RIGHT-OF-WAY POST, 3.4 FEET NORTHWEST OF A RIGHT-OF-WAY POST, 1.5 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1211.677	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1211.704	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1211.684	.016	2/1				VERTICAL CONTROL SURVEY	2016 VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1211.677			1123.557	.016	2011	HORIZONTAL ADJUSTMENT	2025 GPS3793
1211.677	.131		1123.682	.066	1996	GPS - STATIC	2024 HTH210A
1211.677			1123.557	.016	2011	GPS - STATIC	2024 HTH210A
1211.668	.262		1123.531	.197	2011	GPS - RTRN	2023 RTRN2023
1211.576	.262		1123.439	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -88.136 12B = -88.140 09 = -88.018 03 = -87.930

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 16 11.30976	96 03 16.43623	414538.786	159782.118	.010		ADJUSTMENT	2025 GPS3793
46 16 11.30976	96 03 16.43623	414538.786	159782.118	.010	C	GPS - STATIC	2024 HTH210A
46 16 11.30993	96 03 16.43660	414538.760	159782.135	.131	3	GPS - RTRN	2023 RTRN2023
46 16 11.30904	96 03 16.43568	414538.825	159782.045	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 16 11.30946	96 03 16.43660	414538.760	159782.088	.033	C	GPS - STATIC	2024 HTH210A

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2168355.860	796319.195	868223.325	16825955.241	.010		ADJUSTMENT	2025 GPS3793
2168355.860	796319.195	868223.325	16825955.241	.010	C	GPS - STATIC	2024 HTH210A
2168355.835	796319.213	868223.300	16825955.259	.131	3	GPS - RTRN	2023 RTRN2023
2168355.897	796319.121	868223.361	16825955.167	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2168355.833	796319.166	868223.298	16825955.212	.033	C	GPS - STATIC	2024 HTH210A



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_R-DQ4349-3S-21FEB2024.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_R-DQ4349-2-21FEB2024.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_R-DQ4349-1-21FEB2024.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Feb 21, 2024
	Feb 21, 2024
	Feb 21, 2024



Mn/DOT Name: 5602 S

NGS Name: 5602 S

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4347](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	1	132 N	43 W	461629.90	960121.46	2	C	2015	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 49 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5602 S 2015

2.4 MILES EAST-SOUTHEAST OF FERGUS FALLS, 1.65 MILES EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 82 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 29.9, 45.3 FEET NORTH OF TRUNK HIGHWAY 210, 1.0 FOOT SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1294.433	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1294.456	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1294.440	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1294.433			1206.303	.017	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1294.433	.131		1206.428	.066	1996	GPS - STATIC	2024	HTH210A
1294.433			1206.303	.017	2011	GPS - STATIC	2024	HTH210A
1294.443	.262		1206.313	.197	2011	GPS - RTRN	2023	RTRN2023
1294.423	.262		1206.297	.197	2011	GPS - OPUS	2022	GPSBM
1294.427	.262		1206.297	.197	2011	GPS - RTRN	2021	RTRN2021
1294.377	.262		1206.248	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -88.126 12B = -88.133 09 = -88.021 03 = -87.920

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
46 16 29.90335	96 01 21.46150	422623.626	161632.897	.010				ADJUSTMENT
46 16 29.90335	96 01 21.46150	422623.626	161632.897	.010	C			GPS - STATIC
46 16 29.90357	96 01 21.46155	422623.623	161632.919	.131	3			GPS - RTRN
46 16 29.90302	96 01 21.46148	422623.627	161632.863	.131	3			GPS - OPUS
46 16 29.90322	96 01 21.46174	422623.609	161632.884	.131	3			GPS - RTRN
46 16 29.90269	96 01 21.46135	422623.636	161632.830	.131	3			GPS - RTRN

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
46 16 29.90303	96 01 21.46186	422623.601	161632.864	.033	C			GPS - STATIC



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2176472.493	798019.773	876368.609	16827528.253	.010		ADJUSTMENT	2025	GPS3793
2176472.493	798019.773	876368.609	16827528.253	.010	C	GPS - STATIC	2024	HTH210A
2176472.490	798019.795	876368.606	16827528.276	.131	3	GPS - RTRN	2023	RTRN2023
2176472.493	798019.740	876368.609	16827528.220	.131	3	GPS - OPUS	2022	GPSBM
2176472.475	798019.760	876368.591	16827528.241	.131	3	GPS - RTRN	2021	RTRN2021
2176472.501	798019.706	876368.617	16827528.186	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2176472.466	798019.741	876368.582	16827528.222	.033	C	GPS - STATIC	2024	HTH210A

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_S-DQ4347-3N-21FEB2024.jpg	N	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_S-DQ4347-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_S-DQ4347-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 T

NGS Name: 5602 T

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4344](#) [Get Map](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	35	133 N	42 W	461656.56	955538.37	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2015	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 18 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015)

Stamping: 5602 T 2015

2.7 MILES WEST OF UNDERWOOD, 2.6 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN UNDERWOOD, AT TRUNK HIGHWAY 210 MILEPOINT 34.95, 58.9 FEET SOUTH OF TRUNK HIGHWAY 210, 335.9 FEET EAST OF DRIVEWAY NUMBER 26820, 1.5 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1335.138	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1335.125	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1335.125	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1335.138			1247.035	.018	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1335.138	.131		1247.163	.066	1996	GPS - STATIC	2024	HTH210A
1335.138			1247.035	.018	2011	GPS - STATIC	2024	HTH210A
1335.165	.262		1247.120	.197	2011	GPS - RTRN	2023	RTRN2023
1335.102	.262		1247.058	.197	2011	GPS - OPUS	2022	GPSBM
1335.040	.262		1246.996	.197	2011	GPS - OPUS	2022	GPSBM
1335.171	.262		1247.127	.197	2011	GPS - RTRN	2021	RTRN2021
1335.053	.262		1246.982	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -88.044 12B = -88.071 09 = -87.946 03 = -87.815

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 56.55902	95 55 38.37082	446732.464	164254.597	.010		ADJUSTMENT	2025	GPS3793
46 16 56.55902	95 55 38.37082	446732.464	164254.597	.010	C	GPS - STATIC	2024	HTH210A
46 16 56.55905	95 55 38.37014	446732.512	164254.600	.131	3	GPS - RTRN	2023	RTRN2023
46 16 56.55835	95 55 38.37068	446732.474	164254.529	.131	3	GPS - OPUS	2022	GPSBM
46 16 56.55878	95 55 38.37050	446732.487	164254.572	.131	3	GPS - OPUS	2022	GPSBM
46 16 56.55898	95 55 38.37045	446732.491	164254.593	.131	3	GPS - RTRN	2021	RTRN2021
46 16 56.55883	95 55 38.37040	446732.494	164254.578	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 56.55870	95 55 38.37117	446732.440	164254.565	.033	C	GPS - STATIC	2024	HTH210A



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2200622.519	800194.434	900557.732	16829322.565	.010		ADJUSTMENT	2025	GPS3793
2200622.519	800194.434	900557.732	16829322.565	.010	C	GPS - STATIC	2024	HTH210A
2200622.567	800194.436	900557.780	16829322.566	.131	3	GPS - RTRN	2023	RTRN2023
2200622.527	800194.366	900557.739	16829322.497	.131	3	GPS - OPUS	2022	GPSBM
2200622.541	800194.409	900557.754	16829322.540	.131	3	GPS - OPUS	2022	GPSBM
2200622.545	800194.429	900557.758	16829322.560	.131	3	GPS - RTRN	2021	RTRN2021
2200622.548	800194.414	900557.761	16829322.545	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2200622.493	800194.402	900557.706	16829322.534	.033	C	GPS - STATIC	2024	HTH210A

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_T-DQ4344-3S-21FEB2024.jpg	S	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_T-DQ4344-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_T-DQ4344-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 U

NGS Name: 5602 U

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4343](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	36	133 N	42 W	461657.15	955424.51	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2015	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 17 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015)

Stamping: 5602 U 2015

1.7 MILES WEST OF UNDERWOOD, 1.6 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN UNDERWOOD, AT TRUNK HIGHWAY 210 MILEPOINT 35.95, 63.8 FEET SOUTH OF TRUNK HIGHWAY 210, 192.5 FEET WEST-SOUTHWEST OF TRUNK HIGHWAY 210 MILEPOST 36, 1.5 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1375.260	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1375.250	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1375.253	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1375.260			1287.196	.018	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1375.260	.131		1287.324	.066	1996	GPS - STATIC	2024	HTH210A
1375.260			1287.196	.018	2011	GPS - STATIC	2024	HTH210A
1375.279	.262		1287.268	.197	2011	GPS - RTRN	2023	RTRN2023
1375.204	.262		1287.189	.197	2011	GPS - OPUS	2022	GPSBM
1375.220	.262		1287.205	.197	2011	GPS - OPUS	2022	GPSBM
1375.220	.262		1287.205	.197	2011	GPS - RTRN	2021	RTRN2021
1375.184	.262		1287.143	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -88.015 12B = -88.041 09 = -87.920 03 = -87.785

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 57.14933	95 54 24.50844	451920.649	164301.255	.010		ADJUSTMENT	2025	GPS3793
46 16 57.14933	95 54 24.50844	451920.649	164301.255	.010	C	GPS - STATIC	2024	HTH210A
46 16 57.14894	95 54 24.50774	451920.699	164301.216	.131	3	GPS - RTRN	2023	RTRN2023
46 16 57.14839	95 54 24.50830	451920.659	164301.160	.131	3	GPS - OPUS	2022	GPSBM
46 16 57.14850	95 54 24.50848	451920.646	164301.171	.131	3	GPS - OPUS	2022	GPSBM
46 16 57.14942	95 54 24.50832	451920.658	164301.264	.131	3	GPS - RTRN	2021	RTRN2021
46 16 57.14860	95 54 24.50865	451920.635	164301.181	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 57.14901	95 54 24.50880	451920.624	164301.223	.033	C	GPS - STATIC	2024	HTH210A



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2205809.989	800145.043	905745.326	16829191.363	.010		ADJUSTMENT	2025	GPS3793
2205809.989	800145.043	905745.326	16829191.363	.010	C	GPS - STATIC	2024	HTH210A
2205810.037	800145.002	905745.374	16829191.322	.131	3	GPS - RTRN	2023	RTRN2023
2205809.996	800144.947	905745.332	16829191.268	.131	3	GPS - OPUS	2022	GPSBM
2205809.984	800144.959	905745.320	16829191.279	.131	3	GPS - OPUS	2022	GPSBM
2205809.997	800145.052	905745.335	16829191.372	.131	3	GPS - RTRN	2021	RTRN2021
2205809.972	800144.969	905745.308	16829191.290	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2205809.962	800145.011	905745.299	16829191.332	.033	C	GPS - STATIC	2024	HTH210A

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_U-DQ4343-3S-21FEB2024.jpg	S	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_U-DQ4343-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_U-DQ4343-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 V

NGS Name: 5602 V

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4340](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NE	5	132 N	41 W	461643.53	955131.28	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2015	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 18 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5602 V 2015

0.6 MILE SOUTHEAST OF UNDERWOOD, 0.8 MILE EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN UNDERWOOD, AT TRUNK HIGHWAY 210 MILEPOINT 38.25, 72.0 FEET SOUTH-SOUTHWEST OF TRUNK HIGHWAY 210, 45.6 FEET EAST-SOUTHEAST OF A FIELD ENTRANCE, 2.7 FEET NORTH-NORTHEAST OF A RIGHT-OF-WAY POST, 1.5 FEET NORTH-NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1344.948	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1344.935	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1344.935	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1344.886	.262		1256.959	.197	2011	GPS - RTRN	2023	RTRN2023
1344.794	.262		1256.841	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -87.926 12B = -87.949 09 = -87.834 03 = -87.697

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 43.53137	95 51 31.27948	464085.627	162896.107	.131	3	GPS - RTRN	2023	RTRN2023
46 16 43.53098	95 51 31.27932	464085.638	162896.068	.131	3	GPS - RTRN	2015	RTRN2015

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2217945.253	798515.136	917856.827	16827369.852	.131	3	GPS - RTRN	2023	RTRN2023
2217945.263	798515.096	917856.837	16827369.813	.131	3	GPS - RTRN	2015	RTRN2015

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_V-DQ4340-3S-09OCT2023.jpg	S	Oct 9, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_V-DQ4340-2-09OCT2023.jpg		Oct 9, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_V-DQ4340-1-09OCT2023.jpg		Oct 9, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 W

NGS Name: 5602 W

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4339](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
				461632.83	955053.75	2	C	2015	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 23 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015)

Stamping: 5602 W 2015

1.2 MILES SOUTHEAST OF UNDERWOOD, 1.35 MILES EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN UNDERWOOD, AT TRUNK HIGHWAY 210 MILEPOINT 38.85, 71.1 FEET NORTH-NORTHEAST OF TRUNK HIGHWAY 210, 43.6 FEET EAST-SOUTHEAST OF A FIELD ENTRANCE, 67.9 FEET EAST-SOUTHEAST OF A POWER POLE, 1.5 FEET SOUTH-SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1340.260	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1340.250	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1340.250	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1340.260			1252.304	.018	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1340.260	.131		1252.435	.066	1996	GPS - STATIC	2024	HTH210A
1340.260			1252.304	.018	2011	GPS - STATIC	2024	HTH210A
1340.145	.262		1252.251	.197	2011	GPS - RTRN	2023	RTRN2023
1340.188	.262		1252.291	.197	2011	GPS - OPUS	2022	GPSBM
1340.188	.262		1252.291	.197	2011	GPS - OPUS	2022	GPSBM
1340.250	.262		1252.353	.197	2011	GPS - RTRN	2021	RTRN2021
1340.115	.262		1252.199	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -87.897 12B = -87.916 09 = -87.805 03 = -87.670

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>								
Geodetic Position		Otter Tail County				Project Info		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 16 32.82773	95 50 53.74495	466720.400	161807.189	.010		ADJUSTMENT	2025	GPS3793
46 16 32.82773	95 50 53.74495	466720.400	161807.189	.010	C	GPS - STATIC	2024	HTH210A
46 16 32.82750	95 50 53.74549	466720.362	161807.166	.131	3	GPS - RTRN	2023	RTRN2023
46 16 32.82748	95 50 53.74529	466720.376	161807.164	.131	3	GPS - OPUS	2022	GPSBM
46 16 32.82737	95 50 53.74496	466720.399	161807.153	.131	3	GPS - OPUS	2022	GPSBM
46 16 32.82752	95 50 53.74580	466720.341	161807.168	.131	3	GPS - RTRN	2021	RTRN2021
46 16 32.82764	95 50 53.74527	466720.378	161807.180	.131	3	GPS - RTRN	2015	RTRN2015

<u>NAD83(1996)</u>									
Geodetic Position		Otter Tail County						Project Info	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 16 32.82740	95 50 53.74531	466720.375	161807.156	.033	C	GPS - STATIC	2024	HTH210A	



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2220559.066	797377.776	920453.095	16826191.118	.010		ADJUSTMENT	2025	GPS3793
2220559.066	797377.776	920453.095	16826191.118	.010	C	GPS - STATIC	2024	HTH210A
2220559.028	797377.753	920453.056	16826191.096	.131	3	GPS - RTRN	2023	RTRN2023
2220559.042	797377.751	920453.070	16826191.093	.131	3	GPS - OPUS	2022	GPSBM
2220559.065	797377.740	920453.093	16826191.081	.131	3	GPS - OPUS	2022	GPSBM
2220559.006	797377.756	920453.034	16826191.098	.131	3	GPS - RTRN	2021	RTRN2021
2220559.043	797377.767	920453.072	16826191.109	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2220559.040	797377.743	920453.069	16826191.085	.033	C	GPS - STATIC	2024	HTH210A

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_W-DQ4339-3NE-21FEB2024.jpg	NE	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_W-DQ4339-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_W-DQ4339-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 X

NGS Name: 5602 X

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4338](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	3	132 N	41 W	461602.73	954857.73	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2015	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 39 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5602 X 2015

2.7 MILES SOUTHEAST OF UNDERWOOD, 3.1 MILES EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN UNDERWOOD, AT TRUNK HIGHWAY 210 MILEPOINT 40.55, 214.5 FEET SOUTHWEST OF A CABLE BOX, 73.4 FEET NORTH OF TRUNK HIGHWAY 210, 2.2 FEET SOUTH OF A RIGHT-OF-WAY POST, 1.5 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info		
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1378.472	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1378.468	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1378.468	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info		
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1378.472			1290.663	.018	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1378.472	.131		1290.795	.066	1996	GPS - STATIC	2024	HTH210A
1378.472			1290.663	.018	2011	GPS - STATIC	2024	HTH210A
1378.524	.262		1290.742	.197	2011	GPS - RTRN	2023	RTRN2023
1378.406	.262		1290.621	.197	2011	GPS - OPUS	2022	GPSBM
1378.337	.262		1290.552	.197	2011	GPS - OPUS	2022	GPSBM
1378.419	.262		1290.637	.197	2011	GPS - RTRN	2021	RTRN2021
1378.354	.262		1290.555	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -87.785 12B = -87.798 09 = -87.700 03 = -87.575

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 02.73513	95 48 57.72551	474866.690	158746.688	.010		ADJUSTMENT	2025	GPS3793
46 16 02.73513	95 48 57.72551	474866.690	158746.688	.010	C	GPS - STATIC	2024	HTH210A
46 16 02.73459	95 48 57.72496	474866.729	158746.634	.131	3	GPS - RTRN	2023	RTRN2023
46 16 02.73479	95 48 57.72564	474866.681	158746.654	.131	3	GPS - OPUS	2022	GPSBM
46 16 02.73493	95 48 57.72560	474866.684	158746.668	.131	3	GPS - OPUS	2022	GPSBM
46 16 02.73499	95 48 57.72570	474866.677	158746.674	.131	3	GPS - RTRN	2021	RTRN2021
46 16 02.73537	95 48 57.72581	474866.669	158746.713	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 02.73480	95 48 57.72587	474866.665	158746.655	.033	C	GPS - STATIC	2024	HTH210A



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2228646.219	794167.404	928490.768	16822852.834	.010		ADJUSTMENT	2025	GPS3793
2228646.219	794167.404	928490.768	16822852.834	.010	C	GPS - STATIC	2024	HTH210A
2228646.257	794167.349	928490.805	16822852.778	.131	3	GPS - RTRN	2023	RTRN2023
2228646.209	794167.370	928490.758	16822852.799	.131	3	GPS - OPUS	2022	GPSBM
2228646.212	794167.384	928490.761	16822852.814	.131	3	GPS - OPUS	2022	GPSBM
2228646.205	794167.390	928490.754	16822852.820	.131	3	GPS - RTRN	2021	RTRN2021
2228646.199	794167.429	928490.748	16822852.859	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2228646.193	794167.371	928490.742	16822852.801	.033	C	GPS - STATIC	2024	HTH210A

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_X-DQ4338-3N-21FEB2024.jpg	N	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_X-DQ4338-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_X-DQ4338-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5602 Y

NGS Name: 5602 Y

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4336](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	12	132 N	41 W	461601.61	954625.77	2	C	2015	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 6 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 24 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5602 Y 2015

3.0 MILES WEST-SOUTHWEST OF BATTLE LAKE, 3.05 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 IN BATTLE LAKE, AT TRUNK HIGHWAY 210 MILEPOINT 42.6, 67.2 FEET SOUTH OF TRUNK HIGHWAY 210, 8.3 FEET NORTH OF A FENCE LINE, 7.0 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1339.971	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1339.968	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1339.968	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1339.971			1252.228	.020	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1339.971	.131		1252.360	.066	1996	GPS - STATIC	2024	HTH210A
1339.971			1252.228	.020	2011	GPS - STATIC	2024	HTH210A
1339.922	.262		1252.248	.197	2011	GPS - RTRN	2023	RTRN2023
1339.869	.262		1252.183	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -87.674 12B = -87.684 09 = -87.588 03 = -87.474

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>									
Geodetic Position		Otter Tail County				Project Info			
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 16 01.60536	95 46 25.76803	485542.932	158621.671	.010		ADJUSTMENT	2025	GPS3793	
46 16 01.60536	95 46 25.76803	485542.932	158621.671	.010	C	GPS - STATIC	2024	HTH210A	
46 16 01.60505	95 46 25.76722	485542.989	158621.639	.131	3	GPS - RTRN	2023	RTRN2023	
46 16 01.60460	95 46 25.76776	485542.951	158621.594	.131	3	GPS - RTRN	2015	RTRN2015	

<u>NAD83(1996)</u>									
Geodetic Position		Otter Tail County				Project Info			
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 16 01.60503	95 46 25.76839	485542.906	158621.637	.033	C	GPS - STATIC	2024	HTH210A	

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2239316.893	793844.780	939157.674	16822362.013	.010		ADJUSTMENT	2025	GPS3793
2239316.893	793844.780	939157.674	16822362.013	.010	C	GPS - STATIC	2024	HTH210A
2239316.949	793844.748	939157.730	16822361.979	.131	3	GPS - RTRN	2023	RTRN2023
2239316.910	793844.703	939157.691	16822361.935	.131	3	GPS - RTRN	2015	RTRN2015

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2239316.867	793844.748	939157.648	16822361.980	.033	C	GPS - STATIC	2024	HTH210A



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_Y-DQ4336-3S-21FEB2024.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_Y-DQ4336-2-21FEB2024.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_Y-DQ4336-1-21FEB2024.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Feb 21, 2024
	Feb 21, 2024
	Feb 21, 2024



Mn/DOT Name: 5602 Z

NGS Name: 5602 Z

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4335](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SE	6	132 N	40 W	461608.71	954524.25	2	C	2015	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 79 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5602 Z 2015

2.1 MILES WEST-SOUTHWEST OF BATTLE LAKE, 2.2 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 IN BATTLE LAKE, AT TRUNK HIGHWAY 210 MILEPOINT 43.5, 73.2 FEET NORTH-NORTHWEST OF TRUNK HIGHWAY 210, 3.4 FEET WEST OF A RIGHT-OF-WAY POST, 1.5 FEET SOUTH-SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order /(Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1372.960	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1372.953	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1372.957	.016	2/1				VERTICAL CONTROL SURVEY	2016 VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order /(Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1372.960			1285.263	.018	2011	HORIZONTAL ADJUSTMENT	2025 GPS3793
1372.960	.131		1285.391	.066	1996	GPS - STATIC	2024 HTH210A
1372.960			1285.263	.018	2011	GPS - STATIC	2024 HTH210A
1372.852	.262		1285.214	.197	2011	GPS - RTRN	2023 RTRN2023
1372.907	.262		1285.270	.197	2011	GPS - OPUS	2022 GPSBM
1372.891	.262		1285.253	.197	2011	GPS - OPUS	2022 GPSBM
1372.989	.262		1285.352	.197	2011	GPS - RTRN	2021 RTRN2021
1372.829	.262		1285.184	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -87.638 12B = -87.647 09 = -87.549 03 = -87.444

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u> <u>Order</u> <u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 16 08.70638	95 45 24.24782	489865.648	159338.400	.010		ADJUSTMENT	2025 GPS3793
46 16 08.70638	95 45 24.24782	489865.648	159338.400	.010	C	GPS - STATIC	2024 HTH210A
46 16 08.70549	95 45 24.24787	489865.644	159338.310	.131	3	GPS - RTRN	2023 RTRN2023
46 16 08.70618	95 45 24.24812	489865.627	159338.379	.131	3	GPS - OPUS	2022 GPSBM
46 16 08.70600	95 45 24.24802	489865.634	159338.361	.131	3	GPS - OPUS	2022 GPSBM
46 16 08.70599	95 45 24.24692	489865.711	159338.360	.131	3	GPS - RTRN	2021 RTRN2021
46 16 08.70655	95 45 24.24754	489865.668	159338.417	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u> <u>Order</u> <u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 16 08.70605	95 45 24.24818	489865.622	159338.366	.033	C	GPS - STATIC	2024 HTH210A

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2243651.561	794481.264	943502.855	16822930.257	.010		ADJUSTMENT	2025	GPS3793
2243651.561	794481.264	943502.855	16822930.257	.010	C	GPS - STATIC	2024	HTH210A
2243651.555	794481.174	943502.849	16822930.167	.131	3	GPS - RTRN	2023	RTRN2023
2243651.539	794481.245	943502.833	16822930.238	.131	3	GPS - OPUS	2022	GPSBM
2243651.546	794481.226	943502.840	16822930.219	.131	3	GPS - OPUS	2022	GPSBM
2243651.623	794481.224	943502.917	16822930.215	.131	3	GPS - RTRN	2021	RTRN2021
2243651.581	794481.281	943502.875	16822930.274	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2243651.535	794481.232	943502.829	16822930.224	.033	C	GPS - STATIC	2024	HTH210A

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_Z-DQ4335-3NW-21FEB2024.jpg	NW	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_Z-DQ4335-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5602_Z-DQ4335-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5603 A

NGS Name: 5603 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R01084](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/1026
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	3	132 N	40 W	461628.57	954159.11		2

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1974	2005	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 6 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1974)

Stamping: 5603 A

0.7 MILE SOUTHEAST OF BATTLE LAKE, 0.7 MILE EAST ON TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78, 93.0 FEET SOUTH OF TRUNK HIGHWAY 210, 11.0 FEET NORTHWEST OF A RIGHT-OF-WAY SIGN, 1.0 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1385.315	.033	3				VERTICAL CONTROL SURVEY	1969	CS5603

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1384.512	.197		1297.166	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.516 12B = -87.523 09 = -87.411 03 = -87.333

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 16 28.57314	95 41 59.11263	504277.305	161348.940	.066	2	ADJUSTMENT	1999	17648
46 16 28.57315	95 41 59.11262	504277.306	161348.941	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 16 28.57048	95 41 59.10132	504278.100	161348.671	.066	2	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>						<u>Year</u>	<u>Reference</u>
46 16 28.71248	95 41 57.93279			.100	2	CLASSICAL SURVEY	1977	15955

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2258096.051	796224.380	957976.212	16824445.881	.066	2	ADJUSTMENT	1999	17648
2258096.051	796224.381	957976.213	16824445.882	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2258096.840	796224.096	957976.997	16824445.584	.066	2	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1633501.378	468150.591			.100	2	CLASSICAL SURVEY	1977	15955



Mn/DOT Name: 5603 A 1

NGS Name: 5603 A 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0512](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	4	132 N	40 W	461628.27	954246.57	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER IS STEEL ROD

Monument Type	Disk Type	Mon. Agency
COPPER CLAD ROD (NO SLEEVE) (DEPTH 24 FT)	VERTICAL CONTROL DISK	MNDT

Description: (1975) **Stamping:** 5603 A 1 1975

IN BATTLE LAKE, AT THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 21.55, 242.0 FEET EAST OF TRUNK HIGHWAY 78, 75.4 FEET SOUTH OF TRUNK HIGHWAY 210, 71.0 FEET NORTHEAST OF A RIGHT-OF-WAY MONUMENT, 1.5 FEET NORTHEAST OF A POWER POLE NUMBER 10, 0.6 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1349.817	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1349.800	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1349.800	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1349.800	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1349.800	.016	2/1				VERTICAL CONTROL SURVEY	2012	VASHB
1349.800	.016	2/1				VERTICAL ADJUSTMENT	2009	00000591
1349.800	.016	2/1				VERTICAL CONTROL SURVEY	2006	VPEAK
1349.800	.016	2/1				VERTICAL CONTROL SURVEY	2005	VBAT1
1349.800	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1349.026	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1349.026	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1349.774	.262		1262.222	.197	2011	GPS - RTRN	2023	RTRN2023
1349.643	.262		1262.087	.197	2011	GPS - RTRN	2015	RTRN2015
1349.643	.262		1262.087	.197	2011	GPS - RTRN	2015	RTRN2015
1349.387	.262		1262.025	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.552 12B = -87.559 09 = -87.451 03 = -87.365

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 28.27008	95 42 46.57364	500943.196	161317.803	.131	3	GPS - RTRN	2023	RTRN2023
46 16 28.26999	95 42 46.57436	500943.145	161317.794	.131	3	GPS - RTRN	2015	RTRN2015
46 16 28.26999	95 42 46.57436	500943.145	161317.794	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 28.26964	95 42 46.57594	500943.035	161317.759	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2254762.380	796254.980	954642.731	16824529.030	.131	3	GPS - RTRN	2023	RTRN2023
2254762.329	796254.972	954642.680	16824529.022	.131	3	GPS - RTRN	2015	RTRN2015
2254762.329	796254.972	954642.680	16824529.022	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2254762.218	796254.938	954642.568	16824528.991	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5603_A_1-RO0512-3S-12OCT2023.jpg	S	Oct 12, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5603_A_1-RO0512-2-12OCT2023.jpg		Oct 12, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5603_A_1-RO0512-1-12OCT2023.jpg		Oct 12, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5603 B

NGS Name: 5603 B

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4333](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	2	132 N	40 W	461619.03	954039.49	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1969	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (1969)

Stamping: 5603 B 1969

1.75 MILES SOUTHEAST OF BATTLE LAKE, 1.75 MILES EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 IN BATTLE LAKE, AT TRUNK HIGHWAY 210 MILEPOINT 47.40, 147.0 FEET WEST OF DRIVEWAY NUMBER 39041 39013, 118.5 FEET WEST OF CABLE BOX NUMBER 10 W1, 117.0 FEET NORTH OF TRUNK HIGHWAY 210, 13.0 FEET SOUTHWEST OF A POWER POLE, 0.5 FOOT SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1339.531	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1339.502	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1339.505	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1338.852	.033	3				VERTICAL CONTROL SURVEY	1969	CS5603

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1339.531			1251.992	.025	2011	HORIZONTAL ADJUSTMENT	2024	GPS3782
1339.531	.131		1252.130	.066	1996	GPS - STATIC	2024	HTH210B
1339.531			1251.992	.025	2011	GPS - STATIC	2024	HTH210B
1339.456	.262		1252.015	.197	2011	GPS - RTRN	2023	RTRN2023
1339.423	.262		1251.976	.197	2011	GPS - RTRN	2015	RTRN2015
1339.423	.262		1251.976	.197	2011	GPS - RTRN	2015	RTRN2015
1339.397	.262		1252.133	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.441 12B = -87.444 09 = -87.333 03 = -87.264

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 19.02646	95 40 39.49350	509870.984	160383.769	.013		ADJUSTMENT	2024	GPS3782
46 16 19.02646	95 40 39.49350	509870.984	160383.769	.013	C	GPS - STATIC	2024	HTH210B
46 16 19.02683	95 40 39.49288	509871.028	160383.806	.131	3	GPS - RTRN	2023	RTRN2023
46 16 19.02616	95 40 39.49351	509870.984	160383.738	.131	3	GPS - RTRN	2015	RTRN2015
46 16 19.02616	95 40 39.49351	509870.984	160383.738	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 19.02610	95 40 39.49396	509870.952	160383.732	.033	C	GPS - STATIC	2024	HTH210B
46 16 19.02683	95 40 39.49544	509870.848	160383.806	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2263670.156	795155.939	963533.927	16823289.496	.013		ADJUSTMENT	2024	GPS3782
2263670.156	795155.939	963533.927	16823289.496	.013	C	GPS - STATIC	2024	HTH210B
2263670.200	795155.976	963533.972	16823289.532	.131	3	GPS - RTRN	2023	RTRN2023
2263670.154	795155.908	963533.925	16823289.466	.131	3	GPS - RTRN	2015	RTRN2015
2263670.154	795155.908	963533.925	16823289.466	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2263670.123	795155.903	963533.893	16823289.461	.033	C	GPS - STATIC	2024	HTH210B
2263670.020	795155.979	963533.792	16823289.538	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5603_B-DQ4333-3N-20FEB2024.jpg	N	Feb 20, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5603_B-DQ4333-2-20FEB2024.jpg		Feb 20, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5603_B-DQ4333-1-20FEB2024.jpg		Feb 20, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5603 C

NGS Name: 5603 C

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DH4060 Get Map
SW	1	132 N	40 W	461611.23	953923.25	2	C	NGS Quad / Sta Num : 46095313/ USGS Quad: BATTLE LAKE

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1969	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (1969) **Stamping:** 5603 C 1969

2.8 MILES SOUTHEAST OF BATTLE LAKE, 2.8 MILES EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 IN BATTLE LAKE, AT TRUNK HIGHWAY 210 MILEPOINT 48.35, 220.0 FEET NORTH OF THE NORTHWEST CORNER OF THE MOUNT PLEASANT CEMETERY, 98.0 FEET SOUTH OF TRUNK HIGHWAY 210, 8.2 FEET EAST-NORTHEAST OF A POWER POLE, 0.8 FOOT NORTH OF A WITNESS POST.

Station Notes

TREE TO THE SOUTH AT 150 TO 220 DEGREES.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1358.459	.016	2/1					VERTICAL ADJUSTMENT	2019 00000941
1358.416	.016	2/1					VERTICAL ADJUSTMENT	2009 00000591
1358.416	.016	2/1					VERTICAL CONTROL SURVEY	2005 VBAT1
<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1357.674	.033	3					VERTICAL CONTROL SURVEY	1969 CS5603

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1358.459				1271.054	.010	2011	HORIZONTAL ADJUSTMENT	2024 GPS3782
1358.314	.131			1271.188	.066	1996	GPS - STATIC	2024 HTH210B
1358.459				1271.054	.010	2011	GPS - STATIC	2024 HTH210B
1358.416	.262			1271.051	.197	2011	GPS - RTRN	2023 RTRN2023
				1271.054	.010	2011	HORIZONTAL ADJUSTMENT	2012 GPS2800
1358.245	.262			1271.051	.197	1996	GPS - RTRN	2009 RTRN2009
				1271.159	.011	2007	HORIZONTAL ADJUSTMENT	2007 GPS2300
1358.429	.131			1271.188	.066	1996	HORIZONTAL ADJUSTMENT	2005 GPS2135
1358.429	.131			1271.188	.066	1996	GPS - STATIC	2005 HBATT

Geoid Separations(ft): GEOID18 = -87.362 12B = -87.372 09 = -87.254 03 = -87.195

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 11.23265	95 39 23.25373	515227.647	159597.558	.013		ADJUSTMENT	2024	GPS3782
46 16 11.23265	95 39 23.25373	515227.647	159597.558	.013	C	GPS - STATIC	2024	HTH210B
46 16 11.23303	95 39 23.25272	515227.718	159597.597	.131	3	GPS - RTRN	2023	RTRN2023
46 16 11.23265	95 39 23.25373	515227.647	159597.558	.020		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 11.23252	95 39 23.25461	515227.585	159597.545	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 11.23221	95 39 23.25420	515227.614	159597.513	.033	C	GPS - STATIC	2024	HTH210B
46 16 11.23244	95 39 23.25466	515227.581	159597.537	.131	3	GPS - RTRN	2009	RTRN2009
46 16 11.23221	95 39 23.25420	515227.614	159597.513	.033	C	ADJUSTMENT	2005	GPS2135
46 16 11.23221	95 39 23.25420	515227.614	159597.513	.033	C	GPS - STATIC	2005	HBATT

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2269010.630	794270.790	968860.837	16822320.117	.013		ADJUSTMENT	2024	GPS3782
2269010.630	794270.790	968860.837	16822320.117	.013	C	GPS - STATIC	2024	HTH210B
2269010.701	794270.828	968860.909	16822320.154	.131	3	GPS - RTRN	2023	RTRN2023
2269010.630	794270.790	968860.837	16822320.117	.020		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2269010.568	794270.779	968860.775	16822320.107	.020		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2269010.596	794270.746	968860.803	16822320.074	.033	C	GPS - STATIC	2024	HTH210B
2269010.564	794270.770	968860.771	16822320.098	.131	3	GPS - RTRN	2009	RTRN2009
2269010.596	794270.746	968860.803	16822320.074	.033	C	ADJUSTMENT	2005	GPS2135
2269010.596	794270.746	968860.803	16822320.074	.033	C	GPS - STATIC	2005	HBATT

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5603_C-DH4060-3S-20FEB2024.jpg	S	Feb 20, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5603_C-DH4060-2-20FEB2024.jpg		Feb 20, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5603_C-DH4060-1-20FEB2024.jpg		Feb 20, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5603 U

NGS Name: 5603 U

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DH4072](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	2	132 N	40 W	461619.73	954107.35	2	C	2004	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 60 FT)	SURVEY DISK	MNDT

Description: (2004)

Stamping: 5603 U 2004

1.5 MILES EAST OF BATTLE LAKE, 1.5 MILES EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 IN BATTLE LAKE, AT TRUNK HIGHWAY 210 MILEPOINT 47.05, 68.7 FEET SOUTH-SOUTHWEST OF TRUNK HIGHWAY 210, 1.8 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1336.680	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1336.654	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1336.654	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1336.654	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1336.654	.016	2/1				VERTICAL CONTROL SURVEY	2012	VASHB
1336.654	.016	2/1				VERTICAL ADJUSTMENT	2009	00000591
1336.654	.016	2/1				VERTICAL CONTROL SURVEY	2005	VBAT1

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1336.680			1249.138	.009	2011	HORIZONTAL ADJUSTMENT	2024	GPS3782
1336.680	.131		1249.292	.066	1996	GPS - STATIC	2024	HTH210B
1336.680			1249.138	.009	2011	GPS - STATIC	2024	HTH210B
1336.598	.262		1249.135	.197	2011	GPS - RTRN	2023	RTRN2023
1336.654	.262		1249.190	.197	2011	GPS - OPUS	2020	GPSBM
1336.559	.262		1249.089	.197	2011	GPS - RTRN	2015	RTRN2015
1336.559	.262		1249.089	.197	2011	GPS - RTRN	2015	RTRN2015
			1249.138	.009	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1336.497	.262		1249.213	.197	1996	GPS - RTRN	2009	RTRN2009
			1249.249	.009	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1336.644	.131		1249.292	.066	1996	HORIZONTAL ADJUSTMENT	2005	GPS2135
1336.644	.131		1249.292	.066	1996	GPS - STATIC	2005	HBATT

Geoid Separations(ft): GEOID18 = -87.464 12B = -87.470 09 = -87.355 03 = -87.283

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 19.72595	95 41 07.34872	507914.047	160453.762	.010		ADJUSTMENT	2024	GPS3782
46 16 19.72595	95 41 07.34872	507914.047	160453.762	.010	C	GPS - STATIC	2024	HTH210B
46 16 19.72685	95 41 07.34795	507914.101	160453.854	.131	3	GPS - RTRN	2023	RTRN2023
46 16 19.72553	95 41 07.34867	507914.051	160453.720	.131	3	GPS - OPUS	2020	GPSBM
46 16 19.72521	95 41 07.34943	507913.997	160453.687	.131	3	GPS - RTRN	2015	RTRN2015
46 16 19.72521	95 41 07.34943	507913.997	160453.687	.131	3	GPS - RTRN	2015	RTRN2015
46 16 19.72595	95 41 07.34872	507914.047	160453.762	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 19.72587	95 41 07.34959	507913.986	160453.754	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 19.72544	95 41 07.34932	507914.005	160453.711	.033	C	GPS - STATIC	2024	HTH210B
46 16 19.72554	95 41 07.34968	507913.980	160453.721	.131	3	GPS - RTRN	2009	RTRN2009
46 16 19.72544	95 41 07.34932	507914.005	160453.711	.033	C	ADJUSTMENT	2005	GPS2135
46 16 19.72544	95 41 07.34932	507914.005	160453.711	.033	C	GPS - STATIC	2005	HBATT

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2261715.111	795262.143	961580.404	16823426.522	.010		ADJUSTMENT	2024	GPS3782
2261715.111	795262.143	961580.404	16823426.522	.010	C	GPS - STATIC	2024	HTH210B
2261715.167	795262.233	961580.461	16823426.611	.131	3	GPS - RTRN	2023	RTRN2023
2261715.114	795262.100	961580.406	16823426.479	.131	3	GPS - OPUS	2020	GPSBM
2261715.060	795262.069	961580.351	16823426.449	.131	3	GPS - RTRN	2015	RTRN2015
2261715.060	795262.069	961580.351	16823426.449	.131	3	GPS - RTRN	2015	RTRN2015
2261715.111	795262.143	961580.404	16823426.522	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2261715.050	795262.136	961580.342	16823426.515	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2261715.068	795262.092	961580.360	16823426.472	.033	C	GPS - STATIC	2024	HTH210B
2261715.043	795262.102	961580.335	16823426.482	.131	3	GPS - RTRN	2009	RTRN2009
2261715.068	795262.092	961580.360	16823426.472	.033	C	ADJUSTMENT	2005	GPS2135
2261715.068	795262.092	961580.360	16823426.472	.033	C	GPS - STATIC	2005	HBATT

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5603_U-DH4072-3S-20FEB2024.jpg	S	Feb 20, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5603_U-DH4072-2-20FEB2024.jpg		Feb 20, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5603_U-DH4072-1-20FEB2024.jpg		Feb 20, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5603 V

NGS Name: 5603 V

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DH4073](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	1	132 N	40 W	461613.40	953950.05	2	C	2004	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 55 FT)	SURVEY DISK	MNDT

Description: (2004) Stamping: 5603 V 2004

2.5 MILES EAST OF BATTLE LAKE, 2.45 MILES EAST ALONG BATTLE LAKE FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 IN BATTLE LAKE, AT TRUNK HIGHWAY 210 MILEPOST 48.0, 80.9 FEET SOUTH OF TRUNK HIGHWAY 210, 63.5 FEET EAST-NORTHEAST OF A POWER POLE, 47.6 FEET SOUTH OF MILEPOST 48, 2.6 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1383.504	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1383.465	.016	2/1				VERTICAL ADJUSTMENT	2009 00000591
1383.468	.016	2/1				VERTICAL CONTROL SURVEY	2005 VBAT1

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1383.504			1296.047	.009	2011	HORIZONTAL ADJUSTMENT	2024 GPS3782
1383.504	.131		1296.198	.066	1996	GPS - STATIC	2024 HTH210B
1383.504			1296.047	.009	2011	GPS - STATIC	2024 HTH210B
1383.409	.262		1296.021	.197	2011	GPS - RTRN	2023 RTRN2023
			1296.047	.009	2011	HORIZONTAL ADJUSTMENT	2012 GPS2800
1383.304	.262		1296.083	.197	1996	GPS - RTRN	2009 RTRN2009
			1296.159	.009	2007	HORIZONTAL ADJUSTMENT	2007 GPS2300
1383.462	.131		1296.198	.066	1996	HORIZONTAL ADJUSTMENT	2005 GPS2135
1383.462	.131		1296.198	.066	1996	GPS - STATIC	2005 HBATT

Geoid Separations(ft): GEOID18 = -87.388 12B = -87.395 09 = -87.280 03 = -87.218

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Year</u> <u>Reference</u>	
46 16 13.39537	95 39 50.04799	513345.053	159815.313	.010		2024 GPS3782	
46 16 13.39537	95 39 50.04799	513345.053	159815.313	.010	C	2024 HTH210B	
46 16 13.39582	95 39 50.04703	513345.121	159815.359	.131	3	2023 RTRN2023	
46 16 13.39537	95 39 50.04799	513345.053	159815.313	.013		2012 GPS2800	

<u>NAD83(2007)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Year</u> <u>Reference</u>	
46 16 13.39530	95 39 50.04886	513344.992	159815.306	.013		2007 GPS2300	

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Year</u> <u>Reference</u>	
46 16 13.39489	95 39 50.04857	513345.012	159815.265	.033	C	2024 HTH210B	
46 16 13.39553	95 39 50.04938	513344.955	159815.330	.131	3	2009 RTRN2009	
46 16 13.39489	95 39 50.04857	513345.012	159815.265	.033	C	2005 GPS2135	
46 16 13.39489	95 39 50.04857	513345.012	159815.265	.033	C	2005 HBATT	

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2267132.642	794523.335	966986.698	16822602.276	.010		ADJUSTMENT	2024	GPS3782
2267132.642	794523.335	966986.698	16822602.276	.010	C	GPS - STATIC	2024	HTH210B
2267132.710	794523.380	966986.767	16822602.320	.131	3	GPS - RTRN	2023	RTRN2023
2267132.642	794523.335	966986.698	16822602.276	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2267132.580	794523.329	966986.637	16822602.271	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2267132.600	794523.288	966986.656	16822602.229	.033	C	GPS - STATIC	2024	HTH210B
2267132.544	794523.353	966986.601	16822602.296	.131	3	GPS - RTRN	2009	RTRN2009
2267132.600	794523.288	966986.656	16822602.229	.033	C	ADJUSTMENT	2005	GPS2135
2267132.600	794523.288	966986.656	16822602.229	.033	C	GPS - STATIC	2005	HBATT

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5603_V-DH4073-3S-20FEB2024.jpg	S	Feb 20, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5603_V-DH4073-2-20FEB2024.jpg		Feb 20, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5603_V-DH4073-1-20FEB2024.jpg		Feb 20, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5607 A

NGS Name: 5607 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DL8665](#)
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NW	12	137 N	40 W	464140.60	954058.60	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER IS STEEL ROD

Monument Type	Disk Type	Mon. Agency
COPPER CLAD ROD (NO SLEEVE)	VERTICAL CONTROL DISK	MNDT

Description: (1975)

Stamping: 5607 A 1975

2.6 MILES SOUTH-SOUTHEAST OF FRAZEE, AT TRUNK HIGHWAY 10 MILEPOINT 56.95, 2.9 MILES NORTHWEST ON TRUNK HIGHWAY 10 FROM THE JUNCTION OF TRUNK HIGHWAY 10 AND TRUNK HIGHWAY 228 AT LUCE, 100.0 FEET WEST-SOUTHWEST OF EASTBOUND TRUNK HIGHWAY 10, 111.0 FEET NORTHWEST OF DRIVEWAY NUMBER 38836, 8.0 FEET WEST OF A POWER POLE, 2.0 FEET SOUTHEAST OF A CAST IRON MONUMENT, 1.0 FOOT SOUTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1374.292	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1374.321	.016	2/1				VERTICAL ADJUSTMENT	2010	00000640
1374.321	.016	2/1				VERTICAL CONTROL SURVEY	2005	VPERH

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1373.311	.033	3				VERTICAL CONTROL SURVEY	1975	CS5607

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1374.266	.262		1287.182	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.316 12B = -87.316 09 = -87.218 03 = -87.083

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 41 40.56871	95 40 58.61591	508461.869	314532.355	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2265115.462	949284.464	967426.829	16977405.329	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5607_A-DL8665-3W-05AUG2009.jpg	W	Aug 5, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5607_A-DL8665-2-05AUG2009.jpg		Aug 5, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5607_A-DL8665-1-05AUG2009.jpg		Aug 5, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5607 B

NGS Name: 5607 B

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DH4058](#)
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NE	13	137 N	40 W	464059.68	954029.04	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER IS STEEL ROD

Monument Type	Disk Type	Mon. Agency
COPPER CLAD ROD (NO SLEEVE)	VERTICAL CONTROL DISK	MNDT

Description: (2010)

Stamping: 5607 B 1975

3.5 MILES SOUTH-SOUTHEAST OF FRAZEE, AT TRUNK HIGHWAY 10 MILEPOINT 57.85, 2.05 MILES NORTHWEST ON TRUNK HIGHWAY 10 FROM THE JUNCTION OF TRUNK HIGHWAY 10 AND TRUNK HIGHWAY 228 AT LUCE, 109.9 FEET SOUTHWEST OF EASTBOUND TRUNK HIGHWAY 10, 3.1 FEET NORTH OF A POWER POLE AT A JOG IN THE TRUNK HIGHWAY 10 RIGHT-OF-WAY, 1.0 FOOT SOUTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1371.027	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1371.050	.016	2/1				VERTICAL ADJUSTMENT	2010	00000640
1371.050	.016	2/1				VERTICAL CONTROL SURVEY	2005	VPERH

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1370.050	.033	3				VERTICAL CONTROL SURVEY	1975	CS5607

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1370.982	.262		1283.646	.197	2011	GPS - OPUS	2020	GPSBM
			1283.675	.013	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1370.798	.262		1283.692	.197	1996	GPS - RTRN	2009	RTRN2009
			1283.787	.014	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1371.060	.131		1283.859	.066	1996	HORIZONTAL ADJUSTMENT	2005	GPS2123
1371.060	.131		1283.859	.066	1996	GPS - STATIC	2005	HPERH

Geoid Separations(ft): GEOID18 = -87.336 12B = -87.329 09 = -87.234 03 = -87.103

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 40 59.68034	95 40 29.04488	510525.506	310390.709	.131	3	GPS - OPUS	2020	GPSBM
46 40 59.68119	95 40 29.04512	510525.489	310390.795	.016		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 40 59.68111	95 40 29.04600	510525.428	310390.787	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 40 59.68104	95 40 29.04600	510525.428	310390.779	.131	3	GPS - RTRN	2009	RTRN2009
46 40 59.68074	95 40 29.04590	510525.435	310390.749	.033	C	ADJUSTMENT	2005	GPS2123
46 40 59.68074	95 40 29.04590	510525.435	310390.749	.033	C	GPS - STATIC	2005	HPERH

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2267101.811	945105.828	969346.435	16973194.727	.131	3	GPS - OPUS	2020	GPSBM
2267101.796	945105.915	969346.421	16973194.814	.016		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2267101.734	945105.908	969346.360	16973194.808	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2267101.734	945105.901	969346.359	16973194.801	.131	3	GPS - RTRN	2009	RTRN2009
2267101.740	945105.870	969346.365	16973194.770	.033	C	ADJUSTMENT	2005	GPS2123
2267101.740	945105.870	969346.365	16973194.770	.033	C	GPS - STATIC	2005	HPERH

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5607_B-DH4058-3W-05AUG2009.jpg	W	Aug 5, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5607_B-DH4058-2-19DEC2019.jpg		Dec 19, 2019
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5607_B-DH4058-1-19DEC2019.jpg		Dec 19, 2019

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5607 M

NGS Name: 5607 M

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DH4038](#)
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	13	137 N	40 W	464039.30	954013.53	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2004	2015	GOOD	Horz=YES Vert=YES	YES		RECESSED 10 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
STEEL ROD (NO SLEEVE)	METAL ROD	MNDT

Description: (2015)

Stamping: 5607 M 2004

7.3 MILES NORTHWEST OF PERHAM, 8.4 MILES NORTHWEST ALONG TRUNK HIGHWAY 10 FROM THE JUNCTION OF TRUNK HIGHWAY 10 AND TRUNK HIGHWAY 78 (THE JUNCTION IS 0.5 MILE SOUTH OF PERHAM), AT TRUNK HIGHWAY 10 MILEPOINT 58.30, 66.0 FEET SOUTHWEST OF EASTBOUND TRUNK HIGHWAY 10, 31.0 FEET SOUTH OF A PEDESTAL, 1.2 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1372.412	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1372.432	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1372.432	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1372.432	.016	2/1				VERTICAL ADJUSTMENT	2010	00000640
1372.432	.016	2/1				VERTICAL CONTROL SURVEY	2005	VPERH

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1372.287	.262		1284.951	.197	2011	GPS - RTRN	2015	RTRN2015
			1285.063	.012	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1372.179	.262		1285.066	.197	1996	GPS - RTRN	2009	RTRN2009
			1285.168	.013	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1372.438	.131		1285.250	.066	1996	HORIZONTAL ADJUSTMENT	2005	GPS2123
1372.438	.131		1285.250	.066	1996	GPS - STATIC	2005	HPERH

Geoid Separations(ft): GEOID18 = -87.346 12B = -87.339 09 = -87.244 03 = -87.113

Lat/Lon and County Coordinates (Feet)

NAD83(2011)			Otter Tail County			Acc	Order	Determination Method	Project Info	
Latitude	Longitude		X	Y					Year	Reference
46 40 39.29894	95 40 13.53350		511608.261	308326.361		.131	3	GPS - RTRN	2015	RTRN2015
46 40 39.29931	95 40 13.53294		511608.300	308326.399		.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)			Otter Tail County			Acc	Order	Determination Method	Project Info	
Latitude	Longitude		X	Y					Year	Reference
46 40 39.29924	95 40 13.53372		511608.245	308326.392		.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)			Otter Tail County			Acc	Order	Determination Method	Project Info	
Latitude	Longitude		X	Y					Year	Reference
46 40 39.29890	95 40 13.53379		511608.240	308326.357		.131	3	GPS - RTRN	2009	RTRN2009
46 40 39.29875	95 40 13.53356		511608.256	308326.342		.033	C	ADJUSTMENT	2005	GPS2123
46 40 39.29875	95 40 13.53356		511608.256	308326.342		.033	C	GPS - STATIC	2005	HPERH



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2268146.025	943022.042	970357.379	16971094.150	.131	3	GPS - RTRN	2015	RTRN2015
2268146.065	943022.079	970357.419	16971094.186	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2268146.011	943022.073	970357.365	16971094.180	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2268146.005	943022.038	970357.358	16971094.146	.131	3	GPS - RTRN	2009	RTRN2009
2268146.021	943022.023	970357.374	16971094.131	.033	C	ADJUSTMENT	2005	GPS2123
2268146.021	943022.023	970357.374	16971094.131	.033	C	GPS - STATIC	2005	HPERH

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5607_M-DH4038-3SW-25AUG2015.jpg	SW	Aug 25, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5607_M-DH4038-2-25AUG2015.jpg		Aug 25, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5607_M-DH4038-1-25AUG2015.jpg		Aug 25, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5607 N

NGS Name: 5607 N

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	2	137 N	40 W	464242.13	954204.25	2	C

NGS ACRN: [DH4039](#)
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2004	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 60 FT)	SURVEY DISK	MNDT

Description: (2004)

Stamping: 5607 N 2004

1.0 MILE SOUTH OF FRAZEE, 0.95 MILE SOUTHEAST ALONG TRUNK HIGHWAY 10 FROM THE JUNCTION OF TRUNK HIGHWAY 10 AND TRUNK HIGHWAY 87 (THE JUNCTION IS 0.8 MILE SOUTHWEST OF FRAZEE), AT TRUNK HIGHWAY 10 MILEPOINT 55.50, 0.20 MILE SOUTHEAST OF A REST AREA ENTRANCE, 73.0 FEET NORTHEAST OF WESTBOUND TRUNK HIGHWAY 10, 27.5 FEET SOUTHWEST OF A POWER POLE, 2.7 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1377.520	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1377.553	.016	2/1				VERTICAL ADJUSTMENT	2010 00000640
1377.550	.016	2/1				VERTICAL CONTROL SURVEY	2005 VPERH

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1377.553			1290.230	.010	2011	HORIZONTAL ADJUSTMENT	2019 GPS3292
1377.553	.131		1290.401	.066	1996	GPS - STATIC	2019 HBCKR
1377.553			1290.230	.010	2011	GPS - STATIC	2019 HBCKR
1377.494	.262		1290.217	.197	2011	GPS - RTRN	2015 RTRN2015
			1290.230	.010	2011	HORIZONTAL ADJUSTMENT	2012 GPS2800
1377.478	.262		1290.427	.197	1996	GPS - RTRN	2009 RTRN2009
			1290.335	.010	2007	HORIZONTAL ADJUSTMENT	2007 GPS2300
1377.556	.131		1290.401	.066	1996	HORIZONTAL ADJUSTMENT	2005 GPS2123
1377.556	.131		1290.401	.066	1996	GPS - STATIC	2005 HPERH

Geoid Separations(ft): GEOID18 = -87.273 12B = -87.277 09 = -87.168 03 = -87.047

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u> <u>Order</u> <u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 42 42.13474	95 42 04.25213	503885.047	320768.558	.007		ADJUSTMENT	2019 GPS3292
46 42 42.13474	95 42 04.25213	503885.047	320768.558	.007	C	GPS - STATIC	2019 HBCKR
46 42 42.13396	95 42 04.25123	503885.110	320768.479	.131	3	GPS - RTRN	2015 RTRN2015
46 42 42.13474	95 42 04.25213	503885.047	320768.558	.010		ADJUSTMENT	2012 GPS2800

<u>NAD83(2007)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u> <u>Order</u> <u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 42 42.13466	95 42 04.25297	503884.989	320768.550	.010		ADJUSTMENT	2007 GPS2300

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u> <u>Order</u> <u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 42 42.13432	95 42 04.25285	503884.997	320768.515	.033	C	GPS - STATIC	2019 HBCKR
46 42 42.13455	95 42 04.25297	503884.989	320768.539	.131	3	GPS - RTRN	2009 RTRN2009
46 42 42.13432	95 42 04.25285	503884.997	320768.515	.033	C	ADJUSTMENT	2005 GPS2123
46 42 42.13432	95 42 04.25285	503884.997	320768.515	.033	C	GPS - STATIC	2005 HPERH

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2260655.446	955603.571	963067.720	16983796.129	.007		ADJUSTMENT	2019	GPS3292
2260655.446	955603.571	963067.720	16983796.129	.007	C	GPS - STATIC	2019	HBACKR
2260655.508	955603.491	963067.780	16983796.048	.131	3	GPS - RTRN	2015	RTRN2015
2260655.446	955603.571	963067.720	16983796.129	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2260655.387	955603.565	963067.661	16983796.123	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2260655.395	955603.530	963067.669	16983796.088	.033	C	GPS - STATIC	2019	HBACKR
2260655.387	955603.553	963067.661	16983796.112	.131	3	GPS - RTRN	2009	RTRN2009
2260655.395	955603.530	963067.669	16983796.088	.033	C	ADJUSTMENT	2005	GPS2123
2260655.395	955603.530	963067.669	16983796.088	.033	C	GPS - STATIC	2005	HPERH

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5607_N-DH4039-3NE-06AUG2015.jpg	NE	Aug 6, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5607_N-DH4039-2-06AUG2015.jpg		Aug 6, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5607_N-DH4039-1-06AUG2015.jpg		Aug 6, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5611 A

NGS Name: 5611 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ1972](#) [Get Map](#)
NGS Quad / Sta Num : 46096124/
USGS Quad: ROLLAG

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NW	30	137 N	43 W	463935.85	961021.73	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2023	GOOD	Horz=YES Vert=YES	YES		PROJECTS 8 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (2014)

Stamping: 5611 A 1952

7.25 MILES WEST OF DUNVILLA, 7.05 MILES WEST ALONG TRUNK HIGHWAY 34 FROM THE JUNCTION OF TRUNK HIGHWAY 34 AND TRUNK HIGHWAY 59 IN DUNVILLA, AT TRUNK HIGHWAY 34 MILEPOINT 11.75, 143.0 FEET EAST OF COUNTY ROAD 128 (155TH AVENUE), 75.0 FEET NORTH OF TRUNK HIGHWAY 34, 7.7 FEET EAST OF A POWER POLE WITH A GUY WIRE, 1.2 FEET WEST OF A RIGHT-OF-WAY POST, 1.5 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1393.039	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1393.039			1305.791	.016	2011	HORIZONTAL ADJUSTMENT	2024 GPS3671
1393.039	.131		1305.942	.066	1996	GPS - STATIC	2023 HTH9
1393.039			1305.791	.016	2011	GPS - STATIC	2023 HTH9
1393.252	.262		1305.969	.197	2011	GPS - RTRN	2022 RTRN2022
1393.039	.131		1305.942	.066	1996	GPS - STATIC	2021 HOTTE
1393.039			1305.791	.022	2011	HORIZONTAL ADJUSTMENT	2020 GPS3384
1393.039			1305.791	.022	2011	GPS - STATIC	2020 HOTTE
1393.039	.262		1305.791	.197	2011	GPS - RTRN	2014 RTRN2014

Geoid Separations(ft): GEOID18 = -87.283 12B = -87.247 09 = -87.152 03 = -87.073

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year Reference	
46 39 35.84628	96 10 21.72558	385480.600	302224.385	.010		ADJUSTMENT	2024 GPS3671	
46 39 35.84628	96 10 21.72558	385480.600	302224.385	.010	C	GPS - STATIC	2023 HTH9	
46 39 35.84467	96 10 21.72506	385480.635	302224.222	.131	3	GPS - RTRN	2022 RTRN2022	
46 39 35.84628	96 10 21.72558	385480.600	302224.385	.016		ADJUSTMENT	2020 GPS3384	
46 39 35.84628	96 10 21.72558	385480.600	302224.385	.016	C	GPS - STATIC	2020 HOTTE	
46 39 35.84601	96 10 21.72486	385480.650	302224.358	.131	3	GPS - RTRN	2014 RTRN2014	

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year Reference	
46 39 35.84593	96 10 21.72607	385480.565	302224.350	.033	C	GPS - STATIC	2023 HTH9	
46 39 35.84593	96 10 21.72607	385480.565	302224.350	.033	C	GPS - STATIC	2021 HOTTE	

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2141942.581	939256.555	844074.939	16969348.052	.010		ADJUSTMENT	2024	GPS3671
2141942.581	939256.555	844074.939	16969348.052	.010	C	GPS - STATIC	2023	HTH9
2141942.613	939256.391	844074.969	16969347.888	.131	3	GPS - RTRN	2022	RTRN2022
2141942.581	939256.555	844074.939	16969348.052	.016		ADJUSTMENT	2020	GPS3384
2141942.581	939256.555	844074.939	16969348.052	.016	C	GPS - STATIC	2020	HOTTE
2141942.631	939256.526	844074.988	16969348.023	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2141942.546	939256.520	844074.904	16969348.018	.033	C	GPS - STATIC	2023	HTH9
2141942.546	939256.520	844074.904	16969348.018	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5611_A-DQ1972-3N-13SEP2022.jpg	N	Sep 13, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5611_A-DQ1972-2-13SEP2022.jpg		Sep 13, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5611_A-DQ1972-1-13SEP2022.jpg		Sep 13, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5611 B

NGS Name: 5611 B

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096124/
USGS Quad: ROLLAG

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	20	137 N	43 W	463936.00	960755.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1953	2014	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (2014)

Stamping:

5.7 MILES WEST OF DUNVILLA, 5.5 MILES WEST ON TRUNK HIGHWAY 34 FROM THE JUNCTION OF TRUNK HIGHWAY 34 AND TRUNK HIGHWAY 59 IN DUNVILLA, 57.0 FEET LEFT OF TRUNK HIGHWAY 34, AT TRUNK HIGHWAY 34 STATION 690+66, THE ELEVATION IS NOT AVAILABLE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.300 12B = -87.270 09 = -87.165 03 = -87.070



Mn/DOT Name: 5611 C

NGS Name: 5611 C

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096121/
USGS Quad: CORMORANT

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	27	137 N	43 W	463920.18	960558.74		C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1953	2010	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1953)

Stamping:

2.7 MILES WEST ON TRUNK HIGHWAY 34 FROM THE JUNCTION OF TRUNK HIGHWAY 34 AND TRUNK HIGHWAY 59 AT DUNVILLA, 209.0 FEET RIGHT OF TRUNK HIGHWAY 34, AT TRUNK HIGHWAY 34 STATION 775+70.

Station Notes

THE DISK WAS TURNED IN TO THE OFFICE.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
			1269.745	.066	1996	GPS - STATIC		2001	DIST 4

Geoid Separations(ft): GEOID18 = -87.326 12B = -87.303 09 = -87.198 03 = -87.083

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 39 20.18754	96 05 58.74222	403817.283	300540.646	.033	C	GPS - STATIC	2001	DIST 4

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2160242.712	937233.958	862347.093	16967031.828	.033	C	GPS - STATIC	2001	DIST 4



Mn/DOT Name: 5611 D

NGS Name: 5611 D

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ1982](#) [Get Map](#)
NGS Quad / Sta Num : 46096121/
USGS Quad: CORMORANT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	25	137 N	43 W	463932.30	960246.28	2	3	1952	2014	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (2014)

Stamping: 5611 D 1952

1.2 MILES SOUTHWEST OF DUNVILLA, 0.9 MILE WEST ALONG TRUNK HIGHWAY 34 FROM THE JUNCTION OF TRUNK HIGHWAY 34 AND TRUNK HIGHWAY 59 IN DUNVILLA, AT TRUNK HIGHWAY 34 MILEPOINT 17.95, 91.8 FEET EAST OF 215TH AVENUE, 73.9 FEET SOUTH OF TRUNK HIGHWAY 34, 1.0 FOOT WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1349.709	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1349.856	.262		1262.534	.197	2011	GPS - RTRN	2022 RTRN2022
1349.817	.262		1262.497	.197	2011	GPS - RTRN	2022 RTRN2022
1349.686	.262		1262.379	.197	2011	GPS - RTRN	2014 RTRN2014

Geoid Separations(ft): GEOID18 = -87.323 12B = -87.306 09 = -87.201 03 = -87.070

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 39 32.30194	96 02 46.28314	417248.503	301707.532	.131	3	GPS - RTRN	2022 RTRN2022
46 39 32.30013	96 02 46.28294	417248.516	301707.349	.131	3	GPS - RTRN	2022 RTRN2022
46 39 32.30060	96 02 46.28294	417248.516	301707.397	.131	3	GPS - RTRN	2014 RTRN2014

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>								
MN State Plane - Central Zone		UTM - Zone 15				Project Info		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2173691.552	938151.916	875813.503	16967734.637	.131	3	GPS - RTRN	2022	RTRN2022
2173691.562	938151.733	875813.510	16967734.453	.131	3	GPS - RTRN	2022	RTRN2022
2173691.563	938151.780	875813.511	16967734.501	.131	3	GPS - RTRN	2014	RTRN2014

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5611_D-DQ1982-3S-12OCT2022.jpg	S	Oct 12, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5611_D-DQ1982-2-12OCT2022.jpg		Oct 12, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5611_D-DQ1982-1-12OCT2022.jpg		Oct 12, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5611 E

NGS Name: 5611 E

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ1983](#) [Get Map](#)
NGS Quad / Sta Num : 46096121/
USGS Quad: CORMORANT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	25	137 N	43 W	463932.32	960248.09	2	C	2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 69 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: 5611 E 2014

6.3 MILES NORTH-NORTHEAST OF PELICAN RAPIDS, 1.0 MILE WEST ALONG TRUNK HIGHWAY 34 FROM THE JUNCTION OF TRUNK HIGHWAYS 34 AND 59 (THE JUNCTION IS 6.0 MILES NORTH OF PELICAN RAPIDS), AT TRUNK HIGHWAY 34 MILEPOINT 17.9, 71.9 FEET SOUTH OF TRUNK HIGHWAY 34, 35.4 FEET WEST OF 215TH AVENUE, 3.6 FEET NORTH OF A RIGHT-OF-WAY POST, 3.6 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1348.088	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1348.088			1260.860	.022	2011	HORIZONTAL ADJUSTMENT	2024 GPS3671
1348.088	.131		1260.969	.066	1996	GPS - STATIC	2023 HTH9
1348.088			1260.860	.022	2011	GPS - STATIC	2023 HTH9
1348.098	.262		1260.775	.197	2011	GPS - RTRN	2022 RTRN2022
1348.058	.262		1260.736	.197	2011	GPS - RTRN	2021 RTRN2021
1348.127	.262		1260.805	.197	2011	GPS - OPUS	2020 GPSBM
1348.052	.262		1260.746	.197	2011	GPS - RTRN	2014 RTRN2014

Geoid Separations(ft): GEOID18 = -87.323 12B = -87.306 09 = -87.201 03 = -87.070

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 39 32.32095	96 02 48.09197	417122.333	301709.985	.013		ADJUSTMENT	2024 GPS3671
46 39 32.32095	96 02 48.09197	417122.333	301709.985	.013	C	GPS - STATIC	2023 HTH9
46 39 32.32106	96 02 48.09254	417122.294	301709.996	.131	3	GPS - RTRN	2022 RTRN2022
46 39 32.32125	96 02 48.09230	417122.310	301710.015	.131	3	GPS - RTRN	2021 RTRN2021
46 39 32.32073	96 02 48.09203	417122.329	301709.962	.131	3	GPS - OPUS	2020 GPSBM
46 39 32.32132	96 02 48.09223	417122.315	301710.022	.131	3	GPS - RTRN	2014 RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 39 32.32072	96 02 48.09235	417122.307	301709.961	.033	C	GPS - STATIC	2023 HTH9

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2173565.465	938156.703	875687.467	16967741.443	.013		ADJUSTMENT	2024	GPS3671
2173565.465	938156.703	875687.467	16967741.443	.013	C	GPS - STATIC	2023	HTH9
2173565.425	938156.715	875687.427	16967741.456	.131	3	GPS - RTRN	2022	RTRN2022
2173565.443	938156.734	875687.445	16967741.475	.131	3	GPS - RTRN	2021	RTRN2021
2173565.460	938156.681	875687.462	16967741.421	.131	3	GPS - OPUS	2020	GPSBM
2173565.447	938156.741	875687.450	16967741.481	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2173565.438	938156.680	875687.440	16967741.421	.033	C	GPS - STATIC	2023	HTH9

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5611_E-DQ1983-3S-12OCT2022.jpg	S	Oct 12, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5611_E-DQ1983-2-12OCT2022.jpg		Oct 12, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5611_E-DQ1983-1-12OCT2022.jpg		Oct 12, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5611 F

NGS Name: 5611 F

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DQ1981 NGS Quad / Sta Num : 46096121/ USGS Quad: CORMORANT Get Map
NW	25	137 N	43 W	463930.47	960401.89	2	C	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 84 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: 5611 F 2014

6.2 MILES NORTH OF PELICAN RAPIDS, 2.0 MILES WEST ALONG TRUNK HIGHWAY 34 FROM THE JUNCTION OF TRUNK HIGHWAYS 34 AND 59 (THE JUNCTION IS 6.0 MILES NORTH OF PELICAN RAPIDS), AT TRUNK HIGHWAY 34 MILEPOINT 16.9, 71.5 FEET SOUTHEAST OF TRUNK HIGHWAY 34, 118.0 FEET EAST OF 205TH AVENUE, 17.5 FEET WEST OF A RIGHT-OF-WAY POST, 1.5 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1353.836	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1353.836			1266.579	.022	2011	HORIZONTAL ADJUSTMENT	2024 GPS3671
1353.836	.131		1266.687	.066	1996	GPS - STATIC	2023 HTH9
1353.836			1266.579	.022	2011	GPS - STATIC	2023 HTH9
1353.941	.262		1266.618	.197	2011	GPS - RTRN	2022 RTRN2022
1353.905	.262		1266.579	.197	2011	GPS - RTRN	2022 RTRN2022
1353.869	.262		1266.543	.197	2011	GPS - OPUS	2022 GPSBM
1353.901	.262		1266.576	.197	2011	GPS - OPUS	2022 GPSBM
1353.869	.262		1266.543	.197	2011	GPS - RTRN	2021 RTRN2021
1353.764	.262		1266.457	.197	2011	GPS - RTRN	2014 RTRN2014

Geoid Separations(ft): GEOID18 = -87.326 12B = -87.306 09 = -87.201 03 = -87.077

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 39 30.46631	96 04 01.88773	411973.767	301544.229	.013		ADJUSTMENT	2024 GPS3671
46 39 30.46631	96 04 01.88773	411973.767	301544.229	.013	C	GPS - STATIC	2023 HTH9
46 39 30.46695	96 04 01.88742	411973.788	301544.294	.131	3	GPS - RTRN	2022 RTRN2022
46 39 30.46640	96 04 01.88847	411973.715	301544.239	.131	3	GPS - RTRN	2022 RTRN2022
46 39 30.46586	96 04 01.88807	411973.743	301544.184	.131	3	GPS - OPUS	2022 GPSBM
46 39 30.46604	96 04 01.88800	411973.748	301544.202	.131	3	GPS - OPUS	2022 GPSBM
46 39 30.46644	96 04 01.88820	411973.734	301544.243	.131	3	GPS - RTRN	2021 RTRN2021
46 39 30.46643	96 04 01.88765	411973.772	301544.241	.131	3	GPS - RTRN	2014 RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 39 30.46608	96 04 01.88811	411973.740	301544.206	.033	C	GPS - STATIC	2023 HTH9



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2168415.349	938086.287	870535.161	16967753.475	.013		ADJUSTMENT	2024	GPS3671
2168415.349	938086.287	870535.161	16967753.475	.013	C	GPS - STATIC	2023	HTH9
2168415.371	938086.352	870535.185	16967753.539	.131	3	GPS - RTRN	2022	RTRN2022
2168415.297	938086.298	870535.110	16967753.486	.131	3	GPS - RTRN	2022	RTRN2022
2168415.324	938086.242	870535.135	16967753.430	.131	3	GPS - OPUS	2022	GPSBM
2168415.329	938086.260	870535.141	16967753.448	.131	3	GPS - OPUS	2022	GPSBM
2168415.316	938086.301	870535.128	16967753.490	.131	3	GPS - RTRN	2021	RTRN2021
2168415.354	938086.299	870535.167	16967753.487	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2168415.321	938086.265	870535.133	16967753.453	.033	C	GPS - STATIC	2023	HTH9

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5611_F-DQ1981-3SE-12OCT2022.jpg	SE	Oct 12, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5611_F-DQ1981-2-12OCT2022.jpg		Oct 12, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5611_F-DQ1981-1-12OCT2022.jpg		Oct 12, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5611 G

NGS Name: 5611 G

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ1978](#) [Get Map](#)
NGS Quad / Sta Num : 46096121/
USGS Quad: CORMORANT

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	21	137 N	43 W	463935.43	960656.26	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 39 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) **Stamping:** 5611 G 2014

6.5 MILES NORTH-NORTHWEST OF PELICAN RAPIDS, 4.3 MILES WEST ALONG TRUNK HIGHWAY 34 FROM THE JUNCTION OF TRUNK HIGHWAYS 34 AND 59 (THE JUNCTION IS 6.0 MILES NORTH OF PELICAN RAPIDS), AT TRUNK HIGHWAY 34 MILEPOINT 14.55, 76.0 FEET NORTH OF TRUNK HIGHWAY 34, 20.4 FEET WEST OF 183RD AVENUE EXTENDED, 1.5 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1393.810	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1393.810			1306.605	.022	2011	HORIZONTAL ADJUSTMENT	2024 GPS3671
1393.810	.131		1306.713	.066	1996	GPS - STATIC	2023 HTH9
1393.810			1306.605	.022	2011	GPS - STATIC	2023 HTH9
1393.826	.262		1306.520	.197	2011	GPS - RTRN	2022 RTRN2022
1393.892	.262		1306.585	.197	2011	GPS - OPUS	2022 GPSBM
1393.901	.262		1306.595	.197	2011	GPS - OPUS	2022 GPSBM
1393.757	.262		1306.451	.197	2011	GPS - RTRN	2021 RTRN2021

Geoid Separations(ft): GEOID18 = -87.306 12B = -87.280 09 = -87.178 03 = -87.070

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year Reference	
46 39 35.42738	96 06 56.25994	399812.615	302104.482	.013		ADJUSTMENT	2024 GPS3671	
46 39 35.42738	96 06 56.25994	399812.615	302104.482	.013	C	GPS - STATIC	2023 HTH9	
46 39 35.42750	96 06 56.26081	399812.555	302104.495	.131	3	GPS - RTRN	2022 RTRN2022	
46 39 35.42692	96 06 56.26030	399812.590	302104.436	.131	3	GPS - OPUS	2022 GPSBM	
46 39 35.42717	96 06 56.26019	399812.598	302104.461	.131	3	GPS - OPUS	2022 GPSBM	
46 39 35.42745	96 06 56.25960	399812.639	302104.489	.131	3	GPS - RTRN	2021 RTRN2021	

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year Reference	
46 39 35.42715	96 06 56.26032	399812.589	302104.459	.033	C	GPS - STATIC	2023 HTH9	

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2156268.152	938871.449	858397.849	16968733.349	.013		ADJUSTMENT	2024	GPS3671
2156268.152	938871.449	858397.849	16968733.349	.013	C	GPS - STATIC	2023	HTH9
2156268.092	938871.462	858397.789	16968733.364	.131	3	GPS - RTRN	2022	RTRN2022
2156268.126	938871.403	858397.822	16968733.304	.131	3	GPS - OPUS	2022	GPSBM
2156268.134	938871.428	858397.831	16968733.329	.131	3	GPS - OPUS	2022	GPSBM
2156268.176	938871.456	858397.873	16968733.355	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2156268.125	938871.426	858397.822	16968733.327	.033	C	GPS - STATIC	2023	HTH9

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5611_G-DQ1978-3N-13SEP2022.jpg	N	Sep 13, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5611_G-DQ1978-2-13SEP2022.jpg		Sep 13, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5611_G-DQ1978-1-13SEP2022.jpg		Sep 13, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5611 H

NGS Name: 5611 H

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ1976](#) [Get Map](#)
NGS Quad / Sta Num : 46096124/
USGS Quad: ROLLAG

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	29	137 N	43 W	463934.69	960803.26	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 19 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) **Stamping:** 5611 H 2014

6.6 MILES NORTHWEST OF PELICAN RAPIDS, 5.2 MILES WEST ALONG TRUNK HIGHWAY 34 FROM THE JUNCTION OF TRUNK HIGHWAYS 34 AND 59 (THE JUNCTION IS 6.0 MILES NORTH OF PELICAN RAPIDS), AT TRUNK HIGHWAY 34 MILEPOINT 13.65, 54.2 FEET SOUTH OF TRUNK HIGHWAY 34, 27.7 FEET EAST OF A FIELD ENTRANCE, 1.5 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1396.201	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1396.201			1309.000	.022	2011	HORIZONTAL ADJUSTMENT	2024	GPS3671	
1396.201	.131		1309.105	.066	1996	GPS - STATIC	2023	HTH9	
1396.201			1309.000	.022	2011	GPS - STATIC	2023	HTH9	
1396.195	.262		1308.895	.197	2011	GPS - RTRN	2022	RTRN2022	
1396.254	.262		1308.954	.197	2011	GPS - OPUS	2022	GPSBM	
1396.283	.262		1308.984	.197	2011	GPS - OPUS	2022	GPSBM	
1396.247	.262		1308.948	.197	2011	GPS - RTRN	2021	RTRN2021	
1396.113	.262		1308.843	.197	2011	GPS - RTRN	2014	RTRN2014	

Geoid Separations(ft): GEOID18 = -87.300 12B = -87.270 09 = -87.165 03 = -87.070

Lat/Lon and County Coordinates (Feet)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 39 34.69125	96 08 03.26472	395138.296	302054.028	.013		ADJUSTMENT	2024	GPS3671
46 39 34.69125	96 08 03.26472	395138.296	302054.028	.013	C	GPS - STATIC	2023	HTH9
46 39 34.69126	96 08 03.26501	395138.275	302054.029	.131	3	GPS - RTRN	2022	RTRN2022
46 39 34.69086	96 08 03.26515	395138.265	302053.988	.131	3	GPS - OPUS	2022	GPSBM
46 39 34.69115	96 08 03.26472	395138.295	302054.018	.131	3	GPS - OPUS	2022	GPSBM
46 39 34.69127	96 08 03.26418	395138.333	302054.029	.131	3	GPS - RTRN	2021	RTRN2021
46 39 34.69094	96 08 03.26434	395138.322	302053.996	.131	3	GPS - RTRN	2014	RTRN2014

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 39 34.69102	96 08 03.26510	395138.269	302054.004	.033	C	GPS - STATIC	2023	HTH9



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2151594.277	938907.517	853723.447	16968844.295	.013		ADJUSTMENT	2024	GPS3671
2151594.277	938907.517	853723.447	16968844.295	.013	C	GPS - STATIC	2023	HTH9
2151594.257	938907.519	853723.427	16968844.296	.131	3	GPS - RTRN	2022	RTRN2022
2151594.246	938907.478	853723.416	16968844.256	.131	3	GPS - OPUS	2022	GPSBM
2151594.277	938907.507	853723.447	16968844.284	.131	3	GPS - OPUS	2022	GPSBM
2151594.315	938907.518	853723.485	16968844.295	.131	3	GPS - RTRN	2021	RTRN2021
2151594.303	938907.485	853723.473	16968844.262	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2151594.250	938907.494	853723.420	16968844.272	.033	C	GPS - STATIC	2023	HTH9

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5611_H-DQ1976-3S-13SEP2022.jpg	S	Sep 13, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5611_H-DQ1976-2-13SEP2022.jpg		Sep 13, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5611_H-DQ1976-1-13SEP2022.jpg		Sep 13, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5613 A

NGS Name: 5613 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	27	133 N	43 W	461829.01	960529.06		3	1989	2009	GOOD	Horz=NO Vert=YES	NO		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (1989)

Stamping: 5613 A 1989

2.18 MILES NORTH ON TRUNK HIGHWAY 59 (UNION AVENUE) FROM THE NORTH JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 210 (LINCOLN AVENUE) AT FERGUS FALLS, AT TRUNK HIGHWAY 59 MILEPOINT 220.98, 115.0 FEET NORTH OF EXTENDED DEER FIELD DRIVE, 72.2 FEET EAST OF COUNTY ROAD 88, NEAR THE SOUTHWEST CORNER OF A WAYSIDE REST AREA, 12.9 FEET NORTHWEST OF THE NORTH 1 OF 2 POWER POLES, 2.75 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NGVD29</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1229.794	.033	3				VERTICAL CONTROL SURVEY	1989 CS5613

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1230.480	.262		1142.426	.197	1996	GPS - RTRN	2009 RTRN2009

Geoid Separations(ft): GEOID18 = -88.251 12B = -88.245 09 = -88.140 03 = -88.054

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 18 29.00683	96 05 29.05674	405287.635	173773.703	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2159366.475	810477.743	859455.119	16840259.025	.131	3	GPS - RTRN	2009 RTRN2009



Mn/DOT Name: 5613 B

NGS Name: 5613 B

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	21	133 N	43 W	461920.00	960635.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1989	2009	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (1989)

Stamping: 5613 B 1989

4.0 MILES SOUTHEAST OF ELIZABETH, 3.66 MILES NORTH AND NORTHWEST ON TRUNK HIGHWAY 59 FROM THE NORTH JUNCTION OF TRUNK HIGHWAY 59 (UNION AVENUE) AND TRUNK HIGHWAY 210 (LINCOLN AVENUE), AT TRUNK HIGHWAY 59 MILEPOINT 222.5, 109.5 FEET SOUTHWEST OF TRUNK HIGHWAY 59, 129.0 FEET EAST OF A NORTH-SOUTH GRAVEL ROAD, 2.3 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1253.341	.033	3				VERTICAL CONTROL SURVEY	1989 CS5613

Geoid Separations(ft): GEOID18 = -88.274 12B = -88.268 09 = -88.163 03 = -88.081

* No Horizontal Positions in the Database *



Mn/DOT Name: 5613 C

NGS Name: 5613 C

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	17	133 N	43 W	462002.00	960646.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1989	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (1989)

Stamping: 5613 C 1989

4.5 MILES NORTHWEST OF FERGUS FALLS, AT TRUNK HIGHWAY 59 MILEPOINT 223.3, 4.4 MILES NORTH AND NORTHWEST ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 (UNION AVENUE) AND TRUNK HIGHWAY 210 (LINCOLN AVENUE), 104.0 FEET NORTHEAST OF TRUNK HIGHWAY 59, 192.0 FEET WEST OF NORTH-SOUTH GRAVEL ROAD ON THE EAST LINE OF SECTION 17, 2.3 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1209.400	.033	3				VERTICAL CONTROL SURVEY	1989	CS5613

Geoid Separations(ft): GEOID18 = -88.281 12B = -88.277 09 = -88.166 03 = -88.087

* No Horizontal Positions in the Database *



Mn/DOT Name: 5614 A

NGS Name: 5614 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	2	132 N	43 W	461612.00	960318.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1978	1987	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (1987)

Stamping: 5614 A

IN FERGUS FALLS, 0.1 MILE SOUTH ALONG PEBBLE LAKE ROAD FROM THE JUNCTION OF PEBBLE LAKE ROAD AND EVERETT AVENUE IN FERGUS FALLS, THEN 262.0 FEET EAST ALONG TRUNK HIGHWAY 210.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1201.084	.033	3				VERTICAL CONTROL SURVEY	1978 CS5614

Geoid Separations(ft): GEOID18 = -88.136 12B = -88.140 09 = -88.018 03 = -87.930

* No Horizontal Positions in the Database *



Mn/DOT Name: 5614 A RESET

NGS Name: 5614 A RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	2	132 N	43 W	461612.00	960318.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1987	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1987)

Stamping: 5614 A RESET 1987

IN FERGUS FALLS, IN THE NORTHEAST QUADRANT OF THE JUNCTION OF TRUNK HIGHWAY 59 (OLD TRUNK HIGHWAY 52) AND TRUNK HIGHWAY 210, AT TRUNK HIGHWAY 210 MILEPOINT 28.3, 180.0 FEET EAST OF TRUNK HIGHWAY 59, 133.0 FEET NORTH OF TRUNK HIGHWAY 210, 64.1 FEET SOUTHWEST OF THE WEST LAMPERT SIGNPOST, THE ELEVATION IS NOT AVAILABLE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.136 12B = -88.140 09 = -88.018 03 = -87.930



Mn/DOT Name: 5614 B

NGS Name: 5614 B

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4351](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	11	132 N	43 W	461522.82	960304.91	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1978	2015	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER IS STEEL ROD

Monument Type	Disk Type	Mon. Agency
COPPER CLAD ROD (NO SLEEVE)	VERTICAL CONTROL DISK	MNDT

Description: (1991)

Stamping: 5614 B 1978

2.25 MILES SOUTHEAST OF FERGUS FALLS, 1.0 MILE SOUTHEAST ALONG COUNTY ROAD 82 FROM THE JUNCTION OF COUNTY ROAD 82 AND TRUNK HIGHWAY 210 IN FERGUS FALLS, 147.0 FEET NORTHEAST OF COUNTY ROAD 82, 173.0 FEET SOUTH OF DELAGOON PARK DRIVE, 90.0 FEET SOUTH OF THE WEST POST OF THE DELAGOON PARK SIGN, THE ROD DEPTH IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1218.446	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941
1218.475	.016	2/1					VERTICAL ADJUSTMENT	2017	00000911
1218.452	.016	2/1					VERTICAL CONTROL SURVEY	2016	VOTTE
NGVD29				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1217.645	.033	3					VERTICAL CONTROL SURVEY	1978	CS5614

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1218.374	.262			1130.293	.197	2011	GPS - RTRN	2015	RTRN2015
1218.374	.262			1130.293	.197	2011	GPS - RTRN	2015	RTRN2015
1218.374	.262			1130.503	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.077 12B = -88.077 09 = -87.953 03 = -87.871

Lat/Lon and County Coordinates (Feet)

NAD83(2011)				Otter Tail County				Project Info	
Geodetic Position									
Latitude	Longitude			X	Y	Acc	Order	Determination Method	Reference
46 15 22.82174	96 03 04.91186			415327.645	154866.529	.131	3	GPS - RTRN	RTRN2015
46 15 22.82174	96 03 04.91186			415327.645	154866.529	.131	3	GPS - RTRN	RTRN2015
NAD83(1996)				Otter Tail County				Project Info	
Geodetic Position									
Latitude	Longitude			X	Y	Acc	Order	Determination Method	Reference
46 15 22.82297	96 03 04.91356			415327.526	154866.654	.131	3	GPS - RTRN	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)				UTM - Zone 15				Project Info	
MN State Plane - Central Zone									
X	Y			X	Y	Acc	Order	Determination Method	Reference
2169053.500	791390.504			868843.460	16821014.404	.131	3	GPS - RTRN	RTRN2015
2169053.500	791390.504			868843.460	16821014.404	.131	3	GPS - RTRN	RTRN2015
NAD83(1996)				UTM - Zone 15				Project Info	
MN State Plane - Central Zone									
X	Y			X	Y	Acc	Order	Determination Method	Reference
2169053.383	791390.631			868843.346	16821014.534	.131	3	GPS - RTRN	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5614_B-DQ4351-3NE-09SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5614_B-DQ4351-2-09SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5614_B-DQ4351-1-09SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
NE	Sep 9, 2015
	Sep 9, 2015
	Sep 9, 2015



Mn/DOT Name: 5614 C

NGS Name: 5614 C

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4352](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
SE	14	132 N	43 W	461433.21	960234.57	2	3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1978	2015	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER IS STEEL ROD

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	VERTICAL CONTROL DISK	MNDT

Description: (1978)

Stamping: 5614 C 1978

3.25 MILES SOUTHEAST OF FERGUS FALLS, 2.0 MILES SOUTH-SOUTHEAST ALONG COUNTY ROAD 82 FROM THE JUNCTION OF COUNTY ROAD 82 AND TRUNK HIGHWAY 210 IN FERGUS FALLS, 73.0 FEET EAST OF COUNTY ROAD 82, 38.0 FEET NORTH OF PEBBLE SHORES DRIVE, 18.0 FEET EAST OF A BIKE PATH, 4.8 FEET SOUTHWEST OF THE WEST POST OF THE PEBBLE LAKE GOLF COURSE SIGN, AT THE SOUTHWEST CORNER OF THE PEBBLE LAKE GOLF COURSE, 6.8 FEET WEST OF A WITNESS POST, THE ROD DEPTH IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1219.893	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1219.925	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1219.899	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1218.442	.033	3				VERTICAL CONTROL SURVEY	1978	CS5614

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1219.748	.262		1131.753	.197	2011	GPS - RTRN	2015	RTRN2015
1219.748	.262		1131.753	.197	2011	GPS - RTRN	2015	RTRN2015
1219.765	.262		1131.970	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.999 12B = -87.995 09 = -87.871 03 = -87.798

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 14 33.20938	96 02 34.57216	417438.952	149831.577	.131	3	GPS - RTRN	2015	RTRN2015
46 14 33.20938	96 02 34.57216	417438.952	149831.577	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 14 33.20785	96 02 34.57432	417438.799	149831.423	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2171070.975	786318.012	870781.512	16815908.966	.131	3	GPS - RTRN	2015	RTRN2015
2171070.975	786318.012	870781.512	16815908.966	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2171070.820	786317.860	870781.355	16815908.817	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5614_C-DQ4352-3E-09SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5614_C-DQ4352-2-09SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5614_C-DQ4352-1-09SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Sep 9, 2015
	Sep 9, 2015
	Sep 9, 2015



Mn/DOT Name: 5614 D

NGS Name: 5614 D

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4353](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	24	132 N	43 W	461346.36	960207.61	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1978	2016	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER IS STEEL ROD

Monument Type	Disk Type	Mon. Agency
COPPER CLAD ROD (NO SLEEVE)	VERTICAL CONTROL DISK	MNDT

Description: (2015)

Stamping: 5614 D 1978

4.2 MILES SOUTHEAST OF FERGUS FALLS, 1.75 MILES NORTH-NORTHWEST ALONG COUNTY ROAD 82 FROM THE JUNCTION OF COUNTY ROAD 82 AND INTERSTATE HIGHWAY 94/TRUNK HIGHWAY 59 (THE JUNCTION IS 6.0 MILES SOUTH OF FERGUS FALLS), 103.0 FEET WEST-SOUTHWEST OF COUNTY ROAD 82, 29.0 FEET WEST OF THE END POST ON AN EAST-WEST FENCE, 2.0 FEET SOUTH OF A FENCE, 1.2 FEET EAST OF A WITNESS POST. THE ROD DEPTH IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1231.891	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941
1231.927	.016	2/1					VERTICAL ADJUSTMENT	2017	00000911
1231.900	.016	2/1					VERTICAL CONTROL SURVEY	2016	VOTTE

NGVD29				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1231.136	.033	3					VERTICAL CONTROL SURVEY	1978	CS5614

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1231.861	.262			1143.961	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -87.907 12B = -87.900 09 = -87.782 03 = -87.713

Lat/Lon and County Coordinates (Feet)

NAD83(2011)				Otter Tail County				Project Info		
Geodetic Position				X	Y	Acc	Order	Determination Method	Year	Reference
Latitude	Longitude									
46 13 46.36178	96 02 07.60616			419315.262	145077.898	.131	3	GPS - RTRN	2015	RTRN2015

State Plane and UTM Coordinates (Feet)

NAD83(2011)				UTM - Zone 15				Project Info		
MN State Plane - Central Zone				X	Y	Acc	Order	Determination Method	Year	Reference
X	Y									
2172858.730	781531.057			872494.324	16811092.781	.131	3	GPS - RTRN	2015	RTRN2015

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5614_D-DQ4353-3S-15SEP2015.jpg	S	Sep 15, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5614_D-DQ4353-2-15SEP2015.jpg		Sep 15, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5614_D-DQ4353-1-15SEP2015.jpg		Sep 15, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5614 E

NGS Name: 5614 E

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4354](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	25	132 N	43 W	461304.52	960112.52	2	3	1978	2016	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER IS STEEL ROD

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	VERTICAL CONTROL DISK	MNDT

Description: (2015) Stamping: 5614 E 1978

5.3 MILES SOUTHEAST OF FERGUS FALLS, 0.75 MILE NORTH ALONG COUNTY ROAD 82 FROM THE JUNCTION OF COUNTY ROAD 82 AND INTERSTATE HIGHWAY 94 TRUNK HIGHWAY 59 (THE JUNCTION IS 6.0 MILES SOUTH OF FERGUS FALLS), 78.0 FEET NORTHEAST OF COUNTY ROAD 82, 55.0 FEET NORTHWEST OF WEST SWAN VIEW ROAD/1117 TOWNSHIP ROAD. THE ROD DEPTH IS UNKNOWN.

Station Notes

NO WITNESS POST IN THE YARD.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1213.990	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941
1214.026	.016	2/1					VERTICAL ADJUSTMENT	2017	00000911
1213.997	.016	2/1					VERTICAL CONTROL SURVEY	2016	VOTTE
<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1213.229	.033	3					VERTICAL CONTROL SURVEY	1978	CS5614

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1213.826	.262			1126.028	.197	2011	GPS - RTRN	2015	RTRN2015
1213.866	.262			1126.254	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.808 12B = -87.802 09 = -87.677 03 = -87.611

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>				<u>Otter Tail County</u>			<u>Project Info</u>		
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>		<u>Year</u>	<u>Reference</u>	
<u>Latitude</u>	<u>Longitude</u>					<u>Acc</u> <u>Order</u> <u>Determination Method</u>			
46 13 04.51674	96 01 12.52363			423171.665	140823.508	.131 3 GPS - RTRN	2015	RTRN2015	
<u>NAD83(1996)</u>				<u>Otter Tail County</u>			<u>Project Info</u>		
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>		<u>Year</u>	<u>Reference</u>	
<u>Latitude</u>	<u>Longitude</u>					<u>Acc</u> <u>Order</u> <u>Determination Method</u>			
46 13 04.51640	96 01 12.52525			423171.551	140823.475	.131 3 GPS - RTRN	2009	RTRN2009	

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>			<u>Project Info</u>		
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>		<u>Year</u>	<u>Reference</u>	
<u>X</u>	<u>Y</u>					<u>Acc</u> <u>Order</u> <u>Determination Method</u>			
2176635.211	777206.592			876203.609	16806707.937	.131 3 GPS - RTRN	2015	RTRN2015	
<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>			<u>Project Info</u>		
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>		<u>Year</u>	<u>Reference</u>	
<u>X</u>	<u>Y</u>					<u>Acc</u> <u>Order</u> <u>Determination Method</u>			
2176635.097	777206.560			876203.494	16806707.907	.131 3 GPS - RTRN	2009	RTRN2009	



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5614_E-DQ4354-3NE-15SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5614_E-DQ4354-2-15SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5614_E-DQ4354-1-15SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
NE	Sep 15, 2015
	Sep 15, 2015
	Sep 15, 2015



Mn/DOT Name: 5616 A

NGS Name: 5616 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DI3794](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	31	132 N	42 W	461146.40	960106.17	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1970	2015	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (2005)

Stamping: 5616 A 1970

6.0 MILES SOUTHEAST OF FERGUS FALLS, 7.25 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, THEN 0.8 MILE SOUTH ON TRUNK HIGHWAY 59, AT TRUNK HIGHWAY 59 MILEPOINT 211.40, 230.0 FEET EAST OF TRUNK HIGHWAY 59, 282.0 FEET NORTH OF COUNTY ROAD 82, 1.3 FEET WEST OF A STEEL GUARD POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference
1245.326	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1245.326	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1245.372	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1245.339	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1245.454	.016	2/1				VERTICAL ADJUSTMENT	2016	00000869
1245.454	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1245.473	.016	2/1				VERTICAL CONTROL SURVEY	2012	VTENN
1245.372	.016	2/1				VERTICAL ADJUSTMENT	2007	00000425-15
1245.378	.016	2/1				VERTICAL CONTROL SURVEY	2005	VFAUN

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference
1244.683	.033	3				VERTICAL CONTROL SURVEY	1971	CS5616

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference
1245.457	.262		1157.845	.197	2011	GPS - RTRN	2015	RTRN2015
1244.522	.262		1157.088	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.618 12B = -87.615 09 = -87.480 03 = -87.434

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 11 46.39819	96 01 06.17262	423588.090	132907.931	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 11 46.40106	96 01 06.17080	423588.220	132908.221	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2176905.002	769285.730	876348.925	16798781.100	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2176905.137	769286.018	876349.064	16798781.386	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_A-DI3794-3NE-14SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_A-DI3794-2-14SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_A-DI3794-1-14SEP2015.jpg

<u>Dir</u>	<u>Date</u>
NE	Sep 14, 2015
	Sep 14, 2015
	Sep 14, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5616 B

NGS Name: 5616 B

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DI3795](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	1	131 N	43 W	461051.61	960114.76	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1970	2025	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (2005) **Stamping:** 5616 B 1970

7.0 MILES SOUTHEAST OF FERGUS FALLS, 7.25 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, THEN 1.8 MILES SOUTH ON TRUNK HIGHWAY 59 TO TRUNK HIGHWAY 59 MILEPOINT 210.40, THEN 0.1 MILE WEST ON 150TH STREET, 420.0 FEET WEST OF TRUNK HIGHWAY 59, 22.0 FEET NORTH OF 150TH STREET, 1.7 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1209.591	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1209.640	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1209.719	.016	2/1				VERTICAL ADJUSTMENT	2016	00000869
1209.719	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1209.738	.016	2/1				VERTICAL CONTROL SURVEY	2012	VTENN
1209.620	.016	2/1				VERTICAL ADJUSTMENT	2007	00000425-15
1209.630	.016	2/1				VERTICAL CONTROL SURVEY	2005	VFAUN

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1208.879	.033	3				VERTICAL CONTROL SURVEY	1971	CS5616

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1209.591			1122.150	.011	2011	HORIZONTAL ADJUSTMENT	2026	GPS3900
1209.591			1122.150	.011	2011	GPS - STATIC	2026	HTH55N
1209.492	.262		1122.176	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.490 12B = -87.487 09 = -87.346 03 = -87.313

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 10 51.61347	96 01 14.75717	422962.835	127360.240	.007		ADJUSTMENT	2026	GPS3900
46 10 51.61347	96 01 14.75717	422962.835	127360.240	.007	C	GPS - STATIC	2026	HTH55N

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 10 51.61293	96 01 14.75776	422962.794	127360.186	.066		NCAT	2026	HTH55N
46 10 51.61341	96 01 14.75918	422962.694	127360.235	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2176177.259	763751.313	875534.073	16793256.905	.007		ADJUSTMENT	2026	GPS3900
2176177.259	763751.313	875534.073	16793256.905	.007	C	GPS - STATIC	2026	HTH55N

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2176177.216	763751.259	875534.029	16793256.852	.066		NCAT	2026	HTH55N
2176177.117	763751.310	875533.931	16793256.905	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B-DI3795-3N-11AUG2009.jpg	N	Aug 11, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B-DI3795-2-11AUG2009.jpg		Aug 11, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B-DI3795-1-11AUG2009.jpg		Aug 11, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5616 B 1

NGS Name: 5616 B 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DI3785](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	2	131 N	43 W	461052.27	960323.40	2	3	2005	2021	POOR	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	SURVEY DISK	MNDT

Description: (2005) **Stamping:** 5616 B 1 2005

7.0 MILES SOUTH-SOUTHEAST OF FERGUS FALLS, 6.0 MILES SOUTH ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, TO INTERSTATE HIGHWAY 94 MILEPOINT 55.90, THEN 2.20 MILES EAST ON 150TH STREET, 36.8 FEET NORTH OF 150TH STREET, 9.3 FEET EAST OF A POWER POLE, 1.2 FEET SOUTH OF A WITNESS POST.

Station Notes

FOUND CAP LOOSE. USE WITH CAUTION.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1208.613	.016	2/1							VERTICAL ADJUSTMENT		2007	00000425-15
1208.626	.016	2/1							VERTICAL CONTROL SURVEY		2005	VFAUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1208.465	.262					1121.100	.197	1996	GPS - RTRN		2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.536 12B = -87.510 09 = -87.388 03 = -87.365

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>		<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Acc</u>	<u>Order</u>			<u>Year</u>	<u>Reference</u>
46 10 52.24174	96 03 23.50226	413903.475	127460.767	.131	3			GPS - RTRN		2009	RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>		<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Acc</u>	<u>Order</u>			<u>Year</u>	<u>Reference</u>
2167122.538	764019.482	866481.507	16793667.345	.131	3			GPS - RTRN		2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_1-DI3785-3N-11AUG2009.jpg	N	Aug 11, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_1-DI3785-2-11AUG2009.jpg		Aug 11, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_1-DI3785-1-11AUG2009.jpg		Aug 11, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5616 B 2

NGS Name: 5616 B 2

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	9	131 N	43 W	461051.00	960531.00	2	

NGS ACRN:	DI3786	Get Map
NGS Quad / Sta Num :	46096221/	
USGS Quad:	DAYTON HOLLOW DAM	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2005	2010	DESTROYED	Horz=NO Vert=NO	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2005) **Stamping:** 5616 B 2 2005

7.0 MILES SOUTH OF FERGUS FALLS, 6.20 MILES SOUTH ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND INTERSTATE HIGHWAY 94 AT FERGUS FALLS, TO INTERSTATE HIGHWAY 94 MILEPOINT 55.90, THEN 0.50 MILE EAST ON 150TH STREET, 34.8 FEET SOUTH OF 150TH STREET, 14.0 FEET WEST OF A FIELD ENTRANCE, 6.2 FEET EAST OF A POWER POLE, 6.4 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1143.544	.016	2/1				VERTICAL ADJUSTMENT	2007	00000425-15
1143.561	.016	2/1				VERTICAL CONTROL SURVEY	2005	VFAUN

Geoid Separations(ft): GEOID18 = -87.579 12B = -87.536 09 = -87.424 03 = -87.415

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_2-DI3786-3S-31MAY2005.jpg	S	May 31, 2005
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_2-DI3786-2-31MAY2005.jpg		May 31, 2005
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_2-DI3786-1-31MAY2005.jpg		May 31, 2005

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5616 B 2 RESET

NGS Name: 5616 B 2 RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	9	131 N	43 W	461051.42	960531.87		3	2009	2014	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2010) **Stamping:** 5616 B 2 RESET 2009

7.0 MILES SOUTH ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, TO INTERSTATE HIGHWAY 94 MILEPOINT 55.90, THEN 0.5 MILE EAST OF 150TH STREET, 34.8 FEET SOUTH OF 150TH STREET, 14.0 FEET WEST OF A FIELD ENTRANCE, 6.2 FEET EAST OF A POWER POLE, 6.4 FEET EAST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1143.118	.262			1055.703	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.582 12B = -87.539 09 = -87.428 03 = -87.418

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 10 51.41747	96 05 31.86546			404870.364	127418.112	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2158091.410	764144.022			857450.136	16793933.753	.131	3	GPS - RTRN	2009 RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_2_RESET-3S-11AUG2009.jpg	S	Aug 11, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_2_RESET-2-11AUG2009.jpg		Aug 11, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_2_RESET-1-11AUG2009.jpg		Aug 11, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5616 B 3

NGS Name: 5616 B 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DI3787](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	17	131 N	43 W	460958.00	960609.00	2		2005	2010	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 30 FT)	SURVEY DISK	MNDT

Description: (2005) **Stamping:** 5616 B 3 2005

8.0 MILES SOUTH OF FERGUS FALLS, 7.20 MILES SOUTH ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND INTERSTATE HIGHWAY 94 AT FERGUS FALLS, TO INTERSTATE HIGHWAY 94 MILEPOINT 55.90, 56.8 FEET SOUTH OF COUNTY ROAD 112, 63.6 FEET WEST OF COUNTY ROAD 1, 19.5 FEET NORTH OF AN ENTRANCE, 1.1 FEET EAST OF A WITNESS POST.

Station Notes

THE DISK WAS TURNED IN TO THE OFFICE.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>				<u>Year</u>	<u>Reference</u>		
1143.882	.016	2/1						VERTICAL ADJUSTMENT	2007	00000425-15		
1143.902	.016	2/1						VERTICAL CONTROL SURVEY	2005	VFAUN		

Geoid Separations(ft): GEOID18 = -87.451 12B = -87.411 09 = -87.293 03 = -87.290

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_3-DI3787-3W-31MAY2005.jpg	W	May 31, 2005
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_3-DI3787-2-31MAY2005.jpg		May 31, 2005
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_3-DI3787-1-31MAY2005.jpg		May 31, 2005

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5616 B 3 RESET

NGS Name: 5616 B 3 RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	17	131 N	43 W	460959.08	960609.21		3	2009	2010	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2010) **Stamping:** 5616 B 3 RESET 2009

8.0 MILES SOUTH OF FERGUS FALLS, 7.0 MILES SOUTH ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, TO INTERSTATE HIGHWAY 94 MILEPOINT 55.90, 63.6 FEET EAST OF COUNTY ROAD 1, 56.8 FEET SOUTH OF COUNTY ROAD 112, 19.5 FEET NORTH OF AN ENTRANCE, 1.1 FEET EAST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1143.580	.262			1056.287	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.457 12B = -87.418 09 = -87.300 03 = -87.296

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 09 59.07834	96 06 09.20632			402216.872	122128.540	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2155340.836	758905.183			854616.614	16788736.771	.131	3	GPS - RTRN	2009 RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_3_RESET-3S-11AUG2009.jpg	S	Aug 11, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_3_RESET-2-11AUG2009.jpg		Aug 11, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_3_RESET-1-11AUG2009.jpg		Aug 11, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5616 B 4

NGS Name: 5616 B 4

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	18	131 N	43 W	460958.00	960817.00	2	3

NGS ACRN: [DI3788](#)
NGS Quad / Sta Num : 46096224/
USGS Quad: ORWELL LAKE

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2005	2010	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2005)

Stamping: 5616 B 4 2005

8.0 MILES SOUTHWEST OF FERGUS FALLS, 7.0 MILES SOUTH ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND INTERSTATE HIGHWAY 94 AT FERGUS FALLS, TO INTERSTATE HIGHWAY 94 MILEPOINT 55.90, THEN 1.75 MILES WEST ON COUNTY ROAD 112, 39.9 FEET SOUTH OF COUNTY ROAD 112, 18.7 FEET EAST OF A FIELD ENTRANCE, 3.5 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1119.844	.016	2/1				VERTICAL ADJUSTMENT	2007 00000425-15
1119.863	.016	2/1				VERTICAL CONTROL SURVEY	2005 VFAUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1119.876	.262		1032.554	.197	1996	GPS - RTRN	2009 RTRN2009

Geoid Separations(ft): GEOID18 = -87.497 12B = -87.447 09 = -87.319 03 = -87.323

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u> <u>Year</u> <u>Reference</u>
46 09 58.85118	96 08 17.68698	393173.365	122151.688	.131	3	GPS - RTRN 2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u> <u>Year</u> <u>Reference</u>
<u>X</u> <u>Y</u>						
2146300.534	759095.691	845576.916	16789069.220	.131	3	GPS - RTRN 2009 RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_4-DI3788-3S-10AUG2009.jpg	S	Aug 10, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_4-DI3788-2-10AUG2009.jpg		Aug 10, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_4-DI3788-1-10AUG2009.jpg		Aug 10, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5616 B 5

NGS Name: 5616 B 5

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DI3789](#)
NGS Quad / Sta Num : 46096224/
USGS Quad: ORWELL LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	11	131 N	44 W	460959.00	961020.00	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2005	2010	DESTROYED	Horz=NO Vert=NO	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 35 FT)	SURVEY DISK	MNDT

Description: (2005) **Stamping:** 5616 B 5 2005

8.5 MILES SOUTHWEST OF FERGUS FALLS, 7.20 MILES SOUTH ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND INTERSTATE HIGHWAY 94 AT FERGUS FALLS, TO INTERSTATE HIGHWAY 94 MILEPOINT 55.90, THEN 3.45 MILES WEST ON COUNTY ROAD 112, 36.4 FEET NORTH OF COUNTY ROAD 112, 14.5 FEET WEST OF A FIELD ENTRANCE, 176.7 FEET EAST OF 150TH AVENUE, 4.7 FEET EAST OF A WITNESS POST.

Station Notes

THE DISK WAS TURNED IN TO THE OFFICE.
FOUND THE CAP LOOSE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1093.177	.016	2/1				VERTICAL ADJUSTMENT	2007	00000425-15	
1093.193	.016	2/1				VERTICAL CONTROL SURVEY	2005	VFAUN	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1093.065	.262		1005.697	.197	1996	GPS - RTRN	2009	RTRN2009	

Geoid Separations(ft): GEOID18 = -87.539 12B = -87.483 09 = -87.362 03 = -87.369

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 09 59.86929	96 10 20.21010	384549.919	122302.649	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2137682.531	759406.193	836961.373	16789515.069	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_5-DI3789-3N-31MAY2005.jpg	N	May 31, 2005
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_5-DI3789-2-31MAY2005.jpg		May 31, 2005
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_5-DI3789-1-31MAY2005.jpg		May 31, 2005

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5616 B 5 RESET

NGS Name: 5616 B 5 RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096224/
USGS Quad: ORWELL LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	11	131 N	44 W	460959.87	961020.21		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2009	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2010)

Stamping: 5616 B 5 RESET 2009

8.5 MILES SOUTHWEST OF FERGUS FALLS, 7.0 MILES SOUTH ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, TO INTERSTATE HIGHWAY 94 MILEPOINT 55.96, THEN 3.45 MILES WEST OF COUNTY ROAD 112, 176.7 FEET EAST OF 150TH AVENUE, 36.4 FEET NORTH OF COUNTY ROAD 112, 14.5 FEET WEST OF A FIELD ENTRANCE, 4.7 FEET EAST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1093.065	.262			1005.694	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.539 12B = -87.483 09 = -87.362 03 = -87.369

Lat/Lon and County Coordinates (Feet)

NAD83(1996)		Geodetic Position		Otter Tail County		Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year
46 09 59.86846	96 10 20.21093	384549.860	122302.565	.131	3	GPS - RTRN	2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)		MN State Plane - Central Zone		UTM - Zone 15		Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year
2137682.470	759406.111	836961.311	16789514.987	.131	3	GPS - RTRN	2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_5_RESET-3N-10AUG2009.jpg	N	Aug 10, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_5_RESET-2-10AUG2009.jpg		Aug 10, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_5_RESET-1-10AUG2009.jpg		Aug 10, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5616 B 6

NGS Name: 5616 B 6

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	15	131 N	44 W	460907.00	961137.00	2	

NGS ACRN: [DI3790](#)
NGS Quad / Sta Num : 46096224/
USGS Quad: ORWELL LAKE

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2005	2010	DESTROYED	Horz=NO Vert=NO	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2005)

Stamping: 5616 B 6 2005

10.0 MILES SOUTHWEST OF FERGUS FALLS, 7.20 MILES SOUTH ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND INTERSTATE HIGHWAY 94 AT FERGUS FALLS, TO INTERSTATE HIGHWAY 94 MILEPOINT 55.90, THEN 3.95 MILES WEST ON COUNTY ROAD 112, THEN 1.0 MILE SOUTH ON COUNTY ROAD 15, THEN 0.50 MILE WEST ON 130TH STREET, 26.9 FEET NORTH OF 130TH STREET, 17.7 FEET WEST OF A FIELD ENTRANCE, 4.8 FEET EAST OF A WITNESS POST.

Station Notes

THE DISK WAS RETURNED TO THE OFFICE. FOUND THE CAP LOOSE.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order /Class</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Year</u>	<u>Reference</u>						
1089.420	.016	2/1				2007	00000425-15						
1089.440	.016	2/1				2005	VFAUN						

Geoid Separations(ft): GEOID18 = -87.428 12B = -87.372 09 = -87.267 03 = -87.267

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_6-DI3790-3N-31MAY2005.jpg	N	May 31, 2005
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_6-DI3790-2-31MAY2005.jpg		May 31, 2005
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_6-DI3790-1-31MAY2005.jpg		May 31, 2005

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5616 B 6 RESET

NGS Name: 5616 B 6 RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096224/
USGS Quad: ORWELL LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	15	131 N	44 W	460907.56	961137.21		3	2009	2009	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2010)

Stamping: 5616 B 6 RESET 2009

10.0 MILES SOUTHWEST OF FERGUS FALLS, 7.2 MILES SOUTH ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND INTERSTATE HIGHWAY 94 AT FERGUS FALLS, TO INTERSTATE HIGHWAY 94 MILEPOINT 55.90, THEN 3.95 MILES WEST ON COUNTY ROAD 112, THEN 1.0 MILE SOUTH ON COUNTY ROAD 15, THEN 0.5 MILE WEST ON 130TH STREET, 26.9 FEET NORTH OF 130TH STREET, 17.7 FEET WEST OF A FIELD ENTRANCE, 4.8 FEET EAST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1089.099	.262			1001.829	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.431 12B = -87.375 09 = -87.270 03 = -87.270

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 09 07.55524	96 11 37.20961			379098.229	117034.964	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2132135.034	754241.015			831331.210	16784435.418	.131	3	GPS - RTRN	2009 RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_6_RESET-3N-06AUG2009.jpg	N	Aug 6, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_6_RESET-2-06AUG2009.jpg		Aug 6, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_B_6_RESET-1-06AUG2009.jpg		Aug 6, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5616 C

NGS Name: 5616 C

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DO8461](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	13	131 N	43 W	460958.57	960110.95	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1970	2025	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (1970)

Stamping: 5616 C

5.0 MILES SOUTHWEST OF DALTON, 2.9 MILES SOUTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94 IN DALTON, AT TRUNK HIGHWAY 59 MILEPOINT 209.35, 224.0 FEET WEST OF TRUNK HIGHWAY 59, 37.0 FEET SOUTH OF 140TH STREET, 1.5 FEET NORTH OF AN EAST-WEST WIRE FENCE NEAR THE CREST OF A HILL, 0.8 FOOT SOUTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1218.164	.016	2/1				VERTICAL ADJUSTMENT	2020 00000941-2
1218.216	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1218.285	.016	2/1				VERTICAL ADJUSTMENT	2016 00000869
1218.285	.016	2/1				VERTICAL ADJUSTMENT	2014 00000821
1218.308	.016	2/1				VERTICAL CONTROL SURVEY	2012 VTENN

<u>NGVD29</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1217.422	.033	3				VERTICAL CONTROL SURVEY	1971 CS5616

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1218.164			1130.844	.011	2011	HORIZONTAL ADJUSTMENT	2026 GPS3900
1218.164			1130.844	.011	2011	GPS - STATIC	2026 HTH55N
1218.082	.262		1130.884	.197	1996	GPS - RTRN	2009 RTRN2009

Geoid Separations(ft): GEOID18 = -87.369 12B = -87.369 09 = -87.221 03 = -87.198

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 09 58.57396	96 01 10.95040	423210.127	121986.017	.007		ADJUSTMENT	2026 GPS3900
46 09 58.57396	96 01 10.95040	423210.127	121986.017	.007	C	GPS - STATIC	2026 HTH55N

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 09 58.57342	96 01 10.95099	423210.085	121985.962	.066		NCAT	2026 HTH55N
46 09 58.57416	96 01 10.95112	423210.076	121986.038	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2176325.005	758374.162	875597.425	16787876.257	.007		ADJUSTMENT	2026 GPS3900
2176325.005	758374.162	875597.425	16787876.257	.007	C	GPS - STATIC	2026 HTH55N

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2176324.962	758374.109	875597.381	16787876.204	.066		NCAT	2026 HTH55N
2176324.955	758374.184	875597.375	16787876.279	.131	3	GPS - RTRN	2009 RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_C-DO8461-3W-02SEP2009.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_C-DO8461-2-02SEP2009.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_C-DO8461-1-02SEP2009.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
W	Sep 2, 2009
	Sep 2, 2009
	Sep 2, 2009



Mn/DOT Name: 5616 D

NGS Name: 5616 D

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	18	131 N	42 W	460920.00	960038.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1970	2009	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1970)

Stamping: 5616 D

4.75 MILES SOUTHWEST OF DALTON, 3.8 MILES SOUTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94 IN DALTON, 108.0 FEET NORTHWEST OF A FIELD ENTRANCE, 50.0 FEET SOUTHWEST OF TRUNK HIGHWAY 59, 0.7 FOOT NORTHEAST OF A STEEL GUARD POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1214.085	.033	3				VERTICAL CONTROL SURVEY	1971 CS5616

Geoid Separations(ft): GEOID18 = -87.290 12B = -87.287 09 = -87.145 03 = -87.126

* No Horizontal Positions in the Database *



Mn/DOT Name: 5616 E

NGS Name: 5616 E

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	19	131 N	42 W	460848.00	955957.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1970	2009	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1970)

Stamping: 5616 E

4.4 MILES SOUTHWEST OF DALTON, 4.7 MILES SOUTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94 IN DALTON, 192.0 FEET WEST OF TRUNK HIGHWAY 59, ON THE WEST SIDE OF A NARROW FIELD, AT THE TOP OF THE BANK NEAR THE EAST SIDE OF ALKALI LAKE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1200.063	.033	3				VERTICAL CONTROL SURVEY	1971 CS5616

Geoid Separations(ft): GEOID18 = -87.231 12B = -87.224 09 = -87.093 03 = -87.073

* No Horizontal Positions in the Database *



Mn/DOT Name: 5616 F

NGS Name: 5616 F

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R01124](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	30	131 N	42 W	460814.96	955959.40	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1979	2025	GOOD	Horz=YES Vert=YES	YES		RECESSED 10 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (1998)

Stamping: 5616 F

10.5 MILES SOUTH-SOUTHEAST OF FERGUS FALLS, 5.45 MILES SOUTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS TO TRUNK HIGHWAY 59 MILEPOINT 206.85, THEN 0.05 MILE WEST ON COUNTY ROAD 110, 34.5 FEET SOUTH OF COUNTY ROAD 110.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1219.184	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1219.246	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1219.299	.016	2/1				VERTICAL ADJUSTMENT	2016	00000869
1219.299	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1219.318	.016	2/1				VERTICAL CONTROL SURVEY	2012	VTENN

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1218.488	.033	3				VERTICAL CONTROL SURVEY	1971	CS5616

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1219.184			1132.038	.011	2011	HORIZONTAL ADJUSTMENT	2026	GPS3900
1219.184			1132.038	.011	2011	GPS - STATIC	2026	HTH55N
1219.053	.262		1132.022	.197	1996	GPS - RTRN	2009	RTRN2009
1219.190	.262		1132.229	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.191 12B = -87.175 09 = -87.047 03 = -87.027

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 08 14.95906	95 59 59.39772	428208.980	111470.605	.007		ADJUSTMENT	2026	GPS3900
46 08 14.95906	95 59 59.39772	428208.980	111470.605	.007	C	GPS - STATIC	2026	HTH55N

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 08 14.95853	95 59 59.39832	428208.938	111470.551	.066		NCAT	2026	HTH55N
46 08 14.95951	95 59 59.39884	428208.901	111470.651	.131	3	GPS - RTRN	2009	RTRN2009
46 08 14.95788	95 59 59.39742	428209.001	111470.485	.131	3	ADJUSTMENT	1999	17648
46 08 14.95796	95 59 59.39679	428209.045	111470.493	.131	3	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 08 14.95710	95 59 59.38509	428209.869	111470.403	.131	3	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 08 15.10420	95 59 58.18365			.100	3	CLASSICAL SURVEY	1981	16333



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2181127.694	747769.461	880234.781	16777193.946	.007		ADJUSTMENT	2026	GPS3900
2181127.694	747769.461	880234.781	16777193.946	.007	C	GPS - STATIC	2026	HTH55N

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2181127.650	747769.409	880234.737	16777193.894	.066		NCAT	2026	HTH55N
2181127.616	747769.509	880234.703	16777193.994	.131	3	GPS - RTRN	2009	RTRN2009
2181127.712	747769.341	880234.797	16777193.825	.131	3	ADJUSTMENT	1999	17648
2181127.757	747769.349	880234.842	16777193.832	.131	3	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2181128.578	747769.243	880235.662	16777193.714	.131	3	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		<u>X</u>	<u>Y</u>	Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1556533.402	419696.216			.100	3	CLASSICAL SURVEY	1981	16333

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:		W	
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_F-RO1124-2-02SEP2009.jpg		Sep 2, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_F-RO1124-1-02SEP2009.jpg		Sep 2, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5616 G

NGS Name: 5616 G

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DO8458](#)
NGS Quad / Sta Num : 46095333/
USGS Quad: FOURMILE LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NE	31	131 N	42 W	460722.49	955958.14	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1970	2025	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (1970)

Stamping: 5616 G

5.5 MILES SOUTHWEST OF DALTON, 6.3 MILES SOUTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94 IN DALTON, AT TRUNK HIGHWAY 59 MILEPOINT 205.85, 232.0 FEET WEST OF TRUNK HIGHWAY 59, 103.0 FEET NORTHWEST OF THE NORTHEAST CORNER OF A SUB-STATION, 56.0 FEET NORTH OF THE NORTHWEST CORNER OF THE TEN MILES LAKE SUB-STATION, 43.0 FEET SOUTH OF 110TH STREET, 0.8 FOOT NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1231.313	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1231.379	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1231.421	.016	2/1				VERTICAL ADJUSTMENT	2016	00000869
1231.421	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1231.441	.016	2/1				VERTICAL CONTROL SURVEY	2012	VTENN

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1230.811	.033	3				VERTICAL CONTROL SURVEY	1971	CS5616

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1231.313			1144.197	.010	2011	HORIZONTAL ADJUSTMENT	2026	GPS3900
1231.313			1144.197	.010	2011	GPS - STATIC	2026	HTH55N
1231.241	.262		1144.266	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.142 12B = -87.113 09 = -86.991 03 = -86.975

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 07 22.48768	95 59 58.14241	428278.378	106154.665	.007		ADJUSTMENT	2026	GPS3900
46 07 22.48768	95 59 58.14241	428278.378	106154.665	.007	C	GPS - STATIC	2026	HTH55N

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 07 22.48715	95 59 58.14301	428278.336	106154.612	.066		NCAT	2026	HTH55N
46 07 22.48798	95 59 58.14311	428278.329	106154.695	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2181098.678	742453.875	880122.444	16771877.703	.007		ADJUSTMENT	2026	GPS3900
2181098.678	742453.875	880122.444	16771877.703	.007	C	GPS - STATIC	2026	HTH55N

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2181098.635	742453.822	880122.400	16771877.651	.066		NCAT	2026	HTH55N
2181098.629	742453.906	880122.396	16771877.735	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_G-DO8458-3SW-11AUG2009.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_G-DO8458-2-11AUG2009.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5616_G-DO8458-1-11AUG2009.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
SW	Aug 11, 2009
	Aug 11, 2009
	Aug 11, 2009



Mn/DOT Name: 5616 H

NGS Name: 5616 H

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095333/
USGS Quad: FOURMILE LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	31	131 N	42 W	460631.00	955958.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1970	1998	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1970) Stamping: 5616 H

4.5 MILES SOUTH AND 4.1 MILES WEST OF DALTON, 7.1 MILES SOUTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94, 295.0 FEET WEST OF TRUNK HIGHWAY 59, 56.0 FEET NORTH OF COUNTY ROAD 26, 8.0 FEET EAST OF A POWER POLE, 1.0 FOOT EAST OF A STEEL GUARD POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NGVD29</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1211.566	.033	3				VERTICAL CONTROL SURVEY	1971	CS5616	

Geoid Separations(ft): GEOID18 = -87.106 12B = -87.067 09 = -86.952 03 = -86.942

* No Horizontal Positions in the Database *



Mn/DOT Name: 5617 A

NGS Name: 5617 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	8	133 N	43 W	462026.00	960740.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1962) Stamping: 5617 A 1962

2.8 MILES NORTHWEST OF FERGUS FALLS, 0.3 MILE NORTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 52, 46.0 FEET RIGHT OF TRUNK HIGHWAY 59, AT TRUNK HIGHWAY 59 STATION 223+21.

Station Notes

PULLED THE TIES, THEY FALL IN A DITCH BOTTOM.

Leveling-Derived Orthometric Heights (Feet)

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1228.472	.033	3						VERTICAL CONTROL SURVEY	1962	CS5617

Geoid Separations(ft): GEOID18 = -88.291 12B = -88.284 09 = -88.176 03 = -88.100

* No Horizontal Positions in the Database *



Mn/DOT Name: 5617 A 1

NGS Name: 5617 A 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	5	133 N	43 W	462126.00	960742.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2015	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1962) Stamping: 5617 A 1 1962

6.0 MILES NORTHWEST OF FERGUS FALLS, 1.3 MILES NORTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 52, 72.0 FEET RIGHT OF TRUNK HIGHWAY 59, AT TRUNK HIGHWAY 59 STATION 284+52.

Leveling-Derived Orthometric Heights (Feet)

<u>NGVD29</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1277.425	.033	3				VERTICAL CONTROL SURVEY	1962	CS5617	

Geoid Separations(ft): GEOID18 = -88.281 12B = -88.274 09 = -88.163 03 = -88.090

* No Horizontal Positions in the Database *



Mn/DOT Name: 5617 A 2

NGS Name: 5617 A 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7107](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	32	134 N	43 W	462211.30	960745.82	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (1962)

Stamping: 5617 A 2 1962

6.5 MILES NORTHWEST OF FERGUS FALLS, 2.2 MILES NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, 73.0 FEET LEFT OF TRUNK HIGHWAY 59 TO INTERSTATE HIGHWAY MILEPOINT 50.80, AT TRUNK HIGHWAY 59 MILEPOINT 226.10, 90.7 FEET NORTH OF 280TH STREET, 75.0 FEET WEST OF TRUNK HIGHWAY 59, 46.4 FEET SOUTH OF A POWER POLE NUMBER 5, 1.5 FEET EAST OF A WITNESS POST.

Station Notes

SOME OF THE CONCRETE IS COMING LOOSE UNDER THE DISK BUT IS STILL CURRENTLY GOOD.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1286.464	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941
1286.461	.016	2/1					VERTICAL ADJUSTMENT	2013	00000792
1286.477	.016	2/1					VERTICAL CONTROL SURVEY	2012	VPELR
<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1285.555	.033	3					VERTICAL CONTROL SURVEY	1962	CS5617

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1286.464				1198.259	.021	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1286.464	.131			1198.377	.066	1996	GPS - STATIC	2023	HTH59
1286.464				1198.259	.021	2011	GPS - STATIC	2023	HTH59
1287.803	.262			1199.535	.197	2011	GPS - RTRN	2023	RTRN2023
1286.438	.262			1198.170	.197	2011	GPS - RTRN	2022	RTRN2022
1286.369	.262			1198.295	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.268 12B = -88.264 09 = -88.146 03 = -88.071

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>									
Geodetic Position		Otter Tail County					Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
46 22 11.29545	96 07 45.82547	395803.191	196340.898	.013		ADJUSTMENT	2024	GPS3672	
46 22 11.29545	96 07 45.82547	395803.191	196340.898	.013	C	GPS - STATIC	2023	HTH59	
46 22 11.29554	96 07 45.82446	395803.262	196340.907	.131	3	GPS - RTRN	2023	RTRN2023	
46 22 11.29475	96 07 45.82491	395803.230	196340.827	.131	3	GPS - RTRN	2022	RTRN2022	
<u>NAD83(1996)</u>									
Geodetic Position		Otter Tail County					Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
46 22 11.29518	96 07 45.82601	395803.154	196340.871	.033	C	GPS - STATIC	2023	HTH59	
46 22 11.29574	96 07 45.82772	395803.034	196340.928	.131	3	GPS - RTRN	2009	RTRN2009	

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2150302.558	833213.633	850748.289	16863144.055	.013		ADJUSTMENT	2024	GPS3672
2150302.558	833213.633	850748.289	16863144.055	.013	C	GPS - STATIC	2023	HTH59
2150302.629	833213.641	850748.360	16863144.061	.131	3	GPS - RTRN	2023	RTRN2023
2150302.595	833213.562	850748.325	16863143.983	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2150302.519	833213.607	850748.250	16863144.029	.033	C	GPS - STATIC	2023	HTH59
2150302.401	833213.667	850748.132	16863144.091	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_A_2-DO7107-3W-14AUG2023.jpg	W	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_A_2-DO7107-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_A_2-DO7107-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5617 B

NGS Name: 5617 B

County: OTTER TAIL, MN (Sheet 1)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	32	134 N	43 W	462253.96	960744.60	2	C

NGS ACRN: [DQ7108](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

[Get Map](#)

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1962	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (1962)

Stamping: 5617 B 1962

IN ELIZABETH, 0.2 MILE NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 10, AT TRUNK HIGHWAY 59 MILEPOINT 226.95, 52.5 FEET EAST OF TRUNK HIGHWAY 59, 58.0 FEET SOUTH OF A FIELD ENTRANCE, 1.0 FOOT WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1247.206	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1247.209	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1247.222	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1246.346	.033	3				VERTICAL CONTROL SURVEY	1962	CS5617

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1247.206			1158.908	.021	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1247.206	.131		1159.020	.066	1996	GPS - STATIC	2023	HTH59
1247.206			1158.908	.021	2011	GPS - STATIC	2023	HTH59
1247.166	.262		1158.908	.197	2011	GPS - RTRN	2022	RTRN2022
1247.107	.262		1159.053	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.254 12B = -88.251 09 = -88.133 03 = -88.051

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 22 53.96123	96 07 44.59816	395911.794	200662.817	.013		ADJUSTMENT	2024	GPS3672
46 22 53.96123	96 07 44.59816	395911.794	200662.817	.013	C	GPS - STATIC	2023	HTH59
46 22 53.96175	96 07 44.59786	395911.815	200662.869	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 22 53.96100	96 07 44.59866	395911.759	200662.794	.033	C	GPS - STATIC	2023	HTH59
46 22 53.96156	96 07 44.59928	395911.716	200662.851	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2150491.113	837532.238	851005.270	16867460.816	.013		ADJUSTMENT	2024	GPS3672
2150491.113	837532.238	851005.270	16867460.816	.013	C	GPS - STATIC	2023	HTH59
2150491.135	837532.290	851005.293	16867460.867	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2150491.077	837532.215	851005.234	16867460.794	.033	C	GPS - STATIC	2023	HTH59
2150491.035	837532.273	851005.193	16867460.852	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_B-DO7108-3E-17OCT2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_B-DO7108-2-17OCT2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_B-DO7108-1-17OCT2022.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Oct 17, 2022
	Oct 17, 2022
	Oct 17, 2022



Mn/DOT Name: 5617 B 1

NGS Name: 5617 B 1

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	29	134 N	43 W	462355.70	960744.05	2	C

NGS ACRN: [DQ7110](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (1962) Stamping: 5617 B 1 1962

1.4 MILES NORTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 10 IN ELIZABETH, AT TRUNK HIGHWAY 59 MILEPOINT 228.15, 74.0 FEET EAST OF TRUNK HIGHWAY 59, 54.3 FEET NORTH OF AN ENTRANCE, 2.0 FEET SOUTHWEST OF A RIGHT-OF-WAY POST, 1.0 FOOT WEST OF A WITNESS POST.

Station Notes

SOME OF THE CONCRETE IS COMING LOOSE UNDER THE DISK BUT IS STILL CURRENTLY GOOD.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1250.093	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941
1250.102	.016	2/1					VERTICAL ADJUSTMENT	2013	00000792
1250.112	.016	2/1					VERTICAL CONTROL SURVEY	2012	VPELR
<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1249.220	.033	3					VERTICAL CONTROL SURVEY	1962	CS5617

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1250.093				1161.832	.022	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1250.093	.131			1161.946	.066	1996	GPS - STATIC	2023	HTH59
1250.093				1161.832	.022	2011	GPS - STATIC	2023	HTH59
1250.083	.262			1161.855	.197	2011	GPS - RTRN	2022	RTRN2022
1249.935	.262			1161.914	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.228 12B = -88.228 09 = -88.107 03 = -88.021

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>				<u>Project Info</u>		
<u>Geodetic Position</u>		<u>Otter Tail County</u>				
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
46 23 55.70169	96 07 44.04752	395982.999	206917.409	.013		ADJUSTMENT
46 23 55.70169	96 07 44.04752	395982.999	206917.409	.013	C	GPS - STATIC
46 23 55.70150	96 07 44.04836	395982.940	206917.390	.131	3	GPS - RTRN
<u>NAD83(1996)</u>				<u>Project Info</u>		
<u>Geodetic Position</u>		<u>Otter Tail County</u>				
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
46 23 55.70146	96 07 44.04803	395982.963	206917.385	.033	C	GPS - STATIC
46 23 55.70165	96 07 44.04952	395982.859	206917.405	.131	3	GPS - RTRN

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2150678.049	843783.625	851291.294	16873710.890	.013		ADJUSTMENT	2024	GPS3672
2150678.049	843783.625	851291.294	16873710.890	.013	C	GPS - STATIC	2023	HTH59
2150677.990	843783.608	851291.235	16873710.873	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2150678.013	843783.603	851291.258	16873710.868	.033	C	GPS - STATIC	2023	HTH59
2150677.909	843783.625	851291.154	16873710.891	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_B_1-DO7110-3E-17OCT2022.jpg	E	Oct 17, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_B_1-DO7110-2-17OCT2022.jpg		Oct 17, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_B_1-DO7110-1-17OCT2022.jpg		Oct 17, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5617 C

NGS Name: 5617 C

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	20	134 N	43 W	462443.00	960741.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1962) Stamping: 5617 C 1962

2.3 MILES NORTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 10 AT ELIZABETH, 71.0 FEET LEFT OF TRUNK HIGHWAY 59, AT TRUNK HIGHWAY 59 STATION 487+12.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1219.712	.033	3				VERTICAL CONTROL SURVEY	1962 CS5617

Geoid Separations(ft): GEOID18 = -88.205 12B = -88.202 09 = -88.084 03 = -87.995

* No Horizontal Positions in the Database *



Mn/DOT Name: 5617 C 1

NGS Name: 5617 C 1

County: OTTER TAIL, MN (Sheet 1)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	17	134 N	43 W	462536.58	960730.12	2	C

NGS ACRN: [DQ7113](#)
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

[Get Map](#)

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1962	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (1962) Stamping: 5617 C 1 1962

3.3 MILES NORTH OF ELIZABETH, 3.3 MILES NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 10 IN ELIZABETH, 237.8 FEET SOUTH OF COUNTY ROAD 118 WEST EXTENDED, 74.6 FEET EAST OF TRUNK HIGHWAY 59, 34.9 FEET NORTH OF A POWER POLE, 1.0 FOOT SOUTH OF A WITNESS POST.

Station Notes

THE LETTER "C" IS STAMPED BACKWARDS.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Project Info		
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1260.076	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941
1260.096	.016	2/1					VERTICAL ADJUSTMENT	2013	00000792
1260.102	.016	2/1					VERTICAL CONTROL SURVEY	2012	VPELR

NGVD29				Ellipsoid (NAD83)			Project Info		
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1259.289	.033	3					VERTICAL CONTROL SURVEY	1962	CS5617

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Project Info		
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1260.076				1171.914	.025	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1260.076	.131			1172.032	.066	1996	GPS - STATIC	2023	HTH59
1260.076				1171.914	.025	2011	GPS - STATIC	2023	HTH59
1260.122	.262			1171.946	.197	2011	GPS - RTRN	2022	RTRN2022
1259.856	.262			1171.904	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.172 12B = -88.172 09 = -88.048 03 = -87.956

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>									
Geodetic Position		Otter Tail County				Project Info			
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 25 36.57815	96 07 30.11589	397012.222	217131.962	.013		ADJUSTMENT	2024	GPS3672	
46 25 36.57815	96 07 30.11589	397012.222	217131.962	.013	C	GPS - STATIC	2023	HTH59	
46 25 36.57736	96 07 30.11571	397012.235	217131.882	.131	3	GPS - RTRN	2022	RTRN2022	

<u>NAD83(1996)</u>									
Geodetic Position		Otter Tail County				Project Info			
Latitude	Longitude	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 25 36.57789	96 07 30.11643	397012.184	217131.936	.033	C	GPS - STATIC	2023	HTH59	
46 25 36.57818	96 07 30.11733	397012.122	217131.966	.131	3	GPS - RTRN	2009	RTRN2009	



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2151896.002	853976.057	852671.191	16883886.671	.013		ADJUSTMENT	2024	GPS3672
2151896.002	853976.057	852671.191	16883886.671	.013	C	GPS - STATIC	2023	HTH59
2151896.012	853975.977	852671.200	16883886.591	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2151895.963	853976.032	852671.152	16883886.647	.033	C	GPS - STATIC	2023	HTH59
2151895.901	853976.062	852671.090	16883886.678	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_C_1-DO7113-3E-17OCT2022.jpg	E	Oct 17, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_C_1-DO7113-2-17OCT2022.jpg		Oct 17, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_C_1-DO7113-1-17OCT2022.jpg		Oct 17, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5617 C 2

NGS Name: 5617 C 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7130](#) [Get Map](#)
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	8	134 N	43 W	462603.60	960726.67	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1962	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (1962) Stamping: 5617 C 2 1962

3.8 MILES NORTH OF ELIZABETH, 3.8 MILES NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 10 IN ELIZABETH, AT TRUNK HIGHWAY 59 MILEPOINT 230.6, 74.4 FEET EAST OF TRUNK HIGHWAY 59, 138.4 FEET SOUTH OF REED CREEK ROAD, 108.3 FEET SOUTH OF A CABLE BOX, 104.5 FEET SOUTH OF A POWER POLE NUMBER 11, 1.0 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj		Year	Reference	
1264.771	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941	
1264.794	.016	2/1					VERTICAL ADJUSTMENT	2013	00000792	
1264.801	.016	2/1					VERTICAL CONTROL SURVEY	2012	VPELR	

NGVD29				Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj		Year	Reference	
1263.961	.033	3					VERTICAL CONTROL SURVEY	1962	CS5617	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj		Year	Reference	
1264.771				1176.664	.020	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672	
1264.771	.131			1176.779	.066	1996	GPS - STATIC	2023	HTH59	
1264.771				1176.664	.020	2011	GPS - STATIC	2023	HTH59	
1264.820	.262			1176.664	.197	2011	GPS - RTRN	2022	RTRN2022	
1264.482	.262			1176.546	.197	1996	GPS - RTRN	2009	RTRN2009	

Geoid Separations(ft): GEOID18 = -88.156 12B = -88.153 09 = -88.028 03 = -87.936

Lat/Lon and County Coordinates (Feet)

NAD83(2011)			Otter Tail County				Determination Method		Project Info	
Latitude	Longitude		X	Y	Acc	Order		Year	Reference	
46 26 03.60093	96 07 26.67205		397267.577	219868.358	.010		ADJUSTMENT	2024	GPS3672	
46 26 03.60093	96 07 26.67205		397267.577	219868.358	.010	C	GPS - STATIC	2023	HTH59	
46 26 03.60108	96 07 26.67268		397267.533	219868.374	.131	3	GPS - RTRN	2022	RTRN2022	

NAD83(1996)			Otter Tail County				Determination Method		Project Info	
Latitude	Longitude		X	Y	Acc	Order		Year	Reference	
46 26 03.60067	96 07 26.67257		397267.540	219868.332	.033	C	GPS - STATIC	2023	HTH59	
46 26 03.60053	96 07 26.67379		397267.455	219868.318	.131	3	GPS - RTRN	2009	RTRN2009	



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2152201.922	856706.904	853020.526	16886613.372	.010		ADJUSTMENT	2024	GPS3672
2152201.922	856706.904	853020.526	16886613.372	.010	C	GPS - STATIC	2023	HTH59
2152201.878	856706.920	853020.482	16886613.388	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2152201.885	856706.879	853020.488	16886613.347	.033	C	GPS - STATIC	2023	HTH59
2152201.799	856706.867	853020.402	16886613.336	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_C_2-DO7130-3E-17OCT2022.jpg	E	Oct 17, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_C_2-DO7130-2-17OCT2022.jpg		Oct 17, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_C_2-DO7130-1-17OCT2022.jpg		Oct 17, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5617 C 3

NGS Name: 5617 C 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	5	134 N	43 W	462704.00	960726.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2010	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1962) Stamping: 5617 C 3 1962

2.7 MILES SOUTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 24 AT ERHARD, 73.0 FEET RIGHT OF TRUNK HIGHWAY 59, AT TRUNK HIGHWAY 59 STATION 626+98.

Station Notes

THE DISK WAS TURNED IN TO THE OFFICE.
FOUND THE MARK, PULLED THE DISK OUT OF THE CONCRETE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1265.303	.033	3				VERTICAL CONTROL SURVEY	1962 CS5617

Geoid Separations(ft): GEOID18 = -88.110 12B = -88.107 09 = -87.985 03 = -87.887

* No Horizontal Positions in the Database *



Mn/DOT Name: 5617 D

NGS Name: 5617 D

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

[Get Map](#)

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
SE	32	135 N	43 W	462748.69	960654.90		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2011	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - LARGE	BENCH MARK DISK	MNDT

Description: (1962)

Stamping: 5617 D 1962

1.75 MILES SOUTHWEST OF ERHARD, 1.75 MILES SOUTHWEST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 24 IN ERHARD, AT TRUNK HIGHWAY 59 MILEPOINT 233.75, 119.9 FEET SOUTH OF 345TH STREET, 73.0 FEET EAST OF TRUNK HIGHWAY 59, 41.2 FEET SOUTH OF A CABLE BOX, 9.3 FEET SOUTHWEST OF A POWER POLE WITH TWO GUY WIRES, 1.0 FOOT WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1285.020	.033	3				VERTICAL CONTROL SURVEY	1962	CS5617

Geoid Separations(ft): GEOID18 = -88.067 12B = -88.061 09 = -87.943 03 = -87.838

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_D-3E-12AUG2009.jpg	E	Aug 12, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_D-2-12AUG2009.jpg		Aug 12, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_D-1-12AUG2009.jpg		Aug 12, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5617 D 1

NGS Name: 5617 D 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	28	135 N	43 W	462823.70	960615.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2010	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1962) Stamping: 5617 D 1 1962

0.9 MILE SOUTHWEST OF ERHARD, 0.8 MILE SOUTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 24 AT ERHARD, 74.0 FEET RIGHT OF TRUNK HIGHWAY 59, AT TRUNK HIGHWAY 59 STATION 724+12.

Station Notes

THE DISK WAS TURNED IN TO THE OFFICE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1291.051	.033	3				VERTICAL CONTROL SURVEY	1962	CS5617

Geoid Separations(ft): GEOID18 = -88.025 12B = -88.012 09 = -87.900 03 = -87.792

* No Horizontal Positions in the Database *



Mn/DOT Name: 5617 E

NGS Name: 5617 E

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	22	135 N	43 W	462939.91	960529.59	2	

NGS ACRN: DO7120	Get Map
NGS Quad / Sta Num : 46096211/	
USGS Quad: ERHARD	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2009	GOOD	Horz=NO Vert=YES	YES	4199		NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (1973)

Stamping: 5617 E 1962

0.7 MILE NORTHEAST OF ERHARD, 0.8 MILE NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 24 IN ERHARD, AT TRUNK HIGHWAY 59 MILEPOINT 236.20.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1279.059	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1279.105	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1279.105	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1278.223	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT
1278.223	.033	3				VERTICAL CONTROL SURVEY	1962	CS5617

Geoid Separations(ft): GEOID18 = -87.930 12B = -87.916 09 = -87.808 03 = -87.697

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_E-DO7120-3N-12AUG2009.jpg	N	Aug 12, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_E-DO7120-2-12AUG2009.jpg		Aug 12, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_E-DO7120-1-12AUG2009.jpg		Aug 12, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5617 F

NGS Name: 5617 F

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7104](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	8	133 N	43 W	462025.88	960741.07	2	C	2009	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5617 F 2009

4.15 MILES NORTH OF FERGUS FALLS, 0.3 MILE NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94 (THE JUNCTION IS 4.5 MILES NORTHWEST OF FERGUS FALLS), AT TRUNK HIGHWAY 59 MILEPOINT 224.15, 144.0 FEET EAST OF NORTHBOUND TRUNK HIGHWAY 59, 85.0 FEET NORTH OF COUNTY ROAD 88, 2.2 FEET SOUTH OF A RIGHT-OF-WAY POST, 24.0 FEET NORTHWEST OF A POWER POLE WITH A GUY WIRE, 2.0 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order /(Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1233.715	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1233.705	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1233.741	.016	2/1				VERTICAL CONTROL SURVEY	2016 VI94D4
1233.705	.016	2/1				VERTICAL ADJUSTMENT	2013 00000792
1233.705	.016	2/1				VERTICAL CONTROL SURVEY	2012 VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order /(Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1233.715			1145.391	.021	2011	HORIZONTAL ADJUSTMENT	2024 GPS3672
1233.715	.131		1145.510	.066	1996	GPS - STATIC	2023 HTH59
1233.715			1145.391	.021	2011	GPS - STATIC	2023 HTH59
1235.043	.262		1146.753	.197	2011	GPS - RTRN	2023 RTRN2023
1233.741	.262		1145.450	.197	2011	GPS - RTRN	2022 RTRN2022
1233.629	.262		1145.349	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -88.291 12B = -88.284 09 = -88.176 03 = -88.100

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 20 25.88052	96 07 41.07276	396080.936	185659.862	.013		ADJUSTMENT	2024 GPS3672
46 20 25.88052	96 07 41.07276	396080.936	185659.862	.013	C	GPS - STATIC	2023 HTH59
46 20 25.88037	96 07 41.07223	396080.973	185659.847	.131	3	GPS - RTRN	2023 RTRN2023
46 20 25.87995	96 07 41.07316	396080.907	185659.804	.131	3	GPS - RTRN	2022 RTRN2022
46 20 25.88008	96 07 41.07152	396081.022	185659.817	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 20 25.88026	96 07 41.07330	396080.898	185659.836	.033	C	GPS - STATIC	2023 HTH59

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2150382.546	822530.688	850659.298	16852457.012	.013		ADJUSTMENT	2024	GPS3672
2150382.546	822530.688	850659.298	16852457.012	.013	C	GPS - STATIC	2023	HTH59
2150382.583	822530.672	850659.334	16852456.995	.131	3	GPS - RTRN	2023	RTRN2023
2150382.516	822530.631	850659.268	16852456.955	.131	3	GPS - RTRN	2022	RTRN2022
2150382.632	822530.641	850659.383	16852456.964	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2150382.507	822530.662	850659.259	16852456.987	.033	C	GPS - STATIC	2023	HTH59

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_F-DO7104-3E-14AUG2023.jpg	E	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_F-DO7104-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_F-DO7104-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5617 G

NGS Name: 5617 G

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DQ7105 NGS Quad / Sta Num : 46096213/ USGS Quad: CARLISLE	Get Map
NW	8	133 N	43 W	462116.54	960743.07	2	C		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2009	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 35 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009)

Stamping: 5617 G 2009

1.8 MILES SOUTH OF ELIZABETH, 1.7 MILES SOUTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 10 IN ELIZABETH, AT TRUNK HIGHWAY 59 MILEPOINT 225.10, 61.6 FEET EAST OF TRUNK HIGHWAY 59, 62.0 FEET SOUTH OF 270TH STREET, 1.6 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1290.050	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1290.043	.016	2/1				VERTICAL ADJUSTMENT	2013 00000792
1290.053	.016	2/1				VERTICAL CONTROL SURVEY	2012 VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1290.050			1201.763	.021	2011	HORIZONTAL ADJUSTMENT	2024 GPS3672
1290.050	.131		1201.881	.066	1996	GPS - STATIC	2023 HTH59
1290.050			1201.763	.021	2011	GPS - STATIC	2023 HTH59
1291.398	.262		1203.118	.197	2011	GPS - RTRN	2023 RTRN2023
1290.020	.262		1201.736	.197	2011	GPS - RTRN	2022 RTRN2022
1289.945	.262		1201.671	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -88.281 12B = -88.274 09 = -88.166 03 = -88.094

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 21 16.54070	96 07 43.06829	395967.652	190792.829	.013		ADJUSTMENT	2024 GPS3672
46 21 16.54070	96 07 43.06829	395967.652	190792.829	.013	C	GPS - STATIC	2023 HTH59
46 21 16.54076	96 07 43.06838	395967.645	190792.835	.131	3	GPS - RTRN	2023 RTRN2023
46 21 16.54111	96 07 43.06918	395967.590	190792.871	.131	3	GPS - RTRN	2022 RTRN2022
46 21 16.54045	96 07 43.06783	395967.684	190792.804	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 21 16.54043	96 07 43.06883	395967.614	190792.802	.033	C	GPS - STATIC	2023 HTH59

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2150364.291	827664.198	850722.223	16857592.173	.013		ADJUSTMENT	2024 GPS3672
2150364.291	827664.198	850722.223	16857592.173	.013	C	GPS - STATIC	2023 HTH59
2150364.285	827664.204	850722.217	16857592.179	.131	3	GPS - RTRN	2023 RTRN2023
2150364.230	827664.241	850722.162	16857592.217	.131	3	GPS - RTRN	2022 RTRN2022
2150364.323	827664.172	850722.254	16857592.146	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2150364.253	827664.172	850722.184	16857592.147	.033	C	GPS - STATIC	2023 HTH59



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_G-DO7105-3E-14AUG2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_G-DO7105-2-14AUG2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_G-DO7105-1-14AUG2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Aug 14, 2023
	Aug 14, 2023
	Aug 14, 2023



Mn/DOT Name: 5617 H

NGS Name: 5617 H

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7109](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	29	134 N	43 W	462328.84	960746.19	2	C	2009	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 60 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) Stamping: 5617 H 2009

0.7 MILE NORTH OF ELIZABETH, 0.8 MILE NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 10 IN ELIZABETH, AT TRUNK HIGHWAY 59 MILEPOINT 227.60, 71.0 FEET WEST OF TRUNK HIGHWAY 59, 41.0 FEET SOUTH OF 295TH STREET, 1.0 FOOT EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1259.843	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1259.850	.016	2/1				VERTICAL ADJUSTMENT	2013 00000792
1259.863	.016	2/1				VERTICAL CONTROL SURVEY	2012 VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1259.843			1171.605	.020	2011	HORIZONTAL ADJUSTMENT	2024 GPS3672
1259.843	.131		1171.720	.066	1996	GPS - STATIC	2023 HTH59
1259.843			1171.605	.020	2011	GPS - STATIC	2023 HTH59
1259.778	.262		1171.536	.197	2011	GPS - RTRN	2022 RTRN2022
1259.866	.262		1171.625	.197	2011	GPS - OPUS	2022 GPSBM
1259.837	.262		1171.595	.197	2011	GPS - OPUS	2022 GPSBM
1259.847	.262		1171.605	.197	2011	GPS - RTRN	2021 RTRN2021

Geoid Separations(ft): GEOID18 = -88.241 12B = -88.241 09 = -88.120 03 = -88.035

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 23 28.83525	96 07 46.19338	395818.391	204196.410	.010		ADJUSTMENT	2024 GPS3672
46 23 28.83525	96 07 46.19338	395818.391	204196.410	.010	C	GPS - STATIC	2023 HTH59
46 23 28.83550	96 07 46.19269	395818.440	204196.435	.131	3	GPS - RTRN	2022 RTRN2022
46 23 28.83498	96 07 46.19384	395818.359	204196.383	.131	3	GPS - OPUS	2022 GPSBM
46 23 28.83487	96 07 46.19348	395818.384	204196.371	.131	3	GPS - OPUS	2022 GPSBM
46 23 28.83512	96 07 46.19261	395818.445	204196.396	.131	3	GPS - RTRN	2021 RTRN2021

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 23 28.83501	96 07 46.19389	395818.355	204196.386	.033	C	GPS - STATIC	2023 HTH59



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2150463.133	841066.493	851033.267	16870996.447	.010		ADJUSTMENT	2024	GPS3672
2150463.133	841066.493	851033.267	16870996.447	.010	C	GPS - STATIC	2023	HTH59
2150463.182	841066.517	851033.316	16870996.471	.131	3	GPS - RTRN	2022	RTRN2022
2150463.101	841066.466	851033.234	16870996.421	.131	3	GPS - OPUS	2022	GPSBM
2150463.126	841066.455	851033.259	16870996.409	.131	3	GPS - OPUS	2022	GPSBM
2150463.187	841066.479	851033.321	16870996.432	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2150463.097	841066.470	851033.230	16870996.424	.033	C	GPS - STATIC	2023	HTH59

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_H-DO7109-3W-17OCT2022.jpg	W	Oct 17, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_H-DO7109-2-17OCT2022.jpg		Oct 17, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_H-DO7109-1-17OCT2022.jpg		Oct 17, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5617 J

NGS Name: 5617 J

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7114](#)
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	5	134 N	43 W	462644.45	960726.51	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 60 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009)

Stamping: 5617 J 2009

3.0 MILES SOUTHWEST OF ERHARD, 3.05 MILES SOUTHWEST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 24 IN ERHARD, AT TRUNK HIGHWAY 59 MILEPOINT 231.35, 71.0 FEET EAST OF TRUNK HIGHWAY 59, 38.9 FEET NORTH OF 175TH AVENUE, 3.0 FEET WEST OF A NORTH/SOUTH FENCE LINE, 2.5 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1280.572	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1280.598	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1280.601	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1280.572			1192.422	.021	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1280.572	.131		1192.537	.066	1996	GPS - STATIC	2023	HTH59
1280.572			1192.422	.021	2011	GPS - STATIC	2023	HTH59
1280.627	.262		1192.501	.197	2011	GPS - RTRN	2022	RTRN2022
1280.581	.262		1192.455	.197	2011	GPS - OPUS	2020	GPSBM
1280.614	.262		1192.488	.197	2011	GPS - OPUS	2020	GPSBM

Geoid Separations(ft): GEOID18 = -88.126 12B = -88.123 09 = -87.999 03 = -87.903

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 26 44.44926	96 07 26.50576	397300.537	224006.592	.013		ADJUSTMENT	2024	GPS3672
46 26 44.44926	96 07 26.50576	397300.537	224006.592	.013	C	GPS - STATIC	2023	HTH59
46 26 44.44930	96 07 26.50563	397300.547	224006.596	.131	3	GPS - RTRN	2022	RTRN2022
46 26 44.44883	96 07 26.50552	397300.554	224006.548	.131	3	GPS - OPUS	2020	GPSBM
46 26 44.44858	96 07 26.50573	397300.539	224006.523	.131	3	GPS - OPUS	2020	GPSBM

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 26 44.44902	96 07 26.50627	397300.502	224006.568	.033	C	GPS - STATIC	2023	HTH59

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2152311.458	860843.285	853195.756	16890749.082	.013		ADJUSTMENT	2024	GPS3672
2152311.458	860843.285	853195.756	16890749.082	.013	C	GPS - STATIC	2023	HTH59
2152311.468	860843.289	853195.765	16890749.086	.131	3	GPS - RTRN	2022	RTRN2022
2152311.474	860843.241	853195.771	16890749.038	.131	3	GPS - OPUS	2020	GPSBM
2152311.459	860843.216	853195.756	16890749.013	.131	3	GPS - OPUS	2020	GPSBM

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2152311.422	860843.262	853195.719	16890749.059	.033	C	GPS - STATIC	2023	HTH59



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_J-DO7114-3E-17OCT2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_J-DO7114-2-17OCT2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_J-DO7114-1-17OCT2022.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Oct 17, 2022
	Oct 17, 2022
	Oct 17, 2022



Mn/DOT Name: 5617 K

NGS Name: 5617 K

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7118](#) [Get Map](#)
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SE	28	135 N	43 W	462824.52	960614.03	2	C	2009	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 50 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) Stamping: 5617 K 2009

0.85 MILE SOUTH OF ERHARD, 0.95 MILE SOUTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 24 IN ERHARD, AT TRUNK HIGHWAY 59 MILEPOINT 233.50, 75.0 FEET SOUTHEAST OF TRUNK HIGHWAY 59, 17.0 FEET NORTHEAST OF THE ENTRANCE TO PELICAN RIVER SHOOTING CLUB NUMBER 35190, 18.2 FEET SOUTHWEST OF A POWER POLE, 3.0 FEET SOUTHWEST OF THE SOUTH POST OF THE PELICAN RIVER SHOOTING CLUB SIGN, 3.0 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1290.496	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1290.535	.016	2/1				VERTICAL ADJUSTMENT	2013 00000792
1290.535	.016	2/1				VERTICAL CONTROL SURVEY	2012 VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1290.496			1202.494	.022	2011	HORIZONTAL ADJUSTMENT	2024 GPS3672
1290.496	.131		1202.606	.066	1996	GPS - STATIC	2023 HTH59
1290.496			1202.494	.022	2011	GPS - STATIC	2023 HTH59
1290.535	.262		1202.511	.197	2011	GPS - RTRN	2022 RTRN2022
1290.519	.262		1202.498	.197	2011	GPS - OPUS	2022 GPSBM
1290.516	.262		1202.494	.197	2011	GPS - OPUS	2022 GPSBM
1290.555	.262		1202.530	.197	2011	GPS - RTRN	2021 RTRN2021

Geoid Separations(ft): GEOID18 = -88.021 12B = -88.008 09 = -87.900 03 = -87.792

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u> <u>Order</u> <u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 28 24.52111	96 06 14.02831	402425.728	234119.303	.013		ADJUSTMENT	2024 GPS3672
46 28 24.52111	96 06 14.02831	402425.728	234119.303	.013	C	GPS - STATIC	2023 HTH59
46 28 24.52130	96 06 14.02767	402425.773	234119.322	.131	3	GPS - RTRN	2022 RTRN2022
46 28 24.52073	96 06 14.02841	402425.721	234119.264	.131	3	GPS - OPUS	2022 GPSBM
46 28 24.52069	96 06 14.02826	402425.732	234119.260	.131	3	GPS - OPUS	2022 GPSBM
46 28 24.52141	96 06 14.02802	402425.749	234119.333	.131	3	GPS - RTRN	2021 RTRN2021

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u> <u>Order</u> <u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 28 24.52088	96 06 14.02880	402425.694	234119.280	.033	C	GPS - STATIC	2023 HTH59

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2157622.270	870858.111	858667.017	16900682.060	.013		ADJUSTMENT	2024	GPS3672
2157622.270	870858.111	858667.017	16900682.060	.013	C	GPS - STATIC	2023	HTH59
2157622.315	870858.130	858667.062	16900682.078	.131	3	GPS - RTRN	2022	RTRN2022
2157622.262	870858.073	858667.008	16900682.022	.131	3	GPS - OPUS	2022	GPSBM
2157622.272	870858.069	858667.019	16900682.018	.131	3	GPS - OPUS	2022	GPSBM
2157622.291	870858.141	858667.038	16900682.090	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2157622.235	870858.089	858666.981	16900682.038	.033	C	GPS - STATIC	2023	HTH59

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_K-DO7118-3SE-17OCT2022.jpg	SE	Oct 17, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_K-DO7118-2-17OCT2022.jpg		Oct 17, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_K-DO7118-1-17OCT2022.jpg		Oct 17, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5617 L

NGS Name: 5617 L

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7119](#)
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	21	135 N	43 W	462908.01	960554.60	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 35 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) Stamping: 5617 L 2009

IN ERHARD, AT THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 24, AT TRUNK HIGHWAY 59 MILEPOINT 234.50, 33.5 FEET EAST OF TRUNK HIGHWAY 59, 50.2 FEET NORTH OF COUNTY ROAD 24, 10.3 FEET NORTH OF A POWER POLE, 5.4 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference
1289.289	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1289.331	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1289.331	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference
1289.289			1201.303	.027	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1289.289	.131		1201.405	.066	1996	GPS - STATIC	2023	HTH59
1289.289			1201.303	.027	2011	GPS - STATIC	2023	HTH59
1289.272	.262		1201.300	.197	2011	GPS - RTRN	2022	RTRN2022

Geoid Separations(ft): GEOID18 = -87.972 12B = -87.959 09 = -87.851 03 = -87.739

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 29 08.00901	96 05 54.59990	403806.867	238518.437	.016		ADJUSTMENT	2024	GPS3672
46 29 08.00901	96 05 54.59990	403806.867	238518.437	.016	C	GPS - STATIC	2023	HTH59
46 29 08.00869	96 05 54.59927	403806.911	238518.405	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 29 08.00881	96 05 54.60040	403806.832	238518.417	.033	C	GPS - STATIC	2023	HTH59

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2159084.412	875230.367	860199.034	16905032.140	.016		ADJUSTMENT	2024	GPS3672
2159084.412	875230.367	860199.034	16905032.140	.016	C	GPS - STATIC	2023	HTH59
2159084.455	875230.334	860199.077	16905032.106	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2159084.376	875230.348	860198.998	16905032.121	.033	C	GPS - STATIC	2023	HTH59

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_L-DO7119-3E-17OCT2022.jpg	E	Oct 17, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_L-DO7119-2-17OCT2022.jpg		Oct 17, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_L-DO7119-1-17OCT2022.jpg		Oct 17, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5617 M

NGS Name: 5617 M

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7123](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	10	135 N	43 W	463051.60	960521.21	2	C	2009	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 35 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) Stamping: 5617 M 2009

2.1 MILES NORTH OF ERHARD, 2.1 MILES NORTH AND NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 24 IN ERHARD, AT TRUNK HIGHWAY 59 MILEPOINT 236.60, 77.0 FEET WEST OF TRUNK HIGHWAY 59, 22.7 FEET NORTH OF 380TH STREET, 10.6 FEET NORTH OF A POWER POLE, 17.6 FEET WEST OF A FIELD ENTRANCE, 1.4 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1307.035	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1307.091	.016	2/1				VERTICAL ADJUSTMENT	2013 00000792
1307.094	.016	2/1				VERTICAL CONTROL SURVEY	2012 VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1307.035			1219.259	.021	2011	HORIZONTAL ADJUSTMENT	2024 GPS3672
1307.035	.131		1219.371	.066	1996	GPS - STATIC	2023 HTH59
1307.035			1219.259	.021	2011	GPS - STATIC	2023 HTH59
1307.041	.262		1219.204	.197	2011	GPS - RTRN	2022 RTRN2022
1307.140	.262		1219.302	.197	2011	GPS - OPUS	2022 GPSBM
1307.002	.262		1219.164	.197	2011	GPS - OPUS	2022 GPSBM
1307.087	.262		1219.250	.197	2011	GPS - RTRN	2021 RTRN2021

Geoid Separations(ft): GEOID18 = -87.838 12B = -87.828 09 = -87.710 03 = -87.595

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 30 51.60044	96 05 21.21375	406192.612	249002.158	.013		ADJUSTMENT	2024 GPS3672
46 30 51.60044	96 05 21.21375	406192.612	249002.158	.013	C	GPS - STATIC	2023 HTH59
46 30 51.60027	96 05 21.21339	406192.637	249002.141	.131	3	GPS - RTRN	2022 RTRN2022
46 30 51.60017	96 05 21.21425	406192.577	249002.132	.131	3	GPS - OPUS	2022 GPSBM
46 30 51.60017	96 05 21.21475	406192.542	249002.132	.131	3	GPS - OPUS	2022 GPSBM
46 30 51.60048	96 05 21.21342	406192.635	249002.162	.131	3	GPS - RTRN	2021 RTRN2021

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 30 51.60021	96 05 21.21426	406192.576	249002.136	.033	C	GPS - STATIC	2023 HTH59



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2161663.471	885666.802	862944.782	16915430.041	.013		ADJUSTMENT	2024	GPS3672
2161663.471	885666.802	862944.782	16915430.041	.013	C	GPS - STATIC	2023	HTH59
2161663.496	885666.784	862944.807	16915430.023	.131	3	GPS - RTRN	2022	RTRN2022
2161663.436	885666.775	862944.746	16915430.015	.131	3	GPS - OPUS	2022	GPSBM
2161663.401	885666.776	862944.711	16915430.016	.131	3	GPS - OPUS	2022	GPSBM
2161663.495	885666.805	862944.806	16915430.044	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2161663.435	885666.780	862944.746	16915430.019	.033	C	GPS - STATIC	2023	HTH59

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_M-DO7123-3W-17OCT2022.jpg	W	Oct 17, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_M-DO7123-2-17OCT2022.jpg		Oct 17, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_M-DO7123-1-17OCT2022.jpg		Oct 17, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5617 N

NGS Name: 5617 N

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7124](#)

[Get Map](#)

NGS Quad / Sta Num : 46096122/

USGS Quad: PELICAN RAPIDS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	10	135 N	43 W	463117.19	960517.32	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2009	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 35 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009)

Stamping: 5617 N 2009

3.4 MILES SOUTH OF PELICAN RAPIDS, 3.35 MILES SOUTH ALONG TRUNK HIGHWAY 59 FROM THE SOUTH JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 237.1, 78.0 FEET EAST OF TRUNK HIGHWAY 59, 39.0 FEET SOUTH OF APPALOOSA ROAD, 3.9 FEET SOUTHEAST OF A RIGHT-OF-WAY POST, 1.7 FEET EAST OF A WITNESS POST.

Station Pair: ERHARD - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1306.595	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1306.651	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1306.657	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1306.595			1218.872	.021	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1306.595	.131		1218.977	.066	1996	GPS - STATIC	2023	HTH59
1306.595			1218.872	.021	2011	GPS - STATIC	2023	HTH59
1306.657	.262		1218.853	.197	2011	GPS - RTRN	2022	RTRN2022
1306.631	.262		1218.826	.197	2011	GPS - RTRN	2021	RTRN2021

Geoid Separations(ft): GEOID18 = -87.805 12B = -87.802 09 = -87.677 03 = -87.556

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 31 17.19351	96 05 17.32385	406476.856	251593.726	.013		ADJUSTMENT	2024	GPS3672
46 31 17.19351	96 05 17.32385	406476.856	251593.726	.013	C	GPS - STATIC	2023	HTH59
46 31 17.19335	96 05 17.32448	406476.812	251593.710	.131	3	GPS - RTRN	2022	RTRN2022
46 31 17.19371	96 05 17.32339	406476.888	251593.746	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 31 17.19331	96 05 17.32436	406476.820	251593.706	.033	C	GPS - STATIC	2023	HTH59

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2161995.594	888252.336	863318.154	16918010.897	.013		ADJUSTMENT	2024	GPS3672
2161995.594	888252.336	863318.154	16918010.897	.013	C	GPS - STATIC	2023	HTH59
2161995.549	888252.321	863318.110	16918010.882	.131	3	GPS - RTRN	2022	RTRN2022
2161995.626	888252.355	863318.187	16918010.916	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2161995.558	888252.316	863318.118	16918010.878	.033	C	GPS - STATIC	2023	HTH59



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_N-DO7124-3E-17OCT2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_N-DO7124-2-17OCT2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_N-DO7124-1-17OCT2022.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Oct 17, 2022
	Oct 17, 2022
	Oct 17, 2022



Mn/DOT Name: 5617 P

NGS Name: 5617 P

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7126](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	3	135 N	43 W	463208.28	960459.85	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2009	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 55 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: 5617 P 2009

2.45 MILES SOUTH OF PELICAN RAPIDS, 2.35 MILES SOUTH ALONG TRUNK HIGHWAY 59 FROM THE EAST JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 EAST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 238.1, 87.0 FEET EAST OF TRUNK HIGHWAY 59, 113.7 FEET SOUTH OF COUNTY ROAD 3, 4.6 FEET WEST OF THE WEST POST OF THE CENTRAL LUTHERAN CHURCH SIGN, 20.8 FEET NORTHEAST OF A RIGHT-OF-WAY POST, 4.0 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1325.968	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1326.031	.016	2/1				VERTICAL ADJUSTMENT	2013 00000792
1326.034	.016	2/1				VERTICAL CONTROL SURVEY	2012 VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1325.968			1235.295	.021	2011	HORIZONTAL ADJUSTMENT	2024 GPS3672
1325.968	.131		1238.400	.066	1996	GPS - STATIC	2023 HTH59
1325.968			1238.295	.021	2011	GPS - STATIC	2023 HTH59
1326.001	.262		1238.265	.197	2011	GPS - RTRN	2022 RTRN2022
1325.949	.262		1238.213	.197	2011	GPS - OPUS	2020 GPSBM
1325.932	.262		1238.196	.197	2011	GPS - OPUS	2020 GPSBM
1326.060	.262		1238.324	.197	2011	GPS - OPUS	2020 GPSBM
1325.991	.262		1238.255	.197	2011	GPS - OPUS	2020 GPSBM
1325.952	.262		1238.219	.197	2011	GPS - RTRN	2014 RTRN2014

Geoid Separations(ft): GEOID18 = -87.736 12B = -87.733 09 = -87.611 03 = -87.487

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 32 08.28426	96 04 59.84973	407722.857	256764.068	.013		ADJUSTMENT	2024 GPS3672
46 32 08.28426	96 04 59.84973	407722.857	256764.068	.013	C	GPS - STATIC	2023 HTH59
46 32 08.28484	96 04 59.84979	407722.854	256764.127	.131	3	GPS - RTRN	2022 RTRN2022
46 32 08.28395	96 04 59.85005	407722.835	256764.037	.131	3	GPS - OPUS	2020 GPSBM
46 32 08.28420	96 04 59.85012	407722.830	256764.062	.131	3	GPS - OPUS	2020 GPSBM
46 32 08.28388	96 04 59.84983	407722.850	256764.030	.131	3	GPS - OPUS	2020 GPSBM
46 32 08.28442	96 04 59.84987	407722.848	256764.085	.131	3	GPS - OPUS	2020 GPSBM
46 32 08.28421	96 04 59.84997	407722.841	256764.063	.131	3	GPS - RTRN	2014 RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 32 08.28406	96 04 59.85024	407722.822	256764.048	.033	C	GPS - STATIC	2023 HTH59



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2163336.914	893398.075	864741.763	16923136.472	.013		ADJUSTMENT	2024	GPS3672
2163336.914	893398.075	864741.763	16923136.472	.013	C	GPS - STATIC	2023	HTH59
2163336.912	893398.134	864741.761	16923136.531	.131	3	GPS - RTRN	2022	RTRN2022
2163336.891	893398.045	864741.739	16923136.441	.131	3	GPS - OPUS	2020	GPSBM
2163336.887	893398.070	864741.735	16923136.467	.131	3	GPS - OPUS	2020	GPSBM
2163336.907	893398.037	864741.754	16923136.434	.131	3	GPS - OPUS	2020	GPSBM
2163336.905	893398.092	864741.754	16923136.488	.131	3	GPS - OPUS	2020	GPSBM
2163336.898	893398.071	864741.746	16923136.468	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2163336.878	893398.056	864741.727	16923136.453	.033	C	GPS - STATIC	2023	HTH59

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_P-DO7126-3E-17OCT2022.jpg	E	Oct 17, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_P-DO7126-2-17OCT2022.jpg		Oct 17, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_P-DO7126-1-17OCT2022.jpg		Oct 17, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5617 Q

NGS Name: 5617 Q

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2040](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	27	136 N	43 W	463400.79	960500.36	2	C	2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 28 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: 5617 Q 2014

IN PELICAN RAPIDS, 0.15 MILE SOUTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAYS 59 AND 108 EAST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 240.3, 33.1 FEET EAST OF TRUNK HIGHWAY 59, 57.5 FEET SOUTH OF SOUTHEAST 3RD AVENUE, 1.5 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1314.125	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1314.125	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1314.125			1226.615	.023	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1314.125	.131		1226.720	.066	1996	GPS - STATIC	2023	HTH59
1314.125			1226.615	.023	2011	GPS - STATIC	2023	HTH59
1314.194	.262		1226.582	.197	2011	GPS - RTRN	2023	RTRN2023
1314.180	.262		1226.572	.197	2011	GPS - RTRN	2022	RTRN2022
1314.062	.262		1226.458	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.608 12B = -87.605 09 = -87.487 03 = -87.355

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
46 34 00.78912	96 05 00.36046			407740.002	268162.244	.013		ADJUSTMENT
46 34 00.78912	96 05 00.36046			407740.002	268162.244	.013	C	GPS - STATIC
46 34 00.78900	96 05 00.36032			407740.012	268162.231	.131	3	GPS - RTRN
46 34 00.78954	96 05 00.36052			407739.998	268162.286	.131	3	GPS - RTRN
46 34 00.78865	96 05 00.35981			407740.047	268162.196	.131	3	GPS - RTRN

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
46 34 00.78892	96 05 00.36095			407739.968	268162.224	.033	C	GPS - STATIC

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
2163565.008	904792.542			865151.593	16934529.928	.013		ADJUSTMENT
2163565.008	904792.542			865151.593	16934529.928	.013	C	GPS - STATIC
2163565.018	904792.530			865151.603	16934529.916	.131	3	GPS - RTRN
2163565.005	904792.585			865151.591	16934529.971	.131	3	GPS - RTRN
2163565.052	904792.493			865151.637	16934529.879	.131	3	GPS - RTRN

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
2163564.974	904792.522			865151.558	16934529.910	.033	C	GPS - STATIC



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_Q-DQ2040-3E-31JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_Q-DQ2040-2-31JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_Q-DQ2040-1-31JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Jul 31, 2023
	Jul 31, 2023
	Jul 31, 2023



Mn/DOT Name: 5617 R

NGS Name: 5617 R

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR9622](#) [Get Map](#)
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	32	135 N	43 W	462752.05	960654.20		C	2022	2023	GOOD	Horz=YES Vert=YES	NO		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 59 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2022) Stamping: 5617 R 2022

1.5 MILES SOUTHWEST OF ERHARD, 1.70 MILES SOUTHWEST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 24 IN ERHARD, AT TRUNK HIGHWAY 59 MILEPOINT 232.75, 72.4 FEET NORTHWEST OF TRUNK HIGHWAY 59, 279.4 FEET SOUTHWEST OF 180TH AVENUE, 261.8 FEET NORTHEAST OF 345TH STREET, 2.1 FEET SOUTHEAST OF A RIGHT-OF-WAY POST, 2.0 FEET SOUTHEAST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1284.469				1196.435	.021	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1284.430	.131			1196.546	.066	1996	GPS - STATIC	2023	HTH59
1284.469				1196.435	.021	2011	GPS - STATIC	2023	HTH59
1283.167	.262			1195.103	.197	2011	GPS - RTRN	2022	RTRN2022

Geoid Separations(ft): GEOID18 = -88.064 03 = -87.834

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>				<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>
		46 27 52.04847	96 06 54.20226	399597.227	230843.485	.013		ADJUSTMENT	2024
		46 27 52.04847	96 06 54.20226	399597.227	230843.485	.013	C	GPS - STATIC	2023
		46 27 52.04845	96 06 54.20189	399597.253	230843.483	.131	3	GPS - RTRN	2022

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>				<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>
		46 27 52.04824	96 06 54.20275	399597.193	230843.462	.033	C	GPS - STATIC	2023

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>
		2154733.990	867635.623	855726.800	16897504.671	.013		ADJUSTMENT	2024
		2154733.990	867635.623	855726.800	16897504.671	.013	C	GPS - STATIC	2023
		2154734.016	867635.620	855726.826	16897504.668	.131	3	GPS - RTRN	2022

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>
		2154733.956	867635.600	855726.765	16897504.649	.033	C	GPS - STATIC	2023

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<u>Location:</u>	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_R-DR9622-3NW-31OCT2022.jpg	NW	Oct 31, 2022
<u>Monument:</u>	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_R-DR9622-2-31OCT2022.jpg		Oct 31, 2022
<u>Disk:</u>	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_R-DR9622-1-31OCT2022.jpg		Oct 31, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5617 S

NGS Name: 5617 S

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	27	136 N	43 W	463414.06	960504.97	2	C

NGS ACRN: DR9623	Get Map
NGS Quad / Sta Num : 46096122/	
USGS Quad: PELICAN RAPIDS	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2022	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 67 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2022)

Stamping: 5617 S 2022

IN PELICAN RAPIDS, 0.10 MILE WEST ALONG TRUNK HIGHWAY 108 FROM THE NORTH JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, THEN 0.05 MILE SOUTH ON NORTHWEST 1ST STREET, THEN 0.05 MILE EAST IN THE PARKING LOT TO THE SURVEY MARK, 178.6 FEET EAST OF 1ST STREET NORTHWEST, 50.7 FEET WEST OF THE NORTHWEST CORNER OF A BRIDGE RAIL, 11.6 FEET SOUTH OF THE EDGE OF A PARKING LOT, 1.5 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1297.543	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPOLI2

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1297.540			1210.027	.016	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1297.589			1210.027	.020	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1297.481	.131		1210.135	.066	1996	GPS - STATIC	2024	HTH108
1297.540			1210.027	.016	2011	GPS - STATIC	2024	HTH108
1297.530	.131		1210.135	.066	1996	GPS - STATIC	2023	HTH59
1297.589			1210.027	.020	2011	GPS - STATIC	2023	HTH59
1297.563	.262		1209.968	.197	2011	GPS - RTRN	2023	RTRN2023
1296.290	.262		1208.695	.197	2011	GPS - RTRN	2022	RTRN2022

Geoid Separations(ft): GEOID18 = -87.595 03 = -87.339

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>								
Geodetic Position		Otter Tail County				Project Info		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 34 14.06450	96 05 04.97187	407424.041	269508.691	.010		ADJUSTMENT	2024	GPS3689
46 34 14.06450	96 05 04.97187	407424.041	269508.691	.013		ADJUSTMENT	2024	GPS3672
46 34 14.06450	96 05 04.97187	407424.041	269508.691	.010	C	GPS - STATIC	2024	HTH108
46 34 14.06450	96 05 04.97187	407424.041	269508.691	.013	C	GPS - STATIC	2023	HTH59
46 34 14.06491	96 05 04.97189	407424.040	269508.733	.131	3	GPS - RTRN	2023	RTRN2023
46 34 14.06460	96 05 04.97216	407424.021	269508.701	.131	3	GPS - RTRN	2022	RTRN2022

<u>NAD83(1996)</u>		<u>Otter Tail County</u>						<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 34 14.06428	96 05 04.97238	407424.005	269508.669	.033	C	GPS - STATIC	2024	HTH108	
46 34 14.06428	96 05 04.97238	407424.005	269508.669	.033	C	GPS - STATIC	2023	HTH59	



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2163274.061	906144.437	864882.150	16935886.776	.010		ADJUSTMENT	2024	GPS3689
2163274.061	906144.437	864882.150	16935886.776	.013		ADJUSTMENT	2024	GPS3672
2163274.061	906144.437	864882.150	16935886.776	.010	C	GPS - STATIC	2024	HTH108
2163274.061	906144.437	864882.150	16935886.776	.013	C	GPS - STATIC	2023	HTH59
2163274.060	906144.478	864882.150	16935886.817	.131	3	GPS - RTRN	2023	RTRN2023
2163274.041	906144.448	864882.130	16935886.787	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2163274.024	906144.415	864882.114	16935886.755	.033	C	GPS - STATIC	2024	HTH108
2163274.024	906144.415	864882.114	16935886.755	.033	C	GPS - STATIC	2023	HTH59

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_S-DR9623-3E-31JUL2023.jpg	E	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_S-DR9623-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5617_S-DR9623-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5618 AA

NGS Name: 5618 AA

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096121/
USGS Quad: CORMORANT

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	20	137 N	42 W	463937.19	960122.06		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2014	DESTROYED	Horz=NO Vert=NO	YES	4824	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE HEADWALL	SURVEY DISK	MNDT

Description: (1952)

Stamping: 5618 AA 1952

IN DUNVILLE, 0.25 MILE NORTHEAST ALONG OLD TRUNK HIGHWAY 59 FROM THE JUNCTION OF OLD TRUNK HIGHWAY 59 AND NEW TRUNK HIGHWAY 59 IN DUNVILLA, TO NEW TRUNK HIGHWAY 59 MILEPOINT 247.60, 59.5 FEET NORTH OF DUNVILLA DRIVE, 15.5 FEET EAST OF OLD TRUNK HIGHWAY 59, IN THE SOUTHEAST CORNER OF TRUNK HIGHWAY 59 BRIDGE NUMBER 4824 OVER THE PELICAN RIVER.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1320.791	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT	
1320.791	.033	3				VERTICAL CONTROL SURVEY	1967	CS5618	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1321.546	.262		1234.489	.197	1996	GPS - RTRN	2009	RTRN2009	

Geoid Separations(ft): GEOID18 = -87.316 12B = -87.303 09 = -87.191 03 = -87.057

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 39 37.18579	96 01 22.05600	423125.816	302178.727	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2179575.853	938514.191	881704.759	16968002.775	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_AA-3N-12AUG2009.jpg	N	Aug 12, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_AA-2-12AUG2009.jpg		Aug 12, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_AA-1-12AUG2009.jpg		Aug 12, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5618 AB

NGS Name: 5618 AB

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	14	136 N	43 W	463514.95	960414.77		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1964	2014	DESTROYED	Horz=NO Vert=NO	YES	56004	FLUSH	NO MAG MATERIAL

Monument Type

BRIDGE ABUTMENT

Disk Type

SURVEY DISK

Mon. Agency

MNDT

Description: (1964)

Stamping: 5618 AB

IN THE SOUTHEAST CORNER OF TRUNK HIGHWAY 59 BRIDGE NUMBER 56004 OVER THE PELICAN RIVER, AT TRUNK HIGHWAY 108 MILEPOINT 242.05, 1.5 MILES NORTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 108 WEST AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1321.060	.033	3				VERTICAL CONTROL SURVEY	1967	CS5618

Geoid Separations(ft): GEOID18 = -87.536 12B = -87.529 09 = -87.411 03 = -87.270

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_AB-3E-04AUG2009.jpg	E	Aug 4, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_AB-2-04AUG2009.jpg		Aug 4, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_AB-1-04AUG2009.jpg		Aug 4, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5618 B

NGS Name: 5618 B

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	2	136 N	43 W	463705.00	960311.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2014	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1962) Stamping: 5618 B

3.55 MILES NORTHEAST OF PELICAN RAPIDS, 3.8 MILES NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 STATION 1314+97, 97.0 FEET LEFT OF TRUNK HIGHWAY 59, 0.5 MILE NORTH OF TRUNK HIGHWAY 59 BRIDGE NUMBER 56005 OVER THE PELICAN RIVER.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1368.901	.033	3				VERTICAL CONTROL SURVEY	1968 CS5618

Geoid Separations(ft): GEOID18 = -87.447 12B = -87.428 09 = -87.326 03 = -87.191

* No Horizontal Positions in the Database *



Mn/DOT Name: 5618 C RESET

NGS Name: 5618 C RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

[Get Map](#)

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
NE	11	136 N	43 W	463639.29	960310.59		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1967	2014	DESTROYED	Horz=NO Vert=NO	YES	56005	FLUSH	NO MAG MATERIAL

Monument Type

BRIDGE ABUTMENT

Disk Type

SURVEY DISK

Mon. Agency

MNDT

Description: (1967)

Stamping: 5618-C RESET 1967

3.1 MILES NORTHEAST OF PELICAN RAPIDS, 3.3 MILES NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 243.85, IN THE SOUTHEAST CORNER OF TRUNK HIGHWAY 59 BRIDGE NUMBER 56005 OVER THE PELICAN RIVER.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1320.709	.033	3				VERTICAL CONTROL SURVEY	1967	CS5618

Geoid Separations(ft): GEOID18 = -87.467 12B = -87.451 09 = -87.346 03 = -87.208

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_C_RESET-3N-12AUG2009.jpg	N	Aug 12, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_C_RESET-2-12AUG2009.jpg		Aug 12, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_C_RESET-1-12AUG2009.jpg		Aug 12, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5618 D

NGS Name: 5618 D

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2044](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	14	136 N	43 W	463600.05	960338.39	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1968	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (1968) **Stamping:** 5618 D 1968

2.3 MILES NORTHEAST OF PELICAN RAPIDS, 2.4 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 STATION MILEPOINT 243.05, 235.7 FEET SOUTH OF COUNTY ROAD 4 EAST, 95.5 FEET EAST OF TRUNK HIGHWAY 59, 23.6 FEET NORTH-NORTHWEST OF A POWER POLE WITH A GUYWIRE, SOUTHEAST OF THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 4, 0.5 FOOT WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj		Year	Reference	
1357.379	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941	

NGVD29				Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj		Year	Reference	
1356.749	.033	3					VERTICAL CONTROL SURVEY	1968	CS5618	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj		Year	Reference	
1357.379				1269.847	.022	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672	
1357.379	.131			1269.955	.066	1996	GPS - STATIC	2023	HTH59	
1357.379				1269.847	.022	2011	GPS - STATIC	2023	HTH59	
1357.474	.262			1269.978	.197	2011	GPS - RTRN	2022	RTRN2022	
1357.330	.262			1269.843	.197	2011	GPS - RTRN	2014	RTRN2014	

Geoid Separations(ft): GEOID18 = -87.497 12B = -87.487 09 = -87.372 03 = -87.237

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position		Otter Tail County		Determination Method			Project Info	
		Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 36 00.05204	96 03 38.39315			413519.968	280219.290	.013		ADJUSTMENT	2024	GPS3672
46 36 00.05204	96 03 38.39315			413519.968	280219.290	.013	C	GPS - STATIC	2023	HTH59
46 36 00.05233	96 03 38.39406			413519.905	280219.319	.131	3	GPS - RTRN	2022	RTRN2022
46 36 00.05143	96 03 38.39379			413519.923	280219.228	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		Geodetic Position		Otter Tail County		Determination Method			Project Info	
		Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 36 00.05181	96 03 38.39363			413519.934	280219.267	.033	C	GPS - STATIC	2023	HTH59

State Plane and UTM Coordinates (Feet)

NAD83(2011)		MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
		X	Y	X	Y	Acc	Order		Year	Reference
2169566.410	916739.035			871345.051	16946383.264	.013		ADJUSTMENT	2024	GPS3672
2169566.410	916739.035			871345.051	16946383.264	.013	C	GPS - STATIC	2023	HTH59
2169566.347	916739.065			871344.989	16946383.295	.131	3	GPS - RTRN	2022	RTRN2022
2169566.364	916738.974			871345.004	16946383.204	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
		X	Y	X	Y	Acc	Order		Year	Reference
2169566.375	916739.012			871345.016	16946383.242	.033	C	GPS - STATIC	2023	HTH59



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_D-DQ2044-3E-12OCT2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_D-DQ2044-2-12OCT2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_D-DQ2044-1-12OCT2022.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Oct 12, 2022
	Oct 12, 2022
	Oct 12, 2022



Mn/DOT Name: 5618 E

NGS Name: 5618 E

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096121/
USGS Quad: CORMORANT

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	36	137 N	43 W	463749.00	960308.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1964	2014	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1964) Stamping: 5618 E

2.5 MILES SOUTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 34 AND TRUNK HIGHWAY 59 AT DUNVILLA, 128.0 FEET RIGHT OF TRUNK HIGHWAY 59, AT TRUNK HIGHWAY 59 STATION 1360+56, NEAR THE JUNCTION OF TRUNK HIGHWAY 59 AND A TOWNSHIP ROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1347.169	.033	3				VERTICAL CONTROL SURVEY	1968 CS5618

Geoid Separations(ft): GEOID18 = -87.415 12B = -87.392 09 = -87.290 03 = -87.159

* No Horizontal Positions in the Database *



Mn/DOT Name: 5618 F

NGS Name: 5618 F

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2049](#) [Get Map](#)
NGS Quad / Sta Num : 46096121/
USGS Quad: CORMORANT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	36	137 N	43 W	463838.77	960247.94	2	C	1968	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (2014) Stamping: 5618 F 1968

2.0 MILES SOUTHWEST OF DUNVILLA, 1.35 MILES SOUTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 34 IN DUNVILLA, AT TRUNK HIGHWAY 59 MILEPOINT 246.25, 210.2 FEET SOUTH OF 470TH STREET, 98.0 FEET WEST OF TRUNK HIGHWAY 59, 1.0 FOOT EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1332.173	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1330.978	.033	3					VERTICAL CONTROL SURVEY	1968	CS5618

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1332.173				1244.788	.021	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1332.173	.131			1244.899	.066	1996	GPS - STATIC	2023	HTH59
1332.173				1244.788	.021	2011	GPS - STATIC	2023	HTH59
1332.192	.262			1244.817	.197	2011	GPS - RTRN	2022	RTRN2022
1332.255	.262			1244.879	.197	2011	GPS - RTRN	2022	RTRN2022
1331.851	.262			1244.499	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.375 12B = -87.352 09 = -87.247 03 = -87.116

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>				<u>Lat/Lon and County Coordinates (Feet)</u>				<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>							
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 38 38.77296	96 02 47.93913	417110.362	296284.788	.013		ADJUSTMENT	2024	GPS3672	
46 38 38.77296	96 02 47.93913	417110.362	296284.788	.013	C	GPS - STATIC	2023	HTH59	
46 38 38.77267	96 02 47.93872	417110.390	296284.758	.131	3	GPS - RTRN	2022	RTRN2022	
46 38 38.77277	96 02 47.93909	417110.364	296284.769	.131	3	GPS - RTRN	2022	RTRN2022	
46 38 38.77312	96 02 47.93916	417110.360	296284.804	.131	3	GPS - RTRN	2014	RTRN2014	

<u>NAD83(1996)</u>				<u>Lat/Lon and County Coordinates (Feet)</u>				<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>							
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 38 38.77274	96 02 47.93961	417110.328	296284.766	.033	C	GPS - STATIC	2023	HTH59	

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2173453.085	932733.329	875488.257	16962318.769	.013		ADJUSTMENT	2024	GPS3672
2173453.085	932733.329	875488.257	16962318.769	.013	C	GPS - STATIC	2023	HTH59
2173453.113	932733.299	875488.285	16962318.738	.131	3	GPS - RTRN	2022	RTRN2022
2173453.087	932733.309	875488.259	16962318.750	.131	3	GPS - RTRN	2022	RTRN2022
2173453.084	932733.345	875488.256	16962318.785	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2173453.051	932733.307	875488.223	16962318.748	.033	C	GPS - STATIC	2023	HTH59

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_F-DQ2049-3W-12OCT2022.jpg	W	Oct 12, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_F-DQ2049-2-12OCT2022.jpg		Oct 12, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_F-DQ2049-1-12OCT2022.jpg		Oct 12, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5618 G

NGS Name: 5618 G

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2059](#) [Get Map](#)
NGS Quad / Sta Num : 46095434/
USGS Quad: LAKE FRANKLIN

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	1	137 N	42 W	464219.23	955538.30	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 40 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014)

Stamping: 5618 G 2014

11.75 MILES NORTHEAST OF PELICAN RAPIDS, 13.0 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAYS 59 AND 108 WEST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 253.65, 46.0 FEET WEST-NORTHWEST OF TRUNK HIGHWAY 59, 1.5 FEET SOUTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Project Info		
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1352.235	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Project Info		
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1352.235			1265.083	.023	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1352.235	.131		1265.194	.066	1996	GPS - STATIC	2023	HTH59
1352.235			1265.083	.023	2011	GPS - STATIC	2023	HTH59
1352.314	.262		1265.155	.197	2011	GPS - RTRN	2022	RTRN2022
1352.297	.262		1265.135	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.159 12B = -87.162 09 = -87.041 03 = -86.896

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 42 19.23107	95 55 38.29877	447148.337	318518.038	.013		ADJUSTMENT	2024	GPS3672
46 42 19.23107	95 55 38.29877	447148.337	318518.038	.013	C	GPS - STATIC	2023	HTH59
46 42 19.23079	95 55 38.29855	447148.352	318518.010	.131	3	GPS - RTRN	2022	RTRN2022
46 42 19.23103	95 55 38.29896	447148.324	318518.034	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 42 19.23083	95 55 38.29928	447148.301	318518.014	.033	C	GPS - STATIC	2023	HTH59

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2203893.738	954404.046	906281.259	16983505.744	.013		ADJUSTMENT	2024	GPS3672
2203893.738	954404.046	906281.259	16983505.744	.013	C	GPS - STATIC	2023	HTH59
2203893.753	954404.017	906281.274	16983505.715	.131	3	GPS - RTRN	2022	RTRN2022
2203893.725	954404.042	906281.246	16983505.740	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2203893.702	954404.022	906281.223	16983505.721	.033	C	GPS - STATIC	2023	HTH59



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_G-DQ2059-3W-12OCT2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_G-DQ2059-2-12OCT2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_G-DQ2059-1-12OCT2022.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
W	Oct 12, 2022
	Oct 12, 2022
	Oct 12, 2022



Mn/DOT Name: 5618 H

NGS Name: 5618 H

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2058](#) [Get Map](#)
NGS Quad / Sta Num : 46095434/
USGS Quad: LAKE FRANKLIN

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	12	137 N	42 W	464132.18	955610.93	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 32 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) **Stamping:** 5618 H 2014

11.2 MILES NORTHEAST OF PELICAN RAPIDS, 12.0 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAYS 59 AND 108 WEST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 252.65, 59.1 FEET SOUTHEAST OF TRUNK HIGHWAY 59, 59.9 FEET NORTHEAST OF THE CORNER OF A BOX CULVERT, 1.5 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj		Year	Reference	
1394.745	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj		Year	Reference	
1394.745				1307.547	.022	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672	
1394.745	.131			1307.661	.066	1996	GPS - STATIC	2023	HTH59	
1394.745				1307.547	.022	2011	GPS - STATIC	2023	HTH59	
1394.807	.262			1307.629	.197	2011	GPS - RTRN	2022	RTRN2022	
1394.771	.262			1307.596	.197	2011	GPS - OPUS	2022	GPSBM	
1394.846	.262			1307.671	.197	2011	GPS - OPUS	2022	GPSBM	
1394.827	.262			1307.652	.197	2011	GPS - RTRN	2021	RTRN2021	
1394.781	.262			1307.606	.197	2011	GPS - RTRN	2014	RTRN2014	

Geoid Separations(ft): GEOID18 = -87.175 12B = -87.172 09 = -87.067 03 = -86.913

Lat/Lon and County Coordinates (Feet)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 41 32.18236	95 56 10.92990	444860.788	313757.460	.013		ADJUSTMENT	2024	GPS3672
46 41 32.18236	95 56 10.92990	444860.788	313757.460	.013	C	GPS - STATIC	2023	HTH59
46 41 32.18262	95 56 10.92922	444860.836	313757.486	.131	3	GPS - RTRN	2022	RTRN2022
46 41 32.18186	95 56 10.93042	444860.752	313757.410	.131	3	GPS - OPUS	2022	GPSBM
46 41 32.18190	95 56 10.93027	444860.762	313757.413	.131	3	GPS - OPUS	2022	GPSBM
46 41 32.18225	95 56 10.92986	444860.791	313757.449	.131	3	GPS - RTRN	2021	RTRN2021
46 41 32.18265	95 56 10.92989	444860.789	313757.489	.131	3	GPS - RTRN	2014	RTRN2014

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 41 32.18213	95 56 10.93041	444860.752	313757.437	.033	C	GPS - STATIC	2023	HTH59



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2201518.742	949687.210	903830.328	16978826.273	.013		ADJUSTMENT	2024	GPS3672
2201518.742	949687.210	903830.328	16978826.273	.013	C	GPS - STATIC	2023	HTH59
2201518.790	949687.235	903830.376	16978826.298	.131	3	GPS - RTRN	2022	RTRN2022
2201518.704	949687.160	903830.290	16978826.224	.131	3	GPS - OPUS	2022	GPSBM
2201518.715	949687.164	903830.301	16978826.228	.131	3	GPS - OPUS	2022	GPSBM
2201518.744	949687.199	903830.330	16978826.262	.131	3	GPS - RTRN	2021	RTRN2021
2201518.743	949687.239	903830.330	16978826.303	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2201518.706	949687.188	903830.292	16978826.251	.033	C	GPS - STATIC	2023	HTH59

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_H-DQ2058-3SE-12OCT2022.jpg	SE	Oct 12, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_H-DQ2058-2-12OCT2022.jpg		Oct 12, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_H-DQ2058-1-12OCT2022.jpg		Oct 12, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5618 J

NGS Name: 5618 J

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2054](#) [Get Map](#)
NGS Quad / Sta Num : 46095434/
USGS Quad: LAKE FRANKLIN

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	15	137 N	42 W	464022.93	955823.53	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 19 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: 5618 J 2014

8.7 MILES NORTHEAST OF PELICAN RAPIDS, 9.75 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAYS 59 AND 108 WEST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 250.4, 80.0 FEET NORTH-NORTHWEST OF TRUNK HIGHWAY 59, 24.5 FEET WEST-SOUTHWEST OF A FIELD ENTRANCE, 1.5 FEET SOUTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1374.948	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1374.948			1287.773	.022	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672	
1374.948	.131		1287.885	.066	1996	GPS - STATIC	2023	HTH59	
1374.948			1287.773	.022	2011	GPS - STATIC	2023	HTH59	
1374.938	.262		1287.691	.197	2011	GPS - RTRN	2022	RTRN2022	
1374.935	.262		1287.688	.197	2011	GPS - OPUS	2020	GPSBM	
1374.889	.262		1287.655	.197	2011	GPS - RTRN	2014	RTRN2014	

Geoid Separations(ft): GEOID18 = -87.247 12B = -87.231 09 = -87.132 03 = -86.988

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Lat/Lon</u>		<u>County Coordinates</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 40 22.93115	95 58 23.52800	435594.064	306769.104	.013		ADJUSTMENT	2024	GPS3672	
46 40 22.93115	95 58 23.52800	435594.064	306769.104	.013	C	GPS - STATIC	2023	HTH59	
46 40 22.93106	95 58 23.52886	435594.004	306769.095	.131	3	GPS - RTRN	2022	RTRN2022	
46 40 22.93140	95 58 23.52864	435594.020	306769.130	.131	3	GPS - OPUS	2020	GPSBM	
46 40 22.93136	95 58 23.52841	435594.035	306769.126	.131	3	GPS - RTRN	2014	RTRN2014	

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Lat/Lon</u>		<u>County Coordinates</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 40 22.93092	95 58 23.52850	435594.029	306769.081	.033	C	GPS - STATIC	2023	HTH59	

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>	
2192125.391	942872.438	894326.332	16972160.871	.013		ADJUSTMENT	2024	GPS3672	
2192125.391	942872.438	894326.332	16972160.871	.013	C	GPS - STATIC	2023	HTH59	
2192125.331	942872.431	894326.271	16972160.865	.131	3	GPS - RTRN	2022	RTRN2022	
2192125.347	942872.464	894326.288	16972160.898	.131	3	GPS - OPUS	2020	GPSBM	
2192125.363	942872.460	894326.304	16972160.894	.131	3	GPS - RTRN	2014	RTRN2014	

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>	
2192125.355	942872.416	894326.296	16972160.849	.033	C	GPS - STATIC	2023	HTH59	



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_J-DQ2054-3N-12OCT2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_J-DQ2054-2-12OCT2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_J-DQ2054-1-12OCT2022.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Oct 12, 2022
	Oct 12, 2022
	Oct 12, 2022



Mn/DOT Name: 5618 K

NGS Name: 5618 K

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2053](#) [Get Map](#)
NGS Quad / Sta Num : 46095434/
USGS Quad: LAKE FRANKLIN

		Reference		Reference	Vert	Horz
1/4	Sec	Twp	Rng	Latitude	Longitude	Order
NW	21	137 N	42 W	464011.88	955938.10	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 24 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014)

Stamping: 5618 K 2014

8.05 MILES NORTHEAST OF PELICAN RAPIDS, 8.75 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAYS 59 AND 108 WEST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 249.4, 74.3 FEET NORTHEAST OF A DRIVEWAY NUMBER 48728 EXTENDED, 68.8 FEET NORTHWEST OF TRUNK HIGHWAY 59, 22.6 FEET SOUTHEAST OF A DRIVEWAY NUMBER 48705/48711, 1.5 FEET SOUTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year
1332.583	.016	2/1				VERTICAL ADJUSTMENT	2019

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year
1332.583			1245.372	.020	2011	HORIZONTAL ADJUSTMENT	2024
1332.583	.131		1245.483	.066	1996	GPS - STATIC	2023
1332.583			1245.372	.020	2011	GPS - STATIC	2023
1332.629	.262		1245.352	.197	2011	GPS - RTRN	2022
1332.648	.262		1245.372	.197	2011	GPS - RTRN	2022
1332.612	.262		1245.335	.197	2011	GPS - OPUS	2022
1332.638	.262		1245.362	.197	2011	GPS - OPUS	2022
1332.691	.262		1245.417	.197	2011	GPS - RTRN	2021
1332.524	.262		1245.263	.197	2011	GPS - RTRN	2014

Geoid Separations(ft): GEOID18 = -87.277 12B = -87.264 09 = -87.155 03 = -87.014

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County		Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method
46 40 11.88089	95 59 38.09626	430389.843	305667.099	.013		ADJUSTMENT
46 40 11.88089	95 59 38.09626	430389.843	305667.099	.013	C	GPS - STATIC
46 40 11.88035	95 59 38.09647	430389.828	305667.044	.131	3	GPS - RTRN
46 40 11.88085	95 59 38.09637	430389.835	305667.095	.131	3	GPS - RTRN
46 40 11.88052	95 59 38.09623	430389.845	305667.062	.131	3	GPS - OPUS
46 40 11.88059	95 59 38.09666	430389.815	305667.069	.131	3	GPS - OPUS
46 40 11.88073	95 59 38.09619	430389.848	305667.083	.131	3	GPS - RTRN
46 40 11.88128	95 59 38.09685	430389.802	305667.139	.131	3	GPS - RTRN

NAD83(1996)		Otter Tail County		Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method
46 40 11.88066	95 59 38.09674	430389.809	305667.076	.033	C	GPS - STATIC

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2186902.305	941867.085	889086.245	16971238.981	.013		ADJUSTMENT	2024	GPS3672
2186902.305	941867.085	889086.245	16971238.981	.013	C	GPS - STATIC	2023	HTH59
2186902.290	941867.030	889086.229	16971238.927	.131	3	GPS - RTRN	2022	RTRN2022
2186902.298	941867.081	889086.238	16971238.977	.131	3	GPS - RTRN	2022	RTRN2022
2186902.307	941867.047	889086.246	16971238.943	.131	3	GPS - OPUS	2022	GPSBM
2186902.277	941867.055	889086.216	16971238.951	.131	3	GPS - OPUS	2022	GPSBM
2186902.310	941867.068	889086.250	16971238.964	.131	3	GPS - RTRN	2021	RTRN2021
2186902.265	941867.125	889086.206	16971239.022	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2186902.272	941867.062	889086.211	16971238.959	.033	C	GPS - STATIC	2023	HTH59

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_K-DQ2053-3NW-12OCT2022.jpg	NW	Oct 12, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_K-DQ2053-2-12OCT2022.jpg		Oct 12, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_K-DQ2053-1-12OCT2022.jpg		Oct 12, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5618 L

NGS Name: 5618 L

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2052](#) [Get Map](#)
NGS Quad / Sta Num : 46096121/
USGS Quad: CORMORANT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SE	20	137 N	42 W	463954.95	960028.82	2	C	2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 17 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: 5618 L 2014

7.3 MILES NORTHEAST OF PELICAN RAPIDS, 8.0 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAYS 59 AND 108 WEST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 248.6, 64.4 FEET SOUTHEAST OF TRUNK HIGHWAY 59, 31.1 FEET NORTHEAST OF A FIELD ENTRANCE, 1.5 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1371.372	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1371.372			1284.105	.021	2011	HORIZONTAL ADJUSTMENT	2024 GPS3672
1371.372	.131		1284.217	.066	1996	GPS - STATIC	2023 HTH59
1371.372			1284.105	.021	2011	GPS - STATIC	2023 HTH59
1371.421	.262		1284.125	.197	2011	GPS - RTRN	2022 RTRN2022
1371.474	.262		1284.177	.197	2011	GPS - RTRN	2022 RTRN2022
1371.405	.262		1284.108	.197	2011	GPS - OPUS	2022 GPSBM
1371.405	.262		1284.108	.197	2011	GPS - OPUS	2022 GPSBM
1371.464	.262		1284.167	.197	2011	GPS - RTRN	2021 RTRN2021
1371.342	.262		1284.059	.197	2011	GPS - RTRN	2014 RTRN2014

Geoid Separations(ft): GEOID18 = -87.296 12B = -87.283 09 = -87.172 03 = -87.034

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Year</u>	<u>Reference</u>
46 39 54.95065	96 00 28.82426	426845.621	303964.537	.013		2024	GPS3672
46 39 54.95065	96 00 28.82426	426845.621	303964.537	.013	C	2023	HTH59
46 39 54.95073	96 00 28.82458	426845.599	303964.546	.131	3	2022	RTRN2022
46 39 54.95016	96 00 28.82448	426845.606	303964.488	.131	3	2022	RTRN2022
46 39 54.95004	96 00 28.82480	426845.583	303964.476	.131	3	2022	GPSBM
46 39 54.95008	96 00 28.82455	426845.601	303964.480	.131	3	2022	GPSBM
46 39 54.95072	96 00 28.82428	426845.620	303964.545	.131	3	2021	RTRN2021
46 39 54.95048	96 00 28.82437	426845.613	303964.520	.131	3	2014	RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Year</u>	<u>Reference</u>
46 39 54.95042	96 00 28.82474	426845.588	303964.514	.033	C	2023	HTH59

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2183327.615	940230.626	885484.706	16969659.464	.013		ADJUSTMENT	2024	GPS3672
2183327.615	940230.626	885484.706	16969659.464	.013	C	GPS - STATIC	2023	HTH59
2183327.593	940230.634	885484.684	16969659.473	.131	3	GPS - RTRN	2022	RTRN2022
2183327.599	940230.576	885484.689	16969659.415	.131	3	GPS - RTRN	2022	RTRN2022
2183327.576	940230.565	885484.666	16969659.403	.131	3	GPS - OPUS	2022	GPSBM
2183327.594	940230.568	885484.683	16969659.407	.131	3	GPS - OPUS	2022	GPSBM
2183327.614	940230.633	885484.705	16969659.471	.131	3	GPS - RTRN	2021	RTRN2021
2183327.607	940230.609	885484.698	16969659.447	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2183327.581	940230.603	885484.672	16969659.442	.033	C	GPS - STATIC	2023	HTH59

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_L-DQ2052-3SE-12OCT2022.jpg	SE	Oct 12, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_L-DQ2052-2-12OCT2022.jpg		Oct 12, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_L-DQ2052-1-12OCT2022.jpg		Oct 12, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5618 M

NGS Name: 5618 M

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2048](#) [Get Map](#)
NGS Quad / Sta Num : 46096121/
USGS Quad: CORMORANT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	2	136 N	43 W	463748.71	960311.77	2	C	2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 37 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: 5618 M 2014

4.2 MILES NORTH OF PELICAN RAPIDS, 4.6 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAYS 59 AND 108 WEST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 245.2, 92.9 FEET WEST OF TRUNK HIGHWAY 59, 43.0 FEET NORTH OF 460TH STREET, 1.5 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1348.573	.016	2/1				VERTICAL ADJUSTMENT		2019	00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1348.573			1261.221	.018	2011	HORIZONTAL ADJUSTMENT		2024	GPS3672
1348.573	.131		1261.329	.066	1996	GPS - STATIC		2023	HTH59
1348.573			1261.221	.018	2011	GPS - STATIC		2023	HTH59
1348.544	.262		1261.129	.197	2011	GPS - RTRN		2022	RTRN2022
1348.491	.262		1261.077	.197	2011	GPS - RTRN		2022	RTRN2022
1348.514	.262		1261.100	.197	2011	GPS - OPUS		2022	GPSBM
1348.619	.262		1261.205	.197	2011	GPS - OPUS		2022	GPSBM
1348.606	.262		1261.192	.197	2011	GPS - RTRN		2021	RTRN2021
1348.564	.262		1261.172	.197	2011	GPS - RTRN		2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.415 12B = -87.392 09 = -87.293 03 = -87.159

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>		<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>					<u>Year</u>	<u>Reference</u>
46 37 48.71240	96 03 11.77419	415425.673	291219.989	.010					ADJUSTMENT	2024	GPS3672
46 37 48.71240	96 03 11.77419	415425.673	291219.989	.010			C		GPS - STATIC	2023	HTH59
46 37 48.71226	96 03 11.77369	415425.708	291219.974	.131		3			GPS - RTRN	2022	RTRN2022
46 37 48.71204	96 03 11.77424	415425.669	291219.952	.131		3			GPS - RTRN	2022	RTRN2022
46 37 48.71186	96 03 11.77477	415425.632	291219.934	.131		3			GPS - OPUS	2022	GPSBM
46 37 48.71204	96 03 11.77452	415425.649	291219.952	.131		3			GPS - OPUS	2022	GPSBM
46 37 48.71191	96 03 11.77363	415425.712	291219.939	.131		3			GPS - RTRN	2021	RTRN2021
46 37 48.71226	96 03 11.77402	415425.685	291219.974	.131		3			GPS - RTRN	2014	RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>		<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>					<u>Year</u>	<u>Reference</u>
46 37 48.71217	96 03 11.77467	415425.639	291219.965	.033		C			GPS - STATIC	2023	HTH59

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2171675.153	927701.207	873629.459	16957314.052	.010		ADJUSTMENT	2024	GPS3672
2171675.153	927701.207	873629.459	16957314.052	.010	C	GPS - STATIC	2023	HTH59
2171675.188	927701.192	873629.493	16957314.036	.131	3	GPS - RTRN	2022	RTRN2022
2171675.149	927701.170	873629.454	16957314.015	.131	3	GPS - RTRN	2022	RTRN2022
2171675.111	927701.153	873629.416	16957313.999	.131	3	GPS - OPUS	2022	GPSBM
2171675.129	927701.171	873629.434	16957314.016	.131	3	GPS - OPUS	2022	GPSBM
2171675.191	927701.156	873629.496	16957314.001	.131	3	GPS - RTRN	2021	RTRN2021
2171675.165	927701.192	873629.470	16957314.037	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2171675.119	927701.184	873629.424	16957314.030	.033	C	GPS - STATIC	2023	HTH59

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_M-DQ2048-3W-12OCT2022.jpg	W	Oct 12, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_M-DQ2048-2-12OCT2022.jpg		Oct 12, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_M-DQ2048-1-12OCT2022.jpg		Oct 12, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5618 N

NGS Name: 5618 N

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	14	136 N	43 W	463552.13	960345.96	2	C

NGS ACRN: [DQ2043](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 23 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014)

Stamping: 5618 N 2014

2.05 MILES NORTH OF PELICAN RAPIDS, 2.25 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAYS 59 AND 108 WEST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 242.85, 78.8 FEET WEST OF TRUNK HIGHWAY 59, 70.6 FEET SOUTH OF PERCHERON LOOP, 1.5 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1351.808	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1351.808			1264.292	.021	2011	HORIZONTAL ADJUSTMENT	2024 GPS3672
1351.808	.131		1264.400	.066	1996	GPS - STATIC	2023 HTH59
1351.808			1264.292	.021	2011	GPS - STATIC	2023 HTH59
1351.861	.262		1264.354	.197	2011	GPS - RTRN	2022 RTRN2022
1351.835	.262		1264.331	.197	2011	GPS - OPUS	2022 GPSBM
1351.812	.262		1264.308	.197	2011	GPS - OPUS	2022 GPSBM
1351.861	.262		1264.354	.197	2011	GPS - RTRN	2021 RTRN2021
1351.772	.262		1264.279	.197	2011	GPS - RTRN	2014 RTRN2014

Geoid Separations(ft): GEOID18 = -87.503 12B = -87.493 09 = -87.378 03 = -87.241

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 35 52.12563	96 03 45.96196	412987.909	279418.551	.013		ADJUSTMENT	2024	GPS3672
46 35 52.12563	96 03 45.96196	412987.909	279418.551	.013	C	GPS - STATIC	2023	HTH59
46 35 52.12615	96 03 45.96140	412987.948	279418.604	.131	3	GPS - RTRN	2022	RTRN2022
46 35 52.12529	96 03 45.96250	412987.871	279418.517	.131	3	GPS - OPUS	2022	GPSBM
46 35 52.12547	96 03 45.96242	412987.877	279418.535	.131	3	GPS - OPUS	2022	GPSBM
46 35 52.12560	96 03 45.96187	412987.915	279418.548	.131	3	GPS - RTRN	2021	RTRN2021
46 35 52.12584	96 03 45.96149	412987.942	279418.572	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 35 52.12541	96 03 45.96244	412987.875	279418.529	.033	C	GPS - STATIC	2023	HTH59



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2169019.688	915948.381	870785.582	16945601.173	.013		ADJUSTMENT	2024	GPS3672
2169019.688	915948.381	870785.582	16945601.173	.013	C	GPS - STATIC	2023	HTH59
2169019.728	915948.433	870785.623	16945601.224	.131	3	GPS - RTRN	2022	RTRN2022
2169019.649	915948.347	870785.543	16945601.140	.131	3	GPS - OPUS	2022	GPSBM
2169019.655	915948.366	870785.549	16945601.158	.131	3	GPS - OPUS	2022	GPSBM
2169019.694	915948.378	870785.588	16945601.169	.131	3	GPS - RTRN	2021	RTRN2021
2169019.721	915948.401	870785.615	16945601.193	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2169019.654	915948.359	870785.547	16945601.152	.033	C	GPS - STATIC	2023	HTH59

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_N-DQ2043-3W-12OCT2022.jpg	W	Oct 12, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_N-DQ2043-2-12OCT2022.jpg		Oct 12, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_N-DQ2043-1-12OCT2022.jpg		Oct 12, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5618 P

NGS Name: 5618 P

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2041](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	14	136 N	43 W	463514.03	960419.53	2	C	2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 24 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: 5618 P 2014

1.2 MILES NORTH OF PELICAN RAPIDS, 1.35 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAYS 59 AND 108 WEST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 241.9, 62.5 FEET NORTHWEST OF TRUNK HIGHWAY 59, 11.0 FEET NORTHEAST OF THE NORTH LEG OF THE PRAIRIE LAKE PUBLIC WATER ACCESS SIGN, 1.0 FOOT NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1319.243	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1319.243			1231.802	.021	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1319.243	.131		1231.914	.066	1996	GPS - STATIC	2023	HTH59
1319.243			1231.802	.021	2011	GPS - STATIC	2023	HTH59
1319.344	.262		1231.809	.197	2011	GPS - RTRN	2023	RTRN2023
1319.292	.262		1231.756	.197	2011	GPS - RTRN	2022	RTRN2022
1319.269	.262		1231.740	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.536 12B = -87.529 09 = -87.411 03 = -87.273

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>								
Geodetic Position		Otter Tail County				Project Info		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 35 14.03035	96 04 19.52936	410626.393	275569.428	.013		ADJUSTMENT	2024	GPS3672
46 35 14.03035	96 04 19.52936	410626.393	275569.428	.013	C	GPS - STATIC	2023	HTH59
46 35 14.03024	96 04 19.52996	410626.351	275569.417	.131	3	GPS - RTRN	2023	RTRN2023
46 35 14.03017	96 04 19.52906	410626.414	275569.409	.131	3	GPS - RTRN	2022	RTRN2022
46 35 14.03045	96 04 19.52916	410626.407	275569.438	.131	3	GPS - RTRN	2014	RTRN2014

<u>NAD83(1996)</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 35 14.03012	96 04 19.52987	410626.357	275569.405	.033	C	GPS - STATIC	2023	HTH59

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>								
MN State Plane - Central Zone		UTM - Zone 15				Project Info		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2166587.633	912144.106	868292.238	16941834.905	.013		ADJUSTMENT	2024	GPS3672
2166587.633	912144.106	868292.238	16941834.905	.013	C	GPS - STATIC	2023	HTH59
2166587.591	912144.096	868292.196	16941834.895	.131	3	GPS - RTRN	2023	RTRN2023
2166587.653	912144.087	868292.258	16941834.886	.131	3	GPS - RTRN	2022	RTRN2022
2166587.647	912144.116	868292.253	16941834.914	.131	3	GPS - RTRN	2014	RTRN2014

<u>NAD83(1996)</u>									
MN State Plane - Central Zone		UTM - Zone 15						Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
2166587.597	912144.083	868292.202	16941834.883	.033	C	GPS - STATIC	2023	HTH59	



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_P-DQ2041-3NW-31JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_P-DQ2041-2-31JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5618_P-DQ2041-1-31JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
NW	Jul 31, 2023
	Jul 31, 2023
	Jul 31, 2023



Mn/DOT Name: 5619 A

NGS Name: 5619 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DK7861](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
NW	10	132 N	40 W	461538.00	954227.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2005	2009	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	SURVEY DISK	MNDT

Description: (2005)

Stamping: 5619 A 2005

0.5 MILE SOUTH OF BATTLE LAKE, 1.0 MILE SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 20.55, 235.0 FEET NORTH OF 205TH STREET, 40.0 FEET EAST OF TRUNK HIGHWAY 78, 12.0 FEET SOUTH OF AN ENTRANCE, 2.6 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1361.654	.016	2/1				VERTICAL ADJUSTMENT	2009	00000591
1361.654	.016	2/1				VERTICAL CONTROL SURVEY	2006	VPEAK

Geoid Separations(ft): GEOID18 = -87.460 12B = -87.470 09 = -87.362 03 = -87.283

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_A-DK7861-3E-05DEC2005.jpg	E	Dec 5, 2005
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_A-DK7861-2-05DEC2005.jpg		Dec 5, 2005
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_A-DK7861-1-05DEC2005.jpg		Dec 5, 2005

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5619 A RESET

NGS Name: 5619 A RESET

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	10	132 N	40 W	461539.69	954231.25	2	C

NGS ACRN: [DQ7768](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2009	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2010)

Stamping: 5619 A RESET 2009

1.5 MILES SOUTH OF BATTLE LAKE, 1.0 MILE SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 20.55, 40.0 FEET EAST OF TRUNK HIGHWAY 78, 235.0 FEET NORTH OF 205TH STREET, 12.0 FEET SOUTH OF A FIELD ENTRANCE, 2.6 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1361.441	.016	2/1				VERTICAL ADJUSTMENT	2013 00000792
1361.444	.016	2/1				VERTICAL CONTROL SURVEY	2012 VASHB

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1361.441			1273.948	.013	2011	HORIZONTAL ADJUSTMENT	2024 GPS3771
1361.441	.131		1274.059	.066	1996	GPS - STATIC	2024 HTH78B
1361.441			1273.948	.013	2011	GPS - STATIC	2024 HTH78B
1361.431	.262		1273.964	.197	2011	GPS - RTRN	2023 RTRN2023
1361.277	.262		1273.803	.197	2011	GPS - RTRN	2015 RTRN2015
1361.277	.262		1273.803	.197	2011	GPS - RTRN	2015 RTRN2015
1361.172	.262		1273.882	.197	1996	GPS - RTRN	2009 RTRN2009

Geoid Separations(ft): GEOID18 = -87.467 12B = -87.474 09 = -87.365 03 = -87.287

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 15 39.69060	95 42 31.25367	502019.914	156396.423	.010		ADJUSTMENT	2024 GPS3771
46 15 39.69060	95 42 31.25367	502019.914	156396.423	.010	C	GPS - STATIC	2024 HTH78B
46 15 39.68973	95 42 31.25400	502019.891	156396.335	.131	3	GPS - RTRN	2023 RTRN2023
46 15 39.69017	95 42 31.25336	502019.936	156396.380	.131	3	GPS - RTRN	2015 RTRN2015
46 15 39.69017	95 42 31.25336	502019.936	156396.380	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 15 39.69047	95 42 31.25396	502019.894	156396.410	.033	C	GPS - STATIC	2024 HTH78B
46 15 39.69062	95 42 31.25514	502019.811	156396.425	.131	3	GPS - RTRN	2009 RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255747.656	791315.165	955550.251	16819573.247	.010		ADJUSTMENT	2024	GPS3771
2255747.656	791315.165	955550.251	16819573.247	.010	C	GPS - STATIC	2024	HTH78B
2255747.631	791315.078	955550.225	16819573.159	.131	3	GPS - RTRN	2023	RTRN2023
2255747.677	791315.121	955550.271	16819573.202	.131	3	GPS - RTRN	2015	RTRN2015
2255747.677	791315.121	955550.271	16819573.202	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255747.635	791315.153	955550.230	16819573.234	.033	C	GPS - STATIC	2024	HTH78B
2255747.553	791315.169	955550.148	16819573.252	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_A_RESET-DO7768-3E-16OCT2023.jpg	E	Oct 16, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_A_RESET-DO7768-2-16OCT2023.jpg		Oct 16, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_A_RESET-DO7768-1-16OCT2023.jpg		Oct 16, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5619 B

NGS Name: 5619 B

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DK7862](#) [Get Map](#)
NGS Quad / Sta Num : 46095324/
USGS Quad: EAGLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	16	132 N	40 W	461447.00	954232.00	2		2005	2009	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	SURVEY DISK	MNDT

Description: (2005)

Stamping: 5619 B 2005

1.5 MILES SOUTH OF BATTLE LAKE, 2.0 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 19.55, 73.0 FEET WEST OF TRUNK HIGHWAY 78, 13.0 FEET SOUTH OF A FIELD ENTRANCE, 2.8 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1339.184	.016	2/1				VERTICAL ADJUSTMENT	2009	00000591
1339.180	.016	2/1				VERTICAL CONTROL SURVEY	2006	VPEAK

Geoid Separations(ft): GEOID18 = -87.388 12B = -87.398 09 = -87.290 03 = -87.214

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_B-DK7862-3SW-05DEC2005.jpg	SW	Dec 5, 2005
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_B-DK7862-2-05DEC2005.jpg		Dec 5, 2005
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_B-DK7862-1-05DEC2005.jpg		Dec 5, 2005

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5619 B RESET

NGS Name: 5619 B RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7769](#)
NGS Quad / Sta Num : 46095324/
USGS Quad: EAGLE LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	16	132 N	40 W	461447.43	954232.54	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2009	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009)

Stamping: 5619 B RESET 2009

1.5 MILES SOUTH OF BATTLE LAKE, 2.0 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 19.55, 73.0 FEET WEST OF TRUNK HIGHWAY 78, 13.0 FEET SOUTH OF A FIELD ENTRANCE, 2.8 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1338.977	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1338.977	.016	2/1				VERTICAL CONTROL SURVEY	2012	VASHB

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1338.977			1251.572	.013	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1338.977	.131		1251.684	.066	1996	GPS - STATIC	2024	HTH78B
1338.977			1251.572	.013	2011	GPS - STATIC	2024	HTH78B
1338.980	.262		1251.592	.197	2011	GPS - RTRN	2023	RTRN2023
1338.885	.262		1251.671	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.388 12B = -87.401 09 = -87.290 03 = -87.214

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 14 47.43117	95 42 32.54137	501929.942	151102.158	.010		ADJUSTMENT	2024	GPS3771
46 14 47.43117	95 42 32.54137	501929.942	151102.158	.010	C	GPS - STATIC	2024	HTH78B
46 14 47.43039	95 42 32.54142	501929.939	151102.079	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 14 47.43104	95 42 32.54166	501929.922	151102.145	.033	C	GPS - STATIC	2024	HTH78B
46 14 47.43213	95 42 32.54392	501929.763	151102.256	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2255559.693	786024.182	955278.935	16814284.753	.010		ADJUSTMENT	2024	GPS3771
2255559.693	786024.182	955278.935	16814284.753	.010	C	GPS - STATIC	2024	HTH78B
2255559.688	786024.102	955278.929	16814284.674	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2255559.673	786024.169	955278.914	16814284.740	.033	C	GPS - STATIC	2024	HTH78B
2255559.516	786024.282	955278.759	16814284.856	.131	3	GPS - RTRN	2009	RTRN2009



<u>Station Photos</u>			
<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_B_RESET-DO7769-3W-16OCT2023.jpg	W	Oct 16, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_B_RESET-DO7769-2-16OCT2023.jpg		Oct 16, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_B_RESET-DO7769-1-16OCT2023.jpg		Oct 16, 2023
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: 5619 C

NGS Name: 5619 C

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DK7863](#) [Get Map](#)
NGS Quad / Sta Num : 46095324/
USGS Quad: EAGLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	21	132 N	40 W	461359.10	954231.43	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2005	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	SURVEY DISK	MNDT

Description: (2005) Stamping: 5619 C 2005

2.5 MILES SOUTH OF BATTLE LAKE, 3.0 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 18.5, 60.0 FEET WEST OF TRUNK HIGHWAY 78, 21.0 FEET NORTH OF A FIELD ENTRANCE, 2.9 FEET SOUTH OF A WITNESS POST.

Station Pair: FISKE - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1360.886	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792	
1360.886	.016	2/1				VERTICAL CONTROL SURVEY	2012	VASHB	
1360.886	.016	2/1				VERTICAL ADJUSTMENT	2009	00000591	
1360.883	.016	2/1				VERTICAL CONTROL SURVEY	2006	VPEAK	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1360.886			1273.515	.012	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771	
1360.886	.131		1273.626	.066	1996	GPS - STATIC	2024	HTH78B	
1360.886			1273.515	.012	2011	GPS - STATIC	2024	HTH78B	
1360.804	.262		1273.495	.197	2011	GPS - RTRN	2023	RTRN2023	
1360.867	.262		1273.557	.197	2011	GPS - OPUS	2020	GPSBM	
1360.781	.262		1273.472	.197	2011	GPS - OPUS	2020	GPSBM	
1360.696	.262		1273.547	.197	1996	GPS - RTRN	2009	RTRN2009	

Geoid Separations(ft): GEOID18 = -87.310 12B = -87.326 09 = -87.218 03 = -87.149

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Latitude</u>		<u>Longitude</u>		<u>Otter Tail County</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
46 13 59.09720	95 42 31.43372	502008.285	146205.596	.010		ADJUSTMENT	2024	GPS3771								
46 13 59.09720	95 42 31.43372	502008.285	146205.596	.010	C	GPS - STATIC	2024	HTH78B								
46 13 59.09679	95 42 31.43309	502008.330	146205.554	.131	3	GPS - RTRN	2023	RTRN2023								
46 13 59.09678	95 42 31.43408	502008.260	146205.553	.131	3	GPS - OPUS	2020	GPSBM								
46 13 59.09718	95 42 31.43394	502008.270	146205.594	.131	3	GPS - OPUS	2020	GPSBM								

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Latitude</u>		<u>Longitude</u>		<u>Otter Tail County</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
46 13 59.09707	95 42 31.43402	502008.264	146205.583	.033	C	GPS - STATIC	2024	HTH78B								
46 13 59.09727	95 42 31.43574	502008.143	146205.603	.131	3	GPS - RTRN	2009	RTRN2009								



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255547.357	781127.664	955189.514	16809387.994	.010		ADJUSTMENT	2024	GPS3771
2255547.357	781127.664	955189.514	16809387.994	.010	C	GPS - STATIC	2024	HTH78B
2255547.401	781127.622	955189.557	16809387.951	.131	3	GPS - RTRN	2023	RTRN2023
2255547.331	781127.622	955189.487	16809387.953	.131	3	GPS - OPUS	2020	GPSBM
2255547.342	781127.662	955189.498	16809387.993	.131	3	GPS - OPUS	2020	GPSBM

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255547.336	781127.651	955189.493	16809387.982	.033	C	GPS - STATIC	2024	HTH78B
2255547.216	781127.674	955189.372	16809388.006	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_C-DK7863-3W-16OCT2023.jpg	W	Oct 16, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_C-DK7863-2-16OCT2023.jpg		Oct 16, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_C-DK7863-1-16OCT2023.jpg		Oct 16, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5619 D

NGS Name: 5619 D

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DK7864 NGS Quad / Sta Num : 46095324/ USGS Quad: EAGLE LAKE Get Map
NW	27	132 N	40 W	461307.63	954229.16	2	C	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2005	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	SURVEY DISK	MNDT

Description: (2005)

Stamping: 5619 D 2005

3.5 MILES SOUTH OF BATTLE LAKE, 4.0 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 17.65, 45.0 FEET EAST OF TRUNK HIGHWAY 78, 29.0 FEET SOUTH OF A FIELD ENTRANCE, 2.7 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1352.153	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1352.153	.016	2/1				VERTICAL CONTROL SURVEY	2012	VASHB
1352.153	.016	2/1				VERTICAL ADJUSTMENT	2009	00000591
1352.146	.016	2/1				VERTICAL CONTROL SURVEY	2006	VPEAK

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1352.153			1264.873	.012	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1352.153	.131		1264.984	.066	1996	GPS - STATIC	2024	HTH78B
1352.153			1264.873	.012	2011	GPS - STATIC	2024	HTH78B
1352.146	.262		1264.912	.197	2011	GPS - RTRN	2023	RTRN2023
1351.926	.262		1264.847	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.234 12B = -87.250 09 = -87.142 03 = -87.080

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u> <u>Order</u> <u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 13 07.62920	95 42 29.15838	502168.812	140991.552	.007		ADJUSTMENT	2024	GPS3771
46 13 07.62920	95 42 29.15838	502168.812	140991.552	.007	C	GPS - STATIC	2024	HTH78B
46 13 07.62923	95 42 29.15945	502168.737	140991.555	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u> <u>Order</u> <u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 13 07.62907	95 42 29.15868	502168.791	140991.539	.033	C	GPS - STATIC	2024	HTH78B
46 13 07.62936	95 42 29.15864	502168.794	140991.568	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u> <u>Order</u> <u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255611.303	775912.242	955171.402	16804171.104	.007		ADJUSTMENT	2024	GPS3771
2255611.303	775912.242	955171.402	16804171.104	.007	C	GPS - STATIC	2024	HTH78B
2255611.228	775912.247	955171.327	16804171.109	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u> <u>Order</u> <u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255611.281	775912.229	955171.380	16804171.091	.033	C	GPS - STATIC	2024	HTH78B
2255611.285	775912.259	955171.384	16804171.121	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_D-DK7864-3E-16OCT2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_D-DK7864-2-16OCT2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_D-DK7864-1-16OCT2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Oct 16, 2023
	Oct 16, 2023
	Oct 16, 2023



Mn/DOT Name: 5619 E

NGS Name: 5619 E

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DK7865](#) [Get Map](#)
NGS Quad / Sta Num : 46095324/
USGS Quad: EAGLE LAKE

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
NE	33	132 N	40 W	461220.00	954230.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2005	2009	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	SURVEY DISK	MNDT

Description: (2005)

Stamping: 5619 E 2005

4.4 MILES SOUTH OF BATTLE LAKE, 4.9 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 16.7, 57.0 FEET WEST OF TRUNK HIGHWAY 78, 29.0 FEET NORTH OF A FIELD ENTRANCE, 2.3 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1377.635	.016	2/1				VERTICAL ADJUSTMENT	2009	00000591
1377.628	.016	2/1				VERTICAL CONTROL SURVEY	2006	VPEAK

Geoid Separations(ft): GEOID18 = -87.172 12B = -87.188 09 = -87.080 03 = -87.024

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_E-DK7865-3W-05DEC2005.jpg	W	Dec 5, 2005
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_E-DK7865-2-05DEC2005.jpg		Dec 5, 2005
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_E-DK7865-1-05DEC2005.jpg		Dec 5, 2005

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5619 E RESET

NGS Name: 5619 E RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7770](#)
NGS Quad / Sta Num : 46095324/
USGS Quad: EAGLE LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	33	132 N	40 W	461220.63	954229.94	2	C	2009	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2010)

Stamping: 5619 E RESET 2009

4.4 MILES SOUTH OF BATTLE LAKE, 4.9 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 16.7, 57.0 FEET WEST OF TRUNK HIGHWAY 78, 29.0 FEET NORTH OF A FIELD ENTRANCE, 2.3 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1377.386	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1377.386	.016	2/1				VERTICAL CONTROL SURVEY	2012	VASHB

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1377.386			1290.184	.012	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1377.386	.131		1290.299	.066	1996	GPS - STATIC	2024	HTH78B
1377.386			1290.184	.012	2011	GPS - STATIC	2024	HTH78B
1377.323	.262		1290.148	.197	2011	GPS - RTRN	2023	RTRN2023
1377.199	.262		1290.175	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.175 12B = -87.188 09 = -87.080 03 = -87.024

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>								
<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>				
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 12 20.63466	95 42 29.93922	502114.406	136230.685	.010		ADJUSTMENT	2024	GPS3771
46 12 20.63466	95 42 29.93922	502114.406	136230.685	.010	C	GPS - STATIC	2024	HTH78B
46 12 20.63408	95 42 29.93925	502114.404	136230.626	.131	3	GPS - RTRN	2023	RTRN2023

<u>NAD83(1996)</u>							<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>						
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 12 20.63454	95 42 29.93951	502114.385	136230.672	.033	C	GPS - STATIC	2024	HTH78B
46 12 20.63467	95 42 29.93971	502114.371	136230.686	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>								
MN State Plane - Central Zone		UTM - Zone 15				Project Info		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2255468.770	771153.840	954954.021	16799414.522	.010		ADJUSTMENT	2024	GPS3771
2255468.770	771153.840	954954.021	16799414.522	.010	C	GPS - STATIC	2024	HTH78B
2255468.767	771153.781	954954.017	16799414.463	.131	3	GPS - RTRN	2023	RTRN2023

<u>NAD83(1996)</u>								
MN State Plane - Central Zone		UTM - Zone 15				Project Info		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2255468.749	771153.828	954954.001	16799414.510	.033	C	GPS - STATIC	2024	HTH78B
2255468.735	771153.842	954953.987	16799414.524	.131	3	GPS - RTRN	2009	RTRN2009



<u>Station Photos</u>		<u>Dir</u>	<u>Date</u>
<u>Type</u>	<u>File Name</u>		
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_E_RESET-DO7770-3W-16OCT2023.jpg	W	Oct 16, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_E_RESET-DO7770-2-16OCT2023.jpg		Oct 16, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_E_RESET-DO7770-1-16OCT2023.jpg		Oct 16, 2023
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: 5619 F

NGS Name: 5619 F

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DK7866](#)
NGS Quad / Sta Num : 46095324/
USGS Quad: EAGLE LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	33	132 N	40 W	461142.01	954229.81	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2005	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	SURVEY DISK	MNDT

Description: (2005) **Stamping:** 5619 F 2005

5.0 MILES SOUTH OF BATTLE LAKE, 5.5 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 15.97, 145.0 FEET NORTH OF 160TH STREET, 71.0 FEET WEST OF TRUNK HIGHWAY 78, 5.0 FEET EAST OF A RIGHT-OF-WAY POST, 1.5 FEET EAST OF A WITNESS POST.

Station Pair: TORG - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1365.919	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1365.919	.016	2/1				VERTICAL CONTROL SURVEY	2012	VASHB
1365.919	.016	2/1				VERTICAL ADJUSTMENT	2009	00000591
1365.909	.016	2/1				VERTICAL CONTROL SURVEY	2006	VPEAK

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1365.919			1278.744	.012	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1365.919	.131		1278.856	.066	1996	GPS - STATIC	2024	HTH78B
1365.919			1278.744	.012	2011	GPS - STATIC	2024	HTH78B
1365.840	.262		1278.715	.197	2011	GPS - RTRN	2023	RTRN2023
1365.824	.262		1278.695	.197	2011	GPS - OPUS	2022	GPSBM
1365.772	.262		1278.642	.197	2011	GPS - OPUS	2022	GPSBM
1365.903	.262		1278.774	.197	2011	GPS - RTRN	2021	RTRN2021
1365.916	.262		1278.928	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.129 12B = -87.142 09 = -87.034 03 = -86.988

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 42.00548	95 42 29.80762	502124.077	132317.297	.010		ADJUSTMENT	2024	GPS3771
46 11 42.00548	95 42 29.80762	502124.077	132317.297	.010	C	GPS - STATIC	2024	HTH78B
46 11 42.00453	95 42 29.80759	502124.079	132317.200	.131	3	GPS - RTRN	2023	RTRN2023
46 11 42.00468	95 42 29.80786	502124.060	132317.216	.131	3	GPS - OPUS	2022	GPSBM
46 11 42.00515	95 42 29.80768	502124.073	132317.263	.131	3	GPS - OPUS	2022	GPSBM
46 11 42.00507	95 42 29.80791	502124.056	132317.255	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 42.00535	95 42 29.80791	502124.056	132317.283	.033	C	GPS - STATIC	2024	HTH78B
46 11 42.00565	95 42 29.80989	502123.917	132317.314	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2255405.986	767241.472	954829.729	16795502.795	.010		ADJUSTMENT	2024	GPS3771
2255405.986	767241.472	954829.729	16795502.795	.010	C	GPS - STATIC	2024	HTH78B
2255405.986	767241.376	954829.728	16795502.699	.131	3	GPS - RTRN	2023	RTRN2023
2255405.968	767241.391	954829.709	16795502.714	.131	3	GPS - OPUS	2022	GPSBM
2255405.981	767241.439	954829.724	16795502.762	.131	3	GPS - OPUS	2022	GPSBM
2255405.965	767241.431	954829.707	16795502.754	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2255405.965	767241.459	954829.708	16795502.782	.033	C	GPS - STATIC	2024	HTH78B
2255405.826	767241.492	954829.570	16795502.817	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_F-DK7866-3W-16OCT2023.jpg	W	Oct 16, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_F-DK7866-2-16OCT2023.jpg		Oct 16, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_F-DK7866-1-16OCT2023.jpg		Oct 16, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5619 G

NGS Name: 5619 G

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DK7867 NGS Quad / Sta Num : 46095324/ USGS Quad: EAGLE LAKE	Get Map
NW	10	131 N	40 W	461046.77	954228.89	2	C		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2005	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	SURVEY DISK	MNDT

Description: (2005)

Stamping: 5619 G 2005

6.5 MILES SOUTH OF BATTLE LAKE, 6.5 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 14.95, 52.0 FEET EAST OF TRUNK HIGHWAY 78, 16.0 FEET SOUTH OF EXTENDED COUNTY ROAD 12, 1.0 FOOT WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1389.472	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1389.472	.016	2/1				VERTICAL CONTROL SURVEY	2012	VASHB
1389.472	.016	2/1				VERTICAL ADJUSTMENT	2009	00000591
1389.462	.016	2/1				VERTICAL CONTROL SURVEY	2006	VPEAK

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1389.472			1302.333	.013	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1389.472	.131		1302.445	.066	1996	GPS - STATIC	2024	HTH78B
1389.472			1302.333	.013	2011	GPS - STATIC	2024	HTH78B
1389.403	.262		1302.327	.197	2011	GPS - RTRN	2023	RTRN2023
1389.594	.262		1302.648	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.077 12B = -87.083 09 = -86.981 03 = -86.949

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 10 46.76911	95 42 28.88539	502189.568	126721.505	.010		ADJUSTMENT	2024	GPS3771
46 10 46.76911	95 42 28.88539	502189.568	126721.505	.010	C	GPS - STATIC	2024	HTH78B
46 10 46.76889	95 42 28.88609	502189.519	126721.483	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 10 46.76898	95 42 28.88569	502189.547	126721.492	.033	C	GPS - STATIC	2024	HTH78B
46 10 46.76963	95 42 28.88648	502189.492	126721.558	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255367.857	761646.184	954703.680	16789907.613	.010		ADJUSTMENT	2024	GPS3771
2255367.857	761646.184	954703.680	16789907.613	.010	C	GPS - STATIC	2024	HTH78B
2255367.807	761646.163	954703.630	16789907.593	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255367.836	761646.172	954703.658	16789907.601	.033	C	GPS - STATIC	2024	HTH78B
2255367.781	761646.239	954703.605	16789907.668	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_G-DK7867-3E-16OCT2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_G-DK7867-2-16OCT2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_G-DK7867-1-16OCT2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Oct 16, 2023
	Oct 16, 2023
	Oct 16, 2023



Mn/DOT Name: 5619 H

NGS Name: 5619 H

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DK7868](#) [Get Map](#)
NGS Quad / Sta Num : 46095324/
USGS Quad: EAGLE LAKE

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
NW	15	131 N	40 W	460957.00	954230.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2005	2009	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2005)

Stamping: 5619 H 2005

7.0 MILES SOUTH OF BATTLE LAKE, 7.5 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 14.0, 25.0 FEET WEST OF NORTHBOUND TRUNK HIGHWAY 78, 20.0 FEET EAST OF SOUTHBOUND TRUNK HIGHWAY 78, 2.2 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1400.404	.016	2/1				VERTICAL ADJUSTMENT	2009	00000591	
1400.391	.016	2/1				VERTICAL CONTROL SURVEY	2006	VPEAK	

Geoid Separations(ft): GEOID18 = -87.044 12B = -87.044 09 = -86.945 03 = -86.919

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_H-DK7868-3S-05DEC2005.jpg	S	Dec 5, 2005
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_H-DK7868-2-05DEC2005.jpg		Dec 5, 2005
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_H-DK7868-1-05DEC2005.jpg		Dec 5, 2005

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5619 H RESET

NGS Name: 5619 H RESET

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	15	131 N	40 W	460957.37	954230.44	2	C

NGS ACRN: [DQ7773](#)
NGS Quad / Sta Num : 46095324/
USGS Quad: EAGLE LAKE

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2009	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009)

Stamping: 5619 H RESET 2009

7.5 MILES SOUTH OF BATTLE LAKE, 7.5 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 14.0, 25.0 FEET WEST OF NORTHBOUND TRUNK HIGHWAY 78, 20.0 FEET EAST OF SOUTHBOUND TRUNK HIGHWAY 78, 2.0 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1400.138	.016	2/1				VERTICAL ADJUSTMENT	2013 00000792
1400.138	.016	2/1				VERTICAL CONTROL SURVEY	2012 VASHB

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1400.138			1313.026	.012	2011	HORIZONTAL ADJUSTMENT	2024 GPS3771
1400.138	.131		1313.137	.066	1996	GPS - STATIC	2024 HTH78B
1400.138			1313.026	.012	2011	GPS - STATIC	2024 HTH78B
1400.053	.262		1313.009	.197	2011	GPS - RTRN	2023 RTRN2023
1399.997	.262		1312.953	.197	2011	GPS - OPUS	2022 GPSBM
1399.895	.262		1312.852	.197	2011	GPS - OPUS	2022 GPSBM
1400.027	.262		1312.983	.197	2011	GPS - RTRN	2021 RTRN2021

Geoid Separations(ft): GEOID18 = -87.044 12B = -87.044 09 = -86.945 03 = -86.919

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Year</u>	<u>Reference</u>
46 09 57.36630	95 42 30.44132	502080.596	121716.680	.010		2024	GPS3771
46 09 57.36630	95 42 30.44132	502080.596	121716.680	.010	C	2024	HTH78B
46 09 57.36666	95 42 30.44225	502080.530	121716.716	.131	3	2023	RTRN2023
46 09 57.36589	95 42 30.44135	502080.594	121716.638	.131	3	2022	GPSBM
46 09 57.36625	95 42 30.44102	502080.617	121716.675	.131	3	2022	GPSBM
46 09 57.36625	95 42 30.44132	502080.596	121716.675	.131	3	2021	RTRN2021

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Year</u>	<u>Reference</u>
46 09 57.36617	95 42 30.44162	502080.575	121716.667	.033	C	2024	HTH78B



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255166.258	756644.914	954423.522	16784909.068	.010		ADJUSTMENT	2024	GPS3771
2255166.258	756644.914	954423.522	16784909.068	.010	C	GPS - STATIC	2024	HTH78B
2255166.193	756644.951	954423.457	16784909.107	.131	3	GPS - RTRN	2023	RTRN2023
2255166.255	756644.872	954423.518	16784909.027	.131	3	GPS - OPUS	2022	GPSBM
2255166.279	756644.908	954423.543	16784909.063	.131	3	GPS - OPUS	2022	GPSBM
2255166.258	756644.909	954423.521	16784909.063	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255166.237	756644.901	954423.500	16784909.056	.033	C	GPS - STATIC	2024	HTH78B

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_H_RESET-DO7773-3E-16OCT2023.jpg	E	Oct 16, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_H_RESET-DO7773-2-16OCT2023.jpg		Oct 16, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_H_RESET-DO7773-1-16OCT2023.jpg		Oct 16, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5619 J

NGS Name: 5619 J

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DK7869](#)
NGS Quad / Sta Num : 46095324/
USGS Quad: EAGLE LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SE	16	131 N	40 W	460904.78	954230.84	2	C	2005	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 40 FT)	SURVEY DISK	MNDT

Description: (2005)

Stamping: 5619 J 2005

8.5 MILES SOUTH OF BATTLE LAKE, 8.5 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 12.95, 58.0 FEET NORTH OF COUNTY ROAD 126, 56.0 FEET WEST OF TRUNK HIGHWAY 78, 2.4 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1331.024	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1331.024	.016	2/1				VERTICAL CONTROL SURVEY	2012	VASHB
1331.024	.016	2/1				VERTICAL ADJUSTMENT	2009	00000591
1331.008	.016	2/1				VERTICAL CONTROL SURVEY	2006	VPEAK

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1331.024			1243.921	.011	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1331.024	.131		1244.043	.066	1996	GPS - STATIC	2024	HTH78B
1331.024			1243.921	.011	2011	GPS - STATIC	2024	HTH78B
1330.916	.262		1243.912	.197	2011	GPS - RTRN	2023	RTRN2023
1330.785	.262		1243.898	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.004 12B = -86.995 09 = -86.909 03 = -86.886

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 09 04.78230	95 42 30.83458	502053.460	116389.596	.010		ADJUSTMENT	2024	GPS3771
46 09 04.78230	95 42 30.83458	502053.460	116389.596	.010	C	GPS - STATIC	2024	HTH78B
46 09 04.78185	95 42 30.83480	502053.445	116389.551	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 09 04.78204	95 42 30.83503	502053.429	116389.570	.033	C	GPS - STATIC	2024	HTH78B
46 09 04.78312	95 42 30.83614	502053.351	116389.679	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255040.506	751319.970	954214.176	16779585.632	.010		ADJUSTMENT	2024	GPS3771
2255040.506	751319.970	954214.176	16779585.632	.010	C	GPS - STATIC	2024	HTH78B
2255040.489	751319.925	954214.159	16779585.587	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255040.474	751319.945	954214.144	16779585.606	.033	C	GPS - STATIC	2024	HTH78B
2255040.397	751320.055	954214.069	16779585.718	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_J-DK7869-3W-16OCT2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_J-DK7869-2-16OCT2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_J-DK7869-1-16OCT2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
W	Oct 16, 2023
	Oct 16, 2023
	Oct 16, 2023



Mn/DOT Name: 5619 K

NGS Name: 5619 K

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DK7870](#) [Get Map](#)
NGS Quad / Sta Num : 46095324/
USGS Quad: EAGLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	22	131 N	40 W	460812.00	954225.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2005	2009	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	SURVEY DISK	MNDT

Description: (2005) Stamping: 5619 K 2005

9.0 MILES SOUTH OF BATTLE LAKE, 9.5 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, TO TRUNK HIGHWAY 78 MILEPOINT 11.95, THEN 0.05 MILE EAST ON COUNTY ROAD 38, 43.0 FEET NORTH OF COUNTY ROAD 38, 12.0 FEET WEST OF AN ENTRANCE NORTH, 2.3 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>				<u>Year</u>	<u>Reference</u>			
1274.289	.016	2/1						VERTICAL ADJUSTMENT	2009	00000591			
1274.269	.016	2/1						VERTICAL CONTROL SURVEY	2006	VPEAK			

Geoid Separations(ft): GEOID18 = -86.965 12B = -86.955 09 = -86.863 03 = -86.844

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_K-DK7870-3N-05DEC2005.jpg	N	Dec 5, 2005
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_K-DK7870-2-05DEC2005.jpg		Dec 5, 2005
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_K-DK7870-1-05DEC2005.jpg		Dec 5, 2005

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5619 K 1

NGS Name: 5619 K 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DK7871](#)
NGS Quad / Sta Num : 46095324/
USGS Quad: EAGLE LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	23	131 N	40 W	460811.70	954017.60	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2005	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	SURVEY DISK	MNDT

Description: (2005)

Stamping: 5619 K 1 2005

9.0 MILES SOUTH OF BATTLE LAKE, 9.5 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, TO TRUNK HIGHWAY 78 MILEPOINT 11.95, THEN 1.77 MILES EAST ON COUNTY ROAD 38, 48.0 FEET NORTH OF COUNTY ROAD 38, 14.0 FEET WEST OF A FIELD ENTRANCE, 2.6 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1356.726	.016	2/1				VERTICAL ADJUSTMENT	2009	00000591	
1356.700	.016	2/1				VERTICAL CONTROL SURVEY	2006	VPEAK	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1356.611	.262		1269.833	.197	1996	GPS - RTRN	2009	RTRN2009	

Geoid Separations(ft): GEOID18 = -86.896 12B = -86.876 09 = -86.794 03 = -86.778

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 08 11.69284	95 40 17.55527	511440.372	111014.475	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2264325.012	745772.712	963412.399	16773892.271	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_K_1-DK7871-3N-29JUL2009.jpg	N	Jul 29, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_K_1-DK7871-2-29JUL2009.jpg		Jul 29, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_K_1-DK7871-1-29JUL2009.jpg		Jul 29, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5619 K RESET

NGS Name: 5619 K RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7774](#) [Get Map](#)
NGS Quad / Sta Num : 46095324/
USGS Quad: EAGLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	22	131 N	40 W	460812.18	954225.60	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2009	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2010) Stamping: 5619 K RESET 2009

9.5 MILES SOUTH OF BATTLE LAKE, 9.5 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE TO TRUNK HIGHWAY 78 MILEPOINT 11.95 THEN 0.05 MILE EAST ALONG COUNTY ROAD 38, 43.0 FEET NORTH OF COUNTY ROAD 38, 12.0 FEET WEST OF DRIVEWAY NUMBER 37555, 2.3 FEET NORTHEAST OF A WITNESS POST.

Station Pair: BUTLER - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1273.967	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1273.964	.016	2/1				VERTICAL CONTROL SURVEY	2012	VASHB

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1273.967			1186.910	.012	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1273.967	.131		1187.032	.066	1996	GPS - STATIC	2024	HTH78B
1273.967			1186.910	.012	2011	GPS - STATIC	2024	HTH78B
1273.826	.262		1186.861	.197	2011	GPS - RTRN	2023	RTRN2023
1273.708	.262		1186.864	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -86.965 12B = -86.955 09 = -86.863 03 = -86.844

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Ellipsoid (NAD83)</u>		<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 08 12.18346	95 42 25.60219	502422.503	111061.061	.010		ADJUSTMENT	2024	GPS3771
46 08 12.18346	95 42 25.60219	502422.503	111061.061	.010	C	GPS - STATIC	2024	HTH78B
46 08 12.18320	95 42 25.60289	502422.453	111061.034	.131	3	GPS - RTRN	2023	RTRN2023

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Ellipsoid (NAD83)</u>		<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 08 12.18321	95 42 25.60264	502422.471	111061.035	.033	C	GPS - STATIC	2024	HTH78B
46 08 12.18365	95 42 25.60322	502422.430	111061.080	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2255310.782	745986.243	954400.801	16774247.199	.010		ADJUSTMENT	2024	GPS3771
2255310.782	745986.243	954400.801	16774247.199	.010	C	GPS - STATIC	2024	HTH78B
2255310.732	745986.217	954400.751	16774247.175	.131	3	GPS - RTRN	2023	RTRN2023

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2255310.750	745986.218	954400.769	16774247.175	.033	C	GPS - STATIC	2024	HTH78B
2255310.710	745986.263	954400.729	16774247.221	.131	3	GPS - RTRN	2009	RTRN2009



<u>Station Photos</u>			
<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_K_RESET-DO7774-3N-16OCT2023.jpg	N	Oct 16, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_K_RESET-DO7774-2-16OCT2023.jpg		Oct 16, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_K_RESET-DO7774-1-16OCT2023.jpg		Oct 16, 2023
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: 5619 L

NGS Name: 5619 L

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7776](#)
NGS Quad / Sta Num : 46095324/
USGS Quad: EAGLE LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	27	131 N	40 W	460732.87	954228.26	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 40 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009)

Stamping: 5619 L 2009

10.5 MILES SOUTH OF BATTLE LAKE, 10.35 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 11.25, 61.8 FEET EAST OF TRUNK HIGHWAY 78, 51.0 FEET NORTH OF 113TH STREET, 1.6 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1257.081	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792	
1257.081	.016	2/1				VERTICAL CONTROL SURVEY	2012	VASHB	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1257.081			1170.090	.012	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771	
1257.081	.131		1170.211	.066	1996	GPS - STATIC	2024	HTH78B	
1257.081			1170.090	.012	2011	GPS - STATIC	2024	HTH78B	
1256.933	.262		1169.994	.197	2011	GPS - RTRN	2023	RTRN2023	

Geoid Separations(ft): GEOID18 = -86.939 12B = -86.929 09 = -86.831 03 = -86.811

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 07 32.87182	95 42 28.25598	502236.051	107078.540	.010		ADJUSTMENT	2024	GPS3771
46 07 32.87182	95 42 28.25598	502236.051	107078.540	.010	C	GPS - STATIC	2024	HTH78B
46 07 32.87234	95 42 28.25591	502236.056	107078.593	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 07 32.87158	95 42 28.25644	502236.018	107078.516	.033	C	GPS - STATIC	2024	HTH78B

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2255050.655	742008.401	954078.277	16770273.092	.010		ADJUSTMENT	2024	GPS3771
2255050.655	742008.401	954078.277	16770273.092	.010	C	GPS - STATIC	2024	HTH78B
2255050.661	742008.453	954078.283	16770273.145	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2255050.622	742008.377	954078.243	16770273.069	.033	C	GPS - STATIC	2024	HTH78B

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_L-DO7776-3E-16OCT2023.jpg	E	Oct 16, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_L-DO7776-2-16OCT2023.jpg		Oct 16, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_L-DO7776-1-16OCT2023.jpg		Oct 16, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5619 M

NGS Name: 5619 M

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7777](#)
NGS Quad / Sta Num : 46095323/
USGS Quad: EVANSVILLE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	33	131 N	40 W	460636.61	954228.67	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 62 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009)

Stamping: 5619 M 2009

11.55 MILES SOUTH OF BATTLE LAKE, 11.40 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 10.15, 32.2 FEET EAST OF TRUNK HIGHWAY 78, 28.6 FEET WEST OF COUNTY ROAD 64, 4.0 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1237.284	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792	
1237.284	.016	2/1				VERTICAL CONTROL SURVEY	2012	VASHB	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1237.284			1150.342	.012	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771	
1237.284	.131		1150.464	.066	1996	GPS - STATIC	2024	HTH78B	
1237.284			1150.342	.012	2011	GPS - STATIC	2024	HTH78B	
1237.179	.262		1150.283	.197	2011	GPS - RTRN	2023	RTRN2023	

Geoid Separations(ft): GEOID18 = -86.896 12B = -86.890 09 = -86.781 03 = -86.768

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 06 36.60921	95 42 28.67046	502207.482	101378.811	.010		ADJUSTMENT	2024	GPS3771
46 06 36.60921	95 42 28.67046	502207.482	101378.811	.010	C	GPS - STATIC	2024	HTH78B
46 06 36.60915	95 42 28.67077	502207.460	101378.805	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 06 36.60896	95 42 28.67090	502207.451	101378.786	.033	C	GPS - STATIC	2024	HTH78B

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2254916.571	736310.959	953854.884	16764577.261	.010		ADJUSTMENT	2024	GPS3771
2254916.571	736310.959	953854.884	16764577.261	.010	C	GPS - STATIC	2024	HTH78B
2254916.549	736310.954	953854.862	16764577.256	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2254916.539	736310.935	953854.852	16764577.237	.033	C	GPS - STATIC	2024	HTH78B

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_M-DO7777-3S-16OCT2023.jpg	S	Oct 16, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_M-DO7777-2-16OCT2023.jpg		Oct 16, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5619_M-DO7777-1-16OCT2023.jpg		Oct 16, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5620 A

NGS Name: 5620 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0513](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

	<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	
NE	4	132 N	40 W	
	461654.00	954243.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	2005	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
METAL ROD (W/BASE PLATE) BURIED (<10 FT)	SURVEY DISK	MNDT

Description: (1975) Stamping: 5620 A 1975

AT BATTLE LAKE, IN THE TOP OF A FOUNDATION AT THE SOUTH CORNER OF THE SOUTHEAST LEG OF A WATER TANK, 1.5 BLOCKS EAST OF THE JUNCTION OF HENNING STREET AND TRUNK HIGHWAY 78, 200.0 FEET SOUTHEAST OF HENNING STREET, 48.3 FEET NORTHEAST OF A GRAVEL ROAD, 141.0 FEET SOUTH OF A FIRE HYDRANT, 0.05 MILE NORTH OF A RAILROAD.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1380.562	.016	2/1					VERTICAL ADJUSTMENT	1991	00000025

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1379.784	.016	2					VERTICAL CONTROL SURVEY	1976	L23961

Geoid Separations(ft): GEOID18 = -87.585 12B = -87.592 09 = -87.483 03 = -87.395

* No Horizontal Positions in the Database *



Mn/DOT Name: 5620 B

NGS Name: 5620 B

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0515](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	34	133 N	40 W	461736.00	954307.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	2005	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STRUCTURE (MASSIVE)	SURVEY DISK	MNDT

Description: (1975)

Stamping: 5620B 1975

AT THE NORTH EDGE OF BATTLE LAKE, IN THE EAST EDGE OF A CONCRETE PUMP HOUSING, 1.1 MILES NORTH ON TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210, 72.3 FEET SOUTHWEST OF TRUNK HIGHWAY 78, AT TRUNK HIGHWAY 78 MILEPOINT 22.65, 78.3 FEET NORTHWEST OF THE WEST LEG OF THE BATTLE LAKE POPULATION 722 SIGN, 30.3 FEET WEST OF A FIRE HYDRANT.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1339.692	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1338.908	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Geoid Separations(ft): GEOID18 = -87.664 12B = -87.670 09 = -87.562 03 = -87.460

* No Horizontal Positions in the Database *



Mn/DOT Name: 5620 C

NGS Name: 5620 C

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R00521](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NE	21	133 N	40 W	461907.14	954311.32	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2024	GOOD	Horz=YES Vert=YES	YES		PROJECTS 3 IN.	MARKER IS STEEL ROD

Monument Type	Disk Type	Mon. Agency
COPPER CLAD ROD (NO SLEEVE) (DEPTH 56 FT)	VERTICAL CONTROL DISK	MNDT

Description: (2012) Stamping: 5620 C 1975

3.2 MILES NORTH OF BATTLE LAKE, 3.2 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE TO TRUNK HIGHWAY 78 MILEPOINT 24.7, THEN 0.05 MILE WEST ON SILVER LAKE ROAD, 49.0 FEET NORTH OF SILVER LAKE ROAD, 2.4 FEET EAST OF A POWER POLE NUMBER 144, 0.7 FOOT EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1346.572	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1346.562	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1346.559	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1346.562	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1345.772	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1345.772	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1346.572			1258.754	.017	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1346.572	.131		1258.869	.066	1996	GPS - STATIC	2024	HTH78B
1346.572			1258.754	.017	2011	GPS - STATIC	2024	HTH78B
1346.543	.262		1258.764	.197	2011	GPS - RTRN	2023	RTRN2023
1346.487	.262		1258.705	.197	2011	GPS - RTRN	2015	RTRN2015
1346.487	.262		1258.705	.197	2011	GPS - RTRN	2015	RTRN2015
1346.214	.262		1258.656	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.779 12B = -87.782 09 = -87.667 03 = -87.559

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 19 07.14493	95 43 11.31521	499205.751	177413.054	.010		ADJUSTMENT	2024	GPS3771
46 19 07.14493	95 43 11.31521	499205.751	177413.054	.010	C	GPS - STATIC	2024	HTH78B
46 19 07.14455	95 43 11.31492	499205.771	177413.015	.131	3	GPS - RTRN	2023	RTRN2023
46 19 07.14506	95 43 11.31649	499205.661	177413.067	.131	3	GPS - RTRN	2015	RTRN2015
46 19 07.14506	95 43 11.31649	499205.661	177413.067	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 19 07.14480	95 43 11.31550	499205.731	177413.041	.033	C	GPS - STATIC	2024	HTH78B
46 19 07.14473	95 43 11.31628	499205.676	177413.033	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2253323.449	812377.504	953458.003	16840675.726	.010		ADJUSTMENT	2024	GPS3771
2253323.449	812377.504	953458.003	16840675.726	.010	C	GPS - STATIC	2024	HTH78B
2253323.468	812377.465	953458.022	16840675.687	.131	3	GPS - RTRN	2023	RTRN2023
2253323.359	812377.519	953457.914	16840675.742	.131	3	GPS - RTRN	2015	RTRN2015
2253323.359	812377.519	953457.914	16840675.742	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2253323.428	812377.491	953457.982	16840675.714	.033	C	GPS - STATIC	2024	HTH78B
2253323.374	812377.485	953457.927	16840675.709	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5620_C-RO0521-3W-17OCT2023.jpg	W	Oct 17, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5620_C-RO0521-2-17OCT2023.jpg		Oct 17, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5620_C-RO0521-1-17OCT2023.jpg		Oct 17, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5620 D

NGS Name: 5620 D

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	15	133 N	40 W	462024.91	954302.76	2	C

NGS ACRN: RO0525	Get Map
NGS Quad / Sta Num : 46095313/	
USGS Quad: BATTLE LAKE	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER IS STEEL ROD

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE) (DEPTH 56 FT)	VERTICAL CONTROL DISK	MNDT

Description: (1975)

Stamping: 5620 D 1975

4.0 MILES NORTH OF BATTLE LAKE, 4.4 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 26.05, EAST OF TRUNK HIGHWAY 78 AT THE NORTHEAST CORNER OF THE SKIBVEDT CEMETERY, 225.0 FEET EAST OF TRUNK HIGHWAY 78, 38.0 FEET SOUTH OF 260TH STREET, 16.5 FEET EAST-NORTHEAST OF THE ROSE MAKKEN 1932 HEADSTONE, 0.6 FOOT WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1346.848	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1346.848	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1346.848	.016	2/1				VERTICAL CONTROL SURVEY	2016 VOTTE
1346.848	.016	2/1				VERTICAL ADJUSTMENT	1991 00000025
<u>NGVD29</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1346.054	.016	2/1				UNKNOWN/APPROXIMATE	1992 UNCHECKD
1346.054	.016	2				VERTICAL CONTROL SURVEY	1976 L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1346.848			1258.964	.012	2011	HORIZONTAL ADJUSTMENT	2024 GPS3771
1346.848	.131		1259.079	.066	1996	GPS - STATIC	2024 HTH78B
1346.848			1258.964	.012	2011	GPS - STATIC	2024 HTH78B
1346.835	.262		1258.980	.197	2011	GPS - RTRN	2023 RTRN2023
1346.753	.262		1258.898	.197	2011	GPS - OPUS	2022 GPSBM
1346.710	.262		1258.856	.197	2011	GPS - OPUS	2022 GPSBM
1346.766	.262		1258.912	.197	2011	GPS - RTRN	2021 RTRN2021
1346.661	.262		1258.807	.197	2011	GPS - RTRN	2015 RTRN2015
1346.661	.262		1258.807	.197	2011	GPS - RTRN	2015 RTRN2015
1346.602	.262		1258.977	.197	1996	GPS - RTRN	2009 RTRN2009

Geoid Separations(ft): GEOID18 = -87.854 12B = -87.854 09 = -87.743 03 = -87.621

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 20 24.90641	95 43 02.76226	499806.185	185290.918	.007		ADJUSTMENT	2024	GPS3771
46 20 24.90641	95 43 02.76226	499806.185	185290.918	.007	C	GPS - STATIC	2024	HTH78B
46 20 24.90564	95 43 02.76247	499806.170	185290.840	.131	3	GPS - RTRN	2023	RTRN2023
46 20 24.90587	95 43 02.76280	499806.147	185290.863	.131	3	GPS - OPUS	2022	GPSBM
46 20 24.90623	95 43 02.76222	499806.188	185290.900	.131	3	GPS - OPUS	2022	GPSBM
46 20 24.90649	95 43 02.76226	499806.185	185290.926	.131	3	GPS - RTRN	2021	RTRN2021
46 20 24.90545	95 43 02.76245	499806.172	185290.821	.131	3	GPS - RTRN	2015	RTRN2015
46 20 24.90545	95 43 02.76245	499806.172	185290.821	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 20 24.90627	95 43 02.76256	499806.164	185290.904	.033	C	GPS - STATIC	2024	HTH78B
46 20 24.90658	95 43 02.76367	499806.086	185290.935	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2254069.551	820241.863	954328.382	16848529.022	.007		ADJUSTMENT	2024	GPS3771
2254069.551	820241.863	954328.382	16848529.022	.007	C	GPS - STATIC	2024	HTH78B
2254069.535	820241.786	954328.365	16848528.945	.131	3	GPS - RTRN	2023	RTRN2023
2254069.512	820241.809	954328.342	16848528.969	.131	3	GPS - OPUS	2022	GPSBM
2254069.553	820241.845	954328.384	16848529.004	.131	3	GPS - OPUS	2022	GPSBM
2254069.551	820241.871	954328.382	16848529.030	.131	3	GPS - RTRN	2021	RTRN2021
2254069.535	820241.766	954328.366	16848528.925	.131	3	GPS - RTRN	2015	RTRN2015
2254069.535	820241.766	954328.366	16848528.925	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2254069.530	820241.850	954328.361	16848529.009	.033	C	GPS - STATIC	2024	HTH78B
2254069.452	820241.882	954328.284	16848529.042	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5620_D-RO0525-3E-17OCT2023.jpg	E	Oct 17, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5620_D-RO0525-2-17OCT2023.jpg		Oct 17, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5620_D-RO0525-1-17OCT2023.jpg		Oct 17, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5620 K

NGS Name: 5620 K

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4332](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	34	133 N	40 W	461719.75	954253.20	2	C	2015	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 89 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5620 K 2015

IN BATTLE LAKE, 1.0 MILE NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 22.5, 56.0 FEET EAST-NORTHEAST OF TRUNK HIGHWAY 78, 17.0 FEET NORTH-NORTHWEST OF THE NORTH END OF A METAL RAILING, 1.5 FEET WEST-SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1339.984	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1339.974	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1339.974	.016	2/1				VERTICAL CONTROL SURVEY	2016 VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1339.984			1252.310	.014	2011	HORIZONTAL ADJUSTMENT	2024 GPS3771
1339.984	.131		1252.422	.066	1996	GPS - STATIC	2024 HTH78B
1339.984			1252.310	.014	2011	GPS - STATIC	2024 HTH78B
1339.905	.262		1252.274	.197	2011	GPS - RTRN	2023 RTRN2023
1339.863	.262		1252.228	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -87.631 12B = -87.638 09 = -87.529 03 = -87.434

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 17 19.75428	95 42 53.20139	500477.475	166533.526	.010		ADJUSTMENT	2024 GPS3771
46 17 19.75428	95 42 53.20139	500477.475	166533.526	.010	C	GPS - STATIC	2024 HTH78B
46 17 19.75445	95 42 53.20133	500477.479	166533.543	.131	3	GPS - RTRN	2023 RTRN2023
46 17 19.75388	95 42 53.20148	500477.469	166533.485	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 17 19.75415	95 42 53.20168	500477.455	166533.512	.033	C	GPS - STATIC	2024 HTH78B

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2254393.364	801477.737	954356.027	16829758.078	.010		ADJUSTMENT	2024 GPS3771
2254393.364	801477.737	954356.027	16829758.078	.010	C	GPS - STATIC	2024 HTH78B
2254393.369	801477.754	954356.032	16829758.095	.131	3	GPS - RTRN	2023 RTRN2023
2254393.357	801477.697	954356.019	16829758.038	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2254393.344	801477.724	954356.006	16829758.066	.033	C	GPS - STATIC	2024 HTH78B



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5620_K-DQ4332-3E-17OCT2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5620_K-DQ4332-2-17OCT2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5620_K-DQ4332-1-17OCT2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Oct 17, 2023
	Oct 17, 2023
	Oct 17, 2023



Mn/DOT Name: 5620 L

NGS Name: 5620 L

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4331](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

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1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	27	133 N	40 W	461758.03	954304.43	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2015	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 83 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015)

Stamping: 5620 L 2015

1.2 MILES NORTH OF BATTLE LAKE, 1.75 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 23.3, 59.6 FEET EAST OF TRUNK HIGHWAY 78, 45.7 FEET SOUTH OF A DRIVEWAY NUMBER 23182, 1.5 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1347.215	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1347.205	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1347.205	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1347.215			1259.489	.008	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1347.215	.131		1259.587	.066	1996	GPS - STATIC	2024	HTH78B
1347.215			1259.489	.008	2011	GPS - STATIC	2024	HTH78B
1347.218	.262		1259.525	.197	2011	GPS - RTRN	2023	RTRN2023
1347.077	.262		1259.384	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -87.690 12B = -87.693 09 = -87.588 03 = -87.483

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 58.03497	95 43 04.42501	499689.286	170411.652	.007		ADJUSTMENT	2024	GPS3771
46 17 58.03497	95 43 04.42501	499689.286	170411.652	.007	C	GPS - STATIC	2024	HTH78B
46 17 58.03521	95 43 04.42506	499689.283	170411.676	.131	3	GPS - RTRN	2023	RTRN2023
46 17 58.03503	95 43 04.42505	499689.283	170411.658	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 58.03483	95 43 04.42521	499689.272	170411.638	.033	C	GPS - STATIC	2024	HTH78B

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2253677.214	805369.277	953701.196	16833661.270	.007		ADJUSTMENT	2024	GPS3771
2253677.214	805369.277	953701.196	16833661.270	.007	C	GPS - STATIC	2024	HTH78B
2253677.211	805369.301	953701.193	16833661.295	.131	3	GPS - RTRN	2023	RTRN2023
2253677.212	805369.283	953701.193	16833661.276	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2253677.200	805369.263	953701.181	16833661.256	.033	C	GPS - STATIC	2024	HTH78B



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5620_L-DQ4331-3E-17OCT2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5620_L-DQ4331-2-17OCT2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5620_L-DQ4331-1-17OCT2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Oct 17, 2023
	Oct 17, 2023
	Oct 17, 2023



Mn/DOT Name: 5620 M

NGS Name: 5620 M

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4328](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	15	133 N	40 W	461938.76	954305.60	2	C	2015	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 62 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5620 M 2015

3.0 MILES NORTH OF BATTLE LAKE, 3.75 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 25.2, 68.2 FEET EAST OF TRUNK HIGHWAY 78, 25.7 FEET SOUTH OF A FIELD ENTRANCE, 1.5 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1370.056	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1370.050	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1370.053	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1370.056			1282.209	.012	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1370.056	.131		1282.324	.066	1996	GPS - STATIC	2024	HTH78B
1370.056			1282.209	.012	2011	GPS - STATIC	2024	HTH78B
1369.955	.262		1282.143	.197	2011	GPS - RTRN	2023	RTRN2023
1369.955	.262		1282.143	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -87.808 12B = -87.812 09 = -87.700 03 = -87.585

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 19 38.75802	95 43 05.59514	499607.323	180615.705	.007		ADJUSTMENT	2024	GPS3771
46 19 38.75802	95 43 05.59514	499607.323	180615.705	.007	C	GPS - STATIC	2024	HTH78B
46 19 38.75839	95 43 05.59584	499607.274	180615.743	.131	3	GPS - RTRN	2023	RTRN2023
46 19 38.75828	95 43 05.59537	499607.307	180615.732	.131	3	GPS - RTRN	2015	RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 19 38.75789	95 43 05.59543	499607.303	180615.692	.033	C	GPS - STATIC	2024	HTH78B

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2253784.193	815571.749	953969.227	16843862.990	.007		ADJUSTMENT	2024	GPS3771
2253784.193	815571.749	953969.227	16843862.990	.007	C	GPS - STATIC	2024	HTH78B
2253784.144	815571.788	953969.179	16843863.029	.131	3	GPS - RTRN	2023	RTRN2023
2253784.177	815571.776	953969.212	16843863.017	.131	3	GPS - RTRN	2015	RTRN2015

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2253784.172	815571.737	953969.206	16843862.978	.033	C	GPS - STATIC	2024	HTH78B



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5620_M-DQ4328-3E-17OCT2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5620_M-DQ4328-2-17OCT2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5620_M-DQ4328-1-17OCT2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Oct 17, 2023
	Oct 17, 2023
	Oct 17, 2023



Mn/DOT Name: 5620 N

NGS Name: 5620 N

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4325](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	1	133 N	40 W	462135.98	953924.51	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2015	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 44 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5620 N 2015

5.5 MILES NORTHEAST OF BATTLE LAKE, 8.6 MILES NORTH AND EAST ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 30.05, 46.5 FEET SOUTHEAST OF TRUNK HIGHWAY 78, 35.8 FEET WEST OF ARBOR LOOP, 73.4 FEET NORTH OF BLANCHE CREEK ROAD EXTENDED, 1.5 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1329.013	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1329.003	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1328.997	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1329.013			1241.195	.011	2011	HORIZONTAL ADJUSTMENT	2024	GPS3764
1329.013	.131		1241.307	.066	1996	GPS - STATIC	2024	HTH78A
1329.013			1241.195	.011	2011	GPS - STATIC	2024	HTH78A
1328.921	.262		1241.120	.197	2011	GPS - RTRN	2023	RTRN2023
1328.902	.262		1241.100	.197	2011	GPS - OPUS	2022	GPSBM
1328.947	.262		1241.146	.197	2011	GPS - OPUS	2022	GPSBM
1328.862	.262		1241.061	.197	2011	GPS - RTRN	2021	RTRN2021
1328.859	.262		1241.057	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -87.802 12B = -87.802 09 = -87.677 03 = -87.572

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 21 35.98351	95 39 24.50951	515114.523	192497.355	.007		ADJUSTMENT	2024	GPS3764
46 21 35.98351	95 39 24.50951	515114.523	192497.355	.007	C	GPS - STATIC	2024	HTH78A
46 21 35.98333	95 39 24.51008	515114.483	192497.337	.131	3	GPS - RTRN	2023	RTRN2023
46 21 35.98283	95 39 24.50963	515114.515	192497.287	.131	3	GPS - OPUS	2022	GPSBM
46 21 35.98294	95 39 24.50956	515114.520	192497.298	.131	3	GPS - OPUS	2022	GPSBM
46 21 35.98344	95 39 24.50972	515114.508	192497.348	.131	3	GPS - RTRN	2021	RTRN2021
46 21 35.98349	95 39 24.50971	515114.509	192497.353	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 21 35.98334	95 39 24.50980	515114.503	192497.338	.033	C	GPS - STATIC	2024	HTH78A



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2269506.678	827162.694	969876.106	16855206.413	.007		ADJUSTMENT	2024	GPS3764
2269506.678	827162.694	969876.106	16855206.413	.007	C	GPS - STATIC	2024	HTH78A
2269506.638	827162.677	969876.065	16855206.396	.131	3	GPS - RTRN	2023	RTRN2023
2269506.669	827162.626	969876.095	16855206.344	.131	3	GPS - OPUS	2022	GPSBM
2269506.674	827162.636	969876.101	16855206.355	.131	3	GPS - OPUS	2022	GPSBM
2269506.663	827162.687	969876.091	16855206.406	.131	3	GPS - RTRN	2021	RTRN2021
2269506.664	827162.692	969876.092	16855206.412	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2269506.657	827162.677	969876.085	16855206.396	.033	C	GPS - STATIC	2024	HTH78A

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5620_N-DQ4325-3SE-17OCT2023.jpg	SE	Oct 17, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5620_N-DQ4325-2-17OCT2023.jpg		Oct 17, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5620_N-DQ4325-1-17OCT2023.jpg		Oct 17, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 A

NGS Name: 5623 A

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	33	136 N	42 W	463306.40	955915.40	2	

NGS ACRN: [DG9851](#) [Get Map](#)
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2009	GOOD	Horz=NO Vert=NO	YES	8936		NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CULVERT - ANY SIZE, ANY TYPE	BENCH MARK DISK	MNDT

Description: (2001) Stamping: 5623 A 1962

4.8 MILES EAST-SOUTHEAST OF PELICAN RAPIDS, IN THE SOUTHEAST CORNER OF A TRUNK HIGHWAY 108 BOX CULVERT AT STONEY BAR, AT TRUNK HIGHWAY 108 MILEPOINT 17.95, 23.0 FEET SOUTH OF TRUNK HIGHWAY 108.

Station Notes

THE SURVEY MARK HAS BEEN DEEMED UNSAFE DUE TO FALL RISK AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1322.556	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1322.602	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1322.579	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1321.779	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT
1321.779	.033	3				VERTICAL CONTROL SURVEY	1962	CS5623

Geoid Separations(ft): GEOID18 = -87.641 12B = -87.621 09 = -87.526 03 = -87.365

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_A-DG9851-3E-04AUG2009.jpg	E	Aug 4, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_A-DG9851-2-04AUG2009.jpg		Aug 4, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_A-DG9851-1-04AUG2009.jpg		Aug 4, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 AA

NGS Name: 5623 AA

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	34	136 N	42 W	463300.00	955745.90	2	

NGS ACRN: [DG9826](#) [Get Map](#)
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2000	2022	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 30 FT)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5623 AA 2000

6.5 MILES EAST OF PELICAN RAPIDS, 7.0 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE SOUTH JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 108 MILEPOINT 19.2, 37.0 FEET NORTH OF TRUNK HIGHWAY 108, 21.0 FEET WEST OF DRIVEWAY NUMBER 25315, 80.4 FEET EAST OF A POWER POLE, 4.1 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1364.712	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1364.754	.016	2/1				VERTICAL ADJUSTMENT	2006 00000497
1364.735	.016	2/1				VERTICAL CONTROL SURVEY	2001 VPOLI

Geoid Separations(ft): GEOID18 = -87.598 12B = -87.579 09 = -87.487 03 = -87.326

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_AA-DG9826-3N-04AUG2009.jpg	N	Aug 4, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_AA-DG9826-2-04AUG2009.jpg		Aug 4, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_AA-DG9826-1-04AUG2009.jpg		Aug 4, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 AA RESET

NGS Name: 5623 AA RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR9940](#)
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	34	136 N	42 W	463300.06	955745.89	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2022	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 30 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2022)

Stamping: 5623 AA RESET 2022

6.5 MILES EAST OF PELICAN RAPIDS, 7.0 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE SOUTH JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 108 MILEPOINT 19.2, 37.0 FEET NORTH OF TRUNK HIGHWAY 108, 21.0 FEET WEST OF DRIVEWAY NUMBER 25315, 80.4 FEET EAST OF A POWER POLE, 4.1 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj	Year	Reference
1364.610	.016	2/1				2024	VPELI2

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj	Year	Reference
1364.590			1277.045	.025	2011	2024	GPS3689
1364.518	.131		1277.140	.066	1996	2024	HTH108
1364.590			1277.045	.025	2011	2024	HTH108
1364.584	.262		1276.982	.197	2011	2023	RTRN2023
1364.630	.262		1277.032	.197	2011	2022	RTRN2022

Geoid Separations(ft): GEOID18 = -87.602 03 = -87.326

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 33 00.06081	95 57 45.88783	438079.452	261892.125	.013		ADJUSTMENT	2024	GPS3689
46 33 00.06081	95 57 45.88783	438079.452	261892.125	.013	C	GPS - STATIC	2024	HTH108
46 33 00.06109	95 57 45.88804	438079.437	261892.154	.131	3	GPS - RTRN	2023	RTRN2023
46 33 00.06083	95 57 45.88818	438079.427	261892.127	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 33 00.06058	95 57 45.88836	438079.415	261892.102	.033	C	GPS - STATIC	2024	HTH108

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2193779.382	897962.743	895263.210	16927216.962	.013		ADJUSTMENT	2024	GPS3689
2193779.382	897962.743	895263.210	16927216.962	.013	C	GPS - STATIC	2024	HTH108
2193779.369	897962.772	895263.196	16927216.992	.131	3	GPS - RTRN	2023	RTRN2023
2193779.358	897962.746	895263.185	16927216.965	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2193779.345	897962.721	895263.172	16927216.941	.033	C	GPS - STATIC	2024	HTH108



<u>Station Photos</u>			
<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_AA_RESET-DR9940-3N-31JUL2023.jpg	N	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_AA_RESET-DR9940-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_AA_RESET-DR9940-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 AB

NGS Name: 5623 AB

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9835](#)
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	34	136 N	41 W	463240.20	954935.33	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2000	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 30 FT)	SURVEY DISK	MNDT

Description: (2001) **Stamping:** 5623 AB 2000

5.0 MILES WEST OF DENT, 5.7 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 IN DENT, AT TRUNK HIGHWAY 105 MILEPOINT 25.9, 72.0 FEET NORTH OF TRUNK HIGHWAY 108, 17.0 FEET WEST OF A DRIVEWAY NUMBER 31811, 5.0 FEET SOUTH OF A POWER POLE, 4.9 FEET SOUTH-SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj	Determination Method	Year	Reference		
1357.442	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2		
1357.442	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941		
1357.458	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497		
1357.468	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI		

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj	Determination Method	Year	Reference		
1357.442			1270.194	.026	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689		
1357.442	.131		1270.289	.066	1996	GPS - STATIC	2024	HTH108		
1357.442			1270.194	.026	2011	GPS - STATIC	2024	HTH108		
1357.560	.262		1270.234	.197	2011	GPS - RTRN	2023	RTRN2023		
1357.569	.262		1270.244	.197	2011	GPS - RTRN	2022	RTRN2022		
1357.445	.262		1270.119	.197	2011	GPS - OPUS	2022	GPSBM		
1357.448	.262		1270.122	.197	2011	GPS - OPUS	2022	GPSBM		
1357.448	.262		1270.122	.197	2011	GPS - RTRN	2021	RTRN2021		
1357.255	.262		1270.178	.197	1996	GPS - RTRN	2009	RTRN2009		

Geoid Separations(ft): GEOID18 = -87.326 12B = -87.323 09 = -87.211 03 = -87.073

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position		Otter Tail County		Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 32 40.20235	95 49 35.32950	472364.983	259803.082	.016		ADJUSTMENT	2024	GPS3689
46 32 40.20235	95 49 35.32950	472364.983	259803.082	.016	C	GPS - STATIC	2024	HTH108
46 32 40.20249	95 49 35.32884	472365.029	259803.096	.131	3	GPS - RTRN	2023	RTRN2023
46 32 40.20143	95 49 35.32956	472364.978	259802.989	.131	3	GPS - RTRN	2022	RTRN2022
46 32 40.20202	95 49 35.32955	472364.979	259803.048	.131	3	GPS - OPUS	2022	GPSBM
46 32 40.20173	95 49 35.32962	472364.974	259803.019	.131	3	GPS - OPUS	2022	GPSBM
46 32 40.20201	95 49 35.32953	472364.980	259803.047	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)		Geodetic Position		Otter Tail County		Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 32 40.20212	95 49 35.33002	472364.946	259803.058	.033	C	GPS - STATIC	2024	HTH108
46 32 40.20261	95 49 35.33170	472364.829	259803.108	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2228016.036	895239.664	929461.612	16923948.101	.016		ADJUSTMENT	2024	GPS3689
2228016.036	895239.664	929461.612	16923948.101	.016	C	GPS - STATIC	2024	HTH108
2228016.082	895239.678	929461.659	16923948.113	.131	3	GPS - RTRN	2023	RTRN2023
2228016.030	895239.571	929461.605	16923948.008	.131	3	GPS - RTRN	2022	RTRN2022
2228016.031	895239.631	929461.608	16923948.067	.131	3	GPS - OPUS	2022	GPSBM
2228016.026	895239.602	929461.602	16923948.039	.131	3	GPS - OPUS	2022	GPSBM
2228016.033	895239.630	929461.609	16923948.066	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2228015.999	895239.642	929461.575	16923948.079	.033	C	GPS - STATIC	2024	HTH108
2228015.883	895239.694	929461.460	16923948.133	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_AB-DG9835-3N-31JUL2023.jpg	N	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_AB-DG9835-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_AB-DG9835-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 AC

NGS Name: 5623 AC

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DS2445](#) [Get Map](#)
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	26	136 N	41 W	463325.11	954824.71	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2023	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 109 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2023)

Stamping: 5623 AC 2023

4.25 MILES WEST OF DENT, 4.25 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE WEST JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 27.30, 64.0 FEET NORTH OF TRUNK HIGHWAY 108, 129.8 FEET EAST OF COUNTY ROAD 85, 1.5 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1369.669	.016	2/1					VERTICAL CONTROL SURVEY	2024	VPELI2

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1369.764	.262			1282.530	.197	2011	GPS - RTRN	2023	RTRN2023

No Geoid Separations Available

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position		Otter Tail County				Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
46 33 25.11266	95 48 24.71298	477306.529	264346.806	.131	3	GPS - RTRN	2023	RTRN2023	

State Plane and UTM Coordinates (Feet)

NAD83(2011)		MN State Plane - Central Zone		UTM - Zone 15				Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference	
2233040.226	899690.557	934557.278	16928319.498	.131	3	GPS - RTRN	2023	RTRN2023	

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_AC-DS2445-3N-09AUG2023.jpg	N	Aug 9, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_AC-DS2445-2-09AUG2023.jpg		Aug 9, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_AC-DS2445-1-09AUG2023.jpg		Aug 9, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 B

NGS Name: 5623 B

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9854](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	22	136 N	43 W	463449.00	960458.00	2		2001	2009	DESTROYED	Horz=NO Vert=NO	NO		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5623 B 2000

AT THE NORTH EDGE OF PELICAN RAPIDS, 0.65 MILE NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 241.25, 78.8 FEET EAST OF TRUNK HIGHWAY 59, 22.7 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1354.039	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1354.111	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1354.098	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPOLI

Geoid Separations(ft): GEOID18 = -87.556 12B = -87.552 09 = -87.437 03 = -87.300

* No Horizontal Positions in the Database *



Mn/DOT Name: 5623 B RESET

NGS Name: 5623 B RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7129](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	22	136 N	43 W	463449.03	960458.61	2	C	2009	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 8 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2010)

Stamping: 5623 B RESET 2009

IN PELICAN RAPIDS, 0.65 MILE NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 WEST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 241.25, 78.8 FEET EAST OF TRUNK HIGHWAY 59, 22.7 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1353.675	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1353.675	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1353.747	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1353.751	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1353.675			1266.208	.015	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1353.675	.131		1266.362	.066	1996	GPS - STATIC	2023	HTH59
1353.675			1266.208	.015	2011	GPS - STATIC	2023	HTH59
1353.737	.262		1266.179	.197	2011	GPS - RTRN	2023	RTRN2023
1353.692	.262		1266.133	.197	2011	GPS - RTRN	2022	RTRN2022
1353.675	.131		1266.362	.066	1996	GPS - STATIC	2021	HOTTE
1353.675			1266.208	.022	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1353.675			1266.208	.022	2011	GPS - STATIC	2020	HOTTE
1353.669	.262		1266.116	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.559 12B = -87.552 09 = -87.437 03 = -87.300

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>								
Geodetic Position		Otter Tail County				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 34 49.03346	96 04 58.60821	407885.074	273049.396	.010		ADJUSTMENT	2024	GPS3672
46 34 49.03346	96 04 58.60821	407885.074	273049.396	.010	C	GPS - STATIC	2023	HTH59
46 34 49.03326	96 04 58.60838	407885.062	273049.375	.131	3	GPS - RTRN	2023	RTRN2023
46 34 49.03361	96 04 58.60780	407885.102	273049.411	.131	3	GPS - RTRN	2022	RTRN2022
46 34 49.03346	96 04 58.60821	407885.074	273049.396	.016		ADJUSTMENT	2020	GPS3384
46 34 49.03346	96 04 58.60821	407885.074	273049.396	.016	C	GPS - STATIC	2020	HOTTE
46 34 49.03379	96 04 58.60812	407885.080	273049.429	.131	3	GPS - RTRN	2014	RTRN2014

<u>NAD83(1996)</u>								
Geodetic Position		Otter Tail County				Project Info		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 34 49.03312	96 04 58.60870	407885.039	273049.361	.033	C	GPS - STATIC	2023	HTH59
46 34 49.03312	96 04 58.60870	407885.039	273049.361	.033	C	GPS - STATIC	2021	HOTTE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2163800.487	909675.558	865465.055	16939410.300	.010		ADJUSTMENT	2024	GPS3672
2163800.487	909675.558	865465.055	16939410.300	.010	C	GPS - STATIC	2023	HTH59
2163800.474	909675.538	865465.042	16939410.280	.131	3	GPS - RTRN	2023	RTRN2023
2163800.516	909675.572	865465.084	16939410.314	.131	3	GPS - RTRN	2022	RTRN2022
2163800.487	909675.558	865465.055	16939410.300	.016		ADJUSTMENT	2020	GPS3384
2163800.487	909675.558	865465.055	16939410.300	.016	C	GPS - STATIC	2020	HOTTE
2163800.494	909675.591	865465.062	16939410.333	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2163800.452	909675.524	865465.019	16939410.267	.033	C	GPS - STATIC	2023	HTH59
2163800.452	909675.524	865465.019	16939410.267	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_B_RESET-DO7129-3E-31JUL2023.jpg	E	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_B_RESET-DO7129-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_B_RESET-DO7129-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 C

NGS Name: 5623 C

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9844](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	27	136 N	43 W	463411.10	960500.21	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1990	2022	GOOD	Horz=NO Vert=NO	YES	5025	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	VERTICAL CONTROL DISK	MNDT

Description: (2014)

Stamping: 5623 C 2000

IN PELICAN RAPIDS, IN A BRIDGE ABUTMENT IN THE SOUTHEAST CORNER OF TRUNK HIGHWAY 59 BRIDGE NUMBER 5025 OVER THE PELICAN RIVER, 0.05 MILE NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 EAST IN PELICAN RAPIDS, 41.0 FEET EAST OF TRUNK HIGHWAY 59, 1.5 FEET NORTH OF THE NORTHWEST CORNER OF A BUILDING. STATION 5623 C WAS SET WHEN THE BRIDGE WAS REMODELED IN 1990 AND STAMPED WHEN FIRST USED IN 2000.

Station Notes

THE SURVEY MARK HAS BEEN DEEMED UNSAFE DUE TO FALL RISK AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference
1305.453	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1305.526	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1305.526	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR
1305.526	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1305.509	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference
1305.388	.262		1217.790	.197	2011	GPS - RTRN	2022	RTRN2022
1305.329	.262		1217.737	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.598 12B = -87.592 09 = -87.477 03 = -87.342

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 34 11.18543	96 05 00.23327	407753.773	269215.470	.131	3	GPS - RTRN	2022	RTRN2022
46 34 11.18647	96 05 00.23382	407753.735	269215.575	.131	3	GPS - RTRN	2014	RTRN2014

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2163598.268	905845.200	865201.657	16935582.297	.131	3	GPS - RTRN	2022	RTRN2022
2163598.232	905845.306	865201.622	16935582.404	.131	3	GPS - RTRN	2014	RTRN2014

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_C-DG9844-3E-12OCT2022.jpg	E	Oct 12, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_C-DG9844-2-12OCT2022.jpg		Oct 12, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_C-DG9844-1-12OCT2022.jpg		Oct 12, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 D

NGS Name: 5623 D

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9821](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	26	136 N	43 W	463412.23	960345.64	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2000	2023	GOOD	Horz=YES Vert=YES	YES		PROJECTS 2 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2001) Stamping: 5623 D 2000

1.0 MILE EAST OF PELICAN RAPIDS, 1.05 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS TO TRUNK HIGHWAY 108 MILEPOINT 13.25, THEN 0.1 MILE SOUTH ON BURR OAK HILLS ROAD, 27.2 FEET EAST OF BURR OAK HILLS ROAD, 11.4 FEET SOUTH OF A POWER POLE, 37.4 FEET NORTH OF A TELEPHONE POLE, 10.3 FEET SOUTH OF A WITNESS POST.

Station Notes

THE CAP WAS FOUND LOOSE. DISTRICT 4 DID NOT WANT THE SURVEY MARK TO GET RESET.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1336.585	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1336.585	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1336.651	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1336.651	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR
1336.651	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1336.634	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1336.585			1249.076	.034	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1336.585	.131		1249.174	.066	1996	GPS - STATIC	2024	HTH108
1336.585			1249.076	.034	2011	GPS - STATIC	2024	HTH108
1336.723	.262		1249.131	.197	2011	GPS - RTRN	2023	RTRN2023
1336.680	.262		1249.089	.197	2011	GPS - RTRN	2022	RTRN2022

Geoid Separations(ft): GEOID18 = -87.592 12B = -87.588 09 = -87.474 03 = -87.333

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 34 12.22826	96 03 45.64275	412965.927	269297.639	.020		ADJUSTMENT	2024	GPS3689
46 34 12.22826	96 03 45.64275	412965.927	269297.639	.020	C	GPS - STATIC	2024	HTH108
46 34 12.22841	96 03 45.64247	412965.946	269297.654	.131	3	GPS - RTRN	2023	RTRN2023
46 34 12.22895	96 03 45.64208	412965.974	269297.709	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 34 12.22806	96 03 45.64331	412965.888	269297.619	.033	C	GPS - STATIC	2024	HTH108



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2168810.394	905830.879	870414.722	16935484.807	.020		ADJUSTMENT	2024	GPS3689
2168810.394	905830.879	870414.722	16935484.807	.020	C	GPS - STATIC	2024	HTH108
2168810.414	905830.894	870414.742	16935484.822	.131	3	GPS - RTRN	2023	RTRN2023
2168810.442	905830.948	870414.772	16935484.875	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2168810.354	905830.860	870414.682	16935484.788	.033	C	GPS - STATIC	2024	HTH108

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_D-DG9821-3E-31JUL2023.jpg	E	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_D-DG9821-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_D-DG9821-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 E

NGS Name: 5623 E

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9822](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	25	136 N	43 W	463411.89	960231.08	2	C	2000	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 40 FT)	SURVEY DISK	MNDT

Description: (2001) Stamping: 5623 E 2000

2.0 MILES EAST OF PELICAN RAPIDS, 2.05 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE SOUTH JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS TO TRUNK HIGHWAY 108 MILEPOINT 14.25, THEN 0.1 MILE SOUTH ON 215TH AVENUE, 35.0 FEET WEST OF 215TH AVENUE, 2.2 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1366.700	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1366.700	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1366.766	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1366.766	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR
1366.766	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1366.749	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1366.700			1279.174	.025	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1366.700	.131		1279.272	.066	1996	GPS - STATIC	2024	HTH108
1366.700			1279.174	.025	2011	GPS - STATIC	2024	HTH108
1366.667	.262		1279.076	.197	2011	GPS - RTRN	2023	RTRN2023
1366.743	.262		1279.151	.197	2011	GPS - RTRN	2022	RTRN2022
1366.707	.262		1279.115	.197	2011	GPS - OPUS	2022	GPSBM
1366.716	.262		1279.125	.197	2011	GPS - OPUS	2022	GPSBM
1366.766	.262		1279.171	.197	2011	GPS - RTRN	2021	RTRN2021

Geoid Separations(ft): GEOID18 = -87.592 12B = -87.585 09 = -87.474 03 = -87.326

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 34	11.89076	96 02	31.07692	418175.731	269241.338	.013		ADJUSTMENT	2024	GPS3689
46 34	11.89076	96 02	31.07692	418175.731	269241.338	.013	C	GPS - STATIC	2024	HTH108
46 34	11.89019	96 02	31.07715	418175.715	269241.280	.131	3	GPS - RTRN	2023	RTRN2023
46 34	11.89032	96 02	31.07626	418175.777	269241.293	.131	3	GPS - RTRN	2022	RTRN2022
46 34	11.88980	96 02	31.07702	418175.724	269241.240	.131	3	GPS - OPUS	2022	GPSBM
46 34	11.89006	96 02	31.07695	418175.729	269241.267	.131	3	GPS - OPUS	2022	GPSBM
46 34	11.89061	96 02	31.07643	418175.765	269241.322	.131	3	GPS - RTRN	2021	RTRN2021

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 34	11.89055	96 02	31.07747	418175.693	269241.317	.033	C	GPS - STATIC	2024	HTH108



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2174017.608	905678.170	875620.619	16935248.985	.013		ADJUSTMENT	2024	GPS3689
2174017.608	905678.170	875620.619	16935248.985	.013	C	GPS - STATIC	2024	HTH108
2174017.591	905678.113	875620.601	16935248.928	.131	3	GPS - RTRN	2023	RTRN2023
2174017.653	905678.124	875620.663	16935248.939	.131	3	GPS - RTRN	2022	RTRN2022
2174017.599	905678.073	875620.608	16935248.888	.131	3	GPS - OPUS	2022	GPSBM
2174017.605	905678.099	875620.614	16935248.915	.131	3	GPS - OPUS	2022	GPSBM
2174017.642	905678.154	875620.653	16935248.969	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2174017.569	905678.150	875620.580	16935248.966	.033	C	GPS - STATIC	2024	HTH108

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_E-DG9822-3W-31JUL2023.jpg	W	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_E-DG9822-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_E-DG9822-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 F

NGS Name: 5623 F

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DG9823 NGS Quad / Sta Num : 46096122/ USGS Quad: PELICAN RAPIDS Get Map
NW	30	136 N	42 W	463415.38	960117.04	2	C	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2000	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5623 F 2000

3.0 MILES EAST OF PELICAN RAPIDS, 3.1 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE SOUTH JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS TO TRUNK HIGHWAY 108 MILEPOINT 15.3, THEN 0.1 MILE SOUTH ON 225TH AVENUE, 110.2 FEET SOUTHWEST OF A POWER POLE, 48.0 FEET WEST OF 225TH AVENUE, 3.8 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1389.466	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1389.466	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1389.528	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1389.512	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1389.466			1301.992	.024	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1389.466	.131		1302.091	.066	1996	GPS - STATIC	2024	HTH108
1389.466			1301.992	.024	2011	GPS - STATIC	2024	HTH108
1389.531	.262		1301.949	.197	2011	GPS - RTRN	2023	RTRN2023
1389.485	.262		1301.900	.197	2011	GPS - RTRN	2022	RTRN2022
1389.479	.262		1301.894	.197	2011	GPS - OPUS	2022	GPSBM
1389.449	.262		1301.864	.197	2011	GPS - OPUS	2022	GPSBM
1389.505	.262		1301.923	.197	2011	GPS - RTRN	2021	RTRN2021

Geoid Separations(ft): GEOID18 = -87.585 12B = -87.575 09 = -87.467 03 = -87.316

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>								
Geodetic Position		Otter Tail County				Project Info		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 34 15.37684	96 01 17.03797	423350.238	269573.916	.013		ADJUSTMENT	2024	GPS3689
46 34 15.37684	96 01 17.03797	423350.238	269573.916	.013	C	GPS - STATIC	2024	HTH108
46 34 15.37661	96 01 17.03820	423350.222	269573.893	.131	3	GPS - RTRN	2023	RTRN2023
46 34 15.37637	96 01 17.03727	423350.287	269573.869	.131	3	GPS - RTRN	2022	RTRN2022
46 34 15.37612	96 01 17.03816	423350.224	269573.843	.131	3	GPS - OPUS	2022	GPSBM
46 34 15.37630	96 01 17.03802	423350.234	269573.862	.131	3	GPS - OPUS	2022	GPSBM
46 34 15.37668	96 01 17.03724	423350.289	269573.900	.131	3	GPS - RTRN	2021	RTRN2021

<u>NAD83(1996)</u>								
Geodetic Position		Otter Tail County		Project Info				
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 34 15.37663	96 01 17.03852	423350.200	269573.895	.033	C	GPS - STATIC	2024	HTH108



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2179196.733	905914.877	880804.586	16935403.116	.013		ADJUSTMENT	2024	GPS3689
2179196.733	905914.877	880804.586	16935403.116	.013	C	GPS - STATIC	2024	HTH108
2179196.717	905914.854	880804.569	16935403.093	.131	3	GPS - RTRN	2023	RTRN2023
2179196.781	905914.829	880804.633	16935403.067	.131	3	GPS - RTRN	2022	RTRN2022
2179196.718	905914.805	880804.570	16935403.044	.131	3	GPS - OPUS	2022	GPSBM
2179196.729	905914.823	880804.581	16935403.062	.131	3	GPS - OPUS	2022	GPSBM
2179196.784	905914.860	880804.637	16935403.098	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2179196.694	905914.857	880804.547	16935403.096	.033	C	GPS - STATIC	2024	HTH108

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_F-DG9823-3W-31JUL2023.jpg	W	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_F-DG9823-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_F-DG9823-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 G

NGS Name: 5623 G

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9824](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	29	136 N	42 W	463352.59	960018.60	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2000	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 40 FT)	SURVEY DISK	MNDT

Description: (2001) Stamping: 5623 G 2000

4.0 MILES EAST OF PELICAN RAPIDS, 4.35 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 108 MILEPOINT 16.55, 37.0 FEET NORTH OF TRUNK HIGHWAY 108, 99.0 FEET WEST OF A DRIVEWAY NUMBER 23097, 2.6 FEET SOUTH OF A FENCE, 2.0 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1330.453	.016	2/1					VERTICAL CONTROL SURVEY	2024	VPELI2
1330.453	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941
1330.506	.016	2/1					VERTICAL ADJUSTMENT	2006	00000497
1330.489	.016	2/1					VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1330.453				1242.973	.027	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1330.453	.131			1243.072	.066	1996	GPS - STATIC	2024	HTH108
1330.453				1242.973	.027	2011	GPS - STATIC	2024	HTH108
1330.430	.262			1242.826	.197	2011	GPS - RTRN	2023	RTRN2023
1330.542	.262			1242.937	.197	2011	GPS - RTRN	2022	RTRN2022

Geoid Separations(ft): GEOID18 = -87.605 12B = -87.592 09 = -87.487 03 = -87.333

Lat/Lon and County Coordinates (Feet)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 33 52.59228	96 00 18.59967	427424.869	267250.254	.013		ADJUSTMENT	2024	GPS3689
46 33 52.59228	96 00 18.59967	427424.869	267250.254	.013	C	GPS - STATIC	2024	HTH108
46 33 52.59284	96 00 18.59987	427424.855	267250.311	.131	3	GPS - RTRN	2023	RTRN2023
46 33 52.59205	96 00 18.60005	427424.842	267250.231	.131	3	GPS - RTRN	2022	RTRN2022

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 33 52.59208	96 00 18.60023	427424.830	267250.234	.033	C	GPS - STATIC	2024	HTH108

State Plane and UTM Coordinates (Feet)

<u>NAVD83(2011)</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
X	Y							
2183227.145	903516.489	884797.541	16932939.966	.013		ADJUSTMENT	2024	GPS3689
2183227.145	903516.489	884797.541	16932939.966	.013	C	GPS - STATIC	2024	HTH108
2183227.132	903516.546	884797.529	16932940.023	.131	3	GPS - RTRN	2023	RTRN2023
2183227.118	903516.466	884797.513	16932939.943	.131	3	GPS - RTRN	2022	RTRN2022

<u>NAVD83(1996)</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
X	Y							
2183227.105	903516.469	884797.501	16932939.947	.033	C	GPS - STATIC	2024	HTH108



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_G-DG9824-3N-31JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_G-DG9824-2-31JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_G-DG9824-1-31JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Jul 31, 2023
	Jul 31, 2023
	Jul 31, 2023



Mn/DOT Name: 5623 H

NGS Name: 5623 H

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9825](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	32	136 N	42 W	463308.08	960017.28	2	C	2000	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 35 FT)	SURVEY DISK	MNDT

Description: (2001) Stamping: 5623 H 2000

4.5 MILES EAST OF PELICAN RAPIDS, 5.1 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS TO TRUNK HIGHWAY 108 MILEPOINT 17.3, THEN 0.3 MILE SOUTHWEST ON CROSS POINT ROAD, 41.0 FEET WEST OF CROSS POINT ROAD, 3.4 FEET NORTH-NORTHEAST OF A POWER POLE, 2.9 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1415.197	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1415.197	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1415.247	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1415.227	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1415.197			1327.691	.026	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1415.197	.131		1327.779	.066	1996	GPS - STATIC	2024	HTH108
1415.197			1327.691	.026	2011	GPS - STATIC	2024	HTH108
1415.269	.262		1327.615	.197	2011	GPS - RTRN	2023	RTRN2023
1415.247	.262		1327.592	.197	2011	GPS - RTRN	2022	RTRN2022
1415.247	.262		1327.596	.197	2011	GPS - OPUS	2020	GPSBM
1415.263	.262		1327.612	.197	2011	GPS - OPUS	2020	GPSBM

Geoid Separations(ft): GEOID18 = -87.651 12B = -87.634 09 = -87.536 03 = -87.378

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>								
Geodetic Position		Otter Tail County				Project Info		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 33 08.07939	96 00 17.27958	427500.686	262740.235	.016		ADJUSTMENT	2024	GPS3689
46 33 08.07939	96 00 17.27958	427500.686	262740.235	.016	C	GPS - STATIC	2024	HTH108
46 33 08.07900	96 00 17.28002	427500.655	262740.196	.131	3	GPS - RTRN	2023	RTRN2023
46 33 08.07873	96 00 17.27950	427500.691	262740.168	.131	3	GPS - RTRN	2022	RTRN2022
46 33 08.07912	96 00 17.28043	427500.626	262740.208	.131	3	GPS - OPUS	2020	GPSBM
46 33 08.07901	96 00 17.28032	427500.634	262740.197	.131	3	GPS - OPUS	2020	GPSBM

<u>NAD83(1996)</u>								
Geodetic Position		Otter Tail County				Project Info		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 33 08.07917	96 00 17.28010	427500.649	262740.213	.033	C	GPS - STATIC	2024	HTH108



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2183219.463	899006.408	884717.949	16928429.126	.016		ADJUSTMENT	2024	GPS3689
2183219.463	899006.408	884717.949	16928429.126	.016	C	GPS - STATIC	2024	HTH108
2183219.431	899006.369	884717.916	16928429.087	.131	3	GPS - RTRN	2023	RTRN2023
2183219.467	899006.341	884717.952	16928429.058	.131	3	GPS - RTRN	2022	RTRN2022
2183219.403	899006.381	884717.888	16928429.100	.131	3	GPS - OPUS	2020	GPSBM
2183219.410	899006.370	884717.896	16928429.089	.131	3	GPS - OPUS	2020	GPSBM

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2183219.426	899006.386	884717.911	16928429.105	.033	C	GPS - STATIC	2024	HTH108

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_H-DG9825-3NW-31JUL2023.jpg	NW	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_H-DG9825-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_H-DG9825-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 J

NGS Name: 5623 J

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9827](#)
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	35	136 N	42 W	463252.30	955629.75	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2000	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 30 FT)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5623 J 2000

7.75 MILES EAST OF PELICAN RAPIDS, 7.75 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 108 MILEPOINT 20.2, 42.0 FEET SOUTH OF TRUNK HIGHWAY 108, 4.3 FEET NORTHWEST OF A STATE PARK SIGN, 2.5 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1437.015	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1437.015	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1437.054	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1437.041	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1437.015			1349.568	.024	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1437.015	.131		1349.663	.066	1996	GPS - STATIC	2024	HTH108
1437.015			1349.568	.024	2011	GPS - STATIC	2024	HTH108
1436.910	.262		1349.364	.197	2011	GPS - RTRN	2023	RTRN2023
1437.044	.262		1349.499	.197	2011	GPS - RTRN	2022	RTRN2022

Geoid Separations(ft): GEOID18 = -87.549 12B = -87.536 09 = -87.444 03 = -87.277

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 32 52.30101	95 56 29.75422	443398.681	261090.121	.013		ADJUSTMENT	2024	GPS3689
46 32 52.30101	95 56 29.75422	443398.681	261090.121	.013	C	GPS - STATIC	2024	HTH108
46 32 52.30087	95 56 29.75342	443398.738	261090.106	.131	3	GPS - RTRN	2023	RTRN2023
46 32 52.30115	95 56 29.75354	443398.729	261090.135	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 32 52.30079	95 56 29.75476	443398.644	261090.099	.033	C	GPS - STATIC	2024	HTH108

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2199082.184	897062.519	900552.588	16926232.085	.013		ADJUSTMENT	2024	GPS3689
2199082.184	897062.519	900552.588	16926232.085	.013	C	GPS - STATIC	2024	HTH108
2199082.240	897062.503	900552.643	16926232.068	.131	3	GPS - RTRN	2023	RTRN2023
2199082.232	897062.532	900552.636	16926232.097	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2199082.146	897062.498	900552.549	16926232.064	.033	C	GPS - STATIC	2024	HTH108



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_J-DG9827-3S-31JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_J-DG9827-2-31JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_J-DG9827-1-31JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Jul 31, 2023
	Jul 31, 2023
	Jul 31, 2023



Mn/DOT Name: 5623 K

NGS Name: 5623 K

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9828](#)
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	36	136 N	42 W	463246.28	955459.99	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2000	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 35 FT)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5623 K 2000

8.8 MILES EAST OF PELICAN RAPIDS, 8.8 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 108 MILEPOINT 21.5, 156.0 FEET NORTH OF TRUNK HIGHWAY 108, 29.0 FEET EAST OF 275TH AVENUE, 12.0 FEET EAST-SOUTHEAST OF A POWER POLE, 4.0 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1407.343	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1407.343	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1407.376	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1407.369	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1407.573			1320.148	.046	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1407.510	.131		1320.243	.066	1996	GPS - STATIC	2024	HTH108
1407.573			1320.148	.046	2011	GPS - STATIC	2024	HTH108
1407.468	.262		1319.988	.197	2011	GPS - RTRN	2023	RTRN2023
1407.379	.262		1319.899	.197	2011	GPS - RTRN	2022	RTRN2022
1407.517	.262		1320.033	.197	2011	GPS - RTRN	2021	RTRN2021
1407.455	.262		1319.971	.197	2011	GPS - OPUS	2020	GPSBM
1407.340	.262		1319.856	.197	2011	GPS - OPUS	2020	GPSBM
1407.271	.262		1319.787	.197	2011	GPS - OPUS	2020	GPSBM

Geoid Separations(ft): GEOID18 = -87.483 12B = -87.480 09 = -87.385 03 = -87.208

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 32 46.28391	95 54 59.98711	449671.791	260463.662	.023		ADJUSTMENT	2024	GPS3689
46 32 46.28391	95 54 59.98711	449671.791	260463.662	.023	C	GPS - STATIC	2024	HTH108
46 32 46.28384	95 54 59.98646	449671.837	260463.655	.131	3	GPS - RTRN	2023	RTRN2023
46 32 46.28405	95 54 59.98719	449671.786	260463.676	.131	3	GPS - RTRN	2022	RTRN2022
46 32 46.28370	95 54 59.98708	449671.794	260463.641	.131	3	GPS - RTRN	2021	RTRN2021
46 32 46.28310	95 54 59.98694	449671.803	260463.580	.131	3	GPS - OPUS	2020	GPSBM
46 32 46.28357	95 54 59.98655	449671.830	260463.628	.131	3	GPS - OPUS	2020	GPSBM
46 32 46.28389	95 54 59.99159	449671.478	260463.661	.131	3	GPS - OPUS	2020	GPSBM

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 32 46.28369	95 54 59.98764	449671.754	260463.640	.033	C	GPS - STATIC	2024	HTH108



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2205341.830	896320.129	906801.434	16925389.846	.023		ADJUSTMENT	2024	GPS3689
2205341.830	896320.129	906801.434	16925389.846	.023	C	GPS - STATIC	2024	HTH108
2205341.875	896320.121	906801.479	16925389.838	.131	3	GPS - RTRN	2023	RTRN2023
2205341.825	896320.144	906801.429	16925389.861	.131	3	GPS - RTRN	2022	RTRN2022
2205341.832	896320.108	906801.435	16925389.825	.131	3	GPS - RTRN	2021	RTRN2021
2205341.840	896320.047	906801.443	16925389.764	.131	3	GPS - OPUS	2020	GPSBM
2205341.869	896320.094	906801.472	16925389.811	.131	3	GPS - OPUS	2020	GPSBM
2205341.517	896320.134	906801.121	16925389.856	.131	3	GPS - OPUS	2020	GPSBM

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2205341.793	896320.108	906801.396	16925389.826	.033	C	GPS - STATIC	2024	HTH108

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_K-DG9828-3N-31JUL2023.jpg	N	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_K-DG9828-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_K-DG9828-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 L

NGS Name: 5623 L

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9829](#) [Get Map](#)
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	6	135 N	41 W	463233.72	955337.88	2	C	2000	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 35 FT)	SURVEY DISK	MNDT

Description: (2001) Stamping: 5623 L 2000

8.0 MILES WEST OF DENT, 8.9 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND EAST LOONEY LANE/432ND STREET IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 22.65, 77.0 FEET SOUTH OF TRUNK HIGHWAY 108, 130.0 FEET WEST OF SILENT ACRES DRIVE EXTENDED, 52.0 FEET EAST OF A DRIVEWAY NUMBER 28578, 5.4 FEET WEST OF A POWER POLE, 1.8 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1389.876	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1389.876	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1389.905	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1389.902	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1389.876			1302.406	.029	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1389.876	.131		1302.501	.066	1996	GPS - STATIC	2024	HTH108
1389.876			1302.406	.029	2011	GPS - STATIC	2024	HTH108
1389.935	.262		1302.488	.197	2011	GPS - RTRN	2023	RTRN2023
1389.915	.262		1302.468	.197	2011	GPS - RTRN	2022	RTRN2022
1389.817	.262		1302.369	.197	2011	GPS - OPUS	2020	GPSBM

Geoid Separations(ft): GEOID18 = -87.447 12B = -87.454 09 = -87.349 03 = -87.175

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>								
Geodetic Position		Otter Tail County		Project Info				
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 32 33.71620	95 53 37.87526	455408.674	259176.718	.016		ADJUSTMENT	2024	GPS3689
46 32 33.71620	95 53 37.87526	455408.674	259176.718	.016	C	GPS - STATIC	2024	HTH108
46 32 33.71649	95 53 37.87498	455408.694	259176.747	.131	3	GPS - RTRN	2023	RTRN2023
46 32 33.71679	95 53 37.87536	455408.667	259176.777	.131	3	GPS - RTRN	2022	RTRN2022
46 32 33.71586	95 53 37.87544	455408.661	259176.683	.131	3	GPS - OPUS	2020	GPSBM

<u>NAD83(1996)</u>								
Geodetic Position		Otter Tail County				Project Info		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 32 33.71597	95 53 37.87579	455408.637	259176.694	.033	C	GPS - STATIC	2024	HTH108

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2211053.182	894927.374	912491.483	16923905.902	.016		ADJUSTMENT	2024	GPS3689
2211053.182	894927.374	912491.483	16923905.902	.016	C	GPS - STATIC	2024	HTH108
2211053.202	894927.403	912491.503	16923905.931	.131	3	GPS - RTRN	2023	RTRN2023
2211053.176	894927.434	912491.478	16923905.962	.131	3	GPS - RTRN	2022	RTRN2022
2211053.168	894927.340	912491.469	16923905.869	.131	3	GPS - OPUS	2020	GPSBM

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2211053.144	894927.352	912491.445	16923905.880	.033	C	GPS - STATIC	2024	HTH108

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_L-DG9829-3S-31JUL2023.jpg	S	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_L-DG9829-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_L-DG9829-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 M

NGS Name: 5623 M

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9830](#) [Get Map](#)
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	32	136 N	41 W	463234.91	955239.32	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2000	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 35 FT)	SURVEY DISK	MNDT

Description: (2001) Stamping: 5623 M 2000

7.5 MILES WEST OF DENT, 8.1 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 34 IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 23.45, 42.0 FEET NORTH OF TRUNK HIGHWAY 108, 3.7 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>				<u>Year</u>	<u>Reference</u>		
1351.264	.016	2/1						VERTICAL CONTROL SURVEY	2024	VPOLI2		
1351.264	.016	2/1						VERTICAL ADJUSTMENT	2019	00000941		
1351.290	.016	2/1						VERTICAL ADJUSTMENT	2006	00000497		
1351.290	.016	2/1						VERTICAL CONTROL SURVEY	2001	VPOLI		

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>				<u>Year</u>	<u>Reference</u>		
1351.264			1263.875	.025	2011			HORIZONTAL ADJUSTMENT	2024	GPS3689		
1351.264	.131		1263.971	.066	1996			GPS - STATIC	2024	HTH108		
1351.264			1263.875	.025	2011			GPS - STATIC	2024	HTH108		
1351.342	.262		1263.934	.197	2011			GPS - RTRN	2023	RTRN2023		
1351.319	.262		1263.908	.197	2011			GPS - RTRN	2022	RTRN2022		
1351.257	.262		1263.846	.197	2011			GPS - RTRN	2021	RTRN2021		
1351.228	.262		1263.816	.197	2011			GPS - OPUS	2020	GPSBM		

Geoid Separations(ft): GEOID18 = -87.411 12B = -87.418 09 = -87.306 03 = -87.142

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Latitude</u>		<u>Longitude</u>		<u>Otter Tail County</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
															<u>Year</u>	<u>Reference</u>
46 32 34.90756	95 52 39.31561	459502.586	259288.667	.013										ADJUSTMENT	2024	GPS3689
46 32 34.90756	95 52 39.31561	459502.586	259288.667	.013	C									GPS - STATIC	2024	HTH108
46 32 34.90805	95 52 39.31544	459502.598	259288.717	.131	3									GPS - RTRN	2023	RTRN2023
46 32 34.90688	95 52 39.31517	459502.616	259288.598	.131	3									GPS - RTRN	2022	RTRN2022
46 32 34.90617	95 52 39.31574	459502.577	259288.526	.131	3									GPS - RTRN	2021	RTRN2021
46 32 34.90724	95 52 39.31572	459502.578	259288.635	.131	3									GPS - OPUS	2020	GPSBM

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Latitude</u>		<u>Longitude</u>		<u>Otter Tail County</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
															<u>Year</u>	<u>Reference</u>
46 32 34.90733	95 52 39.31615	459502.548	259288.644	.033	C									GPS - STATIC	2024	HTH108



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2215147.947	894963.507	916587.423	16923876.827	.013		ADJUSTMENT	2024	GPS3689
2215147.947	894963.507	916587.423	16923876.827	.013	C	GPS - STATIC	2024	HTH108
2215147.960	894963.557	916587.437	16923876.876	.131	3	GPS - RTRN	2023	RTRN2023
2215147.976	894963.438	916587.451	16923876.757	.131	3	GPS - RTRN	2022	RTRN2022
2215147.935	894963.367	916587.409	16923876.686	.131	3	GPS - RTRN	2021	RTRN2021
2215147.939	894963.475	916587.414	16923876.795	.131	3	GPS - OPUS	2020	GPSBM

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2215147.909	894963.485	916587.384	16923876.805	.033	C	GPS - STATIC	2024	HTH108

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_M-DG9830-3N-31JUL2023.jpg	N	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_M-DG9830-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_M-DG9830-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 N

NGS Name: 5623 N

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9834](#) [Get Map](#)
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	33	136 N	41 W	463234.24	955102.78	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2000	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 45 FT)	SURVEY DISK	MNDT

Description: (2001) Stamping: 5623 N 2000

6.0 MILES WEST OF DENT, 6.9 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 24.75, 38.0 FEET NORTH OF TRUNK HIGHWAY 108, 101.5 FEET NORTHEAST OF A REDUCED SPEED AHEAD SIGN, 2.5 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj	Determination Method	Year	Reference		
1379.817	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2		
1379.817	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941		
1379.836	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497		
1379.843	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI		

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj	Determination Method	Year	Reference		
1379.817			1292.534	.023	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689		
1379.817	.131		1292.629	.066	1996	GPS - STATIC	2024	HTH108		
1379.817			1292.534	.023	2011	GPS - STATIC	2024	HTH108		
1379.889	.262		1292.520	.197	2011	GPS - RTRN	2023	RTRN2023		
1379.866	.262		1292.497	.197	2011	GPS - RTRN	2022	RTRN2022		
1379.922	.262		1292.553	.197	2011	GPS - RTRN	2021	RTRN2021		
1379.663	.262		1292.556	.197	1996	GPS - RTRN	2009	RTRN2009		

Geoid Separations(ft): GEOID18 = -87.369 12B = -87.365 09 = -87.257 03 = -87.106

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position		Otter Tail County		Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 32 34.24188	95 51 02.77551	466251.160	259208.640	.013		ADJUSTMENT	2024	GPS3689
46 32 34.24188	95 51 02.77551	466251.160	259208.640	.013	C	GPS - STATIC	2024	HTH108
46 32 34.24227	95 51 02.77500	466251.195	259208.679	.131	3	GPS - RTRN	2023	RTRN2023
46 32 34.24179	95 51 02.77602	466251.124	259208.631	.131	3	GPS - RTRN	2022	RTRN2022
46 32 34.24141	95 51 02.77463	466251.221	259208.592	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)		Geodetic Position		Otter Tail County		Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 32 34.24165	95 51 02.77604	466251.123	259208.616	.033	C	GPS - STATIC	2024	HTH108
46 32 34.24170	95 51 02.77673	466251.074	259208.622	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2221893.029	894758.578	923330.168	16923564.454	.013		ADJUSTMENT	2024	GPS3689
2221893.029	894758.578	923330.168	16923564.454	.013	C	GPS - STATIC	2024	HTH108
2221893.066	894758.617	923330.206	16923564.492	.131	3	GPS - RTRN	2023	RTRN2023
2221892.993	894758.569	923330.132	16923564.446	.131	3	GPS - RTRN	2022	RTRN2022
2221893.090	894758.529	923330.228	16923564.404	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2221892.992	894758.555	923330.130	16923564.432	.033	C	GPS - STATIC	2024	HTH108
2221892.944	894758.561	923330.082	16923564.439	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_N-DG9834-3N-31JUL2023.jpg	N	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_N-DG9834-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_N-DG9834-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 P

NGS Name: 5623 P

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9853](#) [Get Map](#)
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>					
SW	29	136 N	40 W	463323.88	954535.84	2	C					
<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>					
2001	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET					

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 40 FT)	SURVEY DISK	MNDT

Description: (2001) Stamping: 5623 P 2000

2.0 MILES WEST OF DENT, 2.0 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 29.6, 62.5 FEET NORTH OF TRUNK HIGHWAY 108, 52.0 FEET EAST OF DRIVEWAY NUMBER 35011, 2.7 FEET SOUTH OF A FENCE, 15.8 FEET SOUTH-SOUTHWEST OF A POWER POLE, 3.0 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order /(Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1375.781	.016	2/1				VERTICAL CONTROL SURVEY	2024 VPELI2
1375.781	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1375.785	.016	2/1				VERTICAL ADJUSTMENT	2006 00000497
1375.808	.016	2/1				VERTICAL CONTROL SURVEY	2001 VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order /(Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1375.781			1288.534	.027	2011	HORIZONTAL ADJUSTMENT	2024 GPS3689
1375.781	.131		1288.629	.066	1996	GPS - STATIC	2024 HTH108
1375.781			1288.534	.027	2011	GPS - STATIC	2024 HTH108
1375.762	.262		1288.508	.197	2011	GPS - RTRN	2023 RTRN2023
1375.804	.262		1288.547	.197	2011	GPS - RTRN	2022 RTRN2022
1375.735	.262		1288.478	.197	2011	GPS - OPUS	2020 GPSBM
1375.834	.262		1288.577	.197	2011	GPS - OPUS	2020 GPSBM
1375.460	.262		1288.439	.197	1996	GPS - RTRN	2009 RTRN2009

Geoid Separations(ft): GEOID18 = -87.257 12B = -87.250 09 = -87.132 03 = -87.024

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 33 23.87635	95 45 35.83662	489108.853	264211.594	.013		ADJUSTMENT	2024 GPS3689
46 33 23.87635	95 45 35.83662	489108.853	264211.594	.013	C	GPS - STATIC	2024 HTH108
46 33 23.87656	95 45 35.83626	489108.878	264211.615	.131	3	GPS - RTRN	2023 RTRN2023
46 33 23.87545	95 45 35.83717	489108.815	264211.503	.131	3	GPS - RTRN	2022 RTRN2022
46 33 23.87632	95 45 35.83634	489108.873	264211.591	.131	3	GPS - OPUS	2020 GPSBM
46 33 23.87599	95 45 35.83678	489108.842	264211.557	.131	3	GPS - OPUS	2020 GPSBM

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 33 23.87613	95 45 35.83716	489108.816	264211.572	.033	C	GPS - STATIC	2024 HTH108
46 33 23.87711	95 45 35.83792	489108.763	264211.671	.131	3	GPS - RTRN	2009 RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2244836.536	899336.890	946349.172	16927777.906	.013		ADJUSTMENT	2024	GPS3689
2244836.536	899336.890	946349.172	16927777.906	.013	C	GPS - STATIC	2024	HTH108
2244836.561	899336.911	946349.198	16927777.926	.131	3	GPS - RTRN	2023	RTRN2023
2244836.495	899336.799	946349.131	16927777.816	.131	3	GPS - RTRN	2022	RTRN2022
2244836.555	899336.886	946349.192	16927777.902	.131	3	GPS - OPUS	2020	GPSBM
2244836.523	899336.854	946349.160	16927777.869	.131	3	GPS - OPUS	2020	GPSBM

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2244836.497	899336.868	946349.134	16927777.885	.033	C	GPS - STATIC	2024	HTH108
2244836.446	899336.968	946349.084	16927777.986	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_P-DG9853-3N-31JUL2023.jpg	N	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_P-DG9853-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_P-DG9853-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 Q

NGS Name: 5623 Q

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9836](#) [Get Map](#)
NGS Quad / Sta Num : 46095423/
USGS Quad: DENT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	33	136 N	40 W	463323.10	954429.34	2	C	2000	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 40 FT)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5623 Q 2000

1.0 MILE WEST OF DENT, 1.1 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 30.4, 78.0 FEET NORTH OF TRUNK HIGHWAY 108, 34.0 FEET SOUTH OF A FENCE, 3.5 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1371.116	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1371.116	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1371.116	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1371.139	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1371.116			1283.879	.025	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1371.116	.131		1283.974	.066	1996	GPS - STATIC	2024	HTH108
1371.116			1283.879	.025	2011	GPS - STATIC	2024	HTH108
1371.152	.262		1283.866	.197	2011	GPS - RTRN	2023	RTRN2023
1371.152	.262		1283.866	.197	2011	GPS - RTRN	2022	RTRN2022
1371.047	.262		1283.761	.197	2011	GPS - OPUS	2022	GPSBM
1371.080	.262		1283.793	.197	2011	GPS - OPUS	2022	GPSBM
1371.047	.262		1283.761	.197	2011	GPS - RTRN	2021	RTRN2021
1370.945	.262		1283.895	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.287 12B = -87.280 09 = -87.162 03 = -87.050

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 33	23.09977	95 44	29.34123	493756.074	264130.916	.013		ADJUSTMENT	2024	GPS3689
46 33	23.09977	95 44	29.34123	493756.074	264130.916	.013	C	GPS - STATIC	2024	HTH108
46 33	23.10029	95 44	29.34078	493756.106	264130.968	.131	3	GPS - RTRN	2023	RTRN2023
46 33	23.09924	95 44	29.34169	493756.042	264130.862	.131	3	GPS - RTRN	2022	RTRN2022
46 33	23.09922	95 44	29.34164	493756.045	264130.860	.131	3	GPS - OPUS	2022	GPSBM
46 33	23.09972	95 44	29.34121	493756.075	264130.911	.131	3	GPS - OPUS	2022	GPSBM
46 33	23.09970	95 44	29.34087	493756.099	264130.909	.131	3	GPS - RTRN	2021	RTRN2021

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 33	23.09954	95 44	29.34176	493756.037	264130.893	.033	C	GPS - STATIC	2024	HTH108
46 33	23.09977	95 44	29.34262	493755.977	264130.916	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2249480.880	899170.200	950991.281	16927537.238	.013		ADJUSTMENT	2024	GPS3689
2249480.880	899170.200	950991.281	16927537.238	.013	C	GPS - STATIC	2024	HTH108
2249480.912	899170.252	950991.314	16927537.289	.131	3	GPS - RTRN	2023	RTRN2023
2249480.847	899170.147	950991.247	16927537.185	.131	3	GPS - RTRN	2022	RTRN2022
2249480.850	899170.145	950991.251	16927537.183	.131	3	GPS - OPUS	2022	GPSBM
2249480.881	899170.195	950991.282	16927537.232	.131	3	GPS - OPUS	2022	GPSBM
2249480.905	899170.192	950991.306	16927537.230	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2249480.842	899170.177	950991.243	16927537.216	.033	C	GPS - STATIC	2024	HTH108
2249480.783	899170.202	950991.184	16927537.241	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_Q-DG9836-3N-31JUL2023.jpg	N	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_Q-DG9836-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_Q-DG9836-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 R

NGS Name: 5623 R

County: OTTER TAIL, MN (Sheet 1)

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
SW	26	136 N	40 W	463324.63	954147.58	2	C

NGS ACRN: [DG9837](#)

[Get Map](#)

NGS Quad / Sta Num : 46095423/

USGS Quad: DENT

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2000	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 30 FT)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5623 R 2000

1.0 MILE EAST OF DENT, 1.0 MILE EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 32.65, 48.0 FEET NORTH OF TRUNK HIGHWAY 108, 12.5 FEET WEST OF DRIVEWAY NUMBER 38169, 4.0 FEET SOUTH OF A POWER POLE WITH A GUYWIRE, 2.1 FEET SOUTH OF A FENCE, 3.0 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1369.377	.016	2/1				VERTICAL CONTROL SURVEY	2024 VPOLI2
1369.377	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1369.371	.016	2/1				VERTICAL ADJUSTMENT	2006 00000497
1369.384	.016	2/1				VERTICAL CONTROL SURVEY	2001 VPOLI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1369.377			1282.110	.024	2011	HORIZONTAL ADJUSTMENT	2024 GPS3689
1369.377	.131		1282.205	.066	1996	GPS - STATIC	2024 HTH108
1369.377			1282.110	.024	2011	GPS - STATIC	2024 HTH108
1369.426	.262		1282.022	.197	2011	GPS - RTRN	2023 RTRN2023
1369.367	.262		1281.963	.197	2011	GPS - RTRN	2022 RTRN2022
1369.479	.262		1282.077	.197	2011	GPS - RTRN	2021 RTRN2021
1369.131	.262		1281.956	.197	1996	GPS - RTRN	2009 RTRN2009

Geoid Separations(ft): GEOID18 = -87.401 12B = -87.378 09 = -87.277 03 = -87.175

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u> <u>Order</u> <u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 33	24.63305	95 41	47.57692	505061.502	264285.920	.013	ADJUSTMENT 2024 GPS3689
46 33	24.63305	95 41	47.57692	505061.502	264285.920	.013 C	GPS - STATIC 2024 HTH108
46 33	24.63337	95 41	47.57670	505061.517	264285.953	.131 3	GPS - RTRN 2023 RTRN2023
46 33	24.63279	95 41	47.57649	505061.532	264285.894	.131 3	GPS - RTRN 2022 RTRN2022
46 33	24.63328	95 41	47.57579	505061.581	264285.944	.131 3	GPS - RTRN 2021 RTRN2021

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u> <u>Order</u> <u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 33	24.63282	95 41	47.57745	505061.465	264285.897	.033 C	GPS - STATIC 2024 HTH108
46 33	24.63382	95 41	47.57866	505061.380	264285.998	.131 3	GPS - RTRN 2009 RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2260785.814	899115.850	962296.228	16927302.871	.013		ADJUSTMENT	2024	GPS3689
2260785.814	899115.850	962296.228	16927302.871	.013	C	GPS - STATIC	2024	HTH108
2260785.829	899115.882	962296.244	16927302.903	.131	3	GPS - RTRN	2023	RTRN2023
2260785.843	899115.823	962296.257	16927302.844	.131	3	GPS - RTRN	2022	RTRN2022
2260785.893	899115.872	962296.308	16927302.892	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2260785.776	899115.827	962296.190	16927302.849	.033	C	GPS - STATIC	2024	HTH108
2260785.693	899115.930	962296.109	16927302.953	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_R-DG9837-3N-31JUL2023.jpg	N	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_R-DG9837-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_R-DG9837-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 S

NGS Name: 5623 S

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9838](#)

[Get Map](#)

NGS Quad / Sta Num : 46095423/

USGS Quad: DENT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	36	136 N	40 W	463323.26	954024.69	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2000	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 30 FT)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5623 S 2000

2.0 MILES EAST OF DENT, 2.15 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 33.7, 46.5 FEET SOUTH OF TRUNK HIGHWAY 108, 70.0 FEET WEST OF A DRIVEWAY NUMBER 39258, 2.9 FEET NORTH OF A FENCE CORNER, 2.0 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order /(Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1397.842	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1397.842	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1397.829	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1397.838	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order /(Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1397.842			1310.444	.024	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1397.842	.131		1310.539	.066	1996	GPS - STATIC	2024	HTH108
1397.842			1310.444	.024	2011	GPS - STATIC	2024	HTH108
1397.901	.262		1310.427	.197	2011	GPS - RTRN	2023	RTRN2023
1397.812	.262		1310.339	.197	2011	GPS - RTRN	2022	RTRN2022
1397.832	.262		1310.358	.197	2011	GPS - OPUS	2020	GPSBM
1397.861	.262		1310.388	.197	2011	GPS - OPUS	2020	GPSBM
1397.609	.262		1310.362	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.474 12B = -87.447 09 = -87.349 03 = -87.247

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>								
Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 33 23.26168	95 40 24.69171	510854.257	264149.300	.013		ADJUSTMENT	2024	GPS3689
46 33 23.26168	95 40 24.69171	510854.257	264149.300	.013	C	GPS - STATIC	2024	HTH108
46 33 23.26172	95 40 24.69059	510854.335	264149.304	.131	3	GPS - RTRN	2023	RTRN2023
46 33 23.26263	95 40 24.69087	510854.315	264149.396	.131	3	GPS - RTRN	2022	RTRN2022
46 33 23.26180	95 40 24.69119	510854.293	264149.312	.131	3	GPS - OPUS	2020	GPSBM
46 33 23.26154	95 40 24.69162	510854.263	264149.286	.131	3	GPS - OPUS	2020	GPSBM

<u>NAD83(1996)</u>								
Geodetic Position		Otter Tail County				Project Info		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 33 23.26145	95 40 24.69224	510854.219	264149.276	.033	C	GPS - STATIC	2024	HTH108
46 33 23.26304	95 40 24.69274	510854.184	264149.438	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2266574.315	898872.020	968081.220	16926966.866	.013		ADJUSTMENT	2024	GPS3689
2266574.315	898872.020	968081.220	16926966.866	.013	C	GPS - STATIC	2024	HTH108
2266574.393	898872.022	968081.299	16926966.867	.131	3	GPS - RTRN	2023	RTRN2023
2266574.375	898872.115	968081.282	16926966.960	.131	3	GPS - RTRN	2022	RTRN2022
2266574.351	898872.031	968081.257	16926966.877	.131	3	GPS - OPUS	2020	GPSBM
2266574.321	898872.005	968081.226	16926966.851	.131	3	GPS - OPUS	2020	GPSBM

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2266574.278	898871.997	968081.183	16926966.844	.033	C	GPS - STATIC	2024	HTH108
2266574.245	898872.159	968081.153	16926967.006	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_S-DG9838-3S-31JUL2023.jpg	S	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_S-DG9838-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_S-DG9838-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 X

NGS Name: 5623 X

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DG9832	Get Map
NW	33	136 N	41 W	463322.71	955154.50	2	C	NGS Quad / Sta Num : 46095432/ USGS Quad: STAR LAKE	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2000	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 45 FT)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5623 X 2000

7.0 MILES WEST OF DENT, 7.6 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 IN DENT TO TRUNK HIGHWAY MILEPOINT 24.1, THEN 1.05 MILES NORTH ON COUNTY ROAD 41, 52.5 FEET EAST OF COUNTY ROAD 41, 13.0 FEET NORTH OF AN ENTRANCE, 5.6 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1402.648	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1402.648	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1402.671	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1402.681	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1402.648			1315.437	.021	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1402.648	.131		1315.529	.066	1996	GPS - STATIC	2024	HTH108
1402.648			1315.437	.021	2011	GPS - STATIC	2024	HTH108
1402.733	.262		1315.430	.197	2011	GPS - RTRN	2023	RTRN2023
1402.674	.262		1315.371	.197	2011	GPS - RTRN	2022	RTRN2022

Geoid Separations(ft): GEOID18 = -87.300 12B = -87.313 09 = -87.201 03 = -87.031

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 33 22.71343	95 51 54.49515	462644.875	264125.855	.013		ADJUSTMENT	2024	GPS3689
46 33 22.71343	95 51 54.49515	462644.875	264125.855	.013	C	GPS - STATIC	2024	HTH108
46 33 22.71376	95 51 54.49505	462644.882	264125.888	.131	3	GPS - RTRN	2023	RTRN2023
46 33 22.71275	95 51 54.49510	462644.879	264125.786	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 33 22.71320	95 51 54.49568	462644.838	264125.831	.033	C	GPS - STATIC	2024	HTH108

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2218378.844	899741.087	919894.875	16928603.608	.013		ADJUSTMENT	2024	GPS3689
2218378.844	899741.087	919894.875	16928603.608	.013	C	GPS - STATIC	2024	HTH108
2218378.851	899741.120	919894.883	16928603.641	.131	3	GPS - RTRN	2023	RTRN2023
2218378.846	899741.018	919894.876	16928603.538	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2218378.806	899741.064	919894.837	16928603.586	.033	C	GPS - STATIC	2024	HTH108



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_X-DG9832-3E-31JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_X-DG9832-2-31JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_X-DG9832-1-31JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Jul 31, 2023
	Jul 31, 2023
	Jul 31, 2023



Mn/DOT Name: 5623 Y

NGS Name: 5623 Y

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	28	136 N	41 W	463417.00	955154.80	2	

NGS ACRN:	DG9833	Get Map
NGS Quad / Sta Num :	46095432/	
USGS Quad:	STAR LAKE	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2000	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 50 FT)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5623 Y 2000

7.0 MILES WEST OF DENT, 7.6 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 IN DENT TO TRUNK HIGHWAY MILEPOINT 24.1, THEN 1.85 MILES NORTH ON COUNTY ROAD 41, 59.0 FEET NORTHWEST OF COUNTY ROAD 41, 32.0 FEET EAST OF 300TH AVENUE, 4.2 FEET SOUTH-SOUTHEAST OF A FENCE CORNER, 4.8 FEET SOUTH-SOUTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1372.875	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1372.901	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1372.914	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPOLI

Geoid Separations(ft): GEOID18 = -87.224 12B = -87.244 09 = -87.136 03 = -86.955

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_Y-DG9833-3W-04AUG2009.jpg	W	Aug 4, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_Y-DG9833-2-04AUG2009.jpg		Aug 4, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_Y-DG9833-1-04AUG2009.jpg		Aug 4, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5623 Z

NGS Name: 5623 Z

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9831](#) [Get Map](#)
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	4	135 N	41 W	463233.14	955152.53	2	C	2000	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 65 FT)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5623 Z 2000

7.0 MILES WEST OF DENT, 7.6 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 24.1, 74.0 FEET SOUTH OF TRUNK HIGHWAY 108, 42.0 FEET EAST OF 300TH AVENUE, 4.2 FEET NORTH OF A POWER POLE WITH A GUYWIRE, 4.0 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1363.334	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1363.334	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1363.357	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1363.360	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1363.334			1275.965	.021	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1363.334	.131		1276.057	.066	1996	GPS - STATIC	2024	HTH108
1363.334			1275.965	.021	2011	GPS - STATIC	2024	HTH108
1363.416	.262		1276.024	.197	2011	GPS - RTRN	2023	RTRN2023
1363.419	.262		1276.028	.197	2011	GPS - RTRN	2022	RTRN2022

Geoid Separations(ft): GEOID18 = -87.392 12B = -87.395 09 = -87.283 03 = -87.126

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 32 33.13651	95 51 52.52588	462773.111	259102.853	.013		ADJUSTMENT	2024	GPS3689
46 32 33.13651	95 51 52.52588	462773.111	259102.853	.013	C	GPS - STATIC	2024	HTH108
46 32 33.13636	95 51 52.52609	462773.096	259102.838	.131	3	GPS - RTRN	2023	RTRN2023
46 32 33.13720	95 51 52.52527	462773.154	259102.923	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 32 33.13628	95 51 52.52641	462773.074	259102.830	.033	C	GPS - STATIC	2024	HTH108

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2218414.059	894717.207	919850.070	16923578.478	.013		ADJUSTMENT	2024	GPS3689
2218414.059	894717.207	919850.070	16923578.478	.013	C	GPS - STATIC	2024	HTH108
2218414.043	894717.192	919850.055	16923578.463	.131	3	GPS - RTRN	2023	RTRN2023
2218414.103	894717.276	919850.115	16923578.546	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2218414.021	894717.184	919850.032	16923578.456	.033	C	GPS - STATIC	2024	HTH108



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_Z-DG9831-3S-31JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_Z-DG9831-2-31JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5623_Z-DG9831-1-31JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Jul 31, 2023
	Jul 31, 2023
	Jul 31, 2023



Mn/DOT Name: 5625 A

NGS Name: 5625 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9820](#) [Get Map](#)
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	26	136 N	44 W	463421.79	961036.52	2	C	2000	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5625 A 2000

4.5 MILES WEST OF PELICAN RAPIDS, 4.5 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59, AT TRUNK HIGHWAY 108 MILEPOINT 7.55, 72.5 FEET SOUTH OF TRUNK HIGHWAY 108, 40.0 FEET WEST-SOUTHWEST OF A POWER POLE, 16.0 FEET WEST OF EXTENDED COUNTY ROAD 30, 3.5 FEET NORTH OF A FENCE, 2.7 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order /(Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1336.067	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1336.067	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1336.146	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1336.129	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order /(Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1336.067			1248.590	.025	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1336.067	.131		1248.688	.066	1996	GPS - STATIC	2024	HTH108
1336.067			1248.590	.025	2011	GPS - STATIC	2024	HTH108
1336.126	.262		1248.524	.197	2011	GPS - RTRN	2023	RTRN2023
1336.132	.262		1248.531	.197	2011	GPS - RTRN	2022	RTRN2022
1336.031	.262		1248.429	.197	2011	GPS - OPUS	2022	GPSBM
1336.028	.262		1248.426	.197	2011	GPS - OPUS	2022	GPSBM
1336.169	.262		1248.567	.197	2011	GPS - RTRN	2021	RTRN2021

Geoid Separations(ft): GEOID18 = -87.602 12B = -87.588 09 = -87.477 03 = -87.378

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>			<u>Geodetic Position</u>			<u>Otter Tail County</u>			<u>Project Info</u>		
	<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>		
46 34 21.79121	96 10 36.52055	384263.480	270412.770	.013			ADJUSTMENT	2024	GPS3689		
46 34 21.79121	96 10 36.52055	384263.480	270412.770	.013	C		GPS - STATIC	2024	HTH108		
46 34 21.79099	96 10 36.51967	384263.542	270412.747	.131	3		GPS - RTRN	2023	RTRN2023		
46 34 21.79123	96 10 36.51958	384263.548	270412.772	.131	3		GPS - RTRN	2022	RTRN2022		
46 34 21.79031	96 10 36.52100	384263.448	270412.679	.131	3		GPS - OPUS	2022	GPSBM		
46 34 21.79085	96 10 36.52082	384263.461	270412.734	.131	3		GPS - OPUS	2022	GPSBM		
46 34 21.79093	96 10 36.52023	384263.502	270412.742	.131	3		GPS - RTRN	2021	RTRN2021		

<u>NAD83(1996)</u>			<u>Geodetic Position</u>			<u>Otter Tail County</u>			<u>Project Info</u>		
	<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>		
46 34 21.79101	96 10 36.52110	384263.442	270412.750	.033	C		GPS - STATIC	2024	HTH108		



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2140137.111	907476.877	841760.691	16937588.852	.013		ADJUSTMENT	2024	GPS3689
2140137.111	907476.877	841760.691	16937588.852	.013	C	GPS - STATIC	2024	HTH108
2140137.172	907476.854	841760.752	16937588.827	.131	3	GPS - RTRN	2023	RTRN2023
2140137.179	907476.878	841760.759	16937588.851	.131	3	GPS - RTRN	2022	RTRN2022
2140137.078	907476.787	841760.656	16937588.762	.131	3	GPS - OPUS	2022	GPSBM
2140137.092	907476.841	841760.671	16937588.816	.131	3	GPS - OPUS	2022	GPSBM
2140137.133	907476.848	841760.713	16937588.823	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2140137.072	907476.858	841760.652	16937588.833	.033	C	GPS - STATIC	2024	HTH108

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_A-DG9820-3S-27JUL2023.jpg	S	Jul 27, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_A-DG9820-2-27JUL2023.jpg		Jul 27, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_A-DG9820-1-27JUL2023.jpg		Jul 27, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5625 B

NGS Name: 5625 B

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9819](#) [Get Map](#)
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	34	136 N	44 W	463329.89	961220.98	2	C	2000	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5625 B 2000

7.5 MILES EAST OF LAWNDALE, 5.5 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND INTERSTATE HIGHWAY 94, AT TRUNK HIGHWAY 108 MILEPOINT 5.5, 70.0 FEET SOUTH OF TRUNK HIGHWAY 108, 5.0 FEET NORTH OF A RIGHT-OF-WAY POST, 5.1 FEET NORTH-NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1364.961	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1364.961	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1365.040	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1365.020	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1364.961			1277.356	.021	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1364.961	.131		1277.455	.066	1996	GPS - STATIC	2024	HTH108
1364.961			1277.356	.021	2011	GPS - STATIC	2024	HTH108
1364.994	.262		1277.301	.197	2011	GPS - RTRN	2023	RTRN2023
1364.974	.262		1277.281	.197	2011	GPS - RTRN	2022	RTRN2022
1364.991	.262		1277.297	.197	2011	GPS - OPUS	2022	GPSBM
1364.869	.262		1277.176	.197	2011	GPS - OPUS	2022	GPSBM
1364.997	.262		1277.304	.197	2011	GPS - RTRN	2021	RTRN2021

Geoid Separations(ft): GEOID18 = -87.693 12B = -87.674 09 = -87.569 03 = -87.480

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
46 33	29.88723	96 12	20.98057	376932.717	265198.136	.013		ADJUSTMENT
46 33	29.88723	96 12	20.98057	376932.717	265198.136	.013	C	GPS - STATIC
46 33	29.88764	96 12	20.97997	376932.759	265198.178	.131	3	GPS - RTRN
46 33	29.88776	96 12	20.98013	376932.748	265198.190	.131	3	GPS - RTRN
46 33	29.88666	96 12	20.98098	376932.688	265198.079	.131	3	GPS - OPUS
46 33	29.88670	96 12	20.98087	376932.696	265198.083	.131	3	GPS - OPUS
46 33	29.88764	96 12	20.98031	376932.736	265198.178	.131	3	GPS - RTRN

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
46 33	29.88703	96 12	20.98112	376932.679	265198.116	.033	C	GPS - STATIC



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2132712.026	902399.455	834252.496	16932628.539	.013		ADJUSTMENT	2024	GPS3689
2132712.026	902399.455	834252.496	16932628.539	.013	C	GPS - STATIC	2024	HTH108
2132712.068	902399.496	834252.540	16932628.578	.131	3	GPS - RTRN	2023	RTRN2023
2132712.057	902399.508	834252.529	16932628.591	.131	3	GPS - RTRN	2022	RTRN2022
2132711.995	902399.398	834252.465	16932628.482	.131	3	GPS - OPUS	2022	GPSBM
2132712.003	902399.402	834252.473	16932628.486	.131	3	GPS - OPUS	2022	GPSBM
2132712.045	902399.496	834252.516	16932628.579	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2132711.987	902399.436	834252.457	16932628.520	.033	C	GPS - STATIC	2024	HTH108

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_B-DG9819-3S-27JUL2023.jpg	S	Jul 27, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_B-DG9819-2-27JUL2023.jpg		Jul 27, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_B-DG9819-1-27JUL2023.jpg		Jul 27, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5625 BB

NGS Name: 5625 BB

County: OTTER TAIL, MN (Sheet 1)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	30	136 N	43 W	463422.32	960904.90	2	C

NGS ACRN: [DG9848](#)
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

[Get Map](#)

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1955	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (2001)

Stamping: 5625 BB 2000

3.25 MILES WEST OF PELICAN RAPIDS, 3.25 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 108 MILEPOINT 8.8, 74.0 FEET SOUTH OF TRUNK HIGHWAY 108, 66.0 FEET EAST OF AN ENTRANCE, 4.1 FEET WEST OF A POWER POLE, 0.4 FOOT NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1301.477	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1301.261	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1301.333	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1301.316	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1301.428			1213.895	.024	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1301.261	.131		1213.997	.066	1996	GPS - STATIC	2024	HTH108
1301.428			1213.895	.024	2011	GPS - STATIC	2024	HTH108
1301.546	.262		1213.944	.197	2011	GPS - RTRN	2023	RTRN2023
1301.533	.262		1213.931	.197	2011	GPS - RTRN	2022	RTRN2022
1301.572	.262		1213.971	.197	2011	GPS - RTRN	2021	RTRN2021
1301.513	.262		1213.912	.197	2011	GPS - OPUS	2020	GPSBM

Geoid Separations(ft): GEOID18 = -87.602 12B = -87.588 09 = -87.470 03 = -87.369

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 34 22.32357	96 09 04.90409	390664.700	270430.496	.013		ADJUSTMENT	2024	GPS3689
46 34 22.32357	96 09 04.90409	390664.700	270430.496	.013	C	GPS - STATIC	2024	HTH108
46 34 22.32383	96 09 04.90378	390664.722	270430.522	.131	3	GPS - RTRN	2023	RTRN2023
46 34 22.32415	96 09 04.90404	390664.704	270430.555	.131	3	GPS - RTRN	2022	RTRN2022
46 34 22.32371	96 09 04.90424	390664.689	270430.510	.131	3	GPS - RTRN	2021	RTRN2021
46 34 22.32304	96 09 04.90468	390664.658	270430.443	.131	3	GPS - OPUS	2020	GPSBM

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 34 22.32336	96 09 04.90464	390664.661	270430.475	.033	C	GPS - STATIC	2024	HTH108



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2146536.757	907376.135	848160.423	16937385.914	.013		ADJUSTMENT	2024	GPS3689
2146536.757	907376.135	848160.423	16937385.914	.013	C	GPS - STATIC	2024	HTH108
2146536.780	907376.161	848160.446	16937385.939	.131	3	GPS - RTRN	2023	RTRN2023
2146536.762	907376.194	848160.429	16937385.972	.131	3	GPS - RTRN	2022	RTRN2022
2146536.748	907376.150	848160.413	16937385.928	.131	3	GPS - RTRN	2021	RTRN2021
2146536.715	907376.083	848160.380	16937385.862	.131	3	GPS - OPUS	2020	GPSBM

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2146536.719	907376.115	848160.384	16937385.894	.033	C	GPS - STATIC	2024	HTH108

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_BB-DG9848-3S-27JUL2023.jpg	S	Jul 27, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_BB-DG9848-2-27JUL2023.jpg		Jul 27, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_BB-DG9848-1-27JUL2023.jpg		Jul 27, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5625 C

NGS Name: 5625 C

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9818](#) [Get Map](#)
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>				
SE	28	136 N	44 W	463331.48	961338.64	2	3				
<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>				
2000	2023	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET				

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2001) Stamping: 5625 C 2000

6.5 MILES EAST OF LAWNSDALE, 4.4 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND INTERSTATE HIGHWAY 94 IN PELICAN RAPIDS (THE JUNCTION IS 2.0 MILES EAST OF LAWNSDALE), AT TRUNK HIGHWAY 108 MILEPOINT 4.4, 73.0 FEET NORTH OF TRUNK HIGHWAY 108, 15.0 FEET SOUTHEAST OF A CABLE MARKER, 1.3 FEET SOUTH OF A RIGHT-OF-WAY POST, 3.0 FEET WEST OF A WITNESS POST.

Station Pair: NOBLE - OTTER TAIL, MN

Station Notes

THE DISK WAS RETURNED TO THE OFFICE.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1350.457	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1350.542	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1350.519	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1350.503	.262		1262.809	.197	2011	GPS - RTRN	2022	RTRN2022

Geoid Separations(ft): GEOID18 = -87.693 12B = -87.677 09 = -87.575 03 = -87.490

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
46 33 31.48229	96 13 38.63710	371506.757	265394.035	.131	3	2022	RTRN2022

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>									
MN State Plane - Central Zone		UTM - Zone 15			Project Info				
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
2127291.304	902695.706	828834.929	16933011.386	.131	3	GPS - RTRN	2022	RTRN2022	

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<u>Location:</u>	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_C-DG9818-3N-18OCT2022.jpg	N	Oct 18, 2022
<u>Monument:</u>	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_C-DG9818-2-18OCT2022.jpg		Oct 18, 2022
<u>Disk:</u>	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_C-DG9818-1-18OCT2022.jpg		Oct 18, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5625 C RESET

NGS Name: 5625 C RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DS2446](#) [Get Map](#)
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	28	136 N	44 W	463331.48	961338.64	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2023	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2023)

Stamping: 5625 C RESET 2023

6.5 MILES EAST OF LAWNSDALE, 4.4 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND INTERSTATE HIGHWAY 94 IN PELICAN RAPIDS (THE JUNCTION IS 2.0 MILES EAST OF LAWNSDALE), AT TRUNK HIGHWAY 108 MILEPOINT 4.4, 73.0 FEET NORTH OF TRUNK HIGHWAY 108, 1.3 FEET SOUTH OF A RIGHT-OF-WAY POST, 3.0 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Determination Method			Project Info	
Height	Acc	Order / (Class)	Height	Acc	Adj	Height	Acc	Adj	Year	Reference			
1350.256	.016	2/1							2024	VPELI2			

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Determination Method			Project Info	
Height	Acc	Order / (Class)	Height	Acc	Adj	Height	Acc	Adj	Year	Reference			
1350.312	.262		1262.619	.197	2011				2023	RTRN2023			

No Geoid Separations Available

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order	Year	Reference			
46 33 31.48292	96 13 38.63710	371506.757	265394.099	.131	3	2023	RTRN2023			

State Plane and UTM Coordinates (Feet)

NAD83(2011)		MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order	Year	Reference			
2127291.305	902695.769	828834.931	16933011.450	.131	3	2023	RTRN2023			

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_C_RESET-DS2446-3N-31JUL2023.jpg	N	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_C_RESET-DS2446-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_C_RESET-DS2446-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5625 CC

NGS Name: 5625 CC

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DG9849 NGS Quad / Sta Num : 46096123/ USGS Quad: LAKE OLAF	Get Map
NW	29	136 N	43 W	463419.49	960809.55	2	C		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1955	2024	GOOD	Horz=YES Vert=YES	YES		PROJECTS 2 IN.	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (2001)

Stamping: 5625 CC 2000

2.55 MILES WEST OF PELICAN RAPIDS, 2.55 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 108 MILEPOINT 9.5, 76.0 FEET SOUTH OF TRUNK HIGHWAY 108, 36.0 FEET EAST 170TH AVENUE, 5.4 FEET NORTHWEST OF A POWER POLE, 8.4 FEET WEST OF THE RIGHT-OF-WAY, 0.4 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order /(Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1313.826	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1313.826	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1313.898	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1313.879	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order /(Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1313.826			1226.316	.024	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1313.826	.131		1226.415	.066	1996	GPS - STATIC	2024	HTH108
1313.826			1226.316	.024	2011	GPS - STATIC	2024	HTH108
1313.843	.262		1226.241	.197	2011	GPS - RTRN	2023	RTRN2023
1313.823	.262		1226.221	.197	2011	GPS - RTRN	2022	RTRN2022
1313.806	.262		1226.205	.197	2011	GPS - OPUS	2022	GPSBM
1313.905	.262		1226.303	.197	2011	GPS - OPUS	2022	GPSBM
1313.856	.262		1226.257	.197	2011	GPS - RTRN	2021	RTRN2021

Geoid Separations(ft): GEOID18 = -87.602 12B = -87.588 09 = -87.474 03 = -87.365

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 34	19.48803	96 08 09.54820	394530.695	270122.345	.013			ADJUSTMENT	2024	GPS3689
46 34	19.48803	96 08 09.54820	394530.695	270122.345	.013	C		GPS - STATIC	2024	HTH108
46 34	19.48806	96 08 09.54782	394530.721	270122.348	.131	3		GPS - RTRN	2023	RTRN2023
46 34	19.48858	96 08 09.54814	394530.699	270122.400	.131	3		GPS - RTRN	2022	RTRN2022
46 34	19.48778	96 08 09.54841	394530.680	270122.319	.131	3		GPS - OPUS	2022	GPSBM
46 34	19.48746	96 08 09.54848	394530.675	270122.287	.131	3		GPS - OPUS	2022	GPSBM
46 34	19.48847	96 08 09.54837	394530.683	270122.389	.131	3		GPS - RTRN	2021	RTRN2021

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 34	19.48783	96 08 09.54876	394530.656	270122.325	.033	C		GPS - STATIC	2024	HTH108



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2150395.902	906996.529	852014.493	16936944.606	.013		ADJUSTMENT	2024	GPS3689
2150395.902	906996.529	852014.493	16936944.606	.013	C	GPS - STATIC	2024	HTH108
2150395.929	906996.531	852014.520	16936944.608	.131	3	GPS - RTRN	2023	RTRN2023
2150395.907	906996.584	852014.499	16936944.661	.131	3	GPS - RTRN	2022	RTRN2022
2150395.887	906996.504	852014.477	16936944.581	.131	3	GPS - OPUS	2022	GPSBM
2150395.881	906996.471	852014.471	16936944.549	.131	3	GPS - OPUS	2022	GPSBM
2150395.891	906996.573	852014.483	16936944.651	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2150395.862	906996.509	852014.453	16936944.587	.033	C	GPS - STATIC	2024	HTH108

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_CC-DG9849-3S-31JUL2023.jpg	S	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_CC-DG9849-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_CC-DG9849-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5625 D

NGS Name: 5625 D

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9816](#) [Get Map](#)
NGS Quad / Sta Num : 46096132/
USGS Quad: LAWNSDALE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	30	136 N	44 W	463333.00	961538.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2001	2010	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5625 D 2000

4.8 MILES EAST OF LAWNSDALE, 2.8 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND INTERSTATE HIGHWAY 94 (THE JUNCTION IS 2.0 MILES EAST OF LAWNSDALE), AT TRUNK HIGHWAY 108 MILEPOINT 2.8, 172.0 FEET NORTH OF TRUNK HIGHWAY 108, 38.0 FEET WEST OF 110TH AVENUE, 32.0 FEET SOUTH OF AN ENTRANCE, 3.5 FEET SOUTHWEST OF A RIGHT-OF-WAY POST, 3.0 FEET SOUTH OF A WITNESS POST.

Station Notes

FOUND THE CAP LOOSE. THE DISK WAS RETURNED TO THE OFFICE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1256.300	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1256.389	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1256.372	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPOLI

Geoid Separations(ft): GEOID18 = -87.687 12B = -87.674 09 = -87.572 03 = -87.487

* No Horizontal Positions in the Database *



Mn/DOT Name: 5625 D RESET

NGS Name: 5625 D RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR9941](#) [Get Map](#)
NGS Quad / Sta Num : 46096132/
USGS Quad: LAWNDALE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>					
SE	30	136 N	44 W	463333.10	961538.92	2	C					
<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>					
2009	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	MARKER W/BAR MAGNET					

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009)

Stamping: 5625 D RESET 2009

4.8 MILES EAST OF LAWNDALE, 2.8 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND INTERSTATE HIGHWAY 94 (THE JUNCTION IS 2.0 MILES EAST OF LAWNDALE), AT TRUNK HIGHWAY 108 MILEPOINT 2.8, 172.0 FEET NORTH OF TRUNK HIGHWAY 108, 38.0 FEET WEST OF 110TH AVENUE, 32.0 FEET SOUTH OF AN ENTRANCE, 3.5 FEET SOUTHWEST OF A RIGHT-OF-WAY POST, 3.0 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1256.041	.016	2/1				VERTICAL CONTROL SURVEY	2024 VPELI2

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1256.044			1168.429	.022	2011	HORIZONTAL ADJUSTMENT	2024 GPS3689
1256.028	.131		1168.528	.066	1996	GPS - STATIC	2024 HTH108
1256.044			1168.429	.022	2011	GPS - STATIC	2024 HTH108
1256.100	.262		1168.413	.197	2011	GPS - RTRN	2023 RTRN2023
1256.080	.262		1168.393	.197	2011	GPS - RTRN	2022 RTRN2022

Geoid Separations(ft): GEOID18 = -87.687 12B = -87.674 09 = -87.572 03 = -87.487

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>								
<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 33 33.10363	96 15 38.92218	363101.887	265614.348	.013		ADJUSTMENT	2024	GPS3689
46 33 33.10363	96 15 38.92218	363101.887	265614.348	.013	C	GPS - STATIC	2024	HTH108
46 33 33.10381	96 15 38.92188	363101.908	265614.366	.131	3	GPS - RTRN	2023	RTRN2023
46 33 33.10317	96 15 38.92181	363101.912	265614.301	.131	3	GPS - RTRN	2022	RTRN2022

<u>NAD83(1996)</u>		<u>Otter Tail County</u>						<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 33 33.10343	96 15 38.92274	363101.847	265614.328	.033	C	GPS - STATIC	2024	HTH108	

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>								
MN State Plane - Central Zone		UTM - Zone 15				Project Info		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2118893.010	903071.484	820440.087	16933521.328	.013		ADJUSTMENT	2024	GPS3689
2118893.010	903071.484	820440.087	16933521.328	.013	C	GPS - STATIC	2024	HTH108
2118893.031	903071.502	820440.109	16933521.346	.131	3	GPS - RTRN	2023	RTRN2023
2118893.034	903071.437	820440.111	16933521.281	.131	3	GPS - RTRN	2022	RTRN2022

<u>NAD83(1996)</u>								
MN State Plane - Central Zone		UTM - Zone 15		Project Info				
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2118892.970	903071.465	820440.047	16933521.310	.033	C	GPS - STATIC	2024	HTH108



<u>Station Photos</u>			
<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_D_RESET-DR9941-3W-27JUL2023.jpg	W	Jul 27, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_D_RESET-DR9941-2-27JUL2023.jpg		Jul 27, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_D_RESET-DR9941-1-27JUL2023.jpg		Jul 27, 2023
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: 5625 E

NGS Name: 5625 E

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9815](#) [Get Map](#)
NGS Quad / Sta Num : 46096132/
USGS Quad: LAWNDALE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	31	136 N	44 W	463331.11	961624.86	2	C	2000	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2001)

Stamping: 5625 E 2000

4.2 MILES EAST OF LAWNDALE, 2.2 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND INTERSTATE HIGHWAY 94 (THE JUNCTION IS 2.0 MILES EAST OF LAWNDALE), AT TRUNK HIGHWAY 108 MILEPOINT 2.2, 64.5 FEET SOUTH OF TRUNK HIGHWAY 108, 3.9 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1222.714	.016	2/1				VERTICAL CONTROL SURVEY	2024 VPELI2
1222.714	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1222.806	.016	2/1				VERTICAL ADJUSTMENT	2006 00000497
1222.790	.016	2/1				VERTICAL CONTROL SURVEY	2001 VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1222.714			1135.099	.015	2011	HORIZONTAL ADJUSTMENT	2024 GPS3689
1222.714	.131		1135.254	.066	1996	GPS - STATIC	2024 HTH108
1222.714			1135.099	.015	2011	GPS - STATIC	2024 HTH108
1222.826	.262		1135.139	.197	2011	GPS - RTRN	2023 RTRN2023
1222.770	.262		1135.083	.197	2011	GPS - RTRN	2022 RTRN2022
1222.714	.131		1135.254	.066	1996	GPS - STATIC	2021 HOTTE
1222.714			1135.099	.020	2011	HORIZONTAL ADJUSTMENT	2020 GPS3384
1222.714			1135.099	.020	2011	GPS - STATIC	2020 HOTTE

Geoid Separations(ft): GEOID18 = -87.687 12B = -87.677 09 = -87.572 03 = -87.487

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 33 31.10758	96 16 24.85706	359890.384	265434.471	.010		ADJUSTMENT	2024 GPS3689
46 33 31.10758	96 16 24.85706	359890.384	265434.471	.010	C	GPS - STATIC	2024 HTH108
46 33 31.10732	96 16 24.85652	359890.421	265434.444	.131	3	GPS - RTRN	2023 RTRN2023
46 33 31.10782	96 16 24.85622	359890.442	265434.495	.131	3	GPS - RTRN	2022 RTRN2022
46 33 31.10758	96 16 24.85706	359890.384	265434.471	.013		ADJUSTMENT	2020 GPS3384
46 33 31.10758	96 16 24.85706	359890.384	265434.471	.013	C	GPS - STATIC	2020 HOTTE

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 33 31.10726	96 16 24.85755	359890.349	265434.439	.033	C	GPS - STATIC	2024 HTH108
46 33 31.10726	96 16 24.85755	359890.349	265434.439	.033	C	GPS - STATIC	2021 HOTTE



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2115679.132	902951.088	817223.279	16933452.199	.010		ADJUSTMENT	2024	GPS3689
2115679.132	902951.088	817223.279	16933452.199	.010	C	GPS - STATIC	2024	HTH108
2115679.170	902951.061	817223.316	16933452.170	.131	3	GPS - RTRN	2023	RTRN2023
2115679.192	902951.111	817223.339	16933452.220	.131	3	GPS - RTRN	2022	RTRN2022
2115679.132	902951.088	817223.279	16933452.199	.013		ADJUSTMENT	2020	GPS3384
2115679.132	902951.088	817223.279	16933452.199	.013	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2115679.098	902951.057	817223.244	16933452.167	.033	C	GPS - STATIC	2024	HTH108
2115679.098	902951.057	817223.244	16933452.167	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_E-DG9815-3S-27JUL2023.jpg	S	Jul 27, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_E-DG9815-2-27JUL2023.jpg		Jul 27, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_E-DG9815-1-27JUL2023.jpg		Jul 27, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5625 EE

NGS Name: 5625 EE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9850](#)

[Get Map](#)

NGS Quad / Sta Num : 46096122/

USGS Quad: PELICAN RAPIDS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	28	136 N	43 W	463416.59	960557.90	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1955	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (2001)

Stamping: 5625 EE 2000

0.75 MILE WEST OF PELICAN RAPIDS, 0.75 MILE WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 108 MILEPOINT 11.30, 74.0 FEET SOUTH OF TRUNK HIGHWAY 108, 25.0 FEET WEST OF NORTHWEST 9TH STREET EXTENDED, 1.3 FEET WEST-SOUTHWEST OF A CABLE MARKER, 0.4 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1321.231	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1321.231	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1321.300	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1321.300	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR
1321.300	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1321.283	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1321.231			1233.679	.024	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1321.231	.131		1233.777	.066	1996	GPS - STATIC	2024	HTH108
1321.231			1233.679	.024	2011	GPS - STATIC	2024	HTH108
1321.280	.262		1233.682	.197	2011	GPS - RTRN	2023	RTRN2023
1321.336	.262		1233.738	.197	2011	GPS - RTRN	2022	RTRN2022

Geoid Separations(ft): GEOID18 = -87.598 12B = -87.588 09 = -87.470 03 = -87.346

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>									
Geodetic Position		Otter Tail County					Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
46 34 16.58781	96 05 57.89646	403727.458	269781.882	.013		ADJUSTMENT	2024	GPS3689	
46 34 16.58781	96 05 57.89646	403727.458	269781.882	.013	C	GPS - STATIC	2024	HTH108	
46 34 16.58770	96 05 57.89625	403727.473	269781.871	.131	3	GPS - RTRN	2023	RTRN2023	
46 34 16.58778	96 05 57.89747	403727.388	269781.879	.131	3	GPS - RTRN	2022	RTRN2022	

<u>NAD83(1996)</u>										
Geodetic Position				Otter Tail County			Project Info			
<u>Latitude</u>		<u>Longitude</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 34	16.58760	96 05	57.89701	403727.420	269781.861	.033	C	GPS - STATIC	2024	HTH108

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>			<u>MN State Plane - Central Zone</u>			<u>UTM - Zone 15</u>			<u>Project Info</u>		
			<u>X</u>	<u>Y</u>		<u>X</u>	<u>Y</u>		<u>Year</u>	<u>Reference</u>	
					<u>Order</u>			<u>Determination Method</u>			
			2159583.632	906485.961		861196.314	16936287.272	.013	ADJUSTMENT	2024	GPS3689
			2159583.632	906485.961		861196.314	16936287.272	.013	C GPS - STATIC	2024	HTH108
			2159583.647	906485.950		861196.329	16936287.261	.131	3 GPS - RTRN	2023	RTRN2023
			2159583.562	906485.960		861196.244	16936287.272	.131	3 GPS - RTRN	2022	RTRN2022

<u>NAD83(1996)</u>			<u>MN State Plane - Central Zone</u>			<u>UTM - Zone 15</u>			<u>Project Info</u>		
			<u>X</u>	<u>Y</u>		<u>X</u>	<u>Y</u>		<u>Year</u>	<u>Reference</u>	
					<u>Order</u>			<u>Determination Method</u>			
			2159583.593	906485.941		861196.275	16936287.252	.033	C GPS - STATIC	2024	HTH108



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_EE-DG9850-3S-31JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_EE-DG9850-2-31JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5625_EE-DG9850-1-31JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Jul 31, 2023
	Jul 31, 2023
	Jul 31, 2023



Mn/DOT Name: 5626 A

NGS Name: 5626 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095431/
USGS Quad: VERGAS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	19	137 N	40 W	463929.42	954624.45		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	MNDT

Description: (1952) **Stamping:** 5626 A 1952

2.0 MILES EAST OF VERGAS, 1.25 MILES SOUTHEAST ALONG TRUNK HIGHWAY 228 FROM THE JUNCTION OF TRUNK HIGHWAY 228 AND COUNTY ROAD 4 IN VERGAS, AT TRUNK HIGHWAY 108 MILEPOINT 2.05, 72.4 FEET NORTH OF TRUNK HIGHWAY 228, 23.4 FEET EAST OF A FIELD ENTRANCE.

Station Pair: MINK - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1370.880	.033	3				VERTICAL CONTROL SURVEY	1952	CS5626

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1371.565	.262		1284.692	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.113 12B = -87.109 09 = -87.014 03 = -86.876

Lat/Lon and County Coordinates (Feet)

Geodetic Position		Otter Tail County		Project Info		
Latitude	Longitude	X	Y	Acc	Order	Reference
46 39 29.42027	95 46 24.45338	485737.706	301248.322	.131	3	RTRN2009

State Plane and UTM Coordinates (Feet)

MN State Plane - Central Zone		UTM - Zone 15		Project Info		
X	Y	X	Y	Acc	Order	Reference
2242152.054	936425.056	944256.220	16964912.283	.131	3	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5626_A-3N-05AUG2009.jpg	N	Aug 5, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5626_A-2-05AUG2009.jpg		Aug 5, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5626_A-1-05AUG2009.jpg		Aug 5, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5626 B

NGS Name: 5626 B

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	22	137 N	40 W	463929.61	954353.55		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1952	2009	GOOD	Horz=NO Vert=YES	YES		PROJECTS 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	MNDT

Description: (1952) **Stamping:** 5626 B 1952

4.1 MILES EAST OF VERGAS, 3.25 MILES EAST ALONG TRUNK HIGHWAY 228 FROM THE JUNCTION OF TRUNK HIGHWAY 228 AND COUNTY ROAD 4 NORTH, AT TRUNK HIGHWAY 228 MILEPOINT 4.05, 74.4 FEET NORTH OF TRUNK HIGHWAY 228, 35.0 FEET EAST OF SOUTH ROSE LAKE ROAD, 2.9 FEET NORTHEAST OF CABLE BOX NUMBER 4 W3, 15.4 FEET WEST OF A POWER POLE WITH 2 GUYWIRES, 6.0 FEET WEST OF A RIGHT-OF-WAY POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1380.240	.033	3					VERTICAL CONTROL SURVEY	1952	CS5626

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1380.886	.262			1293.938	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.185 12B = -87.185 09 = -87.080 03 = -86.952

Lat/Lon and County Coordinates (Feet)

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 39 29.60921	95 43 53.54644	496264.701	301262.696	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2252676.210	936244.534	954778.328	16964563.530	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5626_B-3N-05AUG2009.jpg	N	Aug 5, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5626_B-2-05AUG2009.jpg		Aug 5, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5626_B-1-05AUG2009.jpg		Aug 5, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5626 C RESET

NGS Name: 5626 C RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	23	137 N	40 W	463938.45	954138.35		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1979	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CULVERT - ANY SIZE, ANY TYPE	BENCH MARK DISK	MNDT

Description: (1979)

Stamping: 5626 C RESET 1979

1.9 MILES WEST ON TRUNK HIGHWAY 228 FROM THE JUNCTION OF TRUNK HIGHWAY 10 AND TRUNK HIGHWAY 228 AT LUCE, 23.3 FEET SOUTH OF TRUNK HIGHWAY 228, AT TRUNK HIGHWAY 228 MILEPOINT 5.9, IN THE SOUTHEAST CORNER OF A TRUNK HIGHWAY 228 BOX CULVERT AT THE RIVER BETWEEN RICE LAKE AND LONG LAKE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1349.259	.033	3				VERTICAL CONTROL SURVEY	1979	CS5626

Geoid Separations(ft): GEOID18 = -87.273 12B = -87.270 09 = -87.165 03 = -87.041

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5626_C_RESET-3E-05AUG2009.jpg	E	Aug 5, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5626_C_RESET-2-05AUG2009.jpg		Aug 5, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5626_C_RESET-1-05AUG2009.jpg		Aug 5, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 A

NGS Name: 5680 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0198](#)
NGS Quad / Sta Num : 46096241/
USGS Quad: ROTHSA

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NE	31	135 N	44 W	462817.60	961546.87	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1968	2015	GOOD	Horz=NO Vert=NO	YES	56804	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (2015)

Stamping: 5680 A 1968

0.9 MILE EAST OF ROTHSA, 1.2 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 11 IN ROTHSA, AT INTERSTATE HIGHWAY 94 MILEPOINT 39.45, IN THE SOUTHEAST CORNER OF COUNTY ROAD 24 BRIDGE NUMBER 56804 OVER INTERSTATE HIGHWAY 94, 22.5 FEET SOUTH OF COUNTY ROAD 24.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1276.621	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1276.720	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1276.713	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1276.625	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1275.686	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1275.686	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1275.686	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1275.686	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1276.684	.262		1188.521	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -88.169 12B = -88.163 09 = -88.058 03 = -87.979

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 28 17.59784	96 15 46.86541	362325.999	233654.541	.131	3	GPS - RTRN	2015	RTRN2015

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2117525.950	871135.572	818563.755	16901597.115	.131	3	GPS - RTRN	2015	RTRN2015

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_A-RP0198-3W-16SEP2015.jpg	W	Sep 16, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_A-RP0198-2-16SEP2015.jpg		Sep 16, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_A-RP0198-1-16SEP2015.jpg		Sep 16, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 A 1

NGS Name: 5680 A 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0195](#)
NGS Quad / Sta Num : 46096241/
USGS Quad: ROTHSA Y

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	32	135 N	44 W	462722.99	961506.68	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1968	2023	GOOD	Horz=YES Vert=YES	YES		PROJECTS 6 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	MNDT

Description: (2015)

Stamping: 5680 A 1 1968

1.8 MILES SOUTHEAST OF ROTHSA Y, 2.35 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 11 IN ROTHSA Y, AT INTERSTATE HIGHWAY 94 MILEPOINT 40.60, 96.0 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 2.0 FEET NORTHEAST OF A RIGHT-OF-WAY FENCE, 2.0 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1229.492	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1229.581	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1229.571	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1229.571	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1228.643	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1228.643	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1228.643	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1228.643	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1229.492			1141.349	.013	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1229.492			1141.349	.013	2011	GPS - STATIC	2025	HTH94B
1229.564	.262		1141.353	.197	2011	GPS - RTRN	2023	RTRN2023
1229.502	.262		1141.290	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -88.208 12B = -88.208 09 = -88.097 03 = -88.021

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 27 22.98754	96 15 06.68381	365101.099	228102.838	.010		ADJUSTMENT	2025	GPS3847
46 27 22.98754	96 15 06.68381	365101.099	228102.838	.010	C	GPS - STATIC	2025	HTH94B
46 27 22.98750	96 15 06.68406	365101.081	228102.834	.131	3	GPS - RTRN	2023	RTRN2023
46 27 22.98796	96 15 06.68418	365101.073	228102.881	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 27 22.98709	96 15 06.68452	365101.049	228102.793	.066		NCAT	2025	HTH94B



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2120197.486	865534.181	821147.090	16895951.470	.010		ADJUSTMENT	2025	GPS3847
2120197.486	865534.181	821147.090	16895951.470	.010	C	GPS - STATIC	2025	HTH94B
2120197.468	865534.177	821147.073	16895951.467	.131	3	GPS - RTRN	2023	RTRN2023
2120197.461	865534.224	821147.066	16895951.514	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2120197.435	865534.137	821147.039	16895951.427	.066		NCAT	2025	HTH94B

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_A_1-RP0195-3SW-14AUG2023.jpg	SW	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_A_1-RP0195-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_A_1-RP0195-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 AA

NGS Name: 5680 AA

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0145](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	25	132 N	43 W	461238.53	960126.26	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2016	GOOD	Horz=NO Vert=YES	YES		PROJECTS 6 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (2015) **Stamping:** 5680 AA 1966

5.0 MILES SOUTHEAST OF FERGUS FALLS, 7.3 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 61.40, 85.0 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, AT INTERSTATE HIGHWAY 94 STATION 1392+00, 15.0 FEET NORTHEAST OF A RIGHT-OF-WAY FENCE, 0.5 FOOT NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1247.977	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1247.977	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1248.013	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1247.990	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1247.990	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1248.104	.016	2/1				VERTICAL ADJUSTMENT	2016	00000869
1248.104	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1248.121	.016	2/1				VERTICAL CONTROL SURVEY	2012	VTENN
1247.999	.016	2/1				VERTICAL ADJUSTMENT	2007	00000425-15
1248.013	.016	2/1				VERTICAL CONTROL SURVEY	2005	VFAUN
1247.999	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1247.242	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1247.242	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1247.242	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1247.242	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1247.904	.262		1160.158	.197	2011	GPS - RTRN	2015	RTRN2015
1247.868	.262		1160.306	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.752 12B = -87.743 09 = -87.615 03 = -87.562

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 12 38.52875	96 01 26.25791	422195.621	138194.500	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 12 38.52786	96 01 26.25810	422195.607	138194.409	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2175610.807	774596.452	875137.930	16804113.334	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2175610.791	774596.363	875137.913	16804113.244	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AA-RP0145-3SW-15SEP2015.jpg	SW	Sep 15, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AA-RP0145-2-15SEP2015.jpg		Sep 15, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AA-RP0145-1-15SEP2015.jpg		Sep 15, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 AB

NGS Name: 5680 AB

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2693](#)
NGS Quad / Sta Num : 46095333/
USGS Quad: FOURMILE LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	36	131 N	42 W	460631.64	955351.17	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2015	2025	GOOD	Horz=YES Vert=YES	YES		RECESSED 5 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 48 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) **Stamping:** 5680 AB 2015

4.5 MILES SOUTH OF DALTON, 3.35 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 35 (THE JUNCTION IS 2.0 MILES SOUTH-SOUTHWEST OF DALTON), AT INTERSTATE HIGHWAY 94 MILEPOINT 70.9, 82.8 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 31.2 FEET EAST-SOUTHEAST OF A CABLE MARKER, 16.7 FEET NORTHEAST OF A RIGHT-OF-WAY FENCE, 1.5 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1255.811	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1255.811	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1255.805	.016	2/1				VERTICAL CONTROL SURVEY	2016 VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1255.811			1168.721	.021	2011	HORIZONTAL ADJUSTMENT	2025 GPS3847
1255.805	.262		1168.728	.197	2011	GPS - RTRN	2025 RTRN2025
1255.811			1168.721	.021	2011	GPS - STATIC	2025 HTH94B
1257.061	.262		1169.985	.197	2011	GPS - RTRN	2023 RTRN2023
1255.641	.262		1168.577	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -87.077 12B = -87.063 09 = -86.939 03 = -86.922

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position		Otter Tail County		Project Info	
		Latitude	Longitude	X	Y	Year Reference	
46 06 31.63881	95 53 51.16770	454117.562	100927.623	.013		2025	GPS3847
46 06 31.63856	95 53 51.16747	454117.578	100927.597	.131	3	2025	RTRN2025
46 06 31.63881	95 53 51.16770	454117.562	100927.623	.013	C	2025	HTH94B
46 06 31.63821	95 53 51.16777	454117.557	100927.562	.131	3	2023	RTRN2023
46 06 31.63878	95 53 51.16769	454117.563	100927.620	.131	3	2015	RTRN2015

NAD83(1996)		Geodetic Position		Otter Tail County		Project Info	
		Latitude	Longitude	X	Y	Year Reference	
46 06 31.63831	95 53 51.16834	454117.517	100927.572	.066		2025	HTH94B

State Plane and UTM Coordinates (Feet)

NAD83(2011)		MN State Plane - Central Zone		UTM - Zone 15		Project Info	
		X	Y	X	Y	Year Reference	
2206833.140	736750.166	905772.345	16765769.779	.013		2025	GPS3847
2206833.156	736750.140	905772.361	16765769.753	.131	3	2025	RTRN2025
2206833.140	736750.166	905772.345	16765769.779	.013	C	2025	HTH94B
2206833.134	736750.105	905772.338	16765769.719	.131	3	2023	RTRN2023
2206833.141	736750.163	905772.346	16765769.776	.131	3	2015	RTRN2015

NAD83(1996)		MN State Plane - Central Zone		UTM - Zone 15		Project Info	
		X	Y	X	Y	Year Reference	
2206833.094	736750.116	905772.298	16765769.730	.066		2025	HTH94B



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AB-DQ2693-3SW-30JUL2025.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AB-DQ2693-2-30JUL2025.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AB-DQ2693-1-30JUL2025.jpg

<u>Dir</u>	<u>Date</u>
SW	Jul 30, 2025
	Jul 30, 2025
	Jul 30, 2025

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 AC

NGS Name: 5680 AC

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	26	131 N	42 W	460803.87	955529.63	2	C

NGS ACRN: [DQ2694](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2015	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 12 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5680 AC 2015

2.6 MILES SOUTH OF DALTON, 1.05 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 35 (THE JUNCTION IS 2.0 MILES SOUTH-SOUTHWEST OF DALTON), AT INTERSTATE HIGHWAY 94 MILEPOINT 68.7, 96.4 FEET WEST-SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 11.6 FEET SOUTHEAST OF A RIGHT-OF-WAY POST, 3.7 FEET EAST-NORTHEAST OF A RIGHT-OF-WAY FENCE, 1.5 FEET EAST-NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1296.746	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1296.753	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1296.733	.016	2/1				VERTICAL CONTROL SURVEY	2016 VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1296.746			1209.614	.020	2011	HORIZONTAL ADJUSTMENT	2025 GPS3847
1296.746			1209.614	.020	2011	GPS - STATIC	2025 HTH94B
1298.085	.262		1210.929	.197	2011	GPS - RTRN	2023 RTRN2023
1296.710	.262		1209.555	.197	2011	GPS - OPUS	2022 GPSBM
1296.684	.262		1209.528	.197	2011	GPS - RTRN	2021 RTRN2021
1296.743	.262		1209.587	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -87.155 12B = -87.152 09 = -87.024 03 = -87.001

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 08 03.87123	95 55 29.62707	447204.552	110288.331	.013		ADJUSTMENT	2025 GPS3847
46 08 03.87123	95 55 29.62707	447204.552	110288.331	.013	C	GPS - STATIC	2025 HTH94B
46 08 03.87122	95 55 29.62767	447204.510	110288.330	.131	3	GPS - RTRN	2023 RTRN2023
46 08 03.87074	95 55 29.62744	447204.526	110288.281	.131	3	GPS - OPUS	2022 GPSBM
46 08 03.87111	95 55 29.62654	447204.590	110288.319	.131	3	GPS - RTRN	2021 RTRN2021
46 08 03.87146	95 55 29.62702	447204.556	110288.354	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 08 03.87071	95 55 29.62770	447204.507	110288.278	.066		NCAT	2025 HTH94B

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2200095.533	746235.951	899182.235	16775362.760	.013		ADJUSTMENT	2025	GPS3847
2200095.533	746235.951	899182.235	16775362.760	.013	C	GPS - STATIC	2025	HTH94B
2200095.491	746235.951	899182.193	16775362.761	.131	3	GPS - RTRN	2023	RTRN2023
2200095.506	746235.902	899182.207	16775362.712	.131	3	GPS - OPUS	2022	GPSBM
2200095.570	746235.939	899182.272	16775362.747	.131	3	GPS - RTRN	2021	RTRN2021
2200095.537	746235.975	899182.240	16775362.784	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2200095.488	746235.900	899182.189	16775362.709	.066		NCAT	2025	HTH94B

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AC-DQ2694-3SW-14AUG2023.jpg	SW	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AC-DQ2694-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AC-DQ2694-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 AD

NGS Name: 5680 AD

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DQ2695 NGS Quad / Sta Num : 46095334/ USGS Quad: DALTON	Get Map
NW	23	131 N	42 W	460840.85	955554.56	2	C		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2015	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 34 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) **Stamping:** 5680 AD 2015

2.0 MILES SOUTH-SOUTHWEST OF DALTON, 0.25 MILE SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 35 (THE JUNCTION IS 2.0 MILES SOUTH-SOUTHWEST OF DALTON), AT INTERSTATE HIGHWAY 94 MILEPOINT 67.9, 85.4 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 15.6 FEET SOUTHWEST OF A RIGHT-OF-WAY FENCE, 1.5 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1304.978	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1304.988	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1304.968	.016	2/1				VERTICAL CONTROL SURVEY	2016 VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1304.978			1217.829	.019	2011	HORIZONTAL ADJUSTMENT	2025 GPS3847
1304.978			1217.829	.019	2011	GPS - STATIC	2025 HTH94B
1305.001	.262		1217.806	.197	2011	GPS - RTRN	2023 RTRN2023
1304.883	.262		1217.681	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -87.195 12B = -87.201 09 = -87.063 03 = -87.031

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Year</u> <u>Reference</u>	
46 08 40.84678	95 55 54.56040	445458.717	114038.860	.013		2025 GPS3847	ADJUSTMENT
46 08 40.84678	95 55 54.56040	445458.717	114038.860	.013	C	2025 HTH94B	GPS - STATIC
46 08 40.84678	95 55 54.56035	445458.721	114038.860	.131	3	2023 RTRN2023	GPS - RTRN
46 08 40.84670	95 55 54.56055	445458.707	114038.851	.131	3	2015 RTRN2015	GPS - RTRN

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Year</u> <u>Reference</u>	
46 08 40.84626	95 55 54.56102	445458.673	114038.807	.066		2025 HTH94B	NCAT

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Year</u> <u>Reference</u>	
2198419.659	750017.641	897565.363	16779171.403	.013		2025 GPS3847	ADJUSTMENT
2198419.659	750017.641	897565.363	16779171.403	.013	C	2025 HTH94B	GPS - STATIC
2198419.662	750017.641	897565.366	16779171.403	.131	3	2023 RTRN2023	GPS - RTRN
2198419.648	750017.633	897565.352	16779171.395	.131	3	2015 RTRN2015	GPS - RTRN

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Year</u> <u>Reference</u>	
2198419.614	750017.589	897565.317	16779171.352	.066		2025 HTH94B	NCAT



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AD-DQ2695-3NE-14AUG2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AD-DQ2695-2-14AUG2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AD-DQ2695-1-14AUG2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
NE	Aug 14, 2023
	Aug 14, 2023
	Aug 14, 2023



Mn/DOT Name: 5680 AE

NGS Name: 5680 AE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2696](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	22	131 N	42 W	460900.90	955642.33	2	C	2015	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 27 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5680 AE 2015

2.1 MILES SOUTHWEST OF DALTON, 0.5 MILE NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 35 (THE JUNCTION IS 2.0 MILES SOUTH-SOUTHWEST OF DALTON), AT INTERSTATE HIGHWAY 94 MILEPOINT 67.15, 92.5 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 16.5 FEET SOUTHWEST OF A RIGHT-OF-WAY FENCE, 1.5 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1253.387	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1253.403	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1253.387	.016	2/1				VERTICAL CONTROL SURVEY	2016 VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1253.387			1166.251	.019	2011	HORIZONTAL ADJUSTMENT	2025 GPS3847
1253.387			1166.251	.019	2011	GPS - STATIC	2025 HTH94B
1253.419	.262		1166.189	.197	2011	GPS - RTRN	2023 RTRN2023
1253.387	.262		1166.149	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -87.228 12B = -87.234 09 = -87.093 03 = -87.054

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 09 00.90119	95 56 42.33284	442100.659	116079.916	.013		ADJUSTMENT	2025 GPS3847
46 09 00.90119	95 56 42.33284	442100.659	116079.916	.013	C	GPS - STATIC	2025 HTH94B
46 09 00.90098	95 56 42.33256	442100.679	116079.894	.131	3	GPS - RTRN	2023 RTRN2023
46 09 00.90093	95 56 42.33280	442100.662	116079.890	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 09 00.90066	95 56 42.33346	442100.616	116079.862	.066		NCAT	2025 HTH94B

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2195100.414	752120.227	894278.492	16781326.438	.013		ADJUSTMENT	2025 GPS3847
2195100.414	752120.227	894278.492	16781326.438	.013	C	GPS - STATIC	2025 HTH94B
2195100.433	752120.205	894278.511	16781326.416	.131	3	GPS - RTRN	2023 RTRN2023
2195100.416	752120.200	894278.494	16781326.412	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2195100.369	752120.174	894278.446	16781326.386	.066		NCAT	2025 HTH94B



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AE-DQ2696-3NE-14AUG2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AE-DQ2696-2-14AUG2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AE-DQ2696-1-14AUG2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
NE	Aug 14, 2023
	Aug 14, 2023
	Aug 14, 2023



Mn/DOT Name: 5680 AF

NGS Name: 5680 AF

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2698](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SE	9	131 N	42 W	461010.84	955742.10	2	C	2015	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 21 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5680 AF 2015

2.2 MILES WEST OF DALTON, 2.1 MILES NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 35 (THE JUNCTION IS 2.0 MILES SOUTH-SOUTHWEST OF DALTON), AT INTERSTATE HIGHWAY 94 MILEPOINT 65.55, 74.5 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 37.2 FEET SOUTHWEST OF A RIGHT-OF-WAY POST AND A RIGHT-OF-WAY FENCE, 1.5 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1249.961	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1249.988	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1249.968	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1249.961			1162.665	.017	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1249.961			1162.665	.017	2011	GPS - STATIC	2025	HTH94B
1249.984	.262		1162.629	.197	2011	GPS - RTRN	2023	RTRN2023
1249.893	.262		1162.530	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -87.355 12B = -87.362 09 = -87.224 03 = -87.188

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 10 10.83668	95 57 42.09818	437914.624	123177.369	.013		ADJUSTMENT	2025	GPS3847
46 10 10.83668	95 57 42.09818	437914.624	123177.369	.013	C	GPS - STATIC	2025	HTH94B
46 10 10.83700	95 57 42.09800	437914.636	123177.402	.131	3	GPS - RTRN	2023	RTRN2023
46 10 10.83653	95 57 42.09785	437914.647	123177.354	.131	3	GPS - RTRN	2015	RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 10 10.83615	95 57 42.09879	437914.581	123177.316	.066		NCAT	2025	HTH94B

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2191047.037	759292.982	890336.911	16788564.162	.013		ADJUSTMENT	2025	GPS3847
2191047.037	759292.982	890336.911	16788564.162	.013	C	GPS - STATIC	2025	HTH94B
2191047.050	759293.014	890336.924	16788564.194	.131	3	GPS - RTRN	2023	RTRN2023
2191047.059	759292.966	890336.933	16788564.146	.131	3	GPS - RTRN	2015	RTRN2015

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2191046.993	759292.929	890336.866	16788564.110	.066		NCAT	2025	HTH94B



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AF-DQ2698-3NE-14AUG2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AF-DQ2698-2-14AUG2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AF-DQ2698-1-14AUG2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
NE	Aug 14, 2023
	Aug 14, 2023
	Aug 14, 2023



Mn/DOT Name: 5680 AG

NGS Name: 5680 AG

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2701](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	31	132 N	42 W	461207.73	960032.05	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2015	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 83 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) **Stamping:** 5680 AG 2015

6.4 MILES SOUTHEAST OF FERGUS FALLS, 0.65 MILE SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 SOUTH (THE JUNCTION IS 6.0 MILES SOUTH OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 62.35, 86.8 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 13.1 FEET NORTHEAST OF A RIGHT-OF-WAY FENCE, 1.5 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference		
1247.852	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941		
1247.891	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911		
1247.862	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4		

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference		
1247.852			1160.224	.017	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847		
1247.852			1160.224	.017	2011	GPS - STATIC	2025	HTH94B		
1249.131	.262		1161.471	.197	2011	GPS - RTRN	2023	RTRN2023		
1247.776	.262		1160.119	.197	2011	GPS - RTRN	2015	RTRN2015		

Geoid Separations(ft): GEOID18 = -87.661 12B = -87.661 09 = -87.523 03 = -87.470

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position		Otter Tail County		Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 07.72819	96 00 32.04549	425996.896	135059.770	.013		ADJUSTMENT	2025	GPS3847
46 12 07.72819	96 00 32.04549	425996.896	135059.770	.013	C	GPS - STATIC	2025	HTH94B
46 12 07.72831	96 00 32.04558	425996.890	135059.782	.131	3	GPS - RTRN	2023	RTRN2023
46 12 07.72841	96 00 32.04550	425996.896	135059.793	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)		Geodetic Position		Otter Tail County		Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 12 07.72763	96 00 32.04607	425996.855	135059.713	.066		NCAT	2025	HTH94B

State Plane and UTM Coordinates (Feet)

NAD83(2011)		MN State Plane - Central Zone		UTM - Zone 15		Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2179352.898	771392.326	878830.460	16800849.677	.013		ADJUSTMENT	2025	GPS3847
2179352.898	771392.326	878830.460	16800849.677	.013	C	GPS - STATIC	2025	HTH94B
2179352.892	771392.338	878830.454	16800849.690	.131	3	GPS - RTRN	2023	RTRN2023
2179352.898	771392.349	878830.461	16800849.700	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)		MN State Plane - Central Zone		UTM - Zone 15		Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2179352.856	771392.271	878830.417	16800849.622	.066		NCAT	2025	HTH94B



<u>Station Photos</u>		<u>Dir</u>	<u>Date</u>
<u>Type</u>	<u>File Name</u>		
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AG-DQ2701-3SW-14AUG2023.jpg	SW	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AG-DQ2701-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AG-DQ2701-1-14AUG2023.jpg		Aug 14, 2023
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: 5680 AH

NGS Name: 5680 AH

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2702](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	25	132 N	43 W	461326.56	960216.80	2	C	2015	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 22 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5680 AH 2015

4.5 MILES SOUTH-SOUTHEAST OF FERGUS FALLS, 2.4 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 EAST (THE JUNCTION IS 2.5 MILES SOUTH OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 60.3, 88.2 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 10.5 FEET SOUTHWEST OF A RIGHT-OF-WAY FENCE, 1.5 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1195.175	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1195.208	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1195.185	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1195.175			1107.314	.017	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1195.175			1107.314	.017	2011	GPS - STATIC	2025	HTH94B
1195.217	.262		1107.344	.197	2011	GPS - RTRN	2023	RTRN2023
1195.099	.262		1107.239	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -87.871 12B = -87.861 09 = -87.743 03 = -87.677

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
		46 13 26.56492	96 02 16.79677	418660.954	143074.972	.010		ADJUSTMENT
		46 13 26.56492	96 02 16.79677	418660.954	143074.972	.010	C	GPS - STATIC
		46 13 26.56497	96 02 16.79639	418660.981	143074.977	.131	3	GPS - RTRN
		46 13 26.56527	96 02 16.79688	418660.947	143075.007	.131	3	GPS - RTRN

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
		46 13 26.56435	96 02 16.79732	418660.915	143074.915	.066		NCAT

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
		2172167.551	779540.853	871771.672	16809113.001	.010		ADJUSTMENT
		2172167.551	779540.853	871771.672	16809113.001	.010	C	GPS - STATIC
		2172167.578	779540.858	871771.699	16809113.005	.131	3	GPS - RTRN
		2172167.544	779540.889	871771.666	16809113.037	.131	3	GPS - RTRN

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
		2172167.511	779540.797	871771.632	16809112.945	.066		NCAT



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AH-DQ2702-3NE-15AUG2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AH-DQ2702-2-15AUG2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AH-DQ2702-1-15AUG2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
NE	Aug 15, 2023
	Aug 15, 2023
	Aug 15, 2023

Mn/DOT Name: 5680 AJ

NGS Name: 5680 AJ

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>	NGS ACRN: DQ2705 Get Map
NW	23	132 N	43 W	461357.50	960257.43	2	C	NGS Quad / Sta Num : 46096221/ USGS Quad: DAYTON HOLLOW DAM

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2015	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type

ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)

Disk Type

METAL ROD (WITH REMOVABLE ID DISK)

Mon. Agency

MNDT

Description: (2015)

Stamping: 5680 AJ 2015

3.5 MILES SOUTH OF FERGUS FALLS, 1.64 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 EAST (THE JUNCTION IS 2.5 MILES SOUTH OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 59.45, 134.7 FEET NORTHEAST OF INTERSTATE HIGHWAY 94, 91.4 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 41.1 FEET SOUTHEAST OF A CROSSOVER, 1.5 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Project Info		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1228.725	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1228.751	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1228.731	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Project Info		
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1228.725			1140.795	.016	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1228.725			1140.795	.016	2011	GPS - STATIC	2025	HTH94B
1230.007	.262		1142.065	.197	2011	GPS - RTRN	2023	RTRN2023
1228.734	.262		1140.795	.197	2011	GPS - OPUS	2020	GPSBM
1228.698	.262		1140.759	.197	2011	GPS - OPUS	2020	GPSBM
1228.738	.262		1140.798	.197	2011	GPS - OPUS	2020	GPSBM
1228.652	.262		1140.716	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -87.939 12B = -87.936 09 = -87.812 03 = -87.743

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 57.50507	96 02 57.43345	415816.823	146221.206	.010		ADJUSTMENT	2025	GPS3847
46 13 57.50507	96 02 57.43345	415816.823	146221.206	.010	C	GPS - STATIC	2025	HTH94B
46 13 57.50508	96 02 57.43269	415816.877	146221.207	.131	3	GPS - RTRN	2023	RTRN2023
46 13 57.50479	96 02 57.43356	415816.815	146221.178	.131	3	GPS - OPUS	2020	GPSBM
46 13 57.50497	96 02 57.43363	415816.810	146221.196	.131	3	GPS - OPUS	2020	GPSBM
46 13 57.50515	96 02 57.43338	415816.828	146221.214	.131	3	GPS - OPUS	2020	GPSBM
46 13 57.50564	96 02 57.43302	415816.854	146221.264	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Project Info				
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 13 57.50449	96 02 57.43400	415816.784	146221.148	.066		NCAT	2025	HTH94B



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2169382.520	782738.766	869036.324	16812355.474	.010		ADJUSTMENT	2025	GPS3847
2169382.520	782738.766	869036.324	16812355.474	.010	C	GPS - STATIC	2025	HTH94B
2169382.574	782738.766	869036.378	16812355.472	.131	3	GPS - RTRN	2023	RTRN2023
2169382.512	782738.738	869036.315	16812355.445	.131	3	GPS - OPUS	2020	GPSBM
2169382.507	782738.756	869036.311	16812355.464	.131	3	GPS - OPUS	2020	GPSBM
2169382.525	782738.774	869036.330	16812355.482	.131	3	GPS - OPUS	2020	GPSBM
2169382.552	782738.823	869036.356	16812355.530	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2169382.480	782738.708	869036.283	16812355.416	.066		NCAT	2025	HTH94B

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AJ-DQ2703-3SE-14AUG2023.jpg	SE	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AJ-DQ2703-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AJ-DQ2703-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 AK

NGS Name: 5680 AK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2704](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	14	132 N	43 W	461432.57	960337.48	2	C	2015	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 17 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5680 AK 2015

2.8 MILES SOUTH OF FERGUS FALLS, 0.7 MILE SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 EAST (THE JUNCTION IS 2.5 MILES SOUTH OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 58.6, 88.7 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 11.7 FEET SOUTHWEST OF A RIGHT-OF-WAY FENCE, 1.5 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1226.375	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1226.398	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1226.385	.016	2/1				VERTICAL CONTROL SURVEY	2016 VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1226.375			1138.380	.011	2011	HORIZONTAL ADJUSTMENT	2025 GPS3847
1226.375			1138.380	.011	2011	GPS - STATIC	2025 HTH94B
1226.382	.262		1138.374	.197	2011	GPS - RTRN	2023 RTRN2023
1226.303	.262		1138.295	.197	2011	GPS - OPUS	2022 GPSBM
1226.349	.262		1138.341	.197	2011	GPS - OPUS	2022 GPSBM
1226.382	.262		1138.374	.197	2011	GPS - RTRN	2021 RTRN2021
1226.280	.262		1138.272	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -88.008 12B = -88.008 09 = -87.880 03 = -87.808

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u> <u>Order</u> <u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 14 32.57465	96 03 37.47634	413017.145	149786.002	.007		ADJUSTMENT	2025 GPS3847
46 14 32.57465	96 03 37.47634	413017.145	149786.002	.007	C	GPS - STATIC	2025 HTH94B
46 14 32.57438	96 03 37.47579	413017.183	149785.975	.131	3	GPS - RTRN	2023 RTRN2023
46 14 32.57419	96 03 37.47614	413017.159	149785.956	.131	3	GPS - OPUS	2022 GPSBM
46 14 32.57426	96 03 37.47650	413017.133	149785.963	.131	3	GPS - OPUS	2022 GPSBM
46 14 32.57470	96 03 37.47672	413017.118	149786.008	.131	3	GPS - RTRN	2021 RTRN2021
46 14 32.57459	96 03 37.47670	413017.120	149785.996	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u> <u>Order</u> <u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 14 32.57407	96 03 37.47688	413017.106	149785.944	.066		NCAT	2025 HTH94B



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2166649.674	786354.290	866359.752	16816014.866	.007		ADJUSTMENT	2025	GPS3847
2166649.674	786354.290	866359.752	16816014.866	.007	C	GPS - STATIC	2025	HTH94B
2166649.712	786354.262	866359.790	16816014.837	.131	3	GPS - RTRN	2023	RTRN2023
2166649.687	786354.243	866359.764	16816014.819	.131	3	GPS - OPUS	2022	GPSBM
2166649.662	786354.250	866359.739	16816014.827	.131	3	GPS - OPUS	2022	GPSBM
2166649.648	786354.295	866359.725	16816014.872	.131	3	GPS - RTRN	2021	RTRN2021
2166649.649	786354.284	866359.726	16816014.861	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2166649.635	786354.232	866359.712	16816014.809	.066		NCAT	2025	HTH94B

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AK-DQ2704-3NE-15AUG2023.jpg	NE	Aug 15, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AK-DQ2704-2-15AUG2023.jpg		Aug 15, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AK-DQ2704-1-15AUG2023.jpg		Aug 15, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 AL

NGS Name: 5680 AL

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	9	132 N	43 W	461604.90	960602.95	2	C

NGS ACRN: [DQ2708](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2015	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 22 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015)

Stamping: 5680 AL 2015

1.6 MILES SOUTHWEST OF FERGUS FALLS, 1.8 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 56.0, 47.6 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 35.0 FEET SOUTHWEST OF A RAMP FROM WESTBOUND INTERSTATE HIGHWAY 94 TO COUNTY ROAD 1, 16.5 FEET NORTHEAST OF MILEPOST 56, 1.5 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1190.172	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1190.201	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1190.191	.016	2/1				VERTICAL CONTROL SURVEY	2016 VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1190.172			1102.035	.019	2011	HORIZONTAL ADJUSTMENT	2025 GPS3793
1190.172	.131		1102.157	.066	1996	GPS - STATIC	2024 HTH210A
1190.172			1102.035	.019	2011	GPS - STATIC	2024 HTH210A
1190.139	.262		1101.983	.197	2011	GPS - RTRN	2023 RTRN2023
1190.211	.262		1102.055	.197	2011	GPS - OPUS	2022 GPSBM
1190.165	.262		1102.009	.197	2011	GPS - RTRN	2021 RTRN2021
1190.080	.262		1101.927	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -88.156 12B = -88.156 09 = -88.038 03 = -87.956

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 16 04.90497	96 06 02.94678	402837.456	159186.668	.010		ADJUSTMENT	2025 GPS3793
46 16 04.90497	96 06 02.94678	402837.456	159186.668	.010	C	GPS - STATIC	2024 HTH210A
46 16 04.90489	96 06 02.94683	402837.453	159186.660	.131	3	GPS - RTRN	2023 RTRN2023
46 16 04.90433	96 06 02.94728	402837.421	159186.604	.131	3	GPS - OPUS	2022 GPSBM
46 16 04.90460	96 06 02.94752	402837.404	159186.631	.131	3	GPS - RTRN	2021 RTRN2021
46 16 04.90465	96 06 02.94696	402837.443	159186.636	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 16 04.90469	96 06 02.94715	402837.430	159186.640	.033	C	GPS - STATIC	2024 HTH210A



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2156647.074	795940.491	856505.706	16825761.002	.010		ADJUSTMENT	2025	GPS3793
2156647.074	795940.491	856505.706	16825761.002	.010	C	GPS - STATIC	2024	HTH210A
2156647.070	795940.483	856505.702	16825760.993	.131	3	GPS - RTRN	2023	RTRN2023
2156647.037	795940.427	856505.669	16825760.938	.131	3	GPS - OPUS	2022	GPSBM
2156647.021	795940.455	856505.653	16825760.966	.131	3	GPS - RTRN	2021	RTRN2021
2156647.060	795940.459	856505.692	16825760.969	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2156647.047	795940.463	856505.679	16825760.974	.033	C	GPS - STATIC	2024	HTH210A

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AL-DQ2708-3NE-21FEB2024.jpg	NE	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AL-DQ2708-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AL-DQ2708-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 AM

NGS Name: 5680 AM

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2709](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	32	133 N	43 W	461701.06	960659.32	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2015	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 29 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) **Stamping:** 5680 AM 2015

IN FERGUS FALLS, 0.45 MILE SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 54.65, 100.5 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 20.0 FEET SOUTHWEST OF A RIGHT-OF-WAY FENCE, 1.5 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1147.816	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1147.855	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1147.829	.016	2/1				VERTICAL CONTROL SURVEY	2016 VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1147.816			1059.611	.021	2011	HORIZONTAL ADJUSTMENT	2025 GPS3793
1147.816	.131		1059.732	.066	1996	GPS - STATIC	2024 HTH210A
1147.816			1059.611	.021	2011	GPS - STATIC	2024 HTH210A
1147.793	.262		1059.568	.197	2011	GPS - RTRN	2023 RTRN2023
1147.718	.262		1059.499	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -88.225 12B = -88.218 09 = -88.100 03 = -88.025

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position		Otter Tail County		Project Info	
		Latitude	Longitude	X	Y	Year Reference	
		46 17 01.05805	96 06 59.31507	398905.942	164894.949	2025	GPS3793
		46 17 01.05805	96 06 59.31507	398905.942	164894.949	2024	HTH210A
		46 17 01.05772	96 06 59.31518	398905.934	164894.915	2023	RTRN2023
		46 17 01.05797	96 06 59.31543	398905.917	164894.941	2015	RTRN2015

NAD83(1996)		Geodetic Position		Otter Tail County		Project Info	
		Latitude	Longitude	X	Y	Year Reference	
		46 17 01.05775	96 06 59.31544	398905.916	164894.919	2024	HTH210A

State Plane and UTM Coordinates (Feet)

NAD83(2011)		MN State Plane - Central Zone		UTM - Zone 15		Project Info	
		X	Y	X	Y	Year Reference	
		2152822.400	801719.795	852771.168	16831602.103	2025	GPS3793
		2152822.400	801719.795	852771.168	16831602.103	2024	HTH210A
		2152822.392	801719.761	852771.159	16831602.070	2023	RTRN2023
		2152822.375	801719.787	852771.142	16831602.096	2015	RTRN2015

NAD83(1996)		MN State Plane - Central Zone		UTM - Zone 15		Project Info	
		X	Y	X	Y	Year Reference	
		2152822.374	801719.765	852771.141	16831602.074	2024	HTH210A



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AM-DQ2709-3NE-21FEB2024.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AM-DQ2709-2-21FEB2024.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AM-DQ2709-1-21FEB2024.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
NE	Feb 21, 2024
	Feb 21, 2024
	Feb 21, 2024



Mn/DOT Name: 5680 AN

NGS Name: 5680 AN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2711](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	29	133 N	43 W	461810.19	960719.30	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2015	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 16 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5680 AN 2015

2.7 MILES NORTHWEST OF FERGUS FALLS, 0.9 MILE NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 53.25, 78.8 FEET EAST OF WESTBOUND INTERSTATE HIGHWAY 94, 7.8 FEET WEST OF A RIGHT-OF-WAY FENCE, 1.5 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1229.112	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1229.145	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1229.125	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1229.112			1140.841	.016	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1229.112			1140.841	.016	2011	GPS - STATIC	2025	HTH94B
1229.122	.262		1140.861	.197	2011	GPS - RTRN	2023	RTRN2023
1228.980	.262		1140.726	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -88.261 12B = -88.254 09 = -88.146 03 = -88.071

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 18 10.18821	96 07 19.30011	397538.144	171905.420	.010		ADJUSTMENT	2025	GPS3847
46 18 10.18821	96 07 19.30011	397538.144	171905.420	.010	C	GPS - STATIC	2025	HTH94B
46 18 10.18768	96 07 19.29981	397538.165	171905.366	.131	3	GPS - RTRN	2023	RTRN2023
46 18 10.18836	96 07 19.29969	397538.174	171905.435	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 18 10.18769	96 07 19.30075	397538.099	171905.368	.066		NCAT	2025	HTH94B

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2151584.761	808753.449	851644.185	16838657.135	.010		ADJUSTMENT	2025	GPS3847
2151584.761	808753.449	851644.185	16838657.135	.010	C	GPS - STATIC	2025	HTH94B
2151584.780	808753.395	851644.204	16838657.080	.131	3	GPS - RTRN	2023	RTRN2023
2151584.791	808753.464	851644.215	16838657.149	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2151584.715	808753.398	851644.138	16838657.084	.066		NCAT	2025	HTH94B



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AN-DQ2711-3E-15AUG2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AN-DQ2711-2-15AUG2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AN-DQ2711-1-15AUG2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Aug 15, 2023
	Aug 15, 2023
	Aug 15, 2023



Mn/DOT Name: 5680 AP

NGS Name: 5680 AP

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2712](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	20	133 N	43 W	461854.99	960719.82	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2015	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 17 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) **Stamping:** 5680 AP 2015

3.3 MILES NORTHWEST OF FERGUS FALLS, 1.8 MILES NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 52.4, 84.4 FEET EAST OF WESTBOUND INTERSTATE HIGHWAY 94, 14.4 FEET WEST OF A RIGHT-OF-WAY FENCE, 1.5 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj				Year	Reference		
1246.671	.016	2/1				VERTICAL ADJUSTMENT			2019	00000941		
1246.690	.016	2/1				VERTICAL ADJUSTMENT			2017	00000911		
1246.687	.016	2/1				VERTICAL CONTROL SURVEY			2016	VI94D4		

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj				Year	Reference		
1246.671			1158.400	.017	2011	HORIZONTAL ADJUSTMENT			2025	GPS3847		
1246.671			1158.400	.017	2011	GPS - STATIC			2025	HTH94B		
1246.671	.262		1158.397	.197	2011	GPS - RTRN			2023	RTRN2023		
1246.641	.262		1158.367	.197	2011	GPS - RTRN			2022	RTRN2022		
1246.576	.262		1158.308	.197	2011	GPS - RTRN			2015	RTRN2015		
1246.576	.262		1158.308	.197	2011	GPS - RTRN			2015	RTRN2015		

Geoid Separations(ft): GEOID18 = -88.274 12B = -88.268 09 = -88.159 03 = -88.087

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position		Otter Tail County		Acc		Order		Determination Method		Project Info	
Latitude	Longitude	X	Y							Year	Reference		
46 18 54.99260	96 07 19.82339	397524.674	176444.590	.010		ADJUSTMENT				2025	GPS3847		
46 18 54.99260	96 07 19.82339	397524.674	176444.590	.010	C	GPS - STATIC				2025	HTH94B		
46 18 54.99207	96 07 19.82298	397524.702	176444.536	.131	3	GPS - RTRN				2023	RTRN2023		
46 18 54.99272	96 07 19.82291	397524.708	176444.602	.131	3	GPS - RTRN				2022	RTRN2022		
46 18 54.99232	96 07 19.82291	397524.707	176444.561	.131	3	GPS - RTRN				2015	RTRN2015		
46 18 54.99232	96 07 19.82291	397524.707	176444.561	.131	3	GPS - RTRN				2015	RTRN2015		

NAD83(1996)		Geodetic Position		Otter Tail County		Acc		Order		Determination Method		Project Info	
Latitude	Longitude	X	Y							Year	Reference		
46 18 54.99209	96 07 19.82404	397524.628	176444.538	.066		NCAT				2025	HTH94B		

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2151655.300	813291.490	851786.395	16843195.258	.010		ADJUSTMENT	2025	GPS3847
2151655.300	813291.490	851786.395	16843195.258	.010	C	GPS - STATIC	2025	HTH94B
2151655.328	813291.435	851786.422	16843195.204	.131	3	GPS - RTRN	2023	RTRN2023
2151655.334	813291.501	851786.429	16843195.269	.131	3	GPS - RTRN	2022	RTRN2022
2151655.333	813291.461	851786.428	16843195.229	.131	3	GPS - RTRN	2015	RTRN2015
2151655.333	813291.461	851786.428	16843195.229	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2151655.254	813291.439	851786.348	16843195.209	.066		NCAT	2025	HTH94B

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AP-DQ2712-3E-15AUG2023.jpg	E	Aug 15, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AP-DQ2712-2-15AUG2023.jpg		Aug 15, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AP-DQ2712-1-15AUG2023.jpg		Aug 15, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 AQ

NGS Name: 5680 AQ

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2713](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	20	133 N	43 W	461927.34	960720.03	2	C	2015	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 22 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5680 AQ 2015

3.6 MILES NORTHWEST OF FERGUS FALLS, 2.45 MILES NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 51.75, 90.2 FEET EAST OF WESTBOUND INTERSTATE HIGHWAY 94, 9.5 FEET WEST OF A RIGHT-OF-WAY FENCE, 1.5 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1250.237	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1250.244	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1250.253	.016	2/1				VERTICAL CONTROL SURVEY	2016 VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1250.237			1161.950	.016	2011	HORIZONTAL ADJUSTMENT	2025 GPS3847
1250.237			1161.950	.016	2011	GPS - STATIC	2025 HTH94B
1250.214	.262		1161.930	.197	2011	GPS - RTRN	2023 RTRN2023
1250.181	.262		1161.897	.197	2011	GPS - RTRN	2022 RTRN2022
1250.148	.262		1161.871	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -88.284 12B = -88.274 09 = -88.169 03 = -88.094

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 19 27.33937	96 07 20.03400	397526.692	179721.612	.010		ADJUSTMENT	2025 GPS3847
46 19 27.33937	96 07 20.03400	397526.692	179721.612	.010	C	GPS - STATIC	2025 HTH94B
46 19 27.33896	96 07 20.03341	397526.733	179721.571	.131	3	GPS - RTRN	2023 RTRN2023
46 19 27.33966	96 07 20.03364	397526.718	179721.642	.131	3	GPS - RTRN	2022 RTRN2022
46 19 27.33926	96 07 20.03365	397526.717	179721.601	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 19 27.33887	96 07 20.03465	397526.647	179721.562	.066		NCAT	2025 HTH94B

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2151717.966	816567.481	851900.825	16846471.123	.010		ADJUSTMENT	2025 GPS3847
2151717.966	816567.481	851900.825	16846471.123	.010	C	GPS - STATIC	2025 HTH94B
2151718.006	816567.438	851900.865	16846471.080	.131	3	GPS - RTRN	2023 RTRN2023
2151717.992	816567.510	851900.852	16846471.151	.131	3	GPS - RTRN	2022 RTRN2022
2151717.990	816567.469	851900.849	16846471.111	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2151717.919	816567.431	851900.777	16846471.074	.066		NCAT	2025 HTH94B



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AQ-DQ2713-3E-15AUG2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AQ-DQ2713-2-15AUG2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AQ-DQ2713-1-15AUG2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Aug 15, 2023
	Aug 15, 2023
	Aug 15, 2023



Mn/DOT Name: 5680 AR

NGS Name: 5680 AR

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2714](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

		<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>
NW	17	133 N	43 W	462012.51	960735.28

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2015	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 34 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5680 AR 2015

4.4 MILES NORTHWEST OF FERGUS FALLS, 0.1 MILE SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 NORTH (THE JUNCTION IS 4.5 MILES NORTHWEST OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 50.9, 110.0 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 90.0 FEET NORTHEAST OF A RAMP FROM WESTBOUND INTERSTATE HIGHWAY 94 TO TRUNK HIGHWAY 59 NORTH, 7.8 FEET SOUTHWEST OF A RIGHT-OF-WAY FENCE, 7.0 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1205.811	.016	2/1				VERTICAL ADJUSTMENT		2019	00000941
1205.805	.016	2/1				VERTICAL ADJUSTMENT		2017	00000911
1205.828	.016	2/1				VERTICAL CONTROL SURVEY		2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1205.811			1117.534	.018	2011	HORIZONTAL ADJUSTMENT		2025	GPS3847
1205.811			1117.534	.018	2011	GPS - STATIC		2025	HTH94B
1205.759	.262		1117.468	.197	2011	GPS - RTRN		2023	RTRN2023
1205.778	.262		1117.485	.197	2011	GPS - RTRN		2022	RTRN2022
1205.696	.262		1117.412	.197	2011	GPS - RTRN		2015	RTRN2015

Geoid Separations(ft): GEOID18 = -88.291 12B = -88.284 09 = -88.176 03 = -88.100

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Lat/Lon</u>		<u>County Coordinates</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 20 12.50703	96 07 35.27658	396480.600	184302.922	.010		ADJUSTMENT	2025	GPS3847	
46 20 12.50703	96 07 35.27658	396480.600	184302.922	.010	C	GPS - STATIC	2025	HTH94B	
46 20 12.50682	96 07 35.27623	396480.624	184302.901	.131	3	GPS - RTRN	2023	RTRN2023	
46 20 12.50644	96 07 35.27710	396480.563	184302.863	.131	3	GPS - RTRN	2022	RTRN2022	
46 20 12.50702	96 07 35.27628	396480.621	184302.921	.131	3	GPS - RTRN	2015	RTRN2015	

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Lat/Lon</u>		<u>County Coordinates</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 20 12.50655	96 07 35.27724	396480.553	184302.874	.066		NCAT	2025	HTH94B	

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>	
2150756.976	821166.763	851012.266	16851086.806	.010		ADJUSTMENT	2025	GPS3847	
2150756.976	821166.763	851012.266	16851086.806	.010	C	GPS - STATIC	2025	HTH94B	
2150757.001	821166.741	851012.289	16851086.783	.131	3	GPS - RTRN	2023	RTRN2023	
2150756.939	821166.703	851012.227	16851086.747	.131	3	GPS - RTRN	2022	RTRN2022	
2150756.997	821166.761	851012.287	16851086.804	.131	3	GPS - RTRN	2015	RTRN2015	

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>	
2150756.929	821166.715	851012.218	16851086.759	.066		NCAT	2025	HTH94B	



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AR-DQ2714-3NE-15AUG2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AR-DQ2714-2-15AUG2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AR-DQ2714-1-15AUG2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
NE	Aug 15, 2023
	Aug 15, 2023
	Aug 15, 2023



Mn/DOT Name: 5680 AS

NGS Name: 5680 AS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2717](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	1	133 N	44 W	462142.01	960937.47	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2015	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 27 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) **Stamping:** 5680 AS 2015

6.8 MILES NORTHWEST OF FERGUS FALLS, 2.4 MILES NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 NORTH (THE JUNCTION IS 4.5 MILES NORTHWEST OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 48.5, 90.4 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 9.6 FEET SOUTHWEST OF A RIGHT-OF-WAY FENCE, 1.5 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1260.591	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1260.614	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1260.608	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1260.591			1172.320	.016	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1260.591			1172.320	.016	2011	GPS - STATIC	2025	HTH94B
1261.923	.262		1173.633	.197	2011	GPS - RTRN	2023	RTRN2023
1260.565	.262		1172.278	.197	2011	GPS - RTRN	2022	RTRN2022
1260.578	.262		1172.288	.197	2011	GPS - OPUS	2022	GPSBM
1260.585	.262		1172.294	.197	2011	GPS - OPUS	2022	GPSBM
1260.552	.262		1172.261	.197	2011	GPS - RTRN	2021	RTRN2021
1260.470	.262		1172.189	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -88.291 12B = -88.284 09 = -88.169 03 = -88.110

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 21 42.01090	96 09 37.47182	387957.179	193416.551	.010		ADJUSTMENT	2025	GPS3847
46 21 42.01090	96 09 37.47182	387957.179	193416.551	.010	C	GPS - STATIC	2025	HTH94B
46 21 42.01080	96 09 37.47205	387957.163	193416.540	.131	3	GPS - RTRN	2023	RTRN2023
46 21 42.01110	96 09 37.47255	387957.128	193416.571	.131	3	GPS - RTRN	2022	RTRN2022
46 21 42.01060	96 09 37.47208	387957.160	193416.520	.131	3	GPS - OPUS	2022	GPSBM
46 21 42.01081	96 09 37.47262	387957.123	193416.542	.131	3	GPS - OPUS	2022	GPSBM
46 21 42.01047	96 09 37.47203	387957.164	193416.507	.131	3	GPS - RTRN	2021	RTRN2021
46 21 42.01103	96 09 37.47195	387957.170	193416.564	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 21 42.01043	96 09 37.47250	387957.131	193416.503	.066		NCAT	2025	HTH94B



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2142404.796	830435.372	842804.407	16860490.037	.010		ADJUSTMENT	2025	GPS3847
2142404.796	830435.372	842804.407	16860490.037	.010	C	GPS - STATIC	2025	HTH94B
2142404.780	830435.363	842804.391	16860490.027	.131	3	GPS - RTRN	2023	RTRN2023
2142404.745	830435.394	842804.357	16860490.059	.131	3	GPS - RTRN	2022	RTRN2022
2142404.777	830435.342	842804.388	16860490.007	.131	3	GPS - OPUS	2022	GPSBM
2142404.740	830435.365	842804.350	16860490.030	.131	3	GPS - OPUS	2022	GPSBM
2142404.780	830435.329	842804.391	16860489.994	.131	3	GPS - RTRN	2021	RTRN2021
2142404.787	830435.386	842804.398	16860490.050	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2142404.747	830435.326	842804.357	16860489.991	.066		NCAT	2025	HTH94B

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AS-DQ2717-3NE-14AUG2023.jpg	NE	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AS-DQ2717-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AS-DQ2717-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 AT

NGS Name: 5680 AT

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2718](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	35	134 N	44 W	462249.01	961058.01	2	C	2015	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 22 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015)

Stamping: 5680 AT 2015

8.6 MILES NORTHWEST OF FERGUS FALLS, 4.1 MILES NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 NORTH (THE JUNCTION IS 4.5 MILES NORTHWEST OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 46.85, 89.0 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 9.6 FEET SOUTHWEST OF A RIGHT-OF-WAY FENCE, 1.5 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1267.015	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1267.064	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1267.064	.016	2/1				VERTICAL CONTROL SURVEY	2016 VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1267.015			1178.780	.018	2011	HORIZONTAL ADJUSTMENT	2025 GPS3847
1267.015			1178.780	.018	2011	GPS - STATIC	2025 HTH94B
1268.429	.262		1180.145	.197	2011	GPS - RTRN	2023 RTRN2023
1266.917	.262		1178.633	.197	2011	GPS - OPUS	2022 GPSBM
1266.959	.262		1178.675	.197	2011	GPS - OPUS	2022 GPSBM
1267.064	.262		1178.780	.197	2011	GPS - RTRN	2021 RTRN2021
1266.910	.262		1178.630	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -88.284 12B = -88.281 09 = -88.169 03 = -88.107

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u> <u>Order</u> <u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 22 49.01462	96 10 58.00918	382348.548	200236.995	.010		ADJUSTMENT	2025 GPS3847
46 22 49.01462	96 10 58.00918	382348.548	200236.995	.010	C	GPS - STATIC	2025 HTH94B
46 22 49.01515	96 10 58.00940	382348.533	200237.048	.131	3	GPS - RTRN	2023 RTRN2023
46 22 49.01459	96 10 58.00969	382348.512	200236.992	.131	3	GPS - OPUS	2022 GPSBM
46 22 49.01491	96 10 58.00976	382348.507	200237.024	.131	3	GPS - OPUS	2022 GPSBM
46 22 49.01406	96 10 58.00960	382348.518	200236.938	.131	3	GPS - RTRN	2021 RTRN2021
46 22 49.01421	96 10 58.00964	382348.515	200236.953	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u> <u>Order</u> <u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 22 49.01415	96 10 58.00986	382348.500	200236.947	.066		NCAT	2025 HTH94B



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2136924.079	837357.550	837431.721	16867500.948	.010		ADJUSTMENT	2025	GPS3847
2136924.079	837357.550	837431.721	16867500.948	.010	C	GPS - STATIC	2025	HTH94B
2136924.065	837357.604	837431.708	16867501.002	.131	3	GPS - RTRN	2023	RTRN2023
2136924.043	837357.548	837431.685	16867500.947	.131	3	GPS - OPUS	2022	GPSBM
2136924.039	837357.581	837431.682	16867500.979	.131	3	GPS - OPUS	2022	GPSBM
2136924.048	837357.494	837431.689	16867500.893	.131	3	GPS - RTRN	2021	RTRN2021
2136924.046	837357.510	837431.687	16867500.908	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2136924.030	837357.504	837431.672	16867500.903	.066		NCAT	2025	HTH94B

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AT-DQ2718-3NE-14AUG2023.jpg	NE	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AT-DQ2718-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AT-DQ2718-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 AU

NGS Name: 5680 AU

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2721](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	22	134 N	44 W	462415.72	961210.45	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2015	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 22 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: 5680 AU 2015

5.7 MILES SOUTHEAST OF ROTHSA, 6.8 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 11 IN ROTHSA, AT INTERSTATE HIGHWAY 94 MILEPOINT 44.9, 103.7 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 10.3 FEET SOUTHWEST OF A RIGHT-OF-WAY FENCE, 1.5 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference		
1295.693	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941		
1295.752	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911		
1295.749	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4		

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference		
1295.693			1207.468	.018	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847		
1295.693			1207.468	.018	2011	GPS - STATIC	2025	HTH94B		
1297.081	.262		1208.816	.197	2011	GPS - RTRN	2023	RTRN2023		
1295.624	.262		1207.363	.197	2011	GPS - RTRN	2015	RTRN2015		

Geoid Separations(ft): GEOID18 = -88.264 12B = -88.261 09 = -88.153 03 = -88.087

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position				Otter Tail County		Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference		
46 24 15.71604	96 12 10.45123	377323.425	209051.063	.013		ADJUSTMENT	2025	GPS3847		
46 24 15.71604	96 12 10.45123	377323.425	209051.063	.013	C	GPS - STATIC	2025	HTH94B		
46 24 15.71637	96 12 10.45140	377323.414	209051.096	.131	3	GPS - RTRN	2023	RTRN2023		
46 24 15.71600	96 12 10.45180	377323.385	209051.059	.131	3	GPS - RTRN	2015	RTRN2015		

NAD83(1996)		Geodetic Position				Otter Tail County		Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference		
46 24 15.71557	96 12 10.45192	377323.377	209051.015	.066		NCAT	2025	HTH94B		

State Plane and UTM Coordinates (Feet)

NAD83(2011)		MN State Plane - Central Zone				UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference				
2132063.583	846261.954	832710.905	16876484.981	.013		ADJUSTMENT	2025	GPS3847				
2132063.583	846261.954	832710.905	16876484.981	.013	C	GPS - STATIC	2025	HTH94B				
2132063.571	846261.988	832710.894	16876485.015	.131	3	GPS - RTRN	2023	RTRN2023				
2132063.542	846261.952	832710.865	16876484.978	.131	3	GPS - RTRN	2015	RTRN2015				

NAD83(1996)		MN State Plane - Central Zone				UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference				
2132063.533	846261.908	832710.855	16876484.935	.066		NCAT	2025	HTH94B				



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AU-DQ2721-3NE-14AUG2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AU-DQ2721-2-14AUG2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AU-DQ2721-1-14AUG2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
NE	Aug 14, 2023
	Aug 14, 2023
	Aug 14, 2023



Mn/DOT Name: 5680 AV

NGS Name: 5680 AV

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2723](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NE	16	134 N	44 W	462521.06	961308.35	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2015	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 29 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015)

Stamping: 5680 AV 2015

4.75 MILES SOUTHEAST OF ROTHSA, 5.55 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 11 IN ROTHSA, AT INTERSTATE HIGHWAY 94 MILEPOINT 43.75, 90.5 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 8.7 FEET SOUTHWEST OF A RIGHT-OF-WAY FENCE, 1.5 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1306.336	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1306.408	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1306.398	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1306.336			1218.141	.014	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1306.336			1218.141	.014	2011	GPS - STATIC	2025	HTH94B
1307.684	.262		1219.440	.197	2011	GPS - RTRN	2023	RTRN2023
1306.444	.262		1218.200	.197	2011	GPS - OPUS	2022	GPSBM
1306.352	.262		1218.108	.197	2011	GPS - OPUS	2022	GPSBM
1306.385	.262		1218.141	.197	2011	GPS - RTRN	2021	RTRN2021
1306.283	.262		1218.036	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -88.245 12B = -88.245 09 = -88.140 03 = -88.067

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 25 21.06280	96 13 08.34709	373308.016	215696.540	.010		ADJUSTMENT	2025	GPS3847
46 25 21.06280	96 13 08.34709	373308.016	215696.540	.010	C	GPS - STATIC	2025	HTH94B
46 25 21.06223	96 13 08.34671	373308.042	215696.482	.131	3	GPS - RTRN	2023	RTRN2023
46 25 21.06224	96 13 08.34726	373308.004	215696.484	.131	3	GPS - OPUS	2022	GPSBM
46 25 21.06232	96 13 08.34712	373308.014	215696.492	.131	3	GPS - OPUS	2022	GPSBM
46 25 21.06247	96 13 08.34719	373308.009	215696.507	.131	3	GPS - RTRN	2021	RTRN2021
46 25 21.06274	96 13 08.34716	373308.011	215696.534	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 25 21.06234	96 13 08.34779	373307.967	215696.494	.066		NCAT	2025	HTH94B

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2128172.359	852979.739	828925.068	16883266.500	.010		ADJUSTMENT	2025	GPS3847
2128172.359	852979.739	828925.068	16883266.500	.010	C	GPS - STATIC	2025	HTH94B
2128172.384	852979.681	828925.092	16883266.441	.131	3	GPS - RTRN	2023	RTRN2023
2128172.346	852979.683	828925.053	16883266.444	.131	3	GPS - OPUS	2022	GPSBM
2128172.356	852979.691	828925.064	16883266.452	.131	3	GPS - OPUS	2022	GPSBM
2128172.352	852979.706	828925.059	16883266.467	.131	3	GPS - RTRN	2021	RTRN2021
2128172.354	852979.733	828925.063	16883266.494	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2128172.309	852979.694	828925.017	16883266.456	.066		NCAT	2025	HTH94B

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AV-DQ2723-3NE-14AUG2023.jpg	NE	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AV-DQ2723-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AV-DQ2723-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 AW

NGS Name: 5680 AW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2726](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	5	134 N	44 W	462652.83	961433.24	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2015	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 24 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) **Stamping:** 5680 AW 2015

2.6 MILES SOUTHEAST OF ROTHSA, 3.2 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 11 IN ROTHSA, AT INTERSTATE HIGHWAY 94 MILEPOINT 41.3, 89.2 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 9.8 FEET SOUTHWEST OF A RIGHT-OF-WAY FENCE, 1.5 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1219.771	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1219.856	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1219.840	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1219.771			1131.599	.013	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1219.771			1131.599	.013	2011	GPS - STATIC	2025	HTH94B
1219.814	.262		1131.592	.197	2011	GPS - RTRN	2023	RTRN2023
1219.791	.262		1131.569	.197	2011	GPS - OPUS	2022	GPSBM
1219.830	.262		1131.609	.197	2011	GPS - OPUS	2022	GPSBM
1219.834	.262		1131.612	.197	2011	GPS - RTRN	2021	RTRN2021
1219.774	.262		1131.550	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -88.222 12B = -88.225 09 = -88.110 03 = -88.035

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 26 52.82921	96 14 33.23671	367422.586	225031.848	.010		ADJUSTMENT	2025	GPS3847
46 26 52.82921	96 14 33.23671	367422.586	225031.848	.010	C	GPS - STATIC	2025	HTH94B
46 26 52.82894	96 14 33.23627	367422.616	225031.820	.131	3	GPS - RTRN	2023	RTRN2023
46 26 52.82869	96 14 33.23677	367422.581	225031.795	.131	3	GPS - OPUS	2022	GPSBM
46 26 52.82880	96 14 33.23674	367422.583	225031.806	.131	3	GPS - OPUS	2022	GPSBM
46 26 52.82920	96 14 33.23693	367422.570	225031.847	.131	3	GPS - RTRN	2021	RTRN2021
46 26 52.82915	96 14 33.23632	367422.613	225031.841	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 26 52.82875	96 14 33.23742	367422.536	225031.801	.066		NCAT	2025	HTH94B



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2122461.448	862421.152	823362.300	16892801.491	.010		ADJUSTMENT	2025	GPS3847
2122461.448	862421.152	823362.300	16892801.491	.010	C	GPS - STATIC	2025	HTH94B
2122461.478	862421.125	823362.330	16892801.462	.131	3	GPS - RTRN	2023	RTRN2023
2122461.442	862421.100	823362.294	16892801.439	.131	3	GPS - OPUS	2022	GPSBM
2122461.445	862421.111	823362.296	16892801.450	.131	3	GPS - OPUS	2022	GPSBM
2122461.432	862421.152	823362.285	16892801.491	.131	3	GPS - RTRN	2021	RTRN2021
2122461.475	862421.146	823362.327	16892801.484	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2122461.397	862421.107	823362.249	16892801.447	.066		NCAT	2025	HTH94B

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AW-DQ2726-3NE-14AUG2023.jpg	NE	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AW-DQ2726-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AW-DQ2726-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 AX

NGS Name: 5680 AX

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2727](#)
NGS Quad / Sta Num : 46096241/
USGS Quad: ROTHSA

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NW	32	135 N	44 W	462802.59	961539.69	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2015	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 64 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) **Stamping:** 5680 AX 2015

1.3 MILES SOUTHEAST OF ROTHSA, 1.5 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 11 IN ROTHSA, AT INTERSTATE HIGHWAY 94 MILEPOINT 39.7, 77.8 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 20.5 FEET NORTHEAST OF A RIGHT-OF-WAY FENCE, 1.5 FEET NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info		
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1265.519	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1265.614	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1265.608	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info		
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1265.519			1177.412	.012	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1265.519			1177.412	.012	2011	GPS - STATIC	2025	HTH94B
1265.581	.262		1177.399	.197	2011	GPS - RTRN	2023	RTRN2023
1265.558	.262		1177.376	.197	2011	GPS - OPUS	2022	GPSBM
1265.591	.262		1177.409	.197	2011	GPS - OPUS	2022	GPSBM
1265.558	.262		1177.376	.197	2011	GPS - RTRN	2021	RTRN2021
1265.493	.262		1177.314	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -88.182 12B = -88.179 09 = -88.071 03 = -87.992

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 28 02.59492	96 15 39.68967	362817.809	232131.158	.010		ADJUSTMENT	2025	GPS3847
46 28 02.59492	96 15 39.68967	362817.809	232131.158	.010	C	GPS - STATIC	2025	HTH94B
46 28 02.59484	96 15 39.68992	362817.791	232131.150	.131	3	GPS - RTRN	2023	RTRN2023
46 28 02.59450	96 15 39.69047	362817.752	232131.116	.131	3	GPS - OPUS	2022	GPSBM
46 28 02.59457	96 15 39.68989	362817.793	232131.123	.131	3	GPS - OPUS	2022	GPSBM
46 28 02.59456	96 15 39.68918	362817.843	232131.121	.131	3	GPS - RTRN	2021	RTRN2021
46 28 02.59494	96 15 39.68928	362817.836	232131.160	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 28 02.59447	96 15 39.69038	362817.759	232131.113	.066		NCAT	2025	HTH94B



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2117989.422	869603.545	819003.014	16900057.228	.010		ADJUSTMENT	2025	GPS3847
2117989.422	869603.545	819003.014	16900057.228	.010	C	GPS - STATIC	2025	HTH94B
2117989.405	869603.537	819002.996	16900057.220	.131	3	GPS - RTRN	2023	RTRN2023
2117989.365	869603.504	819002.956	16900057.187	.131	3	GPS - OPUS	2022	GPSBM
2117989.406	869603.509	819002.997	16900057.193	.131	3	GPS - OPUS	2022	GPSBM
2117989.456	869603.507	819003.047	16900057.190	.131	3	GPS - RTRN	2021	RTRN2021
2117989.450	869603.546	819003.041	16900057.229	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2117989.372	869603.500	819002.962	16900057.184	.066		NCAT	2025	HTH94B

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AX-DQ2727-3SW-14AUG2023.jpg	SW	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AX-DQ2727-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AX-DQ2727-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 AY

NGS Name: 5680 AY

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DS3535](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	5	131 N	42 W	461111.17	955853.53		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2023	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 66 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2023) Stamping: 5680 AY 2023

7.9 MILES SOUTH-SOUTHEAST OF FERGUS FALLS, 2.3 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE SOUTHEAST JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 (THE JUNCTION IS 6.0 MILES SOUTH OF FERGUS FALLS), AT INTERSTATE HIGHWAY MILEPOINT 64.00, 88.3 FEET NORTHEAST OF INTERSTATE HIGHWAY 94, 7.4 FEET SOUTHWEST OF A RIGHT-OF-WAY FENCE, 1.5 FEET WEST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88						Project Info		
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1225.732			1138.269	.017	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1225.732			1138.269	.017	2011	GPS - STATIC	2025	HTH94B
1227.058	.262		1139.558	.197	2011	GPS - RTRN	2023	RTRN2023

Geoid Separation(ft): GEOID18 = -87.500

Lat/Lon and County Coordinates (Feet)

NAD83(2011)			Otter Tail County		Project Info				
Latitude	Longitude		X	Y	Acc	Order	Determination Method	Year	Reference
46 11 11.17118	95 58 53.53035		432907.446	129305.806	.010		ADJUSTMENT	2025	GPS3847
46 11 11.17118	95 58 53.53035		432907.446	129305.806	.010	C	GPS - STATIC	2025	HTH94B
46 11 11.17131	95 58 53.52994		432907.474	129305.819	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)			Otter Tail County		Project Info				
Latitude	Longitude		X	Y	Acc	Order	Determination Method	Year	Reference
46 11 11.17064	95 58 53.53094		432907.404	129305.752	.066		NCAT	2025	HTH94B

State Plane and UTM Coordinates (Feet)

NAD83(2011)			MN State Plane - Central Zone		UTM - Zone 15		Project Info				
X	Y		X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2186154.829	765512.218		885541.405	16794861.457	.010				ADJUSTMENT	2025	GPS3847
2186154.829	765512.218		885541.405	16794861.457	.010		C		GPS - STATIC	2025	HTH94B
2186154.858	765512.230		885541.435	16794861.469	.131	3			GPS - RTRN	2023	RTRN2023

NAD83(1996)			MN State Plane - Central Zone		UTM - Zone 15		Project Info				
X	Y		X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2186154.786	765512.164		885541.362	16794861.404	.066				NCAT	2025	HTH94B

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AY-3E-22AUG2023.jpg	E	Aug 22, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AY-2-22AUG2023.jpg		Aug 22, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_AY-1-22AUG2023.jpg		Aug 22, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 B

NGS Name: 5680 B

County: OTTER TAIL, MN (Sheet 1)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz	NGS ACRN: RP0194 NGS Quad / Sta Num : 46096214/ USGS Quad: ELIZABETH	Get Map
				Latitude	Longitude	Order	Order		
NW	9	134 N	44 W	462630.30	961412.13	2	3		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1968	2023	GOOD	Horz=NO Vert=NO	YES	56805	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (2015)

Stamping: 5680 B 1968

3.0 MILES SOUTHEAST OF ROTHSA, 3.55 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 11 IN ROTHSA, AT INTERSTATE HIGHWAY 94 MILEPOINT 41.85, IN THE SOUTHEAST ABUTMENT OF 330TH STREET BRIDGE NUMBER 56805 OVER INTERSTATE HIGHWAY 94, 19.2 FEET SOUTH OF 330TH STREET.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1225.896	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1225.979	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1225.962	.016	2/1				VERTICAL CONTROL SURVEY	2016 VI94D4
1225.962	.016	2/0				VERTICAL ADJUSTMENT	1991 00000025
NGVD29			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1225.040	.016	2/0				UNKNOWN/APPROXIMATE	1992 UNCHECKD
1225.040	.016	2				VERTICAL CONTROL SURVEY	1972 Q460962
1225.040	.016	2				VERTICAL CONTROL SURVEY	1972 L22167-A
1225.040	.016	2				VERTICAL CONTROL SURVEY	1971 L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1227.248	.262		1139.017	.197	2011	GPS - RTRN	2023 RTRN2023
1225.906	.262		1137.675	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -88.231 12B = -88.231 09 = -88.120 03 = -88.044

Lat/Lon and County Coordinates (Feet)

NAD83(2011)			Otter Tail County			Project Info	
Latitude	Longitude		X	Y	Acc Order	Determination Method	Year Reference
46 26 30.30433	96 14 12.12973		368885.617	222740.124	.131 3	GPS - RTRN	2023 RTRN2023
46 26 30.30344	96 14 12.13020		368885.583	222740.035	.131 3	GPS - RTRN	2015 RTRN2015

State Plane and UTM Coordinates (Feet)

NAD83(2011)			UTM - Zone 15			Project Info	
MN State Plane - Central Zone			X	Y	Acc Order	Determination Method	Year Reference
2123881.631	860103.044		824746.105	16890460.103	.131 3	GPS - RTRN	2023 RTRN2023
2123881.596	860102.955		824746.068	16890460.014	.131 3	GPS - RTRN	2015 RTRN2015

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_B-RP0194-3S-03AUG2023.jpg	S	Aug 3, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_B-RP0194-2-03AUG2023.jpg		Aug 3, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_B-RP0194-1-03AUG2023.jpg		Aug 3, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 BB

NGS Name: 5680 BB

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0144](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	31	132 N	42 W	461229.00	960108.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1966	2005	DESTROYED	Horz=NO Vert=NO	NO	9701		SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STRUCTURE (MASSIVE)	SURVEY DISK	MNDT

Description: (1966) Stamping: 5680-BB 1966

5.0 MILES SOUTHEAST OF FERGUS FALLS, AT THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59, IN THE SOUTHEAST CORNER OF TRUNK HIGHWAY 59 BRIDGE NUMBER 9701 OVER INTERSTATE HIGHWAY 94, 19.5 FEET EAST OF TRUNK HIGHWAY 59, AT INTERSTATE HIGHWAY 94 MILEPOINT 61.8.

Station Notes

A NEW BRIDGE RAILING NOW IN PLACE WHERE THE MARK USED TO BE (DUCKS UNLIMITED 2003).

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1275.020	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1274.266	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1274.266	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1274.266	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Geoid Separations(ft): GEOID18 = -87.723 12B = -87.716 09 = -87.588 03 = -87.533

* No Horizontal Positions in the Database *



Mn/DOT Name: 5680 BB 1

NGS Name: 5680 BB 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0143](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NE	36	132 N	43 W	461229.24	960102.73	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2016	GOOD	Horz=NO Vert=YES	YES		RECESSED 3 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (2015) **Stamping:** 5680 BB 1 1966

5.0 MILES SOUTHEAST OF FERGUS FALLS, 300.0 FEET SOUTHEAST OF THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 (THE JUNCTION IS 6.0 MILES SOUTH OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 61.80, AT EASTBOUND INTERSTATE HIGHWAY 94 STATION 1411+00, 75.0 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94 EXIT RAMP TO TRUNK HIGHWAY 59 AND COUNTY ROAD 82, 0.5 FOOT SOUTHWEST OF A RIGHT-OF-WAY FENCE AND A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1267.179	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1267.179	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1267.219	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1267.192	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1267.192	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1267.307	.016	2/1				VERTICAL ADJUSTMENT	2016	00000869
1267.307	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1267.324	.016	2/1				VERTICAL CONTROL SURVEY	2012	VTENN
1267.209	.016	2/1				VERTICAL ADJUSTMENT	2007	00000425-15
1267.209	.016	2/1				VERTICAL CONTROL SURVEY	2005	VFAUN
1267.209	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1266.454	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1266.454	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1266.454	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1266.454	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1267.150	.262		1179.433	.197	2011	GPS - RTRN	2015	RTRN2015
1266.976	.262		1179.443	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.723 12B = -87.716 09 = -87.585 03 = -87.529

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 12 29.23604	96 01 02.72876	423846.865	137246.732	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 12 29.23531	96 01 02.73287	423846.576	137246.660	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2177244.003	773618.413	876756.106	16803109.400	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2177243.713	773618.345	876755.815	16803109.337	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_BB_1-RP0143-3NE-14SEP2015.jpg	NE	Sep 14, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_BB_1-RP0143-2-14SEP2015.jpg		Sep 14, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_BB_1-RP0143-1-14SEP2015.jpg		Sep 14, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 BB 2

NGS Name: 5680 BB 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DI3793](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	36	132 N	43 W	461224.71	960110.60	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1989	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 10 FT)	VERTICAL CONTROL DISK	MNDT

Description: (2015) Stamping: 5680 BB 2 1989

5.0 MILES SOUTHEAST OF FERGUS FALLS, 7.55 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS TO INTERSTATE HIGHWAY 94 MILEPOINT 61.85, THEN 0.05 MILE SOUTH ON TRUNK HIGHWAY 59, 73.0 FEET WEST OF TRUNK HIGHWAY 59, 1.5 FEET EAST OF A RIGHT-OF-WAY FENCE, 0.9 FOOT EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1270.089	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1270.089	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1270.129	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1270.102	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1270.102	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1270.211	.016	2/1				VERTICAL ADJUSTMENT	2016	00000869
1270.211	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1270.227	.016	2/1				VERTICAL CONTROL SURVEY	2012	VTENN
1270.109	.016	2/1				VERTICAL ADJUSTMENT	2007	00000425-15
1270.116	.016	2/1				VERTICAL CONTROL SURVEY	2005	VFAUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1270.089			1182.425	.016	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1270.089			1182.425	.016	2011	GPS - STATIC	2025	HTH94B
1270.125	.262		1182.412	.197	2011	GPS - RTRN	2023	RTRN2023
1270.011	.262		1182.304	.197	2011	GPS - RTRN	2015	RTRN2015
1269.965	.262		1182.439	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.713 12B = -87.707 09 = -87.579 03 = -87.523

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 12 24.71485	96 01 10.59763	423291.661	136790.821	.010		ADJUSTMENT	2025	GPS3847
46 12 24.71485	96 01 10.59763	423291.661	136790.821	.010	C	GPS - STATIC	2025	HTH94B
46 12 24.71487	96 01 10.59800	423291.635	136790.823	.131	3	GPS - RTRN	2023	RTRN2023
46 12 24.71551	96 01 10.59815	423291.625	136790.888	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 12 24.71429	96 01 10.59820	423291.621	136790.764	.066		NCAT	2025	HTH94B
46 12 24.71527	96 01 10.59896	423291.568	136790.864	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2176680.531	773172.918	876185.506	16802672.666	.010		ADJUSTMENT	2025	GPS3847
2176680.531	773172.918	876185.506	16802672.666	.010	C	GPS - STATIC	2025	HTH94B
2176680.505	773172.920	876185.481	16802672.669	.131	3	GPS - RTRN	2023	RTRN2023
2176680.496	773172.985	876185.472	16802672.734	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2176680.489	773172.862	876185.464	16802672.611	.066		NCAT	2025	HTH94B
2176680.438	773172.962	876185.415	16802672.713	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_BB_2-DI3793-3W-15AUG2023.jpg	W	Aug 15, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_BB_2-DI3793-2-15AUG2023.jpg		Aug 15, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_BB_2-DI3793-1-15AUG2023.jpg		Aug 15, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 BB RESET

NGS Name: 5680 BB RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DI3791](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NW	31	132 N	42 W	461227.86	960109.21	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1990	2016	GOOD	Horz=NO Vert=NO	YES	9701	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	VERTICAL CONTROL DISK	MNDT

Description: (2015)

Stamping: 5680 BB RESET 1990

5.0 MILES SOUTHEAST OF FERGUS FALLS, 7.25 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 61.65, AT THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59, IN THE SOUTHEAST CORNER OF TRUNK HIGHWAY 59 BRIDGE NUMBER 9701 OVER INTERSTATE HIGHWAY 94, 19.5 FEET EAST OF TRUNK HIGHWAY 59.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1274.833	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1274.833	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1274.873	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1274.847	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1274.847	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1274.958	.016	2/1				VERTICAL ADJUSTMENT	2016	00000869
1274.958	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1274.974	.016	2/1				VERTICAL CONTROL SURVEY	2012	VTENN
1274.856	.016	2/1				VERTICAL ADJUSTMENT	2007	00000425-15
1274.860	.016	2/1				VERTICAL CONTROL SURVEY	2005	VFAUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1274.748	.262		1187.035	.197	2011	GPS - RTRN	2015	RTRN2015
1274.781	.262		1187.252	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.723 12B = -87.713 09 = -87.585 03 = -87.529

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 12 27.85731	96 01 09.20628	423390.740	137108.796	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 12 27.85736	96 01 09.20741	423390.661	137108.802	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2176785.465	773488.962	876295.433	16802987.130	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2176785.386	773488.968	876295.353	16802987.138	.131	3	GPS - RTRN	2009	RTRN2009



<u>Station Photos</u>			
<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_BB_RESET-DI3791-3N-14SEP2015.jpg	N	Sep 14, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_BB_RESET-DI3791-2-14SEP2015.jpg		Sep 14, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_BB_RESET-DI3791-1-14SEP2015.jpg		Sep 14, 2015
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: 5680 C

NGS Name: 5680 C

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0190](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	16	134 N	44 W	462513.00	961306.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1968	2009	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	SEE DESCRIPTION

Monument Type

CONCRETE FOOTING - SMALL

Disk Type

SURVEY DISK

Mon. Agency

MNDT

Description: (1968)

Stamping: 5680-C 1968

4.5 MILES NORTH OF CARLISLE, 98.0 FEET SOUTHEAST OF EASTBOUND INTERSTATE HIGHWAY 94, AT INTERSTATE HIGHWAY 94 STATION 451+02, 2.0 FEET EAST OF A RIGHT-OF-WAY FENCE, 1.0 FOOT NORTH OF A WITNESS POST.

Station Notes

THE MARK IS GONE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1304.299	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1303.383	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1303.383	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1303.383	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Geoid Separations(ft): GEOID18 = -88.248 12B = -88.248 09 = -88.143 03 = -88.071

* No Horizontal Positions in the Database *



Mn/DOT Name: 5680 C 1

NGS Name: 5680 C 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0189](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	22	134 N	44 W	462436.37	961232.76	2	C	1968	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	MNDT

Description: (2015) Stamping: 5680 C 1 1968

9.7 MILES NORTHWEST OF FERGUS FALLS, 6.4 MILES NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 (THE JUNCTION IS 4.5 MILES NORTHWEST OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 44.40, 98.0 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 2.0 FEET SOUTHWEST OF A RIGHT-OF-WAY FENCE, 1.0 FOOT NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1303.364	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941
1303.426	.016	2/1					VERTICAL ADJUSTMENT	2017	00000911
1303.419	.016	2/1					VERTICAL CONTROL SURVEY	2016	VI94D4
1303.301	.016	2/0					VERTICAL ADJUSTMENT	1991	00000025

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1302.392	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD
1302.392	.016	2					VERTICAL CONTROL SURVEY	1972	Q460962
1302.392	.016	2					VERTICAL CONTROL SURVEY	1972	L22167-A
1302.392	.016	2					VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1303.364				1215.132	.017	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1303.364				1215.132	.017	2011	GPS - STATIC	2025	HTH94B
1304.666	.262			1216.405	.197	2011	GPS - RTRN	2023	RTRN2023
1303.295	.262			1215.037	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -88.261 12B = -88.258 09 = -88.149 03 = -88.081

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>				<u>Project Info</u>			
<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Year</u>		<u>Reference</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
46 24 36.36916	96 12 32.75843	375773.120	211153.051	.010		ADJUSTMENT	2025 GPS3847
46 24 36.36916	96 12 32.75843	375773.120	211153.051	.010	C	GPS - STATIC	2025 HTH94B
46 24 36.36877	96 12 32.75788	375773.158	211153.012	.131	3	GPS - RTRN	2023 RTRN2023
46 24 36.36937	96 12 32.75827	375773.131	211153.072	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>				<u>Project Info</u>			
<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Year</u>		<u>Reference</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
46 24 36.36869	96 12 32.75912	375773.071	211153.004	.066		NCAT	2025 HTH94B



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2130552.642	848392.000	831233.291	16878639.619	.010		ADJUSTMENT	2025	GPS3847
2130552.642	848392.000	831233.291	16878639.619	.010	C	GPS - STATIC	2025	HTH94B
2130552.680	848391.959	831233.327	16878639.578	.131	3	GPS - RTRN	2023	RTRN2023
2130552.654	848392.021	831233.303	16878639.640	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2130552.593	848391.953	831233.240	16878639.574	.066		NCAT	2025	HTH94B

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_C_1-RP0189-3NE-14AUG2023.jpg	NE	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_C_1-RP0189-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_C_1-RP0189-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 CC

NGS Name: 5680 CC

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R00606](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	32	132 N	42 W	461145.06	955944.25	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2015	GOOD	Horz=NO Vert=NO	YES	56801	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (2015)

Stamping: 5680 CC 1966

7.0 MILES SOUTHEAST OF FERGUS FALLS, 1.35 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 (THE JUNCTION IS 6.0 MILES SOUTH OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 63.10, IN THE SOUTHEAST ABUTMENT OF COUNTY ROAD 82 BRIDGE NUMBER 56801 OVER INTERSTATE HIGHWAY 94.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1220.004	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1220.047	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1220.011	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1220.047	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1219.305	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1219.305	.016	2				VERTICAL CONTROL SURVEY	1972	Q460953
1219.305	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1219.305	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1219.968	.262		1132.370	.197	2011	GPS - RTRN	2015	RTRN2015
1219.902	.262		1132.494	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.595 12B = -87.595 09 = -87.457 03 = -87.408

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 11 45.06314	95 59 44.24935	429350.866	132751.527	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 11 45.06347	95 59 44.24918	429350.878	132751.561	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2182663.117	769022.712	882104.134	16798427.535	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2182663.129	769022.745	882104.148	16798427.568	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_CC-RO0606-3W-14SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_CC-RO0606-2-14SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_CC-RO0606-1-14SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
W	Sep 14, 2015
	Sep 14, 2015
	Sep 14, 2015



Mn/DOT Name: 5680 D

NGS Name: 5680 D

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0185](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	22	134 N	44 W	462354.86	961151.49	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1968	2015	DESTROYED	Horz=NO Vert=NO	NO	56812	FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	SURVEY DISK	MNDT

Description: (1968)

Stamping: 5680 D 1968

2.0 MILES NORTH OF CARLISLE, AT INTERSTATE HIGHWAY 94 MILEPOINT 45.35, AT THE JUNCTION OF COUNTY ROAD 21 AND INTERSTATE HIGHWAY 94 IN CARLISLE, AT INTERSTATE HIGHWAY 94 MILEPOINT 45.35, IN THE SOUTHWEST ABUTMENT OF EASTBOUND INTERSTATE HIGHWAY 94 BRIDGE NUMBER 56812 OVER COUNTY ROAD 21.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1294.397	.016	2/0				VERTICAL ADJUSTMENT	1991 00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1293.498	.016	2				VERTICAL CONTROL SURVEY	1972 Q460962
1293.498	.016	2				VERTICAL CONTROL SURVEY	1972 L22167-A
1293.498	.016	2				VERTICAL CONTROL SURVEY	1971 L22167-A

Geoid Separations(ft): GEOID18 = -88.268 12B = -88.264 09 = -88.156 03 = -88.094

* No Horizontal Positions in the Database *



Mn/DOT Name: 5680 DD

NGS Name: 5680 DD

County: OTTER TAIL, MN (Sheet 1)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	9	131 N	42 W	461030.86	955810.59	2	C

NGS ACRN: [RO0601](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	MNDT

Description: (2015) **Stamping:** 5680 DD 1966

8.8 MILES SOUTH OF FERGUS FALLS, 3.3 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 AND COUNTY ROAD 82 (THE JUNCTION IS 6.0 MILES SOUTH OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 65.05, 120.0 FEET SOUTH OF INTERSTATE HIGHWAY 94 MILEPOST 65, 98.0 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 2.0 FEET NORTHEAST OF A RIGHT-OF-WAY FENCE AND A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Year	Reference
1241.553	.016	2/1					2019	00000941
1241.582	.016	2/1					2017	00000911
1241.559	.016	2/1					2016	VI94D4
1241.543	.016	2/0					1991	00000025
NGVD29				Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Year	Reference
1240.821	.016	2/0					1992	UNCHECKD
1240.821	.016	2					1972	Q460953
1240.821	.016	2					1972	L22167-A
1240.821	.016	2					1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Year	Reference
1241.553				1154.174	.017	2011	2025	GPS3847
1241.553				1154.174	.017	2011	2025	HTH94B
1242.868	.262			1155.464	.197	2011	2023	RTRN2023
1241.507	.262			1154.095	.197	2011	2015	RTRN2015
1241.435	.262			1154.197	.197	1996	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.401 12B = -87.411 09 = -87.270 03 = -87.234

Lat/Lon and County Coordinates (Feet)

NAD83(2011)				Otter Tail County			Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 30.85749	95 58 10.58563	435916.063	125211.904	.013		ADJUSTMENT	2025	GPS3847
46 10 30.85749	95 58 10.58563	435916.063	125211.904	.013	C	GPS - STATIC	2025	HTH94B
46 10 30.85722	95 58 10.58569	435916.058	125211.877	.131	3	GPS - RTRN	2023	RTRN2023
46 10 30.85821	95 58 10.58597	435916.039	125211.977	.131	3	GPS - RTRN	2015	RTRN2015
NAD83(1996)				Otter Tail County			Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 10 30.85695	95 58 10.58623	435916.020	125211.849	.066		NCAT	2025	HTH94B
46 10 30.85781	95 58 10.58640	435916.009	125211.937	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2189086.747	761363.884	888408.754	16790666.247	.013		ADJUSTMENT	2025	GPS3847
2189086.747	761363.884	888408.754	16790666.247	.013	C	GPS - STATIC	2025	HTH94B
2189086.743	761363.857	888408.749	16790666.220	.131	3	GPS - RTRN	2023	RTRN2023
2189086.725	761363.958	888408.733	16790666.321	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2189086.704	761363.830	888408.710	16790666.194	.066		NCAT	2025	HTH94B
2189086.694	761363.918	888408.702	16790666.281	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_DD-RO0601-3SW-14AUG2023.jpg	SW	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_DD-RO0601-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_DD-RO0601-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 E

NGS Name: 5680 E

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0184](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NE	35	134 N	44 W	462300.94	961107.06	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1968	2015	GOOD	Horz=NO Vert=NO	YES	56813	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (2015)

Stamping: 5680 E 1968

8.8 MILES NORTHWEST OF FERGUS FALLS, 4.2 MILES NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 (THE JUNCTION IS 4.5 MILES NORTHWEST OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 46.55, IN THE SOUTHEAST ABUTMENT OF WESTBOUND INTERSTATE HIGHWAY 94 BRIDGE NUMBER 56813 OVER COUNTY ROAD 10, 24.0 FEET EAST-NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1281.579	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1281.628	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1281.628	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1281.628	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1280.739	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1280.739	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1280.739	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1280.739	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1281.539	.262		1193.262	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -88.281 12B = -88.277 09 = -88.166 03 = -88.103

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 23 00.93721	96 11 07.05517	381721.464	201448.588	.131	3	GPS - RTRN	2015	RTRN2015

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2136319.606	838580.383	836846.441	16868733.709	.131	3	GPS - RTRN	2015	RTRN2015

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_E-RP0184-3N-15SEP2015.jpg	N	Sep 15, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_E-RP0184-2-15SEP2015.jpg		Sep 15, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_E-RP0184-1-15SEP2015.jpg		Sep 15, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 E 1

NGS Name: 5680 E 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0180](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NW	1	133 N	44 W	462208.77	961019.56	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1968	2023	GOOD	Horz=YES Vert=YES	YES		PROJECTS 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	MNDT

Description: (2015) **Stamping:** 5680 E 1 1968

7.5 MILES NORTHWEST OF FERGUS FALLS, 3.0 MILES NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 (THE JUNCTION IS 4.5 MILES NORTHWEST OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 47.75, 97.0 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, AT INTERSTATE HIGHWAY 94 STATION 672+50, 45.0 FEET SOUTHEAST OF A POWER LINE, 2.0 FEET NORTHEAST OF A RIGHT-OF-WAY FENCE, 1.5 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1264.860	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1264.899	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1264.899	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1264.899	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1264.020	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1264.020	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1264.020	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1264.020	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1264.860			1176.586	.019	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1264.860			1176.586	.019	2011	GPS - STATIC	2025	HTH94B
1266.129	.262		1177.839	.197	2011	GPS - RTRN	2023	RTRN2023
1264.902	.262		1176.615	.197	2011	GPS - OPUS	2022	GPSBM
1264.699	.262		1176.412	.197	2011	GPS - OPUS	2022	GPSBM
1264.735	.262		1176.444	.197	2011	GPS - RTRN	2021	RTRN2021
1264.673	.262		1176.392	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -88.287 12B = -88.284 09 = -88.172 03 = -88.113

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 22 08.77537	96 10 19.55654	385021.103	196144.760	.013		ADJUSTMENT	2025	GPS3847
46 22 08.77537	96 10 19.55654	385021.103	196144.760	.013	C	GPS - STATIC	2025	HTH94B
46 22 08.77507	96 10 19.55568	385021.163	196144.729	.131	3	GPS - RTRN	2023	RTRN2023
46 22 08.77519	96 10 19.55716	385021.059	196144.742	.131	3	GPS - OPUS	2022	GPSBM
46 22 08.77541	96 10 19.55744	385021.039	196144.764	.131	3	GPS - OPUS	2022	GPSBM
46 22 08.77560	96 10 19.55730	385021.050	196144.783	.131	3	GPS - RTRN	2021	RTRN2021
46 22 08.77538	96 10 19.55709	385021.064	196144.761	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 22 08.77490	96 10 19.55722	385021.054	196144.712	.066		NCAT	2025	HTH94B



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2139520.096	833217.093	839962.921	16863318.199	.013		ADJUSTMENT	2025	GPS3847
2139520.096	833217.093	839962.921	16863318.199	.013	C	GPS - STATIC	2025	HTH94B
2139520.155	833217.061	839962.981	16863318.166	.131	3	GPS - RTRN	2023	RTRN2023
2139520.052	833217.076	839962.877	16863318.182	.131	3	GPS - OPUS	2022	GPSBM
2139520.033	833217.098	839962.858	16863318.205	.131	3	GPS - OPUS	2022	GPSBM
2139520.043	833217.117	839962.869	16863318.224	.131	3	GPS - RTRN	2021	RTRN2021
2139520.057	833217.095	839962.883	16863318.201	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2139520.047	833217.046	839962.872	16863318.153	.066		NCAT	2025	HTH94B

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_E_1-RP0180-3SW-03AUG2023.jpg	SW	Aug 3, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_E_1-RP0180-2-03AUG2023.jpg		Aug 3, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_E_1-RP0180-1-03AUG2023.jpg		Aug 3, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 EE

NGS Name: 5680 EE

County: OTTER TAIL, MN (Sheet 1)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order	NGS ACRN: RO0599 NGS Quad / Sta Num : 46095334/ USGS Quad: DALTON	Get Map
NW	15	131 N	42 W	460946.28	955723.85	2	3		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2015	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	MNDT

Description: (2015) **Stamping:** 5680 EE 1966

9.85 MILES SOUTH OF FERGUS FALLS, 3.0 MILES SOUTH ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 AND COUNTY ROAD 82 (THE JUNCTION IS 6.0 MILES SOUTH OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 66.10, AT INTERSTATE HIGHWAY 94 STATION 1638+40, 98.0 FEET WEST-SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 2.0 FEET EAST-NORTHEAST OF A RIGHT-OF-WAY FENCE AND A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Year	Reference
1232.691	.016	2/1					2019	00000941
1232.711	.016	2/1					2017	00000911
1232.698	.016	2/1					2016	VI94D4
1232.698	.016	2/0					1991	00000025
NGVD29				Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Year	Reference
1231.989	.016	2/0					1992	UNCHECKD
1231.989	.016	2					1972	Q460953
1231.989	.016	2					1972	L22167-A
1231.989	.016	2					1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Year	Reference
1232.704	.262			1145.391	.197	2011	2015	RTRN2015
1232.557	.262			1145.418	.197	1996	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.306 12B = -87.313 09 = -87.172 03 = -87.136

Lat/Lon and County Coordinates (Feet)

NAD83(2011)				Otter Tail County			Project Info	
Latitude	Longitude			X	Y	Acc	Year	Reference
46 09 46.28497	95 57 23.84901			439191.519	120686.203	.131	2015	RTRN2015
NAD83(1996)				Otter Tail County			Project Info	
Latitude	Longitude			X	Y	Acc	Year	Reference
46 09 46.28437	95 57 23.85024			439191.432	120686.142	.131	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)				UTM - Zone 15			Project Info	
MN State Plane - Central Zone				X	Y	Acc	Year	Reference
2192277.429	756778.945			891528.077	16786030.330	.131	2015	RTRN2015
NAD83(1996)				UTM - Zone 15			Project Info	
MN State Plane - Central Zone				X	Y	Acc	Year	Reference
2192277.341	756778.887			891527.988	16786030.272	.131	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_EE-RO0599-3W-14SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_EE-RO0599-2-14SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_EE-RO0599-1-14SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
W	Sep 14, 2015
	Sep 14, 2015
	Sep 14, 2015



Mn/DOT Name: 5680 F

NGS Name: 5680 F

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0179](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

Reference		Reference		Vert	Horz		
1/4	Sec	Twp	Rng	Latitude	Longitude	Order	Order
SE	1	133 N	44 W	462143.88	960945.40	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1968	2015	GOOD	Horz=NO Vert=YES	YES		RECESSED 12 IN.	STEEL SPIKE IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (2015) Stamping: 5680 F 1968

4.2 MILES NORTHWEST OF FERGUS FALLS, 2.35 MILES NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 (THE JUNCTION IS 4.5 MILES NORTHWEST OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 48.40, 98.0 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 0.5 FOOT NORTHEAST OF A RIGHT-OF-WAY FENCE, 1.0 FOOT SOUTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1261.182	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941	
1261.208	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911	
1261.198	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4	
1261.198	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025	

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1260.329	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1260.329	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962	
1260.329	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A	
1260.329	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1261.090	.262		1172.806	.197	2011	GPS - RTRN	2015	RTRN2015	

Geoid Separations(ft): GEOID18 = -88.291 12B = -88.284 09 = -88.172 03 = -88.113

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 21 43.87847	96 09 45.40158	387402.077	193608.877	.131	3	GPS - RTRN	2015	RTRN2015

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2141853.422	830637.913	842256.083	16860701.360	.131	3	GPS - RTRN	2015	RTRN2015

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_F-RP0179-3SW-15SEP2015.jpg	SW	Sep 15, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_F-RP0179-2-15SEP2015.jpg		Sep 15, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_F-RP0179-1-15SEP2015.jpg		Sep 15, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 F 1

NGS Name: 5680 F 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0178](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NW	7	133 N	43 W	462100.81	960901.71	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1968	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	MNDT

Description: (2015) **Stamping:** 5680 F 1 1968

3.2 MILES NORTHWEST OF FERGUS FALLS, 1.25 MILES NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 (THE JUNCTION IS 4.5 MILES NORTHWEST OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 49.45, 120.0 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, AT INTERSTATE HIGHWAY 94 STATION 760+85, 2.0 FEET NORTHEAST OF A RIGHT-OF-WAY FENCE, 1.8 FEET SOUTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1222.865	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1222.875	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1222.885	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1222.963	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1222.104	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1222.104	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1222.104	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1222.104	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1222.865			1134.578	.019	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1222.865			1134.578	.019	2011	GPS - STATIC	2025	HTH94B
1224.145	.262		1135.851	.197	2011	GPS - RTRN	2023	RTRN2023
1222.826	.262		1134.529	.197	2011	GPS - RTRN	2022	RTRN2022
1222.806	.262		1134.519	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -88.297 12B = -88.291 09 = -88.179 03 = -88.117

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 21 00.81245	96 09 01.71118	390442.427	189228.940	.013		ADJUSTMENT	2025	GPS3847
46 21 00.81245	96 09 01.71118	390442.427	189228.940	.013	C	GPS - STATIC	2025	HTH94B
46 21 00.81212	96 09 01.71174	390442.388	189228.907	.131	3	GPS - RTRN	2023	RTRN2023
46 21 00.81299	96 09 01.71094	390442.445	189228.995	.131	3	GPS - RTRN	2022	RTRN2022
46 21 00.81231	96 09 01.71166	390442.394	189228.926	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 21 00.81198	96 09 01.71185	390442.380	189228.893	.066		NCAT	2025	HTH94B

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2144811.796	826203.035	845145.114	16856218.445	.013		ADJUSTMENT	2025	GPS3847
2144811.796	826203.035	845145.114	16856218.445	.013	C	GPS - STATIC	2025	HTH94B
2144811.756	826203.003	845145.074	16856218.413	.131	3	GPS - RTRN	2023	RTRN2023
2144811.814	826203.090	845145.134	16856218.499	.131	3	GPS - RTRN	2022	RTRN2022
2144811.762	826203.022	845145.080	16856218.432	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2144811.748	826202.989	845145.066	16856218.399	.066		NCAT	2025	HTH94B

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_F_1-RP0178-3SW-14AUG2023.jpg	SW	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_F_1-RP0178-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_F_1-RP0178-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 FF

NGS Name: 5680 FF

County: OTTER TAIL, MN (Sheet 1)

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
NW	23	131 N	42 W	460845.08	955610.65	2	3

NGS ACRN: [RO0594](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1966	2015	GOOD	Horz=NO Vert=NO	YES	56802	FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (2015)

Stamping: 5680 FF 1966

2.0 MILES SOUTH-SOUTHWEST OF DALTON, AT THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 35 (THE JUNCTION IS 2.0 MILES SOUTH-SOUTHWEST OF DALTON), AT INTERSTATE HIGHWAY 94 MILEPOINT 67.70, IN THE SOUTHEAST ABUTMENT OF COUNTY ROAD 35 BRIDGE NUMBER 56802 OVER INTERSTATE HIGHWAY 94, 19.5 FEET EAST OF COUNTY ROAD 35.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1308.695	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1308.708	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1308.688	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1308.688	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1307.986	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1307.986	.016	2				VERTICAL CONTROL SURVEY	1972	Q460953
1307.986	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1307.986	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1308.547	.262		1221.339	.197	2011	GPS - RTRN	2015	RTRN2015
1308.596	.262		1221.559	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.201 12B = -87.208 09 = -87.067 03 = -87.037

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 08 45.08362	95 56 10.64766	444327.115	114471.188	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 08 45.08325	95 56 10.64973	444326.969	114471.151	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2197296.407	750470.783	896449.015	16779642.244	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2197296.260	750470.749	896448.868	16779642.212	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_FF-RO0594-3N-14SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_FF-RO0594-2-14SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_FF-RO0594-1-14SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Sep 14, 2015
	Sep 14, 2015
	Sep 14, 2015



Mn/DOT Name: 5680 G

NGS Name: 5680 G

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0175](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
NW	17	133 N	43 W	462015.00	960741.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1966	2009	DESTROYED	Horz=NO Vert=NO	NO	9691		SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STRUCTURE (MASSIVE)	SURVEY DISK	MNDT

Description: (1966) **Stamping:** 5680 G 1968

2.0 MILES NORTHWEST OF FERGUS FALLS, NEAR THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94, IN THE SOUTHEAST ABUTMENT OF WESTBOUND INTERSTATE HIGHWAY 94 BRIDGE NUMBER 9691 OVER A RAMP TO TRUNK HIGHWAY 59.

Station Notes

NEW BRIDGE.

FOUND 5680 G RESET IN THE BRIDGE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1239.190	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1238.337	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1238.337	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1238.337	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Geoid Separations(ft): GEOID18 = -88.291 12B = -88.284 09 = -88.176 03 = -88.103

* No Horizontal Positions in the Database *



Mn/DOT Name: 5680 G RESET

NGS Name: 5680 G RESET

County: OTTER TAIL, MN (Sheet 1)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	17	133 N	43 W	462024.51	960756.19	2	3

NGS ACRN: [DO7103](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2015	GOOD	Horz=NO Vert=NO	YES	9691	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	VERTICAL CONTROL DISK	MNDT

Description: (2015)

Stamping: 5680 G RESET 1984

2.0 MILES NORTHWEST OF FERGUS FALLS, IN THE ABUTMENT IN THE SOUTHEAST CORNER OF WESTBOUND INTERSTATE HIGHWAY 94 BRIDGE NUMBER 9691 OVER COUNTY ROAD 88, 3.6 MILES NORTH ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT TRUNK HIGHWAY 94 MILEPOINT 50.55, 26.0 FEET EAST OF WESTBOUND INTERSTATE HIGHWAY 94.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Project Info	
Height	Acc	Order/(Class)		Height	Acc	Adj	Determination Method	Year Reference
1238.957	.016	2/1					VERTICAL ADJUSTMENT	2019 00000941
1238.944	.016	2/1					VERTICAL ADJUSTMENT	2017 00000911
1238.984	.016	2/1					VERTICAL CONTROL SURVEY	2016 VI94D4
1238.944	.016	2/1					VERTICAL ADJUSTMENT	2013 00000792
1238.948	.016	2/1					VERTICAL CONTROL SURVEY	2012 VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Project Info	
Height	Acc	Order/(Class)		Height	Acc	Adj	Determination Method	Year Reference
1238.912	.262			1150.628	.197	2011	GPS - RTRN	2015 RTRN2015
1238.820	.262			1150.713	.197	1996	GPS - RTRN	2009 RTRN2009

Geoid Separations(ft): GEOID18 = -88.294 12B = -88.284 09 = -88.179 03 = -88.107

Lat/Lon and County Coordinates (Feet)

NAD83(2011)				Otter Tail County			Project Info	
Geodetic Position				X	Y	Acc Order	Determination Method	Year Reference
Latitude	Longitude							
46 20 24.50539	96 07 56.18793			395019.662	185526.096	.131 3	GPS - RTRN	2015 RTRN2015
NAD83(1996)				Otter Tail County			Project Info	
Geodetic Position				X	Y	Acc Order	Determination Method	Year Reference
Latitude	Longitude							
46 20 24.50444	96 07 56.18873			395019.605	185526.000	.131 3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)				UTM - Zone 15			Project Info	
MN State Plane - Central Zone				X	Y	Acc Order	Determination Method	Year Reference
X	Y							
2149319.118	822416.603			849593.783	16852359.710	.131 3	GPS - RTRN	2015 RTRN2015
NAD83(1996)				UTM - Zone 15			Project Info	
MN State Plane - Central Zone				X	Y	Acc Order	Determination Method	Year Reference
X	Y							
2149319.059	822416.508			849593.723	16852359.615	.131 3	GPS - RTRN	2009 RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_G_RESET-DO7103-3NW-15SEP2015.jpg	NW	Sep 15, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_G_RESET-DO7103-2-15SEP2015.jpg		Sep 15, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_G_RESET-DO7103-1-15SEP2015.jpg		Sep 15, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 GG

NGS Name: 5680 GG

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R00593](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	26	131 N	42 W	460800.16	955527.96	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2015	GOOD	Horz=NO Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	MNDT

Description: (2015) Stamping: 5680 GG 1966

2.8 MILES SOUTHWEST OF DALTON, 1.1 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 35 (THE JUNCTION IS 2.0 MILES SOUTH-SOUTHWEST OF DALTON), AT INTERSTATE HIGHWAY 94 MILEPOINT 68.75, AT INTERSTATE HIGHWAY 94 STATION 1779+75, 98.0 FEET WEST OF EASTBOUND INTERSTATE HIGHWAY 94, 2.0 FEET EAST OF A RIGHT-OF-WAY FENCE, OPPOSITE A REST AREA, 1.9 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1289.817	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1289.820	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1289.804	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1289.804	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1289.108	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1289.108	.016	2				VERTICAL CONTROL SURVEY	1972	Q460953
1289.108	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1289.108	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1289.607	.262		1202.458	.197	2011	GPS - RTRN	2015	RTRN2015
1289.732	.262		1202.734	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.152 12B = -87.149 09 = -87.021 03 = -86.998

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 08 00.15642	95 55 27.96038	447320.947	109911.692	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 08 00.15540	95 55 27.95907	447321.038	109911.588	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2200204.920	745857.273	899285.705	16774982.301	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2200205.010	745857.168	899285.793	16774982.194	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_GG-RO0593-3W-14SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_GG-RO0593-2-14SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_GG-RO0593-1-14SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
W	Sep 14, 2015
	Sep 14, 2015
	Sep 14, 2015



Mn/DOT Name: 5680 H

NGS Name: 5680 H

County: OTTER TAIL, MN (Sheet 1)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	17	133 N	43 W	462014.55	960743.02	2	3

NGS ACRN: [RP0174](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1968	2015	GOOD	Horz=NO Vert=NO	YES	9688	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (2015)

Stamping: 5680 H 1968

4.5 MILES NORTHWEST OF FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 50.80, 3.4 MILES NORTH ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, IN THE SOUTHEAST ABUTMENT OF A RAMP FROM TRUNK HIGHWAY 59 TO EASTBOUND INTERSTATE HIGHWAY 94, 15.0 FEET EAST OF A RAMP.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1221.707	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1221.697	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1221.723	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1221.697	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1221.697	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR
1221.697	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1220.844	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1220.844	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1220.844	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1220.844	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1221.645	.262		1133.361	.197	2011	GPS - RTRN	2015	RTRN2015
1221.530	.262		1133.426	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.291 12B = -88.284 09 = -88.176 03 = -88.103

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 20 14.54791	96 07 43.02488	395937.988	184512.502	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 20 14.54857	96 07 43.02751	395937.803	184512.570	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2150218.407	821386.320	850477.024	16851314.936	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2150218.224	821386.392	850476.842	16851315.010	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_H-RP0174-3N-15SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_H-RP0174-2-15SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_H-RP0174-1-15SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Sep 15, 2015
	Sep 15, 2015
	Sep 15, 2015



Mn/DOT Name: 5680 J

NGS Name: 5680 J

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: RP0173	Get Map
NW	17	133 N	43 W	462004.45	960725.77	2	3	NGS Quad / Sta Num : 46096212/ USGS Quad: FERGUS FALLS	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1968	2015	GOOD	Horz=NO Vert=NO	YES	9693	FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CULVERT - ANY SIZE, ANY TYPE	BENCH MARK DISK	MNDT

Description: (2015)

Stamping: 5680 J 1968

4.2 MILES NORTHWEST OF FERGUS FALLS, 3.15 MILES NORTH ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 IN WEST FERGUS FALLS, IN THE SOUTHEAST HEADWALL OF A WESTBOUND INTERSTATE HIGHWAY 94 CULVERT AT PELICAN CREEK, 64.4 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1185.116	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1185.112	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1185.129	.016	2/1				VERTICAL CONTROL SURVEY	2016 VI94D4
1185.093	.016	2/1				VERTICAL ADJUSTMENT	2013 00000792
1185.089	.016	2/1				VERTICAL CONTROL SURVEY	2012 VPELR
1185.070	.016	2/0				VERTICAL ADJUSTMENT	1991 00000025

NGVD29			Ellipsoid (NAD83)			Project Info	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1184.220	.016	2/0				UNKNOWN/APPROXIMATE	1992 UNCHECKD
1184.220	.016	2				VERTICAL CONTROL SURVEY	1972 Q460962
1184.220	.016	2				VERTICAL CONTROL SURVEY	1972 L22167-A
1184.220	.016	2				VERTICAL CONTROL SURVEY	1971 L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1184.919	.262		1096.822	.197	1996	GPS - RTRN	2009 RTRN2009

Geoid Separations(ft): GEOID18 = -88.287 12B = -88.281 09 = -88.172 03 = -88.097

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>								
Geodetic Position		Otter Tail County		Project Info				
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 20 04.44926	96 07 25.77243	397143.293	183483.169	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>				
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2151404.298	820334.994	851646.611	16850244.585	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_J-RP0173-3E-31AUG2009.jpg	E	Aug 31, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_J-RP0173-2-31AUG2009.jpg		Aug 31, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_J-RP0173-1-31AUG2009.jpg		Aug 31, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 K

NGS Name: 5680 K

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0171](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	20	133 N	43 W	461845.00	960721.00	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1968	2005	DESTROYED	Horz=NO Vert=NO	NO	9695	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
STRUCTURE (MASSIVE)	SURVEY DISK	MNDT

Description: (1968) **Stamping:** 5680 K 1968

1.0 MILE WEST OF FERGUS FALLS, IN THE SOUTHEAST ABUTMENT OF A WESTBOUND INTERSTATE HIGHWAY 94 BRIDGE
NUMBER 9695 OVER A RAILROAD.

Station Notes

SEE BENCHMARK 5680 K RESET 1986 RECOVERED AT THIS LOCATION ON 9-27-05 BY THE GEODETIC UNIT.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1267.527	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1266.687	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1266.687	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1266.687	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Geoid Separations(ft): GEOID18 = -88.274 12B = -88.264 09 = -88.159 03 = -88.084

* No Horizontal Positions in the Database *



Mn/DOT Name: 5680 K RESET

NGS Name: 5680 K RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DJ9283](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	20	133 N	43 W	461844.60	960720.55	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1986	2015	GOOD	Horz=NO Vert=NO	YES	9695	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	VERTICAL CONTROL DISK	MNDT

Description: (2015)

Stamping: 5680 K RESET 1986

1.0 MILE WEST OF FERGUS FALLS, 1.7 MILES NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 52.65, IN THE SOUTHEAST ABUTMENT OF WESTBOUND INTERSTATE HIGHWAY 94 BRIDGE NUMBER 9695 OVER A RAILROAD, 26.9 FEET EAST OF WESTBOUND INTERSTATE HIGHWAY 94.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1267.701	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1267.734	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1267.727	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1267.727	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1267.727	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR
1267.727	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1267.727	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFALL

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1267.579	.262		1179.315	.197	2011	GPS - RTRN	2015	RTRN2015
1267.576	.262		1179.492	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.274 12B = -88.264 09 = -88.159 03 = -88.084

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 18 44.59772	96 07 20.54602	397468.546	175391.779	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 18 44.59818	96 07 20.54934	397468.313	175391.827	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2151579.706	812240.037	851694.176	16842144.722	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2151579.474	812240.089	851693.944	16842144.778	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_K_RESET-DJ9283-3N-15SEP2015.jpg	N	Sep 15, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_K_RESET-DJ9283-2-15SEP2015.jpg		Sep 15, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_K_RESET-DJ9283-1-15SEP2015.jpg		Sep 15, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 M

NGS Name: 5680 M

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0167](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	32	133 N	43 W	461721.00	960713.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1966	1989	DESTROYED	Horz=NO Vert=NO	NO	9697		SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STRUCTURE (MASSIVE)	SURVEY DISK	MNDT

Description: (1998)

Stamping: 5680 M 1968

2.0 MILES WEST OF FERGUS FALLS, AT THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94, IN THE SOUTHEAST ABUTMENT OF EASTBOUND TRUNK HIGHWAY 210 BRIDGE NUMBER 9697 OVER INTERSTATE HIGHWAY 94.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1199.236	.016	2/0				VERTICAL ADJUSTMENT		1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1198.413	.016	2				VERTICAL CONTROL SURVEY		1972	Q460962
1198.413	.016	2				VERTICAL CONTROL SURVEY		1972	L22167-A
1198.413	.016	2				VERTICAL CONTROL SURVEY		1971	L22167-A

Geoid Separations(ft): GEOID18 = -88.241 12B = -88.231 09 = -88.117 03 = -88.041

* No Horizontal Positions in the Database *



Mn/DOT Name: 5680 M RESET

NGS Name: 5680 M RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DJ9284](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	32	133 N	43 W	461721.58	960713.59	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1989	2015	GOOD	Horz=NO Vert=NO	YES	9697	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	VERTICAL CONTROL DISK	MNDT

Description: (2015)

Stamping: 5680 M RESET 1989

IN FERGUS FALLS, IN THE ABUTMENT IN THE SOUTHEAST CORNER OF EASTBOUND TRUNK HIGHWAY 210 BRIDGE NUMBER 9697 OVER INTERSTATE HIGHWAY 94, AT THE NORTHWEST JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, 25.5 FEET SOUTH OF EASTBOUND TRUNK HIGHWAY 210.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1199.404	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1199.404	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1199.440	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1199.417	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1199.440	.016	2/1				VERTICAL ADJUSTMENT	2015	00000821-R
1199.440	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1199.440	.016	2/1				VERTICAL CONTROL SURVEY	2013	VBREC
1199.440	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1199.440	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFALL

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1198.616	.033	3				VERTICAL CONTROL SURVEY	1989	CS5600

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1199.328	.262		1111.094	.197	2011	GPS - RTRN	2015	RTRN2015
1199.296	.262		1111.179	.197	2007	GPS - RTRN	2011	RTRN2011
1199.292	.262		1111.248	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.241 12B = -88.235 09 = -88.117 03 = -88.044

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 21.58408	96 07 13.58501	397914.280	166979.456	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 21.58363	96 07 13.58765	397914.094	166979.412	.131	3	GPS - RTRN	2011	RTRN2011

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 21.58392	96 07 13.58687	397914.149	166979.441	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2151869.617	803822.021	851851.295	16833719.911	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2151869.431	803821.980	851851.108	16833719.873	.131	3	GPS - RTRN	2011	RTRN2011

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2151869.486	803822.008	851851.164	16833719.900	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_M_RESET-DJ9284-3W-15SEP2015.jpg	W	Sep 15, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_M_RESET-DJ9284-2-15SEP2015.jpg		Sep 15, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_M_RESET-DJ9284-1-15SEP2015.jpg		Sep 15, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 N

NGS Name: 5680 N

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0166](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	32	133 N	43 W	461705.79	960702.90	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2011	GOOD	Horz=NO Vert=NO	YES	9698	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE RAILING	BENCH MARK DISK	MNDT

Description: (1966) Stamping: 5680 N 1966

1.5 MILES WEST OF FERGUS FALLS, 0.3 MILE SOUTHEAST ON INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 IN WEST FERGUS FALLS, AT INTERSTATE HIGHWAY MILEPOINT 54.60, IN THE SOUTHEAST ABUTMENT OF A RAILROAD BRIDGE NUMBER 9698 OVER INTERSTATE HIGHWAY 94, AT RAILROAD MILEPOST 52.0.

Station Notes

THE SURVEY MARK IS ON RAILROAD PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1167.380	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1167.416	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1167.416	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFALL
1167.416	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1166.592	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1166.592	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1166.592	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1166.592	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1167.281	.262		1079.174	.197	2007	GPS - RTRN	2011	RTRN2011
1167.252	.262		1079.224	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.228 12B = -88.222 09 = -88.103 03 = -88.028

Lat/Lon and County Coordinates (Feet)

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 05.78703	96 07 02.90030	398656.554	165375.299	.131	3	GPS - RTRN	2011	RTRN2011

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 05.78812	96 07 02.90150	398656.470	165375.409	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2152581.978	802204.614	852538.329	16832090.841	.131	3	GPS - RTRN	2011	RTRN2011

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2152581.896	802204.726	852538.249	16832090.955	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_N-RP0166-3NW-13OCT2011.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_N-RP0166-2-13OCT2011.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_N-RP0166-1-13OCT2011.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
NW	Oct 13, 2011
	Oct 13, 2011
	Oct 13, 2011



Mn/DOT Name: 5680 P

NGS Name: 5680 P

County: OTTER TAIL, MN (Sheet 1)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	5	132 N	43 W	461648.03	960651.25	2	3

NGS ACRN: [RP0165](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2015	GOOD	Horz=NO Vert=NO	YES		FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
CULVERT - ANY SIZE, ANY TYPE	BENCH MARK DISK	MNDT

Description: (2015)

Stamping: 5680 P 19

2.0 MILES WEST OF FERGUS FALLS, 0.8 MILE SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 54.90, IN THE SOUTHEAST HEADWALL OF AN INTERSTATE HIGHWAY 94 TRIPLE BOX CULVERT AT THE OTTER TAIL RIVER.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1134.273	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1134.273	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1134.312	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1134.289	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1134.312	.016	2/1				VERTICAL ADJUSTMENT	2015	00000821-R
1134.312	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1134.312	.016	2/1				VERTICAL CONTROL SURVEY	2013	VBREC
1134.312	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1134.299	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFALL
1134.312	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1133.492	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1133.492	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1133.492	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1133.492	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1134.191	.262		1046.104	.197	2007	GPS - RTRN	2011	RTRN2011
1134.145	.262		1046.133	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.212 12B = -88.205 09 = -88.087 03 = -88.012

Lat/Lon and County Coordinates (Feet)

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 48.02901	96 06 51.25316	399465.552	163572.171	.131	3	GPS - RTRN	2011	RTRN2011

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 48.02839	96 06 51.25373	399465.512	163572.109	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2153357.360	800387.063	853285.248	16830260.586	.131	3	GPS - RTRN	2011	RTRN2011

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2153357.318	800387.001	853285.205	16830260.524	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_P-RP0165-3E-13OCT2011.jpg	E	Oct 13, 2011
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_P-RP0165-2-13OCT2011.jpg		Oct 13, 2011
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_P-RP0165-1-13OCT2011.jpg		Oct 13, 2011

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 Q

NGS Name: 5680 Q

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0164](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	5	132 N	43 W	461633.19	960641.28	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2015	GOOD	Horz=NO Vert=NO	YES	9876	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (2015)

Stamping: 5680 Q 19

2.0 MILES SOUTHWEST OF FERGUS FALLS, 1.0 MILE SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 55.50, IN THE SOUTHEAST ABUTMENT OF COUNTY ROAD 15 BRIDGE NUMBER 9876 OVER INTERSTATE HIGHWAY 94, 19.5 FEET SOUTH OF COUNTY ROAD 15.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1213.570	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1213.570	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1213.606	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1213.590	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1213.606	.016	2/1				VERTICAL ADJUSTMENT	2015	00000821-R
1213.606	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1213.606	.016	2/1				VERTICAL CONTROL SURVEY	2013	VBREC
1213.606	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1213.600	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFALL
1213.600	.016	2				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1212.786	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKED
1212.786	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1212.786	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1212.786	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1213.462	.262		1125.391	.197	2007	GPS - RTRN	2011	RTRN2011
1213.426	.262		1125.431	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.195 12B = -88.192 09 = -88.074 03 = -87.995

Lat/Lon and County Coordinates (Feet)

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 33.19271	96 06 41.27601	400158.862	162065.651	.131	3	GPS - RTRN	2011	RTRN2011

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 33.19248	96 06 41.27522	400158.917	162065.627	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2154022.577	798868.170	853926.688	16828730.808	.131	3	GPS - RTRN	2011	RTRN2011

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2154022.632	798868.145	853926.742	16828730.783	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_Q-RP0164-3W-13OCT2011.jpg	W	Oct 13, 2011
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_Q-RP0164-2-13OCT2011.jpg		Oct 13, 2011
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_Q-RP0164-1-13OCT2011.jpg		Oct 13, 2011

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 R

NGS Name: 5680 R

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	9	132 N	43 W	461606.79	960609.86	2	3

NGS ACRN: [RP0160](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1966	2015	GOOD	Horz=NO Vert=NO	YES	9699	FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (2015)

Stamping: 5680 R 1966

1.5 MILES SOUTHWEST OF FERGUS FALLS, 1.9 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 55.95, IN THE SOUTHEAST ABUTMENT OF COUNTY ROAD 1 BRIDGE NUMBER 9699 OVER INTERSTATE HIGHWAY 94, 19.5 FEET EAST OF COUNTY ROAD 1.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1204.276	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1204.309	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1204.295	.016	2/1				VERTICAL CONTROL SURVEY	2016 VI94D4
1204.309	.016	2/0				VERTICAL ADJUSTMENT	1991 00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1203.498	.016	2/0				UNKNOWN/APPROXIMATE	1992 UNCHECKD
1203.498	.016	2				VERTICAL CONTROL SURVEY	1972 Q460962
1203.498	.016	2				VERTICAL CONTROL SURVEY	1972 L22167-A
1203.498	.016	2				VERTICAL CONTROL SURVEY	1971 L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1204.177	.262		1116.018	.197	2011	GPS - RTRN	2015 RTRN2015
1204.161	.262		1116.199	.197	1996	GPS - RTRN	2009 RTRN2009

Geoid Separations(ft): GEOID18 = -88.159 12B = -88.159 09 = -88.041 03 = -87.962

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 16 06.78936	96 06 09.86360	402352.433	159379.935	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 16 06.78950	96 06 09.86597	402352.266	159379.950	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2156165.775	796142.675	856027.471	16825970.823	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2156165.609	796142.693	856027.305	16825970.844	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_R-RP0160-3N-15SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_R-RP0160-2-15SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_R-RP0160-1-15SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Sep 15, 2015
	Sep 15, 2015
	Sep 15, 2015



Mn/DOT Name: 5680 S

NGS Name: 5680 S

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0159](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	9	132 N	43 W	461532.34	960515.54	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2024	GOOD	Horz=YES Vert=YES	YES		PROJECTS 8 IN.	STEEL SPIKE IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (2015) Stamping: 5680 S 1966

1.7 MILES SOUTH OF FERGUS FALLS, 0.9 MILE SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 1 IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 56.85, 100.0 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, AT EASTBOUND INTERSTATE HIGHWAY 94 STATION 1152+65, 1.0 FOOT NORTHEAST OF A RIGHT-OF-WAY FENCE, 0.5 FOOT NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1238.282	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1238.308	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1238.308	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1238.308	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1238.308	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1237.504	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1237.504	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1237.504	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1237.504	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1238.282			1150.208	.016	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1238.282	.131		1150.336	.066	1996	GPS - STATIC	2024	HTH210A
1238.282			1150.208	.016	2011	GPS - STATIC	2024	HTH210A
1239.587	.262		1151.481	.197	2011	GPS - RTRN	2023	RTRN2023
1238.196	.262		1150.086	.197	2011	GPS - RTRN	2015	RTRN2015
1238.190	.262		1150.283	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.107 12B = -88.110 09 = -87.985 03 = -87.907

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 15 32.33783	96 05 15.54226	406152.486	155871.517	.010		ADJUSTMENT	2025	GPS3793
46 15 32.33783	96 05 15.54226	406152.486	155871.517	.010	C	GPS - STATIC	2024	HTH210A
46 15 32.33742	96 05 15.54232	406152.481	155871.475	.131	3	GPS - RTRN	2023	RTRN2023
46 15 32.33769	96 05 15.54358	406152.393	155871.503	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 15 32.33752	96 05 15.54263	406152.459	155871.486	.033	C	GPS - STATIC	2024	HTH210A
46 15 32.33820	96 05 15.54280	406152.448	155871.554	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2159899.738	792564.997	859705.996	16822333.398	.010		ADJUSTMENT	2025	GPS3793
2159899.738	792564.997	859705.996	16822333.398	.010	C	GPS - STATIC	2024	HTH210A
2159899.733	792564.956	859705.991	16822333.357	.131	3	GPS - RTRN	2023	RTRN2023
2159899.645	792564.985	859705.903	16822333.387	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2159899.711	792564.966	859705.969	16822333.368	.033	C	GPS - STATIC	2024	HTH210A
2159899.701	792565.035	859705.960	16822333.437	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_S-RP0159-3SW-21FEB2024.jpg	SW	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_S-RP0159-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_S-RP0159-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 T

NGS Name: 5680 T

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0158](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	10	132 N	43 W	461518.10	960455.99	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2016	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (2015) Stamping: 5680 T 1966

2.0 MILES SOUTH OF FERGUS FALLS, 1.2 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 1 IN FERGUS FALLS, TO INTERSTATE HIGHWAY 94 MILEPOINT 57.25, AT INTERSTATE HIGHWAY 94 STATION 1172+60, 100.0 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 0.5 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1239.751	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1239.768	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1239.768	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1239.768	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1239.768	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1238.971	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1238.971	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1238.971	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1238.971	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1239.656	.262		1151.566	.197	2011	GPS - RTRN	2015	RTRN2015
1239.624	.262		1151.737	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.087 12B = -88.090 09 = -87.962 03 = -87.884

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 15 18.09542	96 04 55.99280	407519.533	154422.277	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 15 18.09617	96 04 55.99496	407519.381	154422.354	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2161239.547	791090.898	861022.913	16820837.826	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2161239.397	791090.978	861022.764	16820837.908	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_T-RP0158-3SW-15SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_T-RP0158-2-15SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_T-RP0158-1-15SEP2015.jpg

<u>Dir</u>	<u>Date</u>
SW	Sep 15, 2015
	Sep 15, 2015
	Sep 15, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 U

NGS Name: 5680 U

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0154](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	15	132 N	43 W	461455.00	960418.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1966	2015	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 12 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	SURVEY DISK	MNDT

Description: (1966)

Stamping: 5680-U 1966

2.0 MILES SOUTH OF FERGUS FALLS, NEAR THE JUNCTION OF COUNTY ROAD 25 AND INTERSTATE HIGHWAY 94, 99.0 FEET SOUTH OF EASTBOUND INTERSTATE HIGHWAY 94, AT INTERSTATE HIGHWAY 94 STATION 1200+00, 800.0 FEET WEST OF COUNTY ROAD 25, 3950.0 FEET EAST OF INTERSTATE HIGHWAY 94 MILEPOST 57, 1.0 FOOT NORTH OF A RIGHT-OF-WAY FENCE AND A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1248.846	.016	2/0				VERTICAL ADJUSTMENT	1991 00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1248.052	.016	2				VERTICAL CONTROL SURVEY	1972 Q460962
1248.052	.016	2				VERTICAL CONTROL SURVEY	1972 L22167-A
1248.052	.016	2				VERTICAL CONTROL SURVEY	1971 L22167-A

Geoid Separations(ft): GEOID18 = -88.048 12B = -88.051 09 = -87.920 03 = -87.848

* No Horizontal Positions in the Database *



Mn/DOT Name: 5680 V

NGS Name: 5680 V

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0157](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
NE	15	132 N	43 W	461458.00	960416.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1966	1991	DESTROYED	Horz=NO Vert=NO	NO	9878		SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STRUCTURE (MASSIVE)	SURVEY DISK	MNDT

Description: (1991)

Stamping: 5680-V 1966

2.0 MILES SOUTH OF FERGUS FALLS, IN THE SOUTHEAST CORNER OF COUNTY ROAD 25 BRIDGE NUMBER 9878 OVER INTERSTATE HIGHWAY 94.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1253.639	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1252.842	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1252.842	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1252.842	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Geoid Separations(ft): GEOID18 = -88.051 12B = -88.054 09 = -87.926 03 = -87.851

* No Horizontal Positions in the Database *



Mn/DOT Name: 5680 V RESET

NGS Name: 5680 V RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NE	15	132 N	43 W	461454.84	960418.07		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1991	2015	GOOD	Horz=NO Vert=NO	YES	56806	FLUSH	NO MAG MATERIAL

Monument Type

BRIDGE RAILING

Disk Type

VERTICAL CONTROL DISK

Mon. Agency

MNDT

Description: (2010)

Stamping: 5680 V RESET 1991

2.75 MILES SOUTH OF FERGUS FALLS, IN A BRIDGE RAILING IN THE SOUTHEAST CORNER OF TRUNK HIGHWAY 210
BRIDGE NUMBER 56806 OVER INTERSTATE HIGHWAY 94, AT THE JUNCTION OF TRUNK HIGHWAY 210 EAST, INTERSTATE
HIGHWAY 94 AND COUNTY ROAD 25 (THE JUNCTION IS 2.5 MILES SOUTH OF FERGUS FALLS), AT TRUNK HIGHWAY 210
MILEPOINT 26.35, 24.6 FEET EAST OF TRUNK HIGHWAY 210.

Station Notes

THE DISK WAS SET IN 1966 AND THEN STAMPED WHEN USED IN 1991.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj			Year	Reference
1263.216	.262		1175.165	.197	2011	GPS - RTRN		2015	RTRN2015
1263.190	.262		1175.342	.197	1996	GPS - RTRN		2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.048 12B = -88.051 09 = -87.920 03 = -87.848

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 14 54.84253	96 04 18.06979	410173.954	152054.477	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 14 54.84186	96 04 18.06891	410174.016	152054.409	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2163849.336	788674.694	863595.282	16818379.923	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2163849.396	788674.624	863595.341	16818379.853	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_V_RESET-3E-09SEP2015.jpg	E	Sep 9, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_V_RESET-2-09SEP2015.jpg		Sep 9, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_V_RESET-1-09SEP2015.jpg		Sep 9, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 W

NGS Name: 5680 W

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0153](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	15	132 N	43 W	461440.00	960358.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1966	2010	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 3 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	SURVEY DISK	MNDT

Description: (1966) Stamping: 5680-W 1966

2.5 MILES SOUTH OF FERGUS FALLS, 275.0 FEET SOUTH OF EASTBOUND INTERSTATE HIGHWAY 94, AT INTERSTATE HIGHWAY 94 STATION 1228+05, 30.0 FEET EAST OF COUNTY ROAD 25, 1500.0 FEET EAST OF INTERSTATE HIGHWAY 94 MILEPOST 58, 1.0 FOOT NORTHEAST OF A WITNESS POST.

Station Notes

THE DISK WAS TURNED IN TO THE OFFICE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1236.677	.016	2/0				VERTICAL ADJUSTMENT	1991 00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1235.887	.016	2				VERTICAL CONTROL SURVEY	1972 Q460962
1235.887	.016	2				VERTICAL CONTROL SURVEY	1972 L22167-A
1235.887	.016	2				VERTICAL CONTROL SURVEY	1971 L22167-A

Geoid Separations(ft): GEOID18 = -88.021 12B = -88.025 09 = -87.894 03 = -87.821

* No Horizontal Positions in the Database *



Mn/DOT Name: 5680 X

NGS Name: 5680 X

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0152](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NW	23	132 N	43 W	461420.09	960328.88	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2015	GOOD	Horz=NO Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	MNDT

Description: (2015) Stamping: 5680 X 1966

2.5 MILES SOUTH OF FERGUS FALLS, 0.95 MILE SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 (THE JUNCTION IS 2.5 MILES SOUTH OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 58.85, 98.0 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 2.0 FEET NORTHEAST OF A RIGHT-OF-WAY FENCE AND A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1223.669	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1223.695	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1223.679	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1223.679	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1222.895	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1222.895	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1222.895	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1222.895	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1223.584	.262		1135.598	.197	2011	GPS - RTRN	2015	RTRN2015
1223.538	.262		1135.752	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.985 12B = -87.985 09 = -87.857 03 = -87.789

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 14 20.09161	96 03 28.87697	413616.137	148518.777	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 14 20.09113	96 03 28.87801	413616.064	148518.729	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2167225.030	785076.365	866915.125	16814727.580	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2167224.956	785076.318	866915.050	16814727.535	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_X-RP0152-3SW-15SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_X-RP0152-2-15SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_X-RP0152-1-15SEP2015.jpg

<u>Dir</u>	<u>Date</u>
SW	Sep 15, 2015
	Sep 15, 2015
	Sep 15, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 X 1

NGS Name: 5680 X 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0151](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	23	132 N	43 W	461414.00	960320.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1966	2010	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 12 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	SURVEY DISK	MNDT

Description: (1966) Stamping: 5680 X 1 1966

2.5 MILES SOUTH OF FERGUS FALLS, 1000.0 FEET EAST OF INTERSTATE HIGHWAY 94 MILEPOST 59, 96.0 FEET SOUTH OF EASTBOUND INTERSTATE HIGHWAY 94, AT INTERSTATE HIGHWAY 94 STATION 1275+00, 17.0 FEET NORTH OF A RIGHT-OF-WAY FENCE, 0.5 FOOT NORTH OF A WITNESS POST.

Station Notes

THE DISK WAS TURNED IN TO THE OFFICE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1226.120	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1225.339	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1225.339	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1225.339	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Geoid Separations(ft): GEOID18 = -87.976 12B = -87.972 09 = -87.844 03 = -87.775

* No Horizontal Positions in the Database *



Mn/DOT Name: 5680 Y

NGS Name: 5680 Y

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0150](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NE	23	132 N	43 W	461353.92	960249.38	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2015	GOOD	Horz=NO Vert=YES	YES		PROJECTS 2 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (2015) Stamping: 5680 Y 1966

3.0 MILES SOUTHEAST OF FERGUS FALLS, 2.1 MILES NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 AND COUNTY ROAD 82 (THE JUNCTION IS 6.0 MILES SOUTH OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 59.60, AT INTERSTATE HIGHWAY 94 STATION 1296+03, 98.6 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 20.0 FEET NORTHWEST OF A DEAD END ROAD EXTENDED, 0.5 FOOT SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1238.485	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1238.511	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1238.492	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1238.492	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1237.714	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1237.714	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1237.714	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1237.714	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1238.383	.262		1150.457	.197	2011	GPS - RTRN	2015	RTRN2015
1238.337	.262		1150.601	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.933 12B = -87.926 09 = -87.805 03 = -87.736

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 13 53.92287	96 02 49.38066	416381.440	145855.935	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 13 53.92386	96 02 49.38353	416381.238	145856.036	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2169940.203	782363.156	869588.225	16811971.000	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2169940.004	782363.261	869588.027	16811971.108	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_Y-RP0150-3NE-15SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_Y-RP0150-2-15SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_Y-RP0150-1-15SEP2015.jpg

<u>Dir</u>	<u>Date</u>
NE	Sep 15, 2015
	Sep 15, 2015
	Sep 15, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 5680 Z

NGS Name: 5680 Z

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0149](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	25	132 N	43 W	461301.31	960152.94	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1966	2015	GOOD	Horz=NO Vert=YES	YES		PROJECTS 6 IN.	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	MNDT

Description: (2015) Stamping: 5680 Z 1966

4.0 MILES SOUTHEAST OF FERGUS FALLS, 0.85 MILE NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 AND COUNTY ROAD 82 (THE JUNCTION IS 6.0 MILES SOUTH OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 60.85, 100.0 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, AT INTERSTATE HIGHWAY 94 STATION 1362+30, 25.0 FEET SOUTH OF A DEAD END ROAD EXTENDED, 14.0 FEET NORTH OF A POWER POLE WITH 2 GUY WIRES, 1.0 FOOT SOUTHWEST OF A RIGHT-OF-WAY FENCE, 0.5 FOOT NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1222.219	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941
1222.251	.016	2/1					VERTICAL ADJUSTMENT	2017	00000911
1222.229	.016	2/1					VERTICAL CONTROL SURVEY	2016	VI94D4
1222.229	.016	2/0					VERTICAL ADJUSTMENT	1991	00000025

NGVD29				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1221.461	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD
1221.461	.016	2					VERTICAL CONTROL SURVEY	1972	Q460962
1221.461	.016	2					VERTICAL CONTROL SURVEY	1972	L22167-A
1221.461	.016	2					VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1222.120	.262			1134.319	.197	2011	GPS - RTRN	2015	RTRN2015
1222.084	.262			1134.463	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.812 12B = -87.802 09 = -87.677 03 = -87.621

Lat/Lon and County Coordinates (Feet)

NAD83(2011)				Otter Tail County				Project Info		
Geodetic Position				X	Y	Acc	Order	Determination Method	Year	Reference
Latitude	Longitude									
46 13 01.30947	96 01 52.94338			420327.994	140509.700	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)				Otter Tail County				Project Info		
Geodetic Position				X	Y	Acc	Order	Determination Method	Year	Reference
Latitude	Longitude									
46 13 01.31006	96 01 52.94464			420327.905	140509.761	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)				UTM - Zone 15				Project Info		
MN State Plane - Central Zone				X	Y	Acc	Order	Determination Method	Year	Reference
X	Y									
2173786.602	776945.512			873350.261	16806491.605	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)				UTM - Zone 15				Project Info		
MN State Plane - Central Zone				X	Y	Acc	Order	Determination Method	Year	Reference
X	Y									
2173786.514	776945.574			873350.175	16806491.668	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_Z-RP0149-3SW-15SEP2015.jpg	SW	Sep 15, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_Z-RP0149-2-15SEP2015.jpg		Sep 15, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/5680_Z-RP0149-1-15SEP2015.jpg		Sep 15, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 6 WGW

NGS Name: 6 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095344/
USGS Quad: HEILBERGER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	20	134 N	42 W	462445.39	955936.10		3	1973	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (2000)

Stamping: 6 WGW 1973

6.75 MILES NORTHEAST OF ELIZABETH, 7.0 MILES EAST ALONG COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND TRUNK HIGHWAY 59 IN ELIZABETH TO TRUNK HIGHWAY 59 MILEPOINT 226.8, THEN 3.05 MILES NORTH ON COUNTY ROAD 3, 55.0 FEET EAST OF AN ENTRANCE, 17.0 FEET SOUTH OF A RIGHT-OF-WAY POST, 5.0 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NGVD29</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1326.077	.033	3				VERTICAL CONTROL SURVEY		1974	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1326.936	.262		1239.095	.197	1996	GPS - RTRN		2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.087 12B = -88.090 09 = -87.972 03 = -87.841

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>
46 24 45.39360	95 59 36.09875	430200.802	211802.698	.131	3	GPS - RTRN	2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>
2184975.962	848034.140	885664.547	16877418.766	.131	3	GPS - RTRN	2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/6_WGW-3E-19AUG2009.jpg	E	Aug 19, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/6_WGW-2-19AUG2009.jpg		Aug 19, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/6_WGW-1-19AUG2009.jpg		Aug 19, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 7 WGW

NGS Name: 7 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095344/
USGS Quad: HEILBERGER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	5	134 N	42 W	462722.00	955930.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (2012) Stamping: 7 WGW 1973

5.0 MILES EAST OF ERHARD, 2.0 MILES SOUTH ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND COUNTY ROAD 3 IN ERHARD, 30.0 FEET SOUTH AND 49.0 FEET EAST OF COUNTY ROAD 3 AT A TOWNSHIP ROAD WEST, 4.0 FEET WEST OF A WITNESS POST.

Station Notes

31.5 FEET NORTH OF STATION 7 WGW RESET.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1415.561	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.962 12B = -87.956 09 = -87.848 03 = -87.710

* No Horizontal Positions in the Database *



Mn/DOT Name: 7 WGW RESET

NGS Name: 7 WGW RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095344/
USGS Quad: HEILBERGER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	5	134 N	42 W	462721.84	955927.17		3	1975	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	MNDT

Description: (2000)

Stamping: 7 WGW 1973 RESET 1975

5.5 MILES SOUTHEAST OF ERHARD, 5.3 MILES EAST ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND TRUNK HIGHWAY 59 IN ERHARD TO TRUNK HIGHWAY 59 MILEPOINT 234.5, THEN 2.1 MILES SOUTH ON COUNTY ROAD 3, 49.0 FEET EAST OF COUNTY ROAD 3, 30.0 FEET EAST SOUTH OF EXTENDED 340TH STREET, 28.0 FEET SOUTH OF AN ENTRANCE, 6.9 FEET NORTHWEST OF A POWER POLE WITH A GUY WIRE, 4.0 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NGVD29</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1416.733	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1417.409	.262		1329.702	.197	1996	GPS - RTRN	2009 RTRN2009

Geoid Separations(ft): GEOID18 = -87.959 12B = -87.956 09 = -87.848 03 = -87.707

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 27 21.83667	95 59 27.16640	430881.658	227649.671	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2185949.929	863863.749	886889.852	16893236.091	.131	3	GPS - RTRN	2009 RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/7_WGW_RESET-3E-19AUG2009.jpg	E	Aug 19, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/7_WGW_RESET-2-19AUG2009.jpg		Aug 19, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/7_WGW_RESET-1-19AUG2009.jpg		Aug 19, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 8 WGW

NGS Name: 8 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095344/
USGS Quad: HEILBERGER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	20	135 N	42 W	462907.15	955922.32		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type

COPPER CLAD ROD (NO SLEEVE)

Disk Type

SURVEY DISK

Mon. Agency

USGS

Description: (2008)

Stamping: 8 WGW 1973

5.3 MILES EAST OF ERHARD, 5.3 MILES EAST ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND TRUNK HIGHWAY 59 IN ERHARD TO TRUNK HIGHWAY 59 MILEPOINT 234.5, 103.0 FEET NORTH OF COUNTY ROAD 24, 68.4 FEET SOUTH OF DRIVEWAY NUMBER 36017, 58.5 FEET WEST OF COUNTY ROAD 3, 2.5 FEET NORTH OF A POWER POLE WITH A GUY WIRE, 2.5 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1430.479	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.867 12B = -87.854 09 = -87.759 03 = -87.615

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/8_WGW-3W-19AUG2009.jpg	W	Aug 19, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/8_WGW-2-19AUG2009.jpg		Aug 19, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/8_WGW-1-19AUG2009.jpg		Aug 19, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 8480 K

NGS Name: 8480 K

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0199](#) [Get Map](#)
NGS Quad / Sta Num : 46096241/
USGS Quad: ROTHSA

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NW	30	135 N	44 W	462856.46	961650.47	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1968	2015	GOOD	Horz=NO Vert=NO	YES	56816	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (2015)

Stamping: 8480 K 1968

IN ROTHSA, AT THE JUNCTION OF COUNTY ROAD 11 AND INTERSTATE HIGHWAY 94 IN ROTHSA, AT INTERSTATE HIGHWAY 94 MILEPOINT 38.15, IN THE SOUTHEAST ABUTMENT OF COUNTY ROAD 11 BRIDGE NUMBER 56816 OVER INTERSTATE HIGHWAY 94, 24.0 FEET EAST OF COUNTY ROAD 11.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1229.912	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1230.017	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1230.017	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1230.017	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1229.076	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1229.076	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1229.076	.016	2				VERTICAL CONTROL SURVEY	1972	L22557
1229.076	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1229.076	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-C
1229.076	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-B

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1229.968	.262		1141.838	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -88.140 12B = -88.133 09 = -88.035 03 = -87.953

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 28 56.45909	96 16 50.47375	357901.777	237622.757	.131	3	GPS - RTRN	2015	RTRN2015

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2113176.481	875184.468	814277.285	16905716.512	.131	3	GPS - RTRN	2015	RTRN2015

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/8480_K-RP0199-3N-16SEP2015.jpg	N	Sep 16, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/8480_K-RP0199-2-16SEP2015.jpg		Sep 16, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/8480_K-RP0199-1-16SEP2015.jpg		Sep 16, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 9 ERS

NGS Name: 9 ERS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096132/
USGS Quad: LAWNDAL

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	8	135 N	44 W	463140.29	961540.46		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1950	2014	GOOD	Horz=YES Vert=YES	YES		PROJECTS 5 IN.	STEEL SPIKE ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE POST (PREFABRICATED)	SURVEY DISK	USGS

Description: (2008)

Stamping: TT 9 ERS 1950

4.0 MILES NORTH OF ROTHSA, 3.0 MILES NORTH ALONG COUNTY ROAD 11 FROM THE JUNCTION OF COUNTY ROAD 11 AND INTERSTATE HIGHWAY 94 IN ROTHSA, THEN 1.0 MILE EAST ON 390TH STREET, THEN 0.1 MILE SOUTH ON 110TH AVENUE, 70.0 FEET SOUTH OF DRIVEWAY NUMBER 38886, 59.8 FEET SOUTH-SOUTHWEST OF A POWER POLE, 0.9 FOOT WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1265.394	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.890 12B = -87.874 09 = -87.779 03 = -87.700

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/9_ERS-3E-30SEP2014.jpg	E	Sep 30, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/9_ERS-2-30SEP2014.jpg		Sep 30, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/9_ERS-1-30SEP2014.jpg		Sep 30, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 9 WGW

NGS Name: 9 WGW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	8	135 N	42 W	463115.19	955959.35		

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1973	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type

COPPER CLAD ROD (NO SLEEVE)

Disk Type

SURVEY DISK

Mon. Agency

USGS

Description: (2000)

Stamping: 9 WGW 1973

5.1 MILES SOUTHEAST OF PELICAN RAPIDS, 4.65 MILES SOUTHEAST ALONG COUNTY ROAD 3 FROM THE JUNCTION OF COUNTY ROAD 3 EAST AND TRUNK HIGHWAY 59 TO TRUNK HIGHWAY 59 MILEPOINT 238.15, 70.0 FEET EAST OF EXTENDED DEAD END REL NUMBER 37324, 40.0 FEET SOUTH OF COUNTY ROAD 3, 34.0 FEET WEST OF A FIELD ENTRANCE, 1.0 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1345.207	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT	

Geoid Separations(ft): GEOID18 = -87.769 12B = -87.749 09 = -87.651 03 = -87.506

* No Horizontal Positions in the Database *

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/9_WGW-3S-19AUG2009.jpg	S	Aug 19, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/9_WGW-2-19AUG2009.jpg		Aug 19, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/9_WGW-1-19AUG2009.jpg		Aug 19, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: 94 1

NGS Name: 94 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0168](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	32	133 N	43 W	461741.00	960722.00	2		1968	2008	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	STEEL SPIKE IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	BOLT	MNDT

Description: (2009)

Stamping:

2.0 MILES WEST OF FERGUS FALLS, 2.0 MILES WEST OF FERGUS FALLS AND ABOUT 0.6 MILE NORTH OF THE INTERCHANGE OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94, THE STATION IS THE TOP OF THE SOUTHWEST BOLT ON THE WEST BASE OF THE FERGUS FALLS BRECKENRIDGE EXIT SIGN, 37.0 FEET WEST OF EASTBOUND INTERSTATE HIGHWAY 94 (STATION. 989+90).

Station Notes

THE SET DATE IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1211.802	.016	2/0					VERTICAL ADJUSTMENT	1991	00000025
Geoid Separations(ft): GEOID18 = -88.251 12B = -88.245 09 = -88.130 03 = -88.058									
* No Horizontal Positions in the Database *									



Mn/DOT Name: A 4

NGS Name: A 4

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0750](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	19	133 N	43 W	461922.00	960822.00	1	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	2009	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	PIPE CAP	NGS

Description: (2012)

Stamping:

4.0 MILES NORTHWEST OF FERGUS FALLS, 0.9 MILE NORTH ALONG COUNTY ROAD 116 (170TH AVENUE) FROM THE JUNCTION OF COUNTY ROAD 116 (170TH AVENUE) AND 240TH STREET IN FERGUS FALLS, 486.0 WEST ON A TEE-ROAD, AT THE WEST END OF A CUT. ACCESS IS 0.3 MILE BY FOOT.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1202.301	.007	1				VERTICAL CONTROL SURVEY	1993	POSTED

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1201.448	.007	1				VERTICAL CONTROL SURVEY	1905	L36 MINN

GA1912

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1201.904	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -88.291 12B = -88.284 09 = -88.176 03 = -88.110

* No Horizontal Positions in the Database *



Mn/DOT Name: AASTAD

NGS Name: AASTAD

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5756](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	16	131 N	43 W	460907.45	960605.87		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009)

Stamping: AASTAD 2001 2009

8.85 MILES SOUTH OF FERGUS FALLS, 8.0 MILES SOUTH ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND INTERSTATE HIGHWAY 94 (THE JUNCTION IS 1.5 MILES SOUTH OF FERGUS FALLS), TO INTERSTATE HIGHWAY 94 MILEPOINT 55.95, 108.0 FEET EAST OF COUNTY ROAD 1, 29.0 FEET NORTH OF 130TH STREET, 6.0 FEET SOUTHEAST OF A POWER POLE, 1.3 FEET NORTHWEST OF A WITNESS POST.

Station Notes

SEE M09OTTE FOR THE ROD DEPTH.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Project Info		
Height	Acc	Order/(Class)	Height	Acc	Adj	Determination Method	Year	Reference
1153.823	.131		1066.648	.066	1996	GPS - STATIC	2021	HOTTE
1153.810			1066.494	.025	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1153.810			1066.494	.025	2011	GPS - STATIC	2020	HOTTE
1153.613	.262		1066.458	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.329 12B = -87.303 09 = -87.159 03 = -87.155

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 07.44641	96 06 05.86846	402426.357	116896.827	.016		ADJUSTMENT	2020	GPS3384
46 09 07.44641	96 06 05.86846	402426.357	116896.827	.016	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 09 07.44608	96 06 05.86898	402426.320	116896.793	.033	C	GPS - STATIC	2021	HOTTE
46 09 07.44695	96 06 05.86968	402426.272	116896.882	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2155453.433	753671.200	854647.114	16783499.684	.016		ADJUSTMENT	2020	GPS3384
2155453.433	753671.200	854647.114	16783499.684	.016	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2155453.395	753671.168	854647.076	16783499.652	.033	C	GPS - STATIC	2021	HOTTE
2155453.348	753671.257	854647.030	16783499.742	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/AASTAD-DR5756-3N-02OCT2014.jpg	N	Oct 2, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/AASTAD-DR5756-2-02OCT2014.jpg		Oct 2, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/AASTAD-DR5756-1-02OCT2014.jpg		Oct 2, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: ADAMS RESET

NGS Name: ADAMS RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095332/
USGS Quad: ASHBY

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	35	131 N	41 W	460654.70	954841.60		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2009	2014	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015)

Stamping: ADAMS 1998 2009

6.5 MILES SOUTHEAST OF DALTON, 6.3 MILES EAST ALONG COUNTY ROAD 12 FROM THE JUNCTION OF COUNTY ROAD 12 AND COUNTY ROAD 35 IN DALTON, 3.9 MILES SOUTH ON COUNTY ROAD 47, THEN 0.8 MILE WEST ON COUNTY ROAD 47, THEN 0.4 SOUTH ON COUNTY ROAD 47, 26.2 FEET EAST OF COUNTY ROAD 47, 9.0 FEET SOUTH OF A FIELD ENTRANCE, 17.3 FEET NORTHWEST OF A WITNESS POST.

Station Notes

THE ROD DEPTH IS UNKNOWN.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.037 12B = -87.041 09 = -86.922 03 = -86.890

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ADAMS_RESET-3E-05NOV2009.jpg	E	Nov 5, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ADAMS_RESET-2-05NOV2009.jpg		Nov 5, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ADAMS_RESET-1-05NOV2009.jpg		Nov 5, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: AIRPORT BEACON 1991

NGS Name: AIRPORT BEACON 1991

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AA9003](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	31	133 N	43 W	461712.00	960904.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	1991	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

BLANK

Disk Type

AIRPORT BEACON

Mon. Agency

NOS

Description: (2012)

Stamping:

3.4 MILES WEST OF FERGUS FALLS, 0.7 MILE WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 116 IN FERGUS FALLS, THEN 0.4 MILE SOUTH TOWARD THE AIRPORT, LOCATED ON THE EAST SIDE OF THE AIRPORT TERMINAL AREA AND IS A GREEN AND CLEAR ROTATING BEACON MOUNTED ON TOP OF A SKELETON STEEL TOWER WHICH IS APPROXIMATELY 60.0 FEET HIGH, THE POINT OBSERVED WAS THE SPINDLE OF THE BEACON.

Station Notes

CONTACT THE AIRPORT MANAGER BEFORE USE. FERGUS FALLS MUNICIPAL AIRPORT.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.251 12B = -88.241 09 = -88.126 03 = -88.064



Mn/DOT Name: ALBERT

NGS Name: ALBERT

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SE	2	136 N	44 W	463712.19	961041.61			2009	2009	GOOD	Horz=YES Vert=YES	NO		RECESSED 3 IN.	MARKER W/BAR MAGNET

Monument Type

ALUMINUM ALLOY ROD (NO SLEEVE)

Disk Type

SURVEY DISK

Mon. Agency

MNDT

Description: (2009)

Stamping: ALBERT 1999

5.6 MILES NORTHWEST OF PELICAN RAPIDS, 2.5 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 WEST AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, TO TRUNK HIGHWAY 108 MILEPOINT 9.55, THENCE 3.0 MILES NORTH ALONG COUNTY ROAD 113, THENCE 1.95 MILES WEST ALONG 450TH STREET, THENCE 0.25 MILE NORTH ALONG 150TH AVENUE, THENCE 0.05 MILE WEST ALONG 453RD STREET, 17.0 FEET NORTH OF 453RD STREET, 288.0 FEET WEST OF 150TH AVENUE, 27.0 FEET SOUTH OF A WITNESS POST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.395 12B = -87.375 09 = -87.267 03 = -87.178



Mn/DOT Name: ALKALI MNDT

NGS Name: ALKALI

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R01123](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	19	131 N	42 W	460856.26	955954.98		2

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1978	2009	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 3 IN.	MARK IS STEEL PIPE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	SURVEY DISK	MNDT

Description: (1978) **Stamping:** ALKALI 1978

9.0 MILES SOUTH-SOUTHEAST OF FERGUS FALLS, 4.7 MILES SOUTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94, AT TRUNK HIGHWAY 59 MILEPOINT 207.6, 41.0 FEET EAST-SOUTHEAST OF TRUNK HIGHWAY 59, 103.5 FEET NORTH-NORTHWEST OF A POWER POLE, 2.1 FEET WEST OF A WITNESS POST.

Station Notes

THE TIES FALL INTO A DITCH BOTTOM.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order/(Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1225.719	.197		1138.702	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order/(Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1225.096						RECIPROCAL VERTICAL ANGLE	1979	HORZ

Geoid Separations(ft): GEOID18 = -87.244 12B = -87.237 09 = -87.103 03 = -87.083

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 08 56.25572	95 59 54.97597	428535.292	115653.064	.066	2	ADJUSTMENT	1999	17648
46 08 56.25580	95 59 54.97539	428535.333	115653.072	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 08 56.25488	95 59 54.96369	428536.157	115652.976	.066	2	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>						<u>Year</u>	<u>Reference</u>
46 08 56.40206	95 59 53.76192			.100	2	CLASSICAL SURVEY	1981	16333

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2181531.318	751944.594	880703.965	16781363.622	.066	2	ADJUSTMENT	1999	17648
2181531.359	751944.601	880704.006	16781363.628	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2181532.181	751944.490	880704.826	16781363.504	.066	2	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1556937.019	423871.447			.100	2	CLASSICAL SURVEY	1981	16333



Mn/DOT Name: ALTNER

NGS Name: ALTNER

County: OTTER TAIL, MN (Sheet 1)

<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>	NGS ACRN: DQ2729	Get Map
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>
NW	30	135 N	44 W	462848.52	961633.93
				<u>Order</u>	<u>Order</u>
				2	C
NGS Quad / Sta Num : 46096241/ USGS Quad: ROTHSA					

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 58 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: ALTNER 2014

0.5 MILE EAST OF ROTHSA, 0.30 MILE SOUTHEAST ALONG EASTBOUND INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 11 IN ROTHSA, AT INTERSTATE HIGHWAY 94 MILEPOINT 38.60, 83.7 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 18.6 FEET NORTHEAST OF A RIGHT-OF-WAY FENCE, 1.5 FEET NORTHEAST OF A WITNESS POST.

Station Pair: KNOBEL - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1223.859	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1223.961	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1223.958	.016	2/1				VERTICAL CONTROL SURVEY	2016 VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1223.859			1135.782	.006	2011	HORIZONTAL ADJUSTMENT	2025 GPS3847
1223.859			1135.782	.006	2011	GPS - STATIC	2025 HTH94B
1223.859			1135.782	.006	2011	HORIZONTAL ADJUSTMENT	2025 GPS3805
1223.859	.131		1135.903	.066	1996	GPS - STATIC	2025 HTH94A
1223.859			1135.782	.006	2011	GPS - STATIC	2025 HTH94A
1223.948	.262		1135.802	.197	2011	GPS - RTRN	2023 RTRN2023
1223.859	.131		1135.933	.066	1996	GPS - STATIC	2021 HOTTE
1223.859			1135.782	.022	2011	HORIZONTAL ADJUSTMENT	2020 GPS3384
1223.859			1135.782	.022	2011	GPS - STATIC	2020 HOTTE
1223.862	.262		1135.726	.197	2011	GPS - RTRN	2015 RTRN2015
1223.830	.262		1135.690	.197	2011	GPS - RTRN	2014 RTRN2014

Geoid Separations(ft): GEOID18 = -88.146 12B = -88.140 09 = -88.038 03 = -87.956

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 28 48.52388	96 16 33.92706	359054.055	236810.630	.003		ADJUSTMENT	2025 GPS3847
46 28 48.52388	96 16 33.92706	359054.055	236810.630	.003	C	GPS - STATIC	2025 HTH94B
46 28 48.52388	96 16 33.92706	359054.055	236810.630	.003		ADJUSTMENT	2025 GPS3805
46 28 48.52388	96 16 33.92706	359054.055	236810.630	.003	C	GPS - STATIC	2025 HTH94A
46 28 48.52369	96 16 33.92634	359054.105	236810.611	.131	3	GPS - RTRN	2023 RTRN2023
46 28 48.52388	96 16 33.92706	359054.055	236810.630	.013		ADJUSTMENT	2020 GPS3384
46 28 48.52388	96 16 33.92706	359054.055	236810.630	.013	C	GPS - STATIC	2020 HOTTE
46 28 48.52461	96 16 33.92757	359054.020	236810.705	.131	3	GPS - RTRN	2015 RTRN2015
46 28 48.52335	96 16 33.92658	359054.088	236810.576	.131	3	GPS - RTRN	2014 RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 28 48.52344	96 16 33.92778	359054.004	236810.586	.066		NCAT	2025 HTH94B
46 28 48.52408	96 16 33.92691	359054.066	236810.650	.033	C	GPS - STATIC	2025 HTH94A
46 28 48.52355	96 16 33.92754	359054.021	236810.597	.033	C	GPS - STATIC	2021 HOTTE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2114313.387	874351.262	815401.306	16904864.944	.003		ADJUSTMENT	2025	GPS3847
2114313.387	874351.262	815401.306	16904864.944	.003	C	GPS - STATIC	2025	HTH94B
2114313.387	874351.262	815401.306	16904864.944	.003		ADJUSTMENT	2025	GPS3805
2114313.387	874351.262	815401.306	16904864.944	.003	C	GPS - STATIC	2025	HTH94A
2114313.437	874351.241	815401.355	16904864.923	.131	3	GPS - RTRN	2023	RTRN2023
2114313.387	874351.262	815401.306	16904864.944	.013		ADJUSTMENT	2020	GPS3384
2114313.387	874351.262	815401.306	16904864.944	.013	C	GPS - STATIC	2020	HOTTE
2114313.353	874351.337	815401.273	16904865.020	.131	3	GPS - RTRN	2015	RTRN2015
2114313.419	874351.207	815401.337	16904864.889	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2114313.335	874351.218	815401.253	16904864.902	.066		NCAT	2025	HTH94B
2114313.398	874351.282	815401.317	16904864.964	.033	C	GPS - STATIC	2025	HTH94A
2114313.352	874351.229	815401.271	16904864.913	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ALTNER-DQ2729-3SW-14AUG2023.jpg	SW	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ALTNER-DQ2729-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ALTNER-DQ2729-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: AMOR

NGS Name: AMOR

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095341/
USGS Quad: PHELPS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	29	134 N	40 W	462320.80	954537.00			2000	2009	GOOD	Horz=YES Vert=YES	NO		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2000)

Stamping: AMOR 2000

8.2 MILES NORTH OF BATTLE LAKE, 5.1 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, TO TRUNK HIGHWAY 78 MILEPOINT 26.7, THEN 3.0 MILES WEST AND NORTH ALONG COUNTY ROAD 72, THEN 0.4 MILE NORTHEAST ALONG COUNTY ROAD 1, THEN 1.1 MILES NORTH ALONG 350TH AVENUE, 35.0 FEET EAST OF 350TH AVENUE, 40.0 FEET SOUTH OF EXTENDED 294TH STREET, 8.2 FEET SOUTH OF A POWER POLE, 3.5 FEET NORTH OF A WITNESS POST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.002 12B = -87.999 09 = -87.874 03 = -87.739



Mn/DOT Name: ANDS

NGS Name: ANDS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4348](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	2	132 N	43 W	461616.25	960253.10	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) **Stamping:** ANDS 2014

IN FERGUS FALLS, 2.2 MILES NORTHEAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 28.7, 59.3 FEET SOUTH-SOUTHEAST OF TRUNK HIGHWAY 210, 0.4 MILE EAST NORTHEAST OF COUNTY ROAD 82, 34.5 FEET WEST-SOUTHWEST OF THE EAST ENTRANCE TO THE MARKS SAND AND GRAVEL, 1.5 FEET NORTH-NORTHWEST OF A WITNESS POST.

Station Pair: FERGUS FALLS - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1225.956	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1225.982	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1225.959	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1225.956			1137.826	.015	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1225.956	.131		1137.950	.066	1996	GPS - STATIC	2024	HTH210A
1225.956			1137.826	.015	2011	GPS - STATIC	2024	HTH210A
1225.956	.262		1137.819	.197	2011	GPS - RTRN	2023	RTRN2023
1225.854	.262		1137.714	.197	2011	GPS - RTRN	2015	RTRN2015
1225.854	.262		1137.714	.197	2011	GPS - RTRN	2015	RTRN2015
1225.890	.262		1137.750	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -88.136 12B = -88.140 09 = -88.021 03 = -87.930

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 16.24967	96 02 53.09814	416180.500	160275.626	.010		ADJUSTMENT	2025	GPS3793
46 16 16.24967	96 02 53.09814	416180.500	160275.626	.010	C	GPS - STATIC	2024	HTH210A
46 16 16.24992	96 02 53.09818	416180.498	160275.652	.131	3	GPS - RTRN	2023	RTRN2023
46 16 16.24864	96 02 53.09705	416180.576	160275.522	.131	3	GPS - RTRN	2015	RTRN2015
46 16 16.24864	96 02 53.09705	416180.576	160275.522	.131	3	GPS - RTRN	2015	RTRN2015
46 16 16.24929	96 02 53.09821	416180.495	160275.588	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 16.24935	96 02 53.09851	416180.474	160275.594	.033	C	GPS - STATIC	2024	HTH210A

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2170006.208	796782.168	869881.355	16826392.307	.010		ADJUSTMENT	2025	GPS3793
2170006.208	796782.168	869881.355	16826392.307	.010	C	GPS - STATIC	2024	HTH210A
2170006.206	796782.193	869881.353	16826392.332	.131	3	GPS - RTRN	2023	RTRN2023
2170006.282	796782.062	869881.428	16826392.200	.131	3	GPS - RTRN	2015	RTRN2015
2170006.282	796782.062	869881.428	16826392.200	.131	3	GPS - RTRN	2015	RTRN2015
2170006.202	796782.129	869881.349	16826392.268	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2170006.181	796782.136	869881.328	16826392.275	.033	C	GPS - STATIC	2024	HTH210A

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ANDS-DQ4348-3S-21FEB2024.jpg	S	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ANDS-DQ4348-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ANDS-DQ4348-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: ANNA

NGS Name: ANNA

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	11	131 N	42 W	461025.40	955528.80			2009	2009	GOOD	Horz=YES Vert=YES	NO		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) Stamping: ANNA 2009

AT THE WEST EDGE OF DALTON, 0.1 MILE WEST ALONG COUNTY ROAD 82 FROM THE JUNCTION OF COUNTY ROAD 82 AND COUNTY ROAD 12 (WEST MAIN STREET) IN DALTON, 36.1 FEET NORTH OF COUNTY ROAD 82, 30.5 FEET WEST OF AN ENTRANCE, 47.0 FEET SOUTHEAST OF A POWER POLE, 8.4 FEET SOUTHEAST OF A WITNESS POST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.349 12B = -87.362 09 = -87.231 03 = -87.188



Mn/DOT Name: ANNIE MNDT

NGS Name: ANNIE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9845](#) [Get Map](#)
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	26	136 N	44 W	463339.82	961055.84	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1998	2022	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	SURVEY DISK	MNDT

Description: (2004) Stamping: ANNIE 1998

5.45 MILES WEST OF PELICAN RAPIDS, 5.45 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 108 MILEPOINT 6.6, 76.0 FEET SOUTHEAST OF TRUNK HIGHWAY 108, 56.0 FEET WEST OF 410TH AVENUE, 8.5 FEET SOUTH-SOUTHEAST OF A POWER POLE, 6.6 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1343.363	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1343.439	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1343.419	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Geoid Separations(ft): GEOID18 = -87.670 12B = -87.654 09 = -87.542 03 = -87.447

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ANNIE-DG9845-3S-04AUG2009.jpg	S	Aug 4, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ANNIE-DG9845-2-04AUG2009.jpg		Aug 4, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ANNIE-DG9845-1-04AUG2009.jpg		Aug 4, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: ANNIE MNDT RESET

NGS Name: ANNIE RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR9942](#)
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	26	136 N	44 W	463339.82	961055.84	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2022	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2022) **Stamping:** ANNIE 1998 2022

5.45 MILES WEST OF PELICAN RAPIDS, 5.45 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 108 MILEPOINT 6.6, 76.0 FEET SOUTHEAST OF TRUNK HIGHWAY 108, 56.0 FEET WEST OF 410TH AVENUE, 8.5 FEET SOUTH-SOUTHEAST OF A POWER POLE.

Station Notes

THE SURVEY MARK IS TOO CLOSE TO THE ROAD FOR A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1343.134	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPOLI2	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1343.157			1255.555	.021	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689	
1343.117	.131		1255.657	.066	1996	GPS - STATIC	2024	HTH108	
1343.157			1255.555	.021	2011	GPS - STATIC	2024	HTH108	
1343.239	.262		1255.572	.197	2011	GPS - RTRN	2023	RTRN2023	
1343.153	.262		1255.483	.197	2011	GPS - RTRN	2022	RTRN2022	

Geoid Separations(ft): GEOID18 = -87.670 03 = -87.447

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 33 39.81847	96 10 55.84135	382888.578	266168.371	.013		ADJUSTMENT	2024	GPS3689
46 33 39.81847	96 10 55.84135	382888.578	266168.371	.013	C	GPS - STATIC	2024	HTH108
46 33 39.81869	96 10 55.84089	382888.611	266168.393	.131	3	GPS - RTRN	2023	RTRN2023
46 33 39.81833	96 10 55.84062	382888.629	266168.356	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 33 39.81827	96 10 55.84191	382888.539	266168.351	.033	C	GPS - STATIC	2024	HTH108

State Plane and UTM Coordinates (Feet)

NAD83(2011)		UTM - Zone 15		Determination Method			Project Info	
MN State Plane - Central Zone X	Y	X	Y	Acc	Order		Year	Reference
2138684.071	903259.183	840239.932	16933393.203	.013		ADJUSTMENT	2024	GPS3689
2138684.071	903259.183	840239.932	16933393.203	.013	C	GPS - STATIC	2024	HTH108
2138684.104	903259.205	840239.965	16933393.224	.131	3	GPS - RTRN	2023	RTRN2023
2138684.122	903259.168	840239.983	16933393.187	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)		UTM - Zone 15		Determination Method			Project Info	
MN State Plane - Central Zone X	Y	X	Y	Acc	Order		Year	Reference
2138684.031	903259.164	840239.892	16933393.184	.033	C	GPS - STATIC	2024	HTH108



<u>Station Photos</u>			
<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ANNIE_RESET-DR9942-3S-27JUL2023.jpg	S	Jul 27, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ANNIE_RESET-DR9942-2-27JUL2023.jpg		Jul 27, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ANNIE_RESET-DR9942-1-27JUL2023.jpg		Jul 27, 2023
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: ARCHIE MNDT

NGS Name: ARCHIE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9317](#) [Get Map](#)
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	36	136 N	41 W	463323.16	954710.95	2	C	1982	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MNDT

Description: (1982) Stamping: ARCHIE 1982

3.5 MILES WEST OF DENT, 3.65 MILES WEST ON TRUNK HIGHWAY 108 FROM A RAILROAD CROSSING, AT TRUNK HIGHWAY 108 MILEPOINT 28.3, 15.5 FEET NORTH OF TRUNK HIGHWAY 108, 93.0 FEET WEST OF AN ENTRANCE, OPPOSITE A REST AREA, 89.5 FEET EAST-SOUTHEAST OF A POWER POLE WITH A TRANSFORMER, 75.0 FEET EAST OF AN ENTRANCE, 62.28 FEET NORTHWEST OF ARCHIE MNDT RM 1, 53.97 FEET NORTHEAST OF ARCHIE MNDT RM 2.

Station Notes

USE WITH CAUTION, THE SURVEY MARK IS NEAR EDGE OF ROAD.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>				<u>Year</u>	<u>Reference</u>	
1353.544	.016	2/1						VERTICAL CONTROL SURVEY	2024	VPELI2	
1353.567	.016	2/1						VERTICAL ADJUSTMENT	2019	00000941	
1353.573	.016	2/1						VERTICAL ADJUSTMENT	2006	00000497	
1353.593	.016	2/1						VERTICAL CONTROL SURVEY	2001	VPELI	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>				<u>Year</u>	<u>Reference</u>	
1353.567			1266.346	.028	2011			HORIZONTAL ADJUSTMENT	2024	GPS3689	
1353.567	.131		1266.441	.066	1996			GPS - STATIC	2024	HTH108	
1353.567			1266.346	.028	2011			GPS - STATIC	2024	HTH108	
1353.518	.262		1266.284	.197	2011			GPS - RTRN	2023	RTRN2023	
1353.537	.262		1266.303	.197	2011			GPS - RTRN	2022	RTRN2022	
1353.468	.262		1266.464	.197	1996			GPS - RTRN	2009	RTRN2009	
1352.622	.197		1265.568	.131	1996			HORIZONTAL ADJUSTMENT	1999	17648	

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1352.589						RECIPROCAL VERTICAL ANGLE	1982	HORZ

Geoid Separations(ft): GEOID18 = -87.234 12B = -87.231 09 = -87.123 03 = -87.008

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 23.15786	95 47 10.95270	482461.296	264143.550	.013		ADJUSTMENT	2024	GPS3689
46 33 23.15786	95 47 10.95270	482461.296	264143.550	.013	C	GPS - STATIC	2024	HTH108
46 33 23.15780	95 47 10.95252	482461.308	264143.544	.131	3	GPS - RTRN	2023	RTRN2023
46 33 23.15821	95 47 10.95204	482461.342	264143.586	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 23.15763	95 47 10.95323	482461.259	264143.527	.033	C	GPS - STATIC	2024	HTH108
46 33 23.15805	95 47 10.95422	482461.189	264143.569	.131	3	GPS - RTRN	2009	RTRN2009
46 33 23.15450	95 47 10.95466	482461.158	264143.210	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 23.15083	95 47 10.95418	482461.192	264142.838	.066	2	ADJUSTMENT	1997	16997

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 33 23.30000	95 47 09.78410			.100	2	CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2238189.696	899391.933	939702.550	16927938.818	.013		ADJUSTMENT	2024	GPS3689
2238189.696	899391.933	939702.550	16927938.818	.013	C	GPS - STATIC	2024	HTH108
2238189.708	899391.927	939702.563	16927938.811	.131	3	GPS - RTRN	2023	RTRN2023
2238189.742	899391.967	939702.598	16927938.851	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2238189.658	899391.910	939702.512	16927938.796	.033	C	GPS - STATIC	2024	HTH108
2238189.590	899391.954	939702.445	16927938.841	.131	3	GPS - RTRN	2009	RTRN2009
2238189.552	899391.595	939702.401	16927938.482	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2238189.578	899391.223	939702.422	16927938.109	.066	2	ADJUSTMENT	1997	16997

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1613593.159	571317.837			.100	2	CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ARCHIE-AD9317-3N-31JUL2023.jpg	N	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ARCHIE-AD9317-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ARCHIE-AD9317-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: ARCHIE MNDT AZ MK

NGS Name: ARCHIE AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9318](#)

[Get Map](#)

NGS Quad / Sta Num : 46095432/

USGS Quad: STAR LAKE

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
NW	31	136 N	40 W	463319.10	954649.97	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1982	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	MNDT

Description: (2001)

Stamping: ARCHIE 1982

3.0 MILES WEST OF DENT, 2.9 MILES WEST ON TRUNK HIGHWAY 108 FROM A RAILROAD CROSSING, AT TRUNK HIGHWAY 108 MILEPOINT 28.6, 83.0 FEET SOUTH OF TRUNK HIGHWAY 108, 71.0 FEET EAST OF BEAVER DAM ROAD, 148.0 FEET NORTH-NORTHEAST OF A POWER POLE, 21.0 FEET WEST OF A TELEPHONE CABLE PEDESTAL NUMBER 19W7, 1.2 FEET WEST OF A WITNESS POST.

Station Pair: KERBS - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1393.229	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1393.229	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1393.235	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1393.255	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1393.229			1306.028	.026	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1393.229	.131		1306.123	.066	1996	GPS - STATIC	2024	HTH108
1393.229			1306.028	.026	2011	GPS - STATIC	2024	HTH108
1393.258	.262		1306.018	.197	2011	GPS - RTRN	2023	RTRN2023
1393.196	.262		1305.952	.197	2011	GPS - RTRN	2022	RTRN2022
1393.199	.262		1305.955	.197	2011	GPS - OPUS	2022	GPSBM
1393.308	.262		1306.064	.197	2011	GPS - RTRN	2021	RTRN2021
1393.042	.262		1306.028	.197	1996	GPS - RTRN	2009	RTRN2009
1392.254	.197		1305.194	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1392.254						LEVELING	1982	HORZ

Geoid Separations(ft): GEOID18 = -87.244 12B = -87.237 09 = -87.129 03 = -87.014

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 19.10309	95 46 49.96497	483927.764	263731.513	.013		ADJUSTMENT	2024	GPS3689
46 33 19.10309	95 46 49.96497	483927.764	263731.513	.013	C	GPS - STATIC	2024	HTH108
46 33 19.10258	95 46 49.96512	483927.754	263731.461	.131	3	GPS - RTRN	2023	RTRN2023
46 33 19.10330	95 46 49.96465	483927.786	263731.534	.131	3	GPS - RTRN	2022	RTRN2022
46 33 19.10236	95 46 49.96510	483927.755	263731.439	.131	3	GPS - OPUS	2022	GPSBM
46 33 19.10325	95 46 49.96494	483927.766	263731.529	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 19.10286	95 46 49.96551	483927.726	263731.490	.033	C	GPS - STATIC	2024	HTH108
46 33 19.10326	95 46 49.96596	483927.695	263731.530	.131	3	GPS - RTRN	2009	RTRN2009
46 33 19.09974	95 46 49.96648	483927.658	263731.174	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 19.09608	95 46 49.96631	483927.670	263730.803	.066	2	ADJUSTMENT	1997	16997

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 33 19.24530	95 46 48.79630			.100	2	CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2239648.100	898952.870	941154.112	16927476.481	.013		ADJUSTMENT	2024	GPS3689
2239648.100	898952.870	941154.112	16927476.481	.013	C	GPS - STATIC	2024	HTH108
2239648.089	898952.818	941154.100	16927476.429	.131	3	GPS - RTRN	2023	RTRN2023
2239648.123	898952.890	941154.135	16927476.501	.131	3	GPS - RTRN	2022	RTRN2022
2239648.090	898952.796	941154.101	16927476.407	.131	3	GPS - OPUS	2022	GPSBM
2239648.102	898952.886	941154.115	16927476.497	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2239648.062	898952.847	941154.074	16927476.459	.033	C	GPS - STATIC	2024	HTH108
2239648.031	898952.888	941154.044	16927476.501	.131	3	GPS - RTRN	2009	RTRN2009
2239647.988	898952.532	941153.995	16927476.145	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2239647.993	898952.161	941153.994	16927475.774	.066	2	ADJUSTMENT	1997	16997

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1615051.609	570878.786			.100	2	CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ARCHIE_AZ_MK-AD9318-3S-31JUL2023.jpg	S	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ARCHIE_AZ_MK-AD9318-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ARCHIE_AZ_MK-AD9318-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: ARCHIE MNDT RM 1

NGS Name: ARCHIE RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9296](#) [Get Map](#)
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	36	136 N	41 W	463322.58	954710.65	2	3	1982	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2004)

Stamping: ARCHIE NO 1 1982

3.5 MILES WEST OF DENT, 3.65 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND A RAILROAD CROSSING IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 28.3, 106.0 FEET EAST OF ENTRANCE NUMBER 33738 TO A WAYSIDE REST, 38.0 FEET SOUTH OF TRUNK HIGHWAY 108, 54.7 FEET EAST OF ARCHIE RM 2.

Station Notes

NO WITNESS POST, THE SURVEY MARK IS IN A MOWED AREA.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1348.741	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1348.790	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1348.797	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1348.816	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1348.767	.262		1261.533	.197	2011	GPS - RTRN	2023	RTRN2023
1348.655	.262		1261.648	.197	1996	GPS - RTRN	2009	RTRN2009
1352.688	.262		1265.634	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.234 12B = -87.231 09 = -87.126 03 = -87.008

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 33	22.57975	95 47	10.64643	482482.649	264084.962	.131	3	GPS - RTRN	2023	RTRN2023

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 33	22.58014	95 47	10.64735	482482.584	264085.001	.131	3	GPS - RTRN	2009	RTRN2009
46 33	22.57729	95 47	10.64783	482482.550	264084.712	.131	3	ADJUSTMENT	1999	17648

<u>NAD83(1986)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 33	22.57362	95 47	10.64736	482482.583	264084.341	.131	3	ADJUSTMENT	1997	16997



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2238209.958	899332.966	939721.875	16927879.522	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2238209.894	899333.007	939721.812	16927879.564	.131	3	GPS - RTRN	2009	RTRN2009
2238209.855	899332.719	939721.769	16927879.277	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2238209.881	899332.347	939721.789	16927878.904	.131	3	ADJUSTMENT	1997	16997

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ARCHIE_RM_1-AD9296-3S-31JUL2023.jpg	S	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ARCHIE_RM_1-AD9296-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ARCHIE_RM_1-AD9296-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: ARCHIE MNDT RM 2

NGS Name: ARCHIE RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9297](#)
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	36	136 N	41 W	463322.72	954711.40	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1982	2024	GOOD	Horz=NO Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2004)

Stamping: ARCHIE NO 2 1982

3.5 MILES WEST OF DENT, 3.65 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND A RAILROAD CROSSING IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 28.3, 33.5 FEET SOUTH OF TRUNK HIGHWAY 108, 54.7 FEET WEST OF ARCHIE RM 1, 25.5 FEET EAST OF ENTRANCE NUMBER 33738 TO A WAYSIDE REST, 5.0 FEET EAST OF A 12.0 INCH DIAMETER TWIN OAK, 2.6 FEET NORTH OF A WITNESS POST.

Station Notes

DUE TO TREE COVER, THIS SURVEY MARK HAS BEEN ABANDONED FOR MNDOT GEODETIC HORIZONTAL SURVEYS.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1349.023	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1348.967	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1348.977	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1348.993	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1348.833	.262		1261.595	.197	2011	GPS - RTRN	2023	RTRN2023
1352.688	.262		1265.634	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.234 12B = -87.231 09 = -87.126 03 = -87.008

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 22.72459	95 47 11.40109	482429.919	264099.682	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 22.72168	95 47 11.40475	482429.663	264099.387	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 22.71800	95 47 11.40427	482429.697	264099.015	.131	3	ADJUSTMENT	1997	16997

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2238157.517	899348.659	939669.679	16927896.052	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2238157.256	899348.369	939669.413	16927895.766	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2238157.282	899347.996	939669.433	16927895.392	.131	3	ADJUSTMENT	1997	16997



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ARCHIE_RM_2-AD9297-3S-31JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ARCHIE_RM_2-AD9297-2-31JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ARCHIE_RM_2-AD9297-1-31JUL2023.jpg

<u>Dir</u>	<u>Date</u>
S	Jul 31, 2023
	Jul 31, 2023
	Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: ARMSTRONG

NGS Name: ARMSTRONG

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5757](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	29	132 N	43 W	461259.22	960611.58		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2001	2018	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2001)

Stamping: ARMSTRONG 2001

4.8 MILES SOUTH OF FERGUS FALLS, 3.65 MILES SOUTH ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, 1.5 MILES SOUTH OF FERGUS FALLS TO INTERSTATE HIGHWAY 94 MILEPOINT 55.95, 45.0 FEET WEST OF COUNTY ROAD 1, 49.0 FEET NORTH OF A FIELD ENTRANCE, 1.4 FEET SOUTHWEST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1179.040	.131			1091.336	.066	1996	GPS - STATIC	2021	HOTTE
1179.046				1091.185	.024	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1179.046				1091.185	.024	2011	GPS - STATIC	2020	HOTTE
1178.951	.262			1091.268	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.877 12B = -87.864 09 = -87.723 03 = -87.684

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		NAD83(1996)		Otter Tail County				Project Info	
Latitude	Longitude	Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year
46 12 59.22270	96 06 11.58171	46 12 59.22270	96 06 11.58171	402138.862	140378.926	.016		ADJUSTMENT	2020
46 12 59.22270	96 06 11.58171	46 12 59.22270	96 06 11.58171	402138.862	140378.926	.016	C	GPS - STATIC	2020
46 12 59.22236	96 06 11.58223	46 12 59.22236	96 06 11.58223	402138.825	140378.891	.033	C	GPS - STATIC	2021
46 12 59.22302	96 06 11.58296	46 12 59.22302	96 06 11.58296	402138.774	140378.958	.131	3	GPS - RTRN	2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)		NAD83(1996)		MN State Plane - Central Zone				Project Info	
X	Y	X	Y	X	Y	Acc	Order	Determination Method	Year
2155600.613	777151.418	2155600.613	777151.418	855163.141	16806983.599	.016		ADJUSTMENT	2020
2155600.613	777151.418	2155600.613	777151.418	855163.141	16806983.599	.016	C	GPS - STATIC	2020
2155600.576	777151.385	2155600.576	777151.385	855163.104	16806983.566	.033	C	GPS - STATIC	2021
2155600.526	777151.453	2155600.526	777151.453	855163.055	16806983.635	.131	3	GPS - RTRN	2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ARMSTRONG-DR5757-3W-08OCT2014.jpg	W	Oct 8, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ARMSTRONG-DR5757-2-08OCT2014.jpg		Oct 8, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ARMSTRONG-DR5757-1-08OCT2014.jpg		Oct 8, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: ASHBY RADIO MAST

NGS Name: ASHBY RADIO MAST

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CO9043](#) [Get Map](#)
NGS Quad / Sta Num : 46095331/
USGS Quad: STALKER LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	29	131 N	41 W	460938.28	960106.22		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1979	1979	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

BLANK

Disk Type

RADIO/TV MAST

Mon. Agency

MNDT

Description: (2012)

Stamping:

3.0 MILES NORTHWEST OF ASHBY, 2.4 MILES NORTHWEST ALONG COUNTY ROAD 82 FROM THE JUNCTION OF COUNTY ROAD 82 AND COUNTY ROAD 4, THEN 0.7 MILE NORTH ON COUNTY ROAD 117, 300.0 FEET SOUTHWEST OF A FARM, 1000.0 FEET WEST OF COUNTY ROAD 117.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.109 12B = -87.109 09 = -86.988 03 = -86.962



Mn/DOT Name: AURDAL

NGS Name: AURDAL

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	20	133 N	42 W	461933.65	960018.17		C

NGS ACRN: [DR5758](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2000	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2015)

Stamping: AURDAL 2000

2.0 MILES NORTHEAST OF FERGUS FALLS, 7.10 MILES EAST ALONG COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND TRUNK HIGHWAY 59 IN ELIZABETH, TO TRUNK HIGHWAY 59 MILEPOINT 226.75, THENCE 3.30 MILES SOUTH-SOUTHWEST ALONG COUNTY ROAD 1, THENCE 0.2 MILE EAST ALONG COUNTY ROAD 18, 38.0 FEET SOUTH OF COUNTY ROAD 18, 9.0 FEET WEST OF A FIELD ENTRANCE, 3.0 FEET EAST OF A WITNESS POST, UNKNOWN ROD DEPTH.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1312.333			1224.141	.011	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1312.333			1224.141	.011	2011	GPS - STATIC	2025	HTH94B
1312.333			1224.141	.014	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1312.291	.131		1224.292	.066	1996	GPS - STATIC	2024	HTH210A
1312.333			1224.141	.014	2011	GPS - STATIC	2024	HTH210A
1312.304	.131		1224.292	.066	1996	GPS - STATIC	2021	HOTTE
1312.343			1224.141	.024	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1312.343			1224.141	.024	2011	GPS - STATIC	2020	HOTTE

Geoid Separations(ft): GEOID18 = -88.212 12B = -88.212 09 = -88.100 03 = -87.985

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 19 33.64565	96 00 18.17357	427137.375	180230.602	.007		ADJUSTMENT	2025	GPS3847
46 19 33.64565	96 00 18.17357	427137.375	180230.602	.007	C	GPS - STATIC	2025	HTH94B
46 19 33.64565	96 00 18.17357	427137.375	180230.602	.010		ADJUSTMENT	2025	GPS3793
46 19 33.64565	96 00 18.17357	427137.375	180230.602	.010	C	GPS - STATIC	2024	HTH210A
46 19 33.64565	96 00 18.17357	427137.375	180230.602	.016		ADJUSTMENT	2020	GPS3384
46 19 33.64565	96 00 18.17357	427137.375	180230.602	.016	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 19 33.64510	96 00 18.17416	427137.334	180230.547	.066		NCAT	2025	HTH94B
46 19 33.64533	96 00 18.17409	427137.339	180230.570	.033	C	GPS - STATIC	2024	HTH210A
46 19 33.64533	96 00 18.17409	427137.339	180230.570	.033	C	GPS - STATIC	2021	HOTTE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2181329.091	816528.284	881518.349	16845964.109	.007		ADJUSTMENT	2025	GPS3847
2181329.091	816528.284	881518.349	16845964.109	.007	C	GPS - STATIC	2025	HTH94B
2181329.091	816528.284	881518.349	16845964.109	.010		ADJUSTMENT	2025	GPS3793
2181329.091	816528.284	881518.349	16845964.109	.010	C	GPS - STATIC	2024	HTH210A
2181329.091	816528.284	881518.349	16845964.109	.016		ADJUSTMENT	2020	GPS3384
2181329.091	816528.284	881518.349	16845964.109	.016	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2181329.048	816528.229	881518.306	16845964.055	.066		NCAT	2025	HTH94B
2181329.054	816528.253	881518.311	16845964.078	.033	C	GPS - STATIC	2024	HTH210A
2181329.054	816528.253	881518.311	16845964.078	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/AURDAL-DR5758-3S-21FEB2024.jpg	S	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/AURDAL-DR5758-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/AURDAL-DR5758-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: B 4

NGS Name: B 4

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0107](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	13	133 N	44 W	461944.00	960920.00	1	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	2009	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	BOLT	NGS

Description: (2012)

Stamping:

4.6 MILES NORTHWEST OF FERGUS FALLS, 1.3 MILES NORTH ALONG COUNTY ROAD 116 FROM THE JUNCTION OF COUNTY ROAD 116 AND TRUNK HIGHWAY 210, THEN 1.0 MILE WEST ON COUNTY ROAD 116, THEN 0.8 MILE NORTH ALONG 160TH AVENUE, IN THE SOUTH SIDE OF THE WEST ABUTMENT OF A BRIDGE OVER THE OTTERTAIL RIVER, IN THE SOUTHEAST CORNER OF THE HORIZONTAL SURFACE OF THE BEVELED CAPSTONE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1181.284	.007	1				VERTICAL CONTROL SURVEY	1993	POSTED

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1180.431	.007	1/2				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1180.431	.007	1				VERTICAL CONTROL SURVEY	1929	Q460962
1180.431	.007	1				VERTICAL CONTROL SURVEY	1905	L36 MINN

GA1912

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1180.887	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -88.307 12B = -88.297 09 = -88.189 03 = -88.126

* No Horizontal Positions in the Database *



Mn/DOT Name: BAHLE

NGS Name: BAHLE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	17	132 N	42 W	461421.93	955915.41		3	1998	2014	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2015)

Stamping: BAHLE 1998

6.0 MILES SOUTHEAST OF FERGUS FALLS, 0.75 MILE NORTHEAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 82 IN THE SOUTHEAST PART OF FERGUS FALLS, TO TRUNK HIGHWAY 210 MILEPOINT 29.05, THENCE 3.25 MILES SOUTHEAST ALONG COUNTY ROAD 29, THENCE 0.85 MILE EAST ALONG 1114 TOWNSHIP ROAD (190TH STREET), 35.5 FEET NORTH OF 1114 TOWNSHIP ROAD (190TH STREET), 27.0 FEET WEST OF A POWER POLE, 4.0 FEET SOUTH OF A WITNESS POST, UNKNOWN ROD DEPTH.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1321.897	.262			1234.174	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.923 12B = -87.923 09 = -87.808 03 = -87.720

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 14 21.92813	95 59 15.41062			431434.104	148635.864	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2185039.723	784863.631			884730.396	16814234.347	.131	3	GPS - RTRN	2009 RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BAHLE-3N-01OCT2014.jpg	N	Oct 1, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BAHLE-2-01OCT2014.jpg		Oct 1, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BAHLE-1-01OCT2014.jpg		Oct 1, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: BAKER

NGS Name: BAKER

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095331/
USGS Quad: STALKER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	20	132 N	41 W	461334.55	955209.40		3	2000	2009	GOOD	Horz=YES Vert=YES	NO		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2000)

Stamping: BAKER 2000

4.9 MILES SOUTH OF UNDERWOOD, 2.20 MILES SOUTH AND SOUTHWEST ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 210 IN UNDERWOOD TO TRUNK HIGHWAY 210 MILEPOINT 37.55, THENCE 2.5 MILES SOUTH AND EAST ALONG COUNTY ROAD 39, 49.0 FEET WEST OF COUNTY ROAD 39, 3.0 FEET NORTH OF A RIGHT-OF-WAY POST, 1.0 FOOT EAST OF A WITNESS POST. THE ROD DEPTH IS UNKNOWN.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1388.970	.262			1301.510	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.651 12B = -87.670 09 = -87.556 03 = -87.457

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 13 34.54565	95 52 09.40007			461370.943	143755.520	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2214877.079	779430.640			914487.599	16808330.781	.131	3	GPS - RTRN	2009 RTRN2009



Mn/DOT Name: BAKKEN

NGS Name: BAKKEN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ1977](#)

[Get Map](#)

NGS Quad / Sta Num : 46096124/

USGS Quad: ROLLAG

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	21	137 N	43 W	463935.69	960744.41	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2014)

Stamping: BAKKEN 1999

5.1 MILES WEST OF DUNVILLA, 4.95 MILES WEST ALONG TRUNK HIGHWAY 34 FROM THE JUNCTION OF TRUNK HIGHWAY 34 AND TRUNK HIGHWAY 59 IN DUNVILLA, AT TRUNK HIGHWAY 34 MILEPOINT 13.85, 72.0 FEET NORTH OF TRUNK HIGHWAY 34, 400.0 FEET EAST OF COUNTY ROAD 23 NORTH, 3.6 FEET SOUTH OF A RIGHT-OF-WAY POST, 1.7 FEET SOUTH OF A WITNESS POST.

Station Notes

THE ROD DEPTH IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1421.336	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1421.336			1334.108	.022	2011	HORIZONTAL ADJUSTMENT	2024	GPS3671
1421.336	.131		1334.216	.066	1996	GPS - STATIC	2023	HTH9
1421.336			1334.108	.022	2011	GPS - STATIC	2023	HTH9
1421.303	.262		1334.000	.197	2011	GPS - RTRN	2022	RTRN2022
1421.250	.262		1333.977	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.300 12B = -87.270 09 = -87.168 03 = -87.070

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 39 35.68739	96 07 44.40831	396454.157	302148.050	.013		ADJUSTMENT	2024	GPS3671
46 39 35.68739	96 07 44.40831	396454.157	302148.050	.013	C	GPS - STATIC	2023	HTH9
46 39 35.68689	96 07 44.40751	396454.213	302147.999	.131	3	GPS - RTRN	2022	RTRN2022
46 39 35.68739	96 07 44.40866	396454.133	302148.050	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 39 35.68717	96 07 44.40870	396454.130	302148.028	.033	C	GPS - STATIC	2023	HTH9

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2152911.490	938977.159	855042.092	16968892.852	.013		ADJUSTMENT	2024	GPS3671
2152911.490	938977.159	855042.092	16968892.852	.013	C	GPS - STATIC	2023	HTH9
2152911.545	938977.107	855042.146	16968892.799	.131	3	GPS - RTRN	2022	RTRN2022
2152911.466	938977.159	855042.067	16968892.853	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2152911.463	938977.137	855042.064	16968892.831	.033	C	GPS - STATIC	2023	HTH9



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BAKKEN-DQ1977-3N-13SEP2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BAKKEN-DQ1977-2-13SEP2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BAKKEN-DQ1977-1-13SEP2022.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Sep 13, 2022
	Sep 13, 2022
	Sep 13, 2022



Mn/DOT Name: BATTLE LAKE

NGS Name: BATTLE LAKE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO1083](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/1025
USGS Quad: BATTLE LAKE

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NW	3	132 N	40 W	461630.19	954213.52	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	NGS

Description: (1994) **Stamping:** BATTLE LAKE 1974

0.5 MILE SOUTHEAST OF BATTLE LAKE, 0.5 MILE EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 IN BATTLE LAKE, AT TRUNK HIGHWAY 210 MILEPOINT 46.10, 97.5 FEET NORTH OF TRUNK HIGHWAY 210, 97.0 FEET SOUTH-SOUTHEAST OF A RIGHT-OF-WAY SIGN, 95.85 FEET WEST-SOUTHWEST OF BATTLE LAKE RM 1, 97.41 FEET EAST OF BATTLE LAKE RM 2, 5.4 FEET SOUTH-SOUTHWEST OF A WITNESS POST.

Station Pair: 5602 KA - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1397.382	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1397.366	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1397.366	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1397.366	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1397.366	.016	2/1				VERTICAL CONTROL SURVEY	2012	VASHB
1397.366	.016	2/1				VERTICAL ADJUSTMENT	2009	00000591
1397.366	.016	2/1				VERTICAL CONTROL SURVEY	2005	VBAT1

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1397.382			1309.810	.008	2011	HORIZONTAL ADJUSTMENT	2024	GPS3782
1397.382	.131		1309.955	.066	1996	GPS - STATIC	2024	HTH210B
1397.382			1309.810	.008	2011	GPS - STATIC	2024	HTH210B
1397.284	.262		1309.755	.197	2011	GPS - RTRN	2023	RTRN2023
1397.189	.262		1309.659	.197	2011	GPS - OPUS	2022	GPSBM
1397.304	.262		1309.774	.197	2011	GPS - RTRN	2021	RTRN2021
1397.195	.262		1309.659	.197	2011	GPS - RTRN	2015	RTRN2015
1397.195	.262		1309.659	.197	2011	GPS - RTRN	2015	RTRN2015
			1309.810	.008	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1397.140	.262		1309.794	.197	1996	GPS - RTRN	2009	RTRN2009
			1309.922	.009	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1397.373	.131		1309.955	.066	1996	HORIZONTAL ADJUSTMENT	2005	GPS2135
1397.373	.131		1309.955	.066	1996	GPS - STATIC	2005	HBATT
1397.373	.131		1310.017	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648
1397.376	.131		1309.955	.066	1996	GPS - STATIC	1997	GPS805-C

NGVD29			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1397.012						RECIPROCAL VERTICAL ANGLE	1974	HORZ

Geoid Separations(ft): GEOID18 = -87.529 12B = -87.536 09 = -87.424 03 = -87.342

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 30.18879	95 42 13.52264	503264.983	161512.427	.007		ADJUSTMENT	2024	GPS3782
46 16 30.18879	95 42 13.52264	503264.983	161512.427	.007	C	GPS - STATIC	2024	HTH210B
46 16 30.18846	95 42 13.52196	503265.031	161512.394	.131	3	GPS - RTRN	2023	RTRN2023
46 16 30.18868	95 42 13.52290	503264.965	161512.416	.131	3	GPS - OPUS	2022	GPSBM
46 16 30.18844	95 42 13.52250	503264.993	161512.392	.131	3	GPS - RTRN	2021	RTRN2021
46 16 30.18916	95 42 13.52288	503264.966	161512.465	.131	3	GPS - RTRN	2015	RTRN2015
46 16 30.18916	95 42 13.52288	503264.966	161512.465	.131	3	GPS - RTRN	2015	RTRN2015
46 16 30.18879	95 42 13.52264	503264.983	161512.427	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 30.18870	95 42 13.52351	503264.922	161512.418	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 30.18826	95 42 13.52323	503264.942	161512.373	.033	C	GPS - STATIC	2024	HTH210B
46 16 30.18906	95 42 13.52397	503264.890	161512.455	.131	3	GPS - RTRN	2009	RTRN2009
46 16 30.18826	95 42 13.52323	503264.942	161512.373	.033	C	ADJUSTMENT	2005	GPS2135
46 16 30.18826	95 42 13.52323	503264.942	161512.373	.033	C	GPS - STATIC	2005	HBATT
46 16 30.18826	95 42 13.52323	503264.942	161512.373	.033	C	ADJUSTMENT	1999	17648
46 16 30.18826	95 42 13.52323	503264.942	161512.373	.033	C	GPS - STATIC	1997	GPS805-C

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 30.18562	95 42 13.51216	503265.720	161512.106	.033	1	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 16 30.32754	95 42 12.34323			.100	1	CLASSICAL SURVEY	1977	15955

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2257087.064	796406.559	956970.010	16824643.979	.007		ADJUSTMENT	2024	GPS3782
2257087.064	796406.559	956970.010	16824643.979	.007	C	GPS - STATIC	2024	HTH210B
2257087.110	796406.525	956970.056	16824643.944	.131	3	GPS - RTRN	2023	RTRN2023
2257087.045	796406.548	956969.991	16824643.969	.131	3	GPS - OPUS	2022	GPSBM
2257087.073	796406.523	956970.018	16824643.943	.131	3	GPS - RTRN	2021	RTRN2021
2257087.047	796406.597	956969.994	16824644.017	.131	3	GPS - RTRN	2015	RTRN2015
2257087.047	796406.597	956969.994	16824644.017	.131	3	GPS - RTRN	2015	RTRN2015
2257087.064	796406.559	956970.010	16824643.979	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2257087.002	796406.551	956969.948	16824643.972	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2257087.021	796406.506	956969.966	16824643.927	.033	C	GPS - STATIC	2024	HTH210B
2257086.970	796406.588	956969.917	16824644.010	.131	3	GPS - RTRN	2009	RTRN2009
2257087.021	796406.506	956969.966	16824643.927	.033	C	ADJUSTMENT	2005	GPS2135
2257087.021	796406.506	956969.966	16824643.927	.033	C	GPS - STATIC	2005	HBATT
2257087.021	796406.506	956969.966	16824643.927	.033	C	ADJUSTMENT	1999	17648
2257087.021	796406.506	956969.966	16824643.927	.033	C	GPS - STATIC	1997	GPS805-C

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2257087.794	796406.224	956970.734	16824643.633	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		<u>X</u>	<u>Y</u>	Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1632492.329	468332.707			.100	1	CLASSICAL SURVEY	1977	15955

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BATTLE_LAKE-RO1083-3N-20FEB2024.jpg	N	Feb 20, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BATTLE_LAKE-RO1083-2-20FEB2024.jpg		Feb 20, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BATTLE_LAKE-RO1083-1-20FEB2024.jpg		Feb 20, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: BATTLE LAKE MUN TANK

NGS Name: BATTLE LAKE MUN TANK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO1082](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/1027
USGS Quad: BATTLE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	4	132 N	40 W	461651.29	954240.81		4

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	2015	GOOD	Horz=NO Vert=NO	YES			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	WATER TOWER	NGS

Description: (1975)

Stamping:

IN BATTLE LAKE, 0.15 MILE EAST ALONG HENNING STREET FROM THE JUNCTION OF HENNING STREET AND TRUNK HIGHWAY 210 IN BATTLE LAKE, THEN 0.05 MILE SOUTH ON JEFFERSON AVENUE, 70.0 FEET WEST OF JEFFERSON AVENUE.

Station Notes

THE STATION IS THE RED BALL ATOP THE TANK.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.582 12B = -87.588 09 = -87.480 03 = -87.388

Lat/Lon and County Coordinates (Feet)

Geodetic Position			Otter Tail County					Project Info	
Latitude	Longitude		X	Y	Acc	Order	Determination Method	Year	Reference
46 16 51.29272	95 42 40.80871		501348.023	163650.193	.328	4	ADJUSTMENT	1999	17648
46 16 51.29285	95 42 40.80896		501348.005	163650.206	.328	4	ADJUSTMENT	1998	17655

Geodetic Position			Otter Tail County					Project Info	
Latitude	Longitude		X	Y	Acc	Order	Determination Method	Year	Reference
46 16 51.29017	95 42 40.79765		501348.800	163649.935	.328	4	ADJUSTMENT	1986	17289

Geodetic Position								Project Info	
Latitude	Longitude		X	Y	Acc	Order	Determination Method	Year	Reference
46 16 51.43545	95 42 39.63151				.100	4	CLASSICAL SURVEY	1977	15955

State Plane and UTM Coordinates (Feet)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2255210.265	798579.164	955127.296	16826846.363	.328	4	ADJUSTMENT	1999	17648
2255210.248	798579.178	955127.279	16826846.377	.328	4	ADJUSTMENT	1998	17655

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2255211.037	798578.892	955128.063	16826846.078	.328	4	ADJUSTMENT	1986	17289

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
1630615.317	470505.699			.100	4	CLASSICAL SURVEY	1977	15955

Station Photos

Type	File Name	Dir	Date
Location:			
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BATTLE_LAKE_MUN_TANK-RO1082-2-08SEP2015.jpg		Sep 8, 2015
Disk:			

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: BATTLE LAKE RM 1

NGS Name: BATTLE LAKE RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CO9106](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	3	132 N	40 W	461630.34	954212.18	2	3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1974	2015	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2004)

Stamping: BATTLE LAKE NO 1 1974

0.5 MILE SOUTHEAST OF BATTLE LAKE, 0.5 MILE EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 IN BATTLE LAKE, AT TRUNK HIGHWAY 210 MILEPOINT 46.10, 100.0 FEET NORTH OF TRUNK HIGHWAY 210, 190.9 FEET EAST BATTLE LAKE RM 2, 95.85 FEET EAST-NORTHEAST OF STATION BATTLE LAKE, 0.9 FOOT SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1402.376	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1402.356	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1402.356	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1402.356	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1402.359	.016	2/1				VERTICAL CONTROL SURVEY	2012	VASHB
1402.356	.016	2/1				VERTICAL ADJUSTMENT	2009	00000591
1402.359	.016	2/1				VERTICAL CONTROL SURVEY	2005	VBAT1

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1402.238	.262		1314.702	.197	2011	GPS - RTRN	2015	RTRN2015
1402.238	.262		1314.702	.197	2011	GPS - RTRN	2015	RTRN2015
1402.140	.262		1314.797	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.529 12B = -87.533 09 = -87.424 03 = -87.342

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 16 30.33518	95 42 12.17775	503359.458	161527.273	.131	3	GPS - RTRN	2015	RTRN2015
46 16 30.33518	95 42 12.17775	503359.458	161527.273	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 16 30.33546	95 42 12.17849	503359.406	161527.302	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2257181.784	796419.651	957064.945	16824655.580	.131	3	GPS - RTRN	2015	RTRN2015
2257181.784	796419.651	957064.945	16824655.580	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2257181.733	796419.681	957064.894	16824655.610	.131	3	GPS - RTRN	2009	RTRN2009



<u>Station Photos</u>			
<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BATTLE_LAKE_RM_1-CO9106-3N-08SEP2015.jpg	N	Sep 8, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BATTLE_LAKE_RM_1-CO9106-2-08SEP2015.jpg		Sep 8, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BATTLE_LAKE_RM_1-CO9106-1-08SEP2015.jpg		Sep 8, 2015
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: BATTLE LAKE RM 2

NGS Name: BATTLE LAKE RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CO9107](#)

[Get Map](#)

NGS Quad / Sta Num : 46095313/

USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	3	132 N	40 W	461630.30	954214.89	2	3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1974	2015	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2004)

Stamping: BATTLE LAKE NO 2 1974

0.5 MILE SOUTHEAST OF BATTLE LAKE, 0.5 MILE EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 IN BATTLE LAKE, AT TRUNK HIGHWAY 210 MILEPOINT 46.10, 99.0 FEET NORTH OF TRUNK HIGHWAY 210, 13.2 FEET NORTHEAST OF A CABLE PEDESTAL, 4.0 FEET EAST OF A RIGHT-OF-WAY POST, 190.9 FEET WEST OF BATTLE LAKE RM 1, 97.41 FEET WEST OF STATION BATTLE LAKE, 1.6 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1389.420	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1389.403	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1389.403	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1389.403	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1389.403	.016	2/1				VERTICAL CONTROL SURVEY	2012	VASHB
1389.403	.016	2/1				VERTICAL ADJUSTMENT	2009	00000591
1389.400	.016	2/1				VERTICAL CONTROL SURVEY	2005	VBAT1

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1389.246	.262		1301.710	.197	2011	GPS - RTRN	2015	RTRN2015
1389.246	.262		1301.710	.197	2011	GPS - RTRN	2015	RTRN2015
1389.230	.262		1301.884	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.529 12B = -87.536 09 = -87.428 03 = -87.346

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u> <u>Order</u> <u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 16 30.30453	95 42 14.89420	503168.631	161524.137	.131	3	GPS - RTRN	2015	RTRN2015
46 16 30.30453	95 42 14.89420	503168.631	161524.137	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u> <u>Order</u> <u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 16 30.30401	95 42 14.89586	503168.514	161524.084	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u> <u>Order</u> <u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2256990.957	796420.049	956874.108	16824658.985	.131	3	GPS - RTRN	2015	RTRN2015
2256990.957	796420.049	956874.108	16824658.985	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u> <u>Order</u> <u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2256990.840	796419.999	956873.989	16824658.937	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BATTLE_LAKE_RM_2-CO9107-3N-08SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BATTLE_LAKE_RM_2-CO9107-2-08SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BATTLE_LAKE_RM_2-CO9107-1-08SEP2015.jpg

<u>Dir</u>	<u>Date</u>
N	Sep 8, 2015
	Sep 8, 2015
	Sep 8, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: BATTLE RM 1

NGS Name: BATTLE RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CO9108](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/1023
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	9	132 N	40 W	461544.00	954325.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1967	2009	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

UNKNOWN

Disk Type

REFERENCE MARK DISK

Mon. Agency

USGS

Description: (2012)

Stamping: BATTLE NO 1 1967

1.0 MILE SOUTHWEST OF BATTLE LAKE, 0.5 MILE WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 IN BATTLE LAKE, THEN 0.8 MILE SOUTH ON 368TH STREET, 365.8 FEET EAST OF A NORTH-SOUTH ROAD.

Station Notes

THE SURVEY MARK IS ON PRIVATE PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.513 12B = -87.523 09 = -87.418 03 = -87.329



Mn/DOT Name: BATTLE RM 2

NGS Name: BATTLE RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CO9109](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/1023
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	9	132 N	40 W	461544.01	954325.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1967	2009	NOT FOUND	Horz=? Vert=?	NO			SEE DESCRIPTION

Monument Type

UNKNOWN

Disk Type

REFERENCE MARK DISK

Mon. Agency

USGS

Description: (2012)

Stamping: BATTLE NO 2 1967

1.0 MILE SOUTHWEST OF BATTLE LAKE, 0.5 MILE WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78, THEN 0.8 MILE SOUTH ON 368TH STREET, 246.0 FEET EAST OF A NORTH-SOUTH ROAD.

Station Notes

THE SURVEY MARK IS ON PRIVATE PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.513 12B = -87.523 09 = -87.418 03 = -87.329



Mn/DOT Name: BATTLE USGS

NGS Name: BATTLE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R01085](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/1023
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	9	132 N	40 W	461544.07	954325.25		2

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1967	2005	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (<10 FT)	TRIANGULATION STATION DISK	USGS

Description: (2012) Stamping: BATTLE 1967

1.0 MILE SOUTHWEST OF BATTLE LAKE, 0.5 MILE WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78, THEN 0.8 MILE SOUTH ON 368TH STREET, 310.0 FEET EAST OF A NORTH-SOUTH ROAD, 1.0 FOOT SOUTH OF A FENCE AND A WITNESS POST, 55.75 FEET WEST OF BATTLE USGS RM 1, 63.80 FEET EAST-NORTHEAST OF BATTLE USGS RM 2.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1416.008	.197		1328.665	.131	1996	HORIZONTAL ADJUSTMENT	1999 17648

<u>NGVD29</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1414.991						RECIPROCAL VERTICAL ANGLE	1967 HORZ

Geoid Separations(ft): GEOID18 = -87.513 12B = -87.523 09 = -87.418 03 = -87.329

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 15 44.07101	95 43 25.24996	498225.804	156840.168	.066	2	ADJUSTMENT	1999	17648
46 15 44.07156	95 43 25.24872	498225.891	156840.223	.066	2	ADJUSTMENT	1998	17655

<u>NAD83(1986)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 15 44.06866	95 43 25.23915	498226.564	156839.929	.066	2	ADJUSTMENT	1986	17289

<u>NAD27</u>		<u>Geodetic Position</u>		<u>Project Info</u>				
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 15 44.20931	95 43 24.06750			.100	2	CLASSICAL SURVEY	1977	15945
46 15 44.23600	95 43 24.02700			.100	3	CLASSICAL SURVEY	1967	USGS-HORZ

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2251962.918	791829.018	951773.261	16820146.775	.066	2	ADJUSTMENT	1999	17648
2251963.006	791829.072	951773.350	16820146.828	.066	2	ADJUSTMENT	1998	17655

<u>NAD83(1986)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2251963.673	791828.766	951774.012	16820146.511	.066	2	ADJUSTMENT	1986	17289

<u>NAD27</u>		<u>MN State Plane - Central Zone</u>		<u>Project Info</u>				
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1627368.267	463755.124			.100	2	CLASSICAL SURVEY	1977	15945
1627371.162	463757.774			.100	3	CLASSICAL SURVEY	1967	USGS-HORZ



Mn/DOT Name: BECKS

NGS Name: BECKS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SE	16	136 N	44 W	463552.66	961309.13			1999	2009	GOOD	Horz=YES Vert=YES	NO		RECESSED 3 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (1999)

Stamping: BECKS 1999

6.70 MILES NORTHWEST OF PELICAN RAPIDS, 7.30 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, TO TRUNK HIGHWAY 108 MILEPOINT 4.85, THENCE 2.70 MILES NORTH ALONG COUNTY ROAD 21, 29.0 FEET WEST OF COUNTY ROAD 21, 11.0 FEET SOUTH OF A FIELD ENTRANCE, 6.6 FEET NORTH OF A WITNESS POST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.464 12B = -87.447 09 = -87.339 03 = -87.254



Mn/DOT Name: BEEBE

NGS Name: BEEBE

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	36	131 N	42 W	460711.44	955428.82	2	C

NGS ACRN: [DG9884](#)
NGS Quad / Sta Num : 46095333/
USGS Quad: FOURMILE LAKE

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2004	2025	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	SURVEY DISK	MNDT

Description: (2004)

Stamping: BEEBE 2004

4.0 MILES SOUTH OF DALTON, 2.4 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 35 (THE JUNCTION IS 2.5 MILES SOUTH OF DALTON), AT INTERSTATE HIGHWAY 94 MILEPOST 70.0, 79.5 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 49.9 FEET EAST-NORTHEAST OF MILEPOST 70, 20.0 FEET SOUTHWEST OF A FENCE LINE, 2.0 FEET NORTHWEST OF A WITNESS POST.

Station Pair: HANS MNDT - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1298.409	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1298.409	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1298.409	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1298.409	.016	2/1				VERTICAL ADJUSTMENT	2011	00000690
1298.406	.016	2/1				VERTICAL CONTROL SURVEY	2005	VEVAN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1298.409			1211.346	.008	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1298.482	.262		1211.372	.197	2011	GPS - RTRN	2025	RTRN2025
1298.409			1211.346	.008	2011	GPS - STATIC	2025	HTH94B
1298.419	.262		1211.307	.197	2011	GPS - RTRN	2023	RTRN2023
1298.295	.262		1211.195	.197	2011	GPS - RTRN	2015	RTRN2015
			1211.346	.008	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1298.360	.262		1211.398	.197	1996	GPS - RTRN	2009	RTRN2009
			1211.454	.009	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1298.423	.131		1211.481	.066	1996	HORIZONTAL ADJUSTMENT	2005	GPS2096
1298.423	.131		1211.481	.066	1996	GPS - STATIC	2005	HEVAN

Geoid Separations(ft): GEOID18 = -87.109 12B = -87.096 09 = -86.975 03 = -86.958

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 07 11.43964	95 54 28.82095	451474.206	104965.905	.007		ADJUSTMENT	2025	GPS3847
46 07 11.43884	95 54 28.82110	451474.195	104965.824	.131	3	GPS - RTRN	2025	RTRN2025
46 07 11.43964	95 54 28.82095	451474.206	104965.905	.007	C	GPS - STATIC	2025	HTH94B
46 07 11.43966	95 54 28.82062	451474.229	104965.907	.131	3	GPS - RTRN	2023	RTRN2023
46 07 11.43898	95 54 28.82127	451474.183	104965.838	.131	3	GPS - RTRN	2015	RTRN2015
46 07 11.43964	95 54 28.82095	451474.206	104965.905	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 07 11.43959	95 54 28.82187	451474.141	104965.900	.007		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 07 11.43913	95 54 28.82159	451474.160	104965.853	.066		NCAT	2025	HTH94B
46 07 11.44042	95 54 28.82246	451474.099	104965.984	.131	3	GPS - RTRN	2009	RTRN2009
46 07 11.43913	95 54 28.82158	451474.161	104965.853	.033	C	ADJUSTMENT	2005	GPS2096
46 07 11.43913	95 54 28.82158	451474.161	104965.853	.033	C	GPS - STATIC	2005	HEVAN

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2204265.351	740836.132	903268.139	16769896.653	.007		ADJUSTMENT	2025	GPS3847
2204265.338	740836.051	903268.125	16769896.572	.131	3	GPS - RTRN	2025	RTRN2025
2204265.351	740836.132	903268.139	16769896.653	.007	C	GPS - STATIC	2025	HTH94B
2204265.374	740836.134	903268.162	16769896.654	.131	3	GPS - RTRN	2023	RTRN2023
2204265.327	740836.066	903268.114	16769896.587	.131	3	GPS - RTRN	2015	RTRN2015
2204265.351	740836.132	903268.139	16769896.653	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2204265.286	740836.129	903268.074	16769896.650	.007		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2204265.304	740836.082	903268.092	16769896.603	.066		NCAT	2025	HTH94B
2204265.246	740836.214	903268.035	16769896.736	.131	3	GPS - RTRN	2009	RTRN2009
2204265.305	740836.082	903268.092	16769896.603	.033	C	ADJUSTMENT	2005	GPS2096
2204265.305	740836.082	903268.092	16769896.603	.033	C	GPS - STATIC	2005	HEVAN

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BEEBE-DG9884-3NE-30JUL2025.jpg	NE	Jul 30, 2025
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BEEBE-DG9884-2-30JUL2025.jpg		Jul 30, 2025
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BEEBE-DG9884-1-30JUL2025.jpg		Jul 30, 2025

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: BERRY

NGS Name: BERRY

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR9943](#) [Get Map](#)
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	31	136 N	41 W	463234.72	955339.21	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 29 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) **Stamping:** BERRY 2014

8.0 MILES WEST OF DENT, 8.8 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 22.6, 20.0 FEET NORTH OF TRUNK HIGHWAY 108, 0.05 MILE WEST OF SILENT ACRES DRIVE, 20.0 FEET WEST OF A DRIVEWAY NUMBER 28578 EXTENDED, 1.5 FEET WEST OF A WITNESS POST.

Station Pair: DORA - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1386.001	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1385.988			1298.596	.024	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1385.932	.131		1298.695	.066	1996	GPS - STATIC	2024	HTH108
1385.988			1298.596	.024	2011	GPS - STATIC	2024	HTH108
1386.093	.262		1298.646	.197	2011	GPS - RTRN	2023	RTRN2023
1385.995	.262		1298.551	.197	2011	GPS - RTRN	2022	RTRN2022
1385.883	.262		1298.432	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.447 12B = -87.451 09 = -87.346 03 = -87.172

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 32 34.72124	95 53 39.21435	455315.292	259278.750	.013		ADJUSTMENT	2024	GPS3689
46 32 34.72124	95 53 39.21435	455315.292	259278.750	.013	C	GPS - STATIC	2024	HTH108
46 32 34.72125	95 53 39.21386	455315.326	259278.751	.131	3	GPS - RTRN	2023	RTRN2023
46 32 34.72142	95 53 39.21457	455315.277	259278.768	.131	3	GPS - RTRN	2022	RTRN2022
46 32 34.72125	95 53 39.21441	455315.288	259278.751	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 32 34.72102	95 53 39.21489	455315.254	259278.728	.033	C	GPS - STATIC	2024	HTH108

State Plane and UTM Coordinates (Feet)

NAD83(2011)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Year	Reference
2210961.717	895031.105	912401.656	16924011.105	.013		ADJUSTMENT	2024	GPS3689
2210961.717	895031.105	912401.656	16924011.105	.013	C	GPS - STATIC	2024	HTH108
2210961.751	895031.105	912401.690	16924011.105	.131	3	GPS - RTRN	2023	RTRN2023
2210961.702	895031.123	912401.641	16924011.124	.131	3	GPS - RTRN	2022	RTRN2022
2210961.713	895031.106	912401.652	16924011.107	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Year	Reference
2210961.678	895031.083	912401.617	16924011.085	.033	C	GPS - STATIC	2024	HTH108



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BERRY-DR9943-3N-31JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BERRY-DR9943-2-31JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BERRY-DR9943-1-31JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Jul 31, 2023
	Jul 31, 2023
	Jul 31, 2023



Mn/DOT Name: BETH

NGS Name: BETH

County: OTTER TAIL, MN (Sheet 1)

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
NW	5	133 N	43 W	462153.71	960743.47	2	C

NGS ACRN:	DQ7106	Get Map
NGS Quad / Sta Num :	46096213/	
USGS Quad:	CARLISLE	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2009	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: BETH 2009

1.0 MILE SOUTH OF ELIZABETH, 1.0 MILE SOUTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 10 IN ELIZABETH, AT TRUNK HIGHWAY 59 MILEPOINT 225.80, 70.0 FEET EAST OF TRUNK HIGHWAY 59, 57.0 FEET NORTH OF A DRIVEWAY NUMBER 27685 EXTENDED, 1.2 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1252.829	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1252.826	.016	2/1				VERTICAL ADJUSTMENT	2013 00000792
1252.839	.016	2/1				VERTICAL CONTROL SURVEY	2012 VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1252.829			1164.627	.012	2011	HORIZONTAL ADJUSTMENT	2025 GPS3847
1252.829			1164.627	.012	2011	GPS - STATIC	2025 HTH94B
1252.829			1164.627	.017	2011	HORIZONTAL ADJUSTMENT	2024 GPS3672
1252.829	.131		1164.778	.066	1996	GPS - STATIC	2023 HTH59
1252.829			1164.627	.017	2011	GPS - STATIC	2023 HTH59
1254.125	.262		1165.854	.197	2011	GPS - RTRN	2023 RTRN2023
1252.835	.262		1164.561	.197	2011	GPS - RTRN	2022 RTRN2022
1252.829	.131		1164.778	.066	1996	GPS - STATIC	2021 HOTTE
1252.829			1164.627	.030	2011	HORIZONTAL ADJUSTMENT	2020 GPS3384
1252.829			1164.627	.030	2011	GPS - STATIC	2020 HOTTE
1252.701	.262		1164.433	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -88.274 12B = -88.271 09 = -88.153 03 = -88.081

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u> <u>Order</u> <u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 21	53.71145	96 07	43.46499	395959.443	194558.644	.010	ADJUSTMENT 2025 GPS3847
46 21	53.71145	96 07	43.46499	395959.443	194558.644	.010 C	GPS - STATIC 2025 HTH94B
46 21	53.71145	96 07	43.46499	395959.443	194558.644	.010	ADJUSTMENT 2024 GPS3672
46 21	53.71145	96 07	43.46499	395959.443	194558.644	.010 C	GPS - STATIC 2023 HTH59
46 21	53.71165	96 07	43.46396	395959.515	194558.664	.131 3	GPS - RTRN 2023 RTRN2023
46 21	53.71154	96 07	43.46504	395959.440	194558.653	.131 3	GPS - RTRN 2022 RTRN2022
46 21	53.71145	96 07	43.46499	395959.443	194558.644	.023	ADJUSTMENT 2020 GPS3384
46 21	53.71145	96 07	43.46499	395959.443	194558.644	.023 C	GPS - STATIC 2020 HOTTE
46 21	53.71168	96 07	43.46376	395959.530	194558.667	.131 3	GPS - RTRN 2015 RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u> <u>Order</u> <u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 21	53.71097	96 07	43.46566	395959.396	194558.596	.066	NCAT 2025 HTH94B
46 21	53.71113	96 07	43.46550	395959.407	194558.612	.033 C	GPS - STATIC 2023 HTH59
46 21	53.71113	96 07	43.46550	395959.407	194558.612	.033 C	GPS - STATIC 2021 HOTTE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2150425.778	831429.026	850843.296	16861357.026	.010		ADJUSTMENT	2025	GPS3847
2150425.778	831429.026	850843.296	16861357.026	.010	C	GPS - STATIC	2025	HTH94B
2150425.778	831429.026	850843.296	16861357.026	.010		ADJUSTMENT	2024	GPS3672
2150425.778	831429.026	850843.296	16861357.026	.010	C	GPS - STATIC	2023	HTH59
2150425.851	831429.045	850843.369	16861357.043	.131	3	GPS - RTRN	2023	RTRN2023
2150425.775	831429.036	850843.292	16861357.035	.131	3	GPS - RTRN	2022	RTRN2022
2150425.778	831429.026	850843.296	16861357.026	.023		ADJUSTMENT	2020	GPS3384
2150425.778	831429.026	850843.296	16861357.026	.023	C	GPS - STATIC	2020	HOTTE
2150425.865	831429.048	850843.383	16861357.045	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2150425.730	831428.979	850843.247	16861356.979	.066		NCAT	2025	HTH94B
2150425.742	831428.995	850843.259	16861356.994	.033	C	GPS - STATIC	2023	HTH59
2150425.742	831428.995	850843.259	16861356.994	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BETH-DO7106-3E-14AUG2023.jpg	E	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BETH-DO7106-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BETH-DO7106-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: BR 56023 SE

NGS Name: BR 56023 SE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2042](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	14	136 N	43 W	463514.92	960414.76	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2012	2023	GOOD	Horz=NO Vert=NO	YES	56023	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	SURVEY DISK	MNDT

Description: (2014)

Stamping: BR 56023 SE 2012

1.5 MILES NORTH OF PELICAN RAPIDS, IN A BRIDGE ABUTMENT IN THE SOUTHEAST CORNER OF TRUNK HIGHWAY 59 BRIDGE NUMBER 56023 OVER THE PELICAN RIVER, 1.5 MILES NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 WEST, AT TRUNK HIGHWAY 59 MILEPOST 242.0, 26.5 FEET SOUTHEAST OF TRUNK HIGHWAY 59.

Station Notes

THE SURVEY MARK HAS BEEN DEEMED UNSAFE DUE TO FALL RISK AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj	Year	Reference					
1321.155	.016	2/1				2019	00000941					

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj	Year	Reference					
1321.201	.262		1233.666	.197	2011	2023	RTRN2023					
1321.208	.262		1233.672	.197	2011	2022	RTRN2022					
1321.162	.262		1233.636	.197	2011	2014	RTRN2014					

Geoid Separations(ft): GEOID18 = -87.536 12B = -87.529 09 = -87.411 03 = -87.270

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position		Otter Tail County		Acc		Order		Determination Method		Project Info	
Latitude	Longitude	X	Y	Acc	Order	Year	Reference						
46 35 14.92063	96 04 14.76448	410959.616	275658.131	.131	3	2023	RTRN2023						
46 35 14.92103	96 04 14.76486	410959.589	275658.172	.131	3	2022	RTRN2022						
46 35 14.92128	96 04 14.76471	410959.600	275658.197	.131	3	2014	RTRN2014						

State Plane and UTM Coordinates (Feet)

NAD83(2011)		MN State Plane - Central Zone		UTM - Zone 15		Acc		Order		Determination Method		Project Info	
X	Y	X	Y	Acc	Order	Year	Reference						
2166922.398	912226.616	868628.396	16941912.088	.131	3	2023	RTRN2023						
2166922.373	912226.657	868628.371	16941912.129	.131	3	2022	RTRN2022						
2166922.384	912226.682	868628.382	16941912.154	.131	3	2014	RTRN2014						

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BR_56023_SE-DQ2042-3SW-31JUL2023.jpg	SW	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BR_56023_SE-DQ2042-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BR_56023_SE-DQ2042-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: BR 56027 SE

NGS Name: BR 56027 SE

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	12	136 N	43 W	463639.30	960310.54	2	3

NGS ACRN: [DQ2046](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2012	2022	GOOD	Horz=NO Vert=NO	YES	56027	FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	SURVEY DISK	MNDT

Description: (2014)

Stamping: BR 56027 SE 2012

3.1 MILES NORTHEAST OF PELICAN RAPIDS, IN A BRIDGE ABUTMENT IN THE SOUTHEAST CORNER OF TRUNK HIGHWAY 59 BRIDGE NUMBER 56027 OVER THE PELICAN RIVER, 3.3 MILES NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 WEST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 243.85, 26.5 FEET EAST OF TRUNK HIGHWAY 59.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1321.185	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1321.270	.262		1233.803	.197	2011	GPS - RTRN	2022	RTRN2022
1321.129	.262		1233.679	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.467 12B = -87.451 09 = -87.346 03 = -87.208

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 36 39.29885	96 03 10.54256	415481.735	284187.126	.131	3	GPS - RTRN	2022	RTRN2022
46 36 39.29849	96 03 10.54238	415481.748	284187.089	.131	3	GPS - RTRN	2014	RTRN2014

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>MN State Plane - Central Zone</u> <u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2171601.033	920669.387	873442.905	16950281.944	.131	3	GPS - RTRN	2022	RTRN2022
2171601.045	920669.350	873442.916	16950281.907	.131	3	GPS - RTRN	2014	RTRN2014

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BR_56027_SE-DQ2046-3N-12OCT2022.jpg	N	Oct 12, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BR_56027_SE-DQ2046-2-12OCT2022.jpg		Oct 12, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BR_56027_SE-DQ2046-1-12OCT2022.jpg		Oct 12, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: BREESE

NGS Name: BREESE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2047](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	2	136 N	43 W	463654.82	960311.31	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 49 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) **Stamping:** BREESE 2014

3.4 MILES NORTH OF PELICAN RAPIDS, 3.55 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAYS 59 AND 108 WEST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 244.20, 70.6 FEET WEST OF TRUNK HIGHWAY 59, 72.7 FEET NORTH OF 450TH STREET, 1.5 FEET EAST OF A WITNESS POST.

Station Pair: FOELS - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1349.089	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1349.089			1261.664	.022	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1349.089	.131		1261.776	.066	1996	GPS - STATIC	2023	HTH59
1349.089			1261.664	.022	2011	GPS - STATIC	2023	HTH59
1349.177	.262		1261.720	.197	2011	GPS - RTRN	2022	RTRN2022
1348.938	.262		1261.503	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.454 12B = -87.437 09 = -87.333 03 = -87.198

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 36 54.82186	96 03 11.30918	415434.901	285760.034	.013		ADJUSTMENT	2024	GPS3672
46 36 54.82186	96 03 11.30918	415434.901	285760.034	.013	C	GPS - STATIC	2023	HTH59
46 36 54.82227	96 03 11.30898	415434.916	285760.075	.131	3	GPS - RTRN	2022	RTRN2022
46 36 54.82193	96 03 11.30868	415434.937	285760.041	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 36 54.82164	96 03 11.30966	415434.868	285760.011	.033	C	GPS - STATIC	2023	HTH59

State Plane and UTM Coordinates (Feet)

NAD83(2011)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2171583.325	922242.696	873450.338	16951855.867	.013		ADJUSTMENT	2024	GPS3672
2171583.325	922242.696	873450.338	16951855.867	.013	C	GPS - STATIC	2023	HTH59
2171583.340	922242.737	873450.354	16951855.908	.131	3	GPS - RTRN	2022	RTRN2022
2171583.360	922242.702	873450.374	16951855.873	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2171583.291	922242.674	873450.304	16951855.846	.033	C	GPS - STATIC	2023	HTH59



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BREESE-DQ2047-3W-12OCT2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BREESE-DQ2047-2-12OCT2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BREESE-DQ2047-1-12OCT2022.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
W	Oct 12, 2022
	Oct 12, 2022
	Oct 12, 2022



Mn/DOT Name: BREKKE

NGS Name: BREKKE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	15	133 N	42 W	461934.40	955722.30			2000	2009	GOOD	Horz=YES Vert=YES	NO			MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2012)

Stamping: BREKKE 2000

2.5 MILES NORTHEAST OF FERGUS FALLS, 5.95 MILES EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210, TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, TO TRUNK HIGHWAY 210 MILEPOINT 32.4, THEN 2.95 MILES NORTH ALONG AURDAL RIVER ROAD, THEN 1.0 MILE EAST ALONG COUNTY ROAD 18, 0.25 MILE EAST ALONG BREKKE LAKE ROAD, 27.6 FEET NORTH OF COUNTY ROAD 18, 11.0 FEET WEST OF A FIELD ENTRANCE, 103.0 FEET EAST OF EXTENDED DRIVEWAY NUMBER 25478.

Station Notes

NO WITNESS POST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.159 12B = -88.169 09 = -88.058 03 = -87.923



Mn/DOT Name: BROOKE

NGS Name: BROOKE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DO8459](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	19	131 N	42 W	460904.32	960003.22	2	C	2009	2025	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009)

Stamping: BROOKE 2009

10.3 MILES SOUTH-SOUTHEAST OF FERGUS FALLS, 4.35 MILES SOUTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 SOUTH AND INTERSTATE HIGHWAY 94, AT TRUNK HIGHWAY 59 MILEPOINT 207.85, 63.8 FEET NORTHEAST OF TRUNK HIGHWAY 59, 51.4 FEET SOUTH OF A POWER POLE, 16.5 FEET NORTHWEST OF A FIELD ENTRANCE, 1.3 FEET SOUTHWEST OF A WITNESS POST.

Station Pair: DAVID - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u> <u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1205.637	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1205.696	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1205.755	.016	2/1				VERTICAL ADJUSTMENT	2016	00000869
1205.755	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1205.775	.016	2/1				VERTICAL CONTROL SURVEY	2012	VTENN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u> <u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1205.637			1118.416	.012	2011	HORIZONTAL ADJUSTMENT	2026	GPS3900
1205.637			1118.416	.012	2011	GPS - STATIC	2026	HTH55N
1205.628	.262		1118.370	.197	2011	GPS - OPUS	2020	GPSBM
1205.644	.262		1118.387	.197	2011	GPS - OPUS	2020	GPSBM

Geoid Separations(ft): GEOID18 = -87.257 12B = -87.254 09 = -87.116 03 = -87.096

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u> <u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 09 04.31566	96 00 03.21573	427958.065	116471.656	.007		ADJUSTMENT	2026	GPS3900
46 09 04.31566	96 00 03.21573	427958.065	116471.656	.007	C	GPS - STATIC	2026	HTH55N
46 09 04.31514	96 00 03.21635	427958.022	116471.603	.131	3	GPS - OPUS	2020	GPSBM
46 09 04.31521	96 00 03.21620	427958.032	116471.610	.131	3	GPS - OPUS	2020	GPSBM

<u>NAD83(1996)</u> <u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 09 04.31513	96 00 03.21633	427958.023	116471.602	.066		NCAT	2026	HTH55N

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u> <u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2180969.420	752773.617	880154.953	16782201.633	.007		ADJUSTMENT	2026	GPS3900
2180969.420	752773.617	880154.953	16782201.633	.007	C	GPS - STATIC	2026	HTH55N
2180969.376	752773.566	880154.907	16782201.582	.131	3	GPS - OPUS	2020	GPSBM
2180969.386	752773.573	880154.918	16782201.589	.131	3	GPS - OPUS	2020	GPSBM

<u>NAD83(1996)</u> <u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2180969.377	752773.565	880154.909	16782201.581	.066		NCAT	2026	HTH55N



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BROOKE-DO8459-3NE-05NOV2009.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BROOKE-DO8459-2-23DEC2019.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BROOKE-DO8459-1-23DEC2019.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
NE	Nov 5, 2009
	Dec 23, 2019
	Dec 23, 2019



Mn/DOT Name: BUTLER

NGS Name: BUTLER

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DQ7775 NGS Quad / Sta Num : 46095324/ USGS Quad: EAGLE LAKE	Get Map
NW	27	131 N	40 W	460811.40	954205.54	2	C		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2009	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 90 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) Stamping: BUTLER 2009

9.8 MILES SOUTH OF BATTLE LAKE, 9.55 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE TO TRUNK HIGHWAY 78 MILEPOINT 11.95, THEN 0.3 MILE EAST ON COUNTY ROAD 38, 47.0 FEET SOUTH OF COUNTY ROAD 38, 35.2 FEET WEST OF CABLE BOX NUMBER LP11, 3.1 FEET NORTH OF AN EAST/ WEST FENCE LINE, 1.3 FEET NORTH OF A WITNESS POST.

Station Pair: 5619 K RESET - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u> Orthometric Height			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1306.224	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1306.224	.016	2/1				VERTICAL CONTROL SURVEY	2012	VASHB

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u> Orthometric Height			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1306.224			1219.171	.011	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1306.224	.131		1219.289	.066	1996	GPS - STATIC	2024	HTH78B
1306.224			1219.171	.011	2011	GPS - STATIC	2024	HTH78B
1306.116	.262		1219.161	.197	2011	GPS - RTRN	2023	RTRN2023

Geoid Separations(ft): GEOID18 = -86.955 12B = -86.945 09 = -86.854 03 = -86.834

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u> Geodetic Position		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 08 11.40072	95 42 05.53776	503835.577	110981.985	.010		ADJUSTMENT	2024	GPS3771
46 08 11.40072	95 42 05.53776	503835.577	110981.985	.010	C	GPS - STATIC	2024	HTH78B
46 08 11.40113	95 42 05.53757	503835.590	110982.027	.131	3	GPS - RTRN	2023	RTRN2023

<u>NAD83(1996)</u> Geodetic Position		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 08 11.40047	95 42 05.53820	503835.546	110981.960	.033	C	GPS - STATIC	2024	HTH78B

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u> MN State Plane - Central Zone		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2256721.957	745881.030	955810.447	16774119.845	.010		ADJUSTMENT	2024	GPS3771
2256721.957	745881.030	955810.447	16774119.845	.010	C	GPS - STATIC	2024	HTH78B
2256721.971	745881.071	955810.461	16774119.886	.131	3	GPS - RTRN	2023	RTRN2023

<u>NAD83(1996)</u> MN State Plane - Central Zone		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2256721.926	745881.005	955810.415	16774119.820	.033	C	GPS - STATIC	2024	HTH78B



<u>Station Photos</u>		<u>Dir</u>	<u>Date</u>
<u>Type</u>	<u>File Name</u>		
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BUTLER-DO7775-3S-16OCT2023.jpg	S	Oct 16, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BUTLER-DO7775-2-16OCT2023.jpg		Oct 16, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/BUTLER-DO7775-1-16OCT2023.jpg		Oct 16, 2023
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: C 100

NGS Name: C 100

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0121](#) [Get Map](#)
NGS Quad / Sta Num : 46096242/
USGS Quad: FOXHOME

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	31	133 N	44 W	461657.39	961616.36	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	2009	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	MARKER IS STEEL ROD

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STRUCTURE (MASSIVE)	BENCH MARK DISK	NGS

Description: (2012)

Stamping: C-100 1934

9.1 MILES WEST OF FERGUS FALLS, 3.6 MILES SOUTHWEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 21 IN FERGUS FALLS, 280.5 FEET EAST OF RAILROAD MILEPOST 60, 75.0 FEET NORTH OF A RAILROAD BRIDGE, IN THE SOUTHEAST WING WALL OF A HIGHWAY BRIDGE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1050.287	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1049.489	.033	3				VERTICAL CONTROL SURVEY	1973	USGS-VERT
1049.489	.007	1				VERTICAL CONTROL SURVEY	1941	Q460962
1049.489	.007	1				VERTICAL CONTROL SURVEY	1934	L97 MINN

Geoid Separations(ft): GEOID18 = -88.317 12B = -88.297 09 = -88.199 03 = -88.153

* No Horizontal Positions in the Database *



Mn/DOT Name: C 4

NGS Name: C 4

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0108](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	2	133 N	44 W	462202.00	961123.00	1	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	2009	NOT FOUND	Horz=? Vert=YES	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	PIPE CAP	NGS

Description: (2012) Stamping: EL 1223.472 FT

IN CARLISLE, 0.7 MILE SOUTHEAST ALONG COUNTY ROAD 88 FROM THE JUNCTION OF COUNTY ROAD 88 AND COUNTY ROAD 21 IN CARLISLE, 78.4 FEET NORTH ON A RAILROAD FROM THE RAILROAD STATION, 45.4 FEET NORTH OF RAILROAD MILEPOST 195, 77.0 FEET WEST OF A TRACK, 5.0 FEET NORTH OF A POWER POLE, IN THE NORTHWEST CORNER OF THE CROSSING, AT THE CORNER OF A FENCE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1224.351	.007	1				VERTICAL CONTROL SURVEY	1993	POSTED

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1223.472	.007	1/2				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1223.472	.007	1				VERTICAL CONTROL SURVEY	1929	Q460962
1223.472	.007	1				VERTICAL CONTROL SURVEY	1905	L36 MINN

GA1912

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1223.935	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -88.307 12B = -88.300 09 = -88.189 03 = -88.136

* No Horizontal Positions in the Database *



Mn/DOT Name: CAR MNDT

NGS Name: CAR

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0181](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/1042
USGS Quad: CARLISLE

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	36	134 N	44 W	462210.16	960934.11	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1961	2009	GOOD	Horz=NO Vert=NO	YES		RECESSED 2 IN.	STEEL SPIKE IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRAVERSE STATION DISK	MNDT

Description: (1973) **Stamping:** CAR U.S.C.G.S. 1961

1.4 MILES EAST OF CARLISLE, 2.2 MILES NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94 IN CARLISLE, THEN 1.55 MILES WEST AND NORTH ON 280TH STREET, THEN WALK 350.0 FEET INTO A FIELD TO THE MARK, 346.5 FEET WEST OF A DRIVEWAY NUMBER 15876, 188.0 FEET NORTHWEST OF A POWER POLE, 110.9 FEET NORTHEAST OF A POWER POLE, 50.21 FEET NORTH OF A CAR RM 1, 84.35 FEET EAST OF CAR RM 2.

Station Notes

THE SURVEY MARK IS ON PRIVATE PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1309.623	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1309.620	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1309.650	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR
1309.650	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1308.770	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1308.770	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1308.770	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1308.770	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1309.492	.262		1221.392	.197	1996	GPS - RTRN	2009	RTRN2009
1309.643	.197		1221.668	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -88.281 12B = -88.274 09 = -88.163 03 = -88.097

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 22 10.16140	96 09 34.10706	388209.138	196267.077	.131	3	GPS - RTRN	2009	RTRN2009
46 22 10.16128	96 09 34.10917	388208.990	196267.066	.066	2	ADJUSTMENT	1999	17648
46 22 10.16131	96 09 34.10919	388208.989	196267.069	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 22 10.15770	96 09 34.10069	388209.583	196266.700	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 22 10.30860	96 09 32.88760			.100	2	CLASSICAL SURVEY	1962	12924



State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2142709.432	833280.375	843154.157	16863331.011	.131	3	GPS - RTRN	2009	RTRN2009
2142709.284	833280.366	843154.009	16863331.005	.066	2	ADJUSTMENT	1999	17648
2142709.282	833280.369	843154.007	16863331.008	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2142709.869	833279.989	843154.588	16863330.618	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1518113.953	505206.724			.100	2	CLASSICAL SURVEY	1962	12924

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/CAR-RP0181-3N-11AUG2009.jpg	N	Aug 11, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/CAR-RP0181-2-11AUG2009.jpg		Aug 11, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/CAR-RP0181-1-11AUG2009.jpg		Aug 11, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: CAR RM 1

NGS Name: CAR RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0182](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	1	133 N	44 W	462209.67	960934.09	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1961	2009	DESTROYED	Horz=NO Vert=NO	NO		RECESSED 3 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	SURVEY DISK	MNDT

Description: (2012)

Stamping: CAR NO. 1 1961

1.6 MILES SOUTHWEST OF ELIZABETH, 0.7 MILE SOUTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 10, THEN 1.5 MILES WEST ON 280TH STREET, 27.0 FEET SOUTH OF A TOWNSHIP ROAD, 50.0 FEET SOUTH OF STATION CAR MNDT, 91.0 FEET EAST OF A POWER POLE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1309.374	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1308.495	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1308.495	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1308.495	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Geoid Separations(ft): GEOID18 = -88.281 12B = -88.274 09 = -88.163 03 = -88.097

* No Horizontal Positions in the Database *



Mn/DOT Name: CAR RM 2

NGS Name: CAR RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0183](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	36	134 N	44 W	462210.16	960935.31	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1961	2009	NOT FOUND	Horz=? Vert=YES	NO		RECESSED 12 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	SURVEY DISK	MNDT

Description: (2012)

Stamping: CAR NO. 2 1961

1.6 MILES SOUTHWEST OF ELIZABETH, 0.7 MILE SOUTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 10, THEN 1.5 MILES WEST ON 280TH STREET, 84.5 FEET WEST OF STATION CAR MNDT, 61.0 FEET NORTH OF A POWER POLE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1308.144	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1307.264	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1307.264	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1307.264	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1307.264	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Geoid Separations(ft): GEOID18 = -88.277 12B = -88.274 09 = -88.163 03 = -88.097

* No Horizontal Positions in the Database *



Mn/DOT Name: CARL

NGS Name: CARL

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	23	133 N	44 W	461901.66	961148.33		3	1998	2014	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2015)

Stamping: CARL 1998

3.7 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, TO TRUNK HIGHWAY 210 MILEPOINT 22.55, THEN 2.0 MILES NORTH ALONG COUNTY ROAD 21, 40.0 FEET EAST OF COUNTY ROAD 21, 27.8 FEET NORTHWEST OF A POWER POLE, 36.0 FEET SOUTH OF A FIELD ENTRANCE, 7.0 FEET NORTH OF A WITNESS POST. THE ROD DEPTH IS UNKNOWN.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1203.482	.262			1115.326	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.320 12B = -88.304 09 = -88.205 03 = -88.156

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 19 01.65805	96 11 48.32722			378680.804	177225.357	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2132831.596	814420.749			832975.244	16844622.149	.131	3	GPS - RTRN	2009 RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/CARL-3E-09OCT2008.jpg	E	Oct 9, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/CARL-2-09OCT2008.jpg		Oct 9, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/CARL-1-09OCT2008.jpg		Oct 9, 2008

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: CARLISLE ELEVATOR NORTH GABLE

NGS Name: CARLISLE ELEVATOR NORTH GABLE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0960](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/1018
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	2	133 N	44 W	462206.88	961129.23		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1906	1906	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	GABLE	NGS

Description: (2012)

Stamping:

IN CARLISLE, 0.6 MILE SOUTHEAST ALONG COUNTY ROAD 88 FROM THE JUNCTION OF COUNTY ROAD 88 AND COUNTY ROAD 21 IN CARLISLE.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.307 12B = -88.300 09 = -88.189 03 = -88.136

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 22 06.87618	96 11 29.22707	380134.147	195981.088	.328	4	ADJUSTMENT	1999	17648
46 22 06.87609	96 11 29.22716	380134.141	195981.079	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 22 06.87541	96 11 29.21746	380134.820	195981.006	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>							<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 22 07.03000	96 11 27.98000			.100	4	CLASSICAL SURVEY	1928	00155

USSD

<u>Geodetic Position</u>							<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 22 07.22000	96 11 28.37000				3	CLASSICAL SURVEY		17389-73

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2134631.588	833143.909	835071.843	16863322.380	.328	4	ADJUSTMENT	1999	17648
2134631.581	833143.900	835071.836	16863322.371	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2134632.259	833143.814	835072.513	16863322.275	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - Central Zone</u>							<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1510037.822	505070.853			.100	4	CLASSICAL SURVEY	1928	00155



Mn/DOT Name: CARLISLE MNDT

NGS Name: CARLISLE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0959](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/1043
USGS Quad: CARLISLE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	2	133 N	44 W	462202.40	961125.29		2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1962	2009	NOT FOUND	Horz=? Vert=?	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	DRILL HOLE	MNDT

Description: (2012)

Stamping:

IN CARLISLE, 0.6 MILE SOUTHEAST ALONG COUNTY ROAD 88 FROM THE JUNCTION OF COUNTY ROAD 88 AND COUNTY ROAD 21 IN CARLISLE, ON THE TOP OF A GRAIN ELEVATOR TANK, BETWEEN COUNTY ROAD 52 AND A RAILROAD, ON THE CENTER TANK OF 3, 3.5 FEET WEST OF CENTER OF TANK.

Station Notes

THE TANKS ARE STILL THERE.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference
1278.410	.197		1190.404	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference
1278.016						RECIPROCAL VERTICAL ANGLE	1962	HORZ

Geoid Separations(ft): GEOID18 = -88.307 12B = -88.300 09 = -88.189 03 = -88.140

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 22 02.40163	96 11 25.29180	380407.404	195526.130	.066	2	ADJUSTMENT	1999	17648
46 22 02.40170	96 11 25.29208	380407.385	195526.137	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 22 02.39777	96 11 25.28143	380408.129	195525.735	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 22 02.54480	96 11 24.05840			.100	2	CLASSICAL SURVEY	1963	13276

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2134896.343	832684.031	835329.396	16862858.177	.066	2	ADJUSTMENT	1999	17648
2134896.324	832684.039	835329.376	16862858.185	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2134897.060	832683.622	835330.107	16862857.757	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1510301.603	504609.924			.100	2	CLASSICAL SURVEY	1963	13276



Mn/DOT Name: CHECK POINT 5680 4

NGS Name: CHECK POINT 5680 4

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0789](#) [Get Map](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	31	132 N	42 W	461153.00	960000.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1967	2011	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	SEE DESCRIPTION	MNDT

Description: (2012)

Stamping:

4.4 MILES NORTHWEST OF DALTON, 2.0 MILES SOUTHWEST ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND COUNTY ROAD 82 IN DALTON, THEN 4.8 MILES NORTHWEST ON INTERSTATE HIGHWAY 94.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1210.299	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

Geoid Separations(ft): GEOID18 = -87.618 12B = -87.618 09 = -87.480 03 = -87.428

* No Horizontal Positions in the Database *



Mn/DOT Name: CHECK POINT 5680 5

NGS Name: CHECK POINT 5680 5

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R00595](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	15	131 N	42 W	460928.00	955711.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1967	1969	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	BOLT	MNDT

Description: (2012)

Stamping:

1.5 MILES SOUTHWEST FROM DALTON, 5.6 MILES NORTHWEST ALONG COUNTY ROAD 82 FROM THE JUNCTION OF COUNTY ROAD 82 AND COUNTY ROAD 35 IN DALTON, THEN 0.8 MILE NORTH ON TRUNK HIGHWAY 59, THEN 4.7 MILES SOUTHEAST ON INTERSTATE HIGHWAY 94, IN THE SOUTHEAST BOLT OF THE NORTH LEG OF THE DALTON EXIT SIGN, 30.0 FEET SOUTH OF INTERSTATE HIGHWAY 94 CENTERLINE STATION 1658+50.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1285.053	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

Geoid Separations(ft): GEOID18 = -87.273 12B = -87.280 09 = -87.139 03 = -87.100

* No Horizontal Positions in the Database *



Mn/DOT Name: CHECK POINT VFERG

NGS Name: TBM CHECK POINT

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DM3632](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	3	132 N	43 W	461701.00	960432.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2004	2011	DESTROYED	Horz=NO Vert=NO	NO			NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
OBJECT DRIVEN INTO THE GROUND	SEE DESCRIPTION	MNDT

Description: (2012)

Stamping:

IN FERGUS FALLS, 0.1 MILE WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK 210 AND TRUNK HIGHWAY 297 IN FERGUS FALLS.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1204.492	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1204.519	.016	2/1				VERTICAL ADJUSTMENT	2011 00000690
1204.528	.016	2/1				VERTICAL CONTROL SURVEY	2004 VFERG

Geoid Separations(ft): GEOID18 = -88.199 12B = -88.199 09 = -88.081 03 = -87.995

* No Horizontal Positions in the Database *



Mn/DOT Name: CHURCH 5 MILES N OF STA INDIAN

NGS Name: CHURCH 5 MILES N OF STA INDIAN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0901](#) [Get Map](#)
NGS Quad / Sta Num : 46096123/1013
USGS Quad: LAKE OLAF

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	9	135 N	44 W	463054.77	961311.37		4

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1906	2009	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
BLANK	SEE DESCRIPTION	NGS

Description: (1906)

Stamping:

4.6 MILES NORTHEAST OF ROTHSA, AT THE JUNCTION OF COUNTY ROAD 28 AND COUNTY ROAD 21.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.946 12B = -87.923 09 = -87.831 03 = -87.749

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 30 54.76831	96 13 11.36627	373311.557	249505.128	.328	4	ADJUSTMENT	1999	17648
46 30 54.76813	96 13 11.36618	373311.563	249505.109	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 30 54.76717	96 13 11.35799	373312.135	249505.008	.328	4	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 30 54.92100	96 13 10.13800			.100	4	CLASSICAL SURVEY	1928	00155

USSD

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 30 55.11300	96 13 10.51700				3	CLASSICAL SURVEY		17389-73

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2128801.537	886778.133	830091.799	16917065.024	.328	4	ADJUSTMENT	1999	17648
2128801.543	886778.114	830091.804	16917065.005	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2128802.113	886778.003	830092.373	16917064.885	.328	4	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1504206.001	558704.699			.100	4	CLASSICAL SURVEY	1928	00155



Mn/DOT Name: CHURCH SPIRE

NGS Name: CHURCH SPIRE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP3528](#)
NGS Quad / Sta Num : 46095324/
USGS Quad: EAGLE LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	16	131 N	40 W	460951.12	954231.12		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2010	UNKNOWN	Horz=? Vert=?	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	CHURCH SPIRE	UNK

Description: (2012)

Stamping:

9.9 MILES EAST-SOUTHEAST OF DALTON, 10.2 MILES EAST ON COUNTY ROAD 12 FROM THE JUNCTION OF COUNTY ROAD 12 AND COUNTY ROAD 35, THEN 1.1 MILES SOUTH ON TRUNK HIGHWAY 78.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.041 12B = -87.037 09 = -86.942 03 = -86.916



Mn/DOT Name: CLOUGH

NGS Name: CLOUGH

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DP2119](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
SW	33	133 N	44 W	461708.80	961402.70	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2011	2021	NOT FOUND	Horz=NO Vert=NO	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 50 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2011) Stamping: CLOUGH 2011

7.2 MILES WEST OF FERGUS FALLS, 5.5 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 18.75, 46.5 FEET NORTH OF TRUNK HIGHWAY 210, 16.8 FEET EAST OF A FIELD ENTRANCE, 1.5 FEET WEST OF A WITNESS POST.

Station Pair: FAIR - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1075.779	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1075.792	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1075.838	.016	2/1				VERTICAL ADJUSTMENT	2015	00000821-R
1075.838	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1075.838	.016	2/1				VERTICAL CONTROL SURVEY	2013	VBREC

Geoid Separations(ft): GEOID18 = -88.307 12B = -88.287 09 = -88.186 03 = -88.136

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<u>Location:</u>	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/CLOUGH-DP2119-3N-26OCT2011.jpg	N	Oct 26, 2011
<u>Monument:</u>	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/CLOUGH-DP2119-2-26OCT2011.jpg		Oct 26, 2011
<u>Disk:</u>	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/CLOUGH-DP2119-1-26OCT2011.jpg		Oct 26, 2011

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: COLNESS

NGS Name: COLNESS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2724](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	9	134 N	44 W	462602.83	961345.73	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 19 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) **Stamping:** COLNESS 2014

10.0 MILES NORTHWEST OF FERGUS FALLS, 8.5 MILES NORTHWEST ALONG WESTBOUND INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 (THE JUNCTION IS 4.5 MILES NORTHWEST OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 42.45, 62.2 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 46.0 FEET SOUTHWEST OF A RIGHT-OF-WAY FENCE, 1.5 FEET SOUTHWEST OF A WITNESS POST.

Station Pair: WEDEL - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1300.526	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1300.601	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1300.588	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1300.526			1212.330	.013	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1300.526			1212.330	.013	2011	GPS - STATIC	2025	HTH94B
1301.894	.262		1213.656	.197	2011	GPS - RTRN	2023	RTRN2023
1300.522	.262		1212.288	.197	2011	GPS - RTRN	2015	RTRN2015
1300.444	.262		1212.209	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -88.235 12B = -88.235 09 = -88.130 03 = -88.054

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 26 02.82668	96 13 45.72859	370716.547	219944.349	.010		ADJUSTMENT	2025	GPS3847
46 26 02.82668	96 13 45.72859	370716.547	219944.349	.010	C	GPS - STATIC	2025	HTH94B
46 26 02.82661	96 13 45.72934	370716.494	219944.343	.131	3	GPS - RTRN	2023	RTRN2023
46 26 02.82582	96 13 45.72789	370716.596	219944.262	.131	3	GPS - RTRN	2015	RTRN2015
46 26 02.82687	96 13 45.72801	370716.588	219944.369	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 26 02.82622	96 13 45.72929	370716.498	219944.303	.066		NCAT	2025	HTH94B

State Plane and UTM Coordinates (Feet)

NAD83(2011)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Year	Reference
2125660.276	857274.227	826480.380	16887602.170	.010		ADJUSTMENT	2025	GPS3847
2125660.276	857274.227	826480.380	16887602.170	.010	C	GPS - STATIC	2025	HTH94B
2125660.223	857274.221	826480.327	16887602.165	.131	3	GPS - RTRN	2023	RTRN2023
2125660.322	857274.139	826480.425	16887602.081	.131	3	GPS - RTRN	2015	RTRN2015
2125660.317	857274.245	826480.421	16887602.188	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Year	Reference
2125660.225	857274.182	826480.329	16887602.126	.066		NCAT	2025	HTH94B



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/COLNESS-DQ2724-3NE-14AUG2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/COLNESS-DQ2724-2-14AUG2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/COLNESS-DQ2724-1-14AUG2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
NE	Aug 14, 2023
	Aug 14, 2023
	Aug 14, 2023



Mn/DOT Name: CROW

NGS Name: CROW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR9944](#) [Get Map](#)
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	34	136 N	42 W	463259.41	955801.32	2	C	2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 19 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: CROW 2014

5.5 MILES EAST-SOUTHEAST OF PELICAN RAPIDS, 6.6 MILES EAST-SOUTHEAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 108 MILEPOINT 18.95, 23.7 FEET SOUTH OF TRUNK HIGHWAY 108, 0.3 MILE EAST OF MATSON POINT ROAD, 13.3 FEET WEST OF A FIELD ENTRANCE, 8.9 FEET NORTH OF A WITNESS POST.

Station Pair: MOORE - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1369.823	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPOLI2

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1369.781			1282.242	.024	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1369.702	.131		1282.340	.066	1996	GPS - STATIC	2024	HTH108
1369.781			1282.242	.024	2011	GPS - STATIC	2024	HTH108
1369.758	.262		1282.146	.197	2011	GPS - RTRN	2023	RTRN2023
1369.827	.262		1282.219	.197	2011	GPS - RTRN	2022	RTRN2022
1369.715	.262		1282.127	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.611 12B = -87.588 09 = -87.500 03 = -87.339

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Ellipsoid (NAD83)</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>				<u>Year</u>	<u>Reference</u>
46 32 59.41032	95 58 01.31684	437000.811	261829.607	.013		ADJUSTMENT			2024	GPS3689
46 32 59.41032	95 58 01.31684	437000.811	261829.607	.013	C	GPS - STATIC			2024	HTH108
46 32 59.41024	95 58 01.31658	437000.829	261829.599	.131	3	GPS - RTRN			2023	RTRN2023
46 32 59.40999	95 58 01.31674	437000.818	261829.574	.131	3	GPS - RTRN			2022	RTRN2022
46 32 59.41026	95 58 01.31652	437000.834	261829.601	.131	3	GPS - RTRN			2014	RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Ellipsoid (NAD83)</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>				<u>Year</u>	<u>Reference</u>
46 32 59.41012	95 58 01.31739	437000.773	261829.587	.033	C	GPS - STATIC			2024	HTH108

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>				<u>Year</u>	<u>Reference</u>
2192699.906	897920.209	894182.862	16927191.623	.013		ADJUSTMENT			2024	GPS3689
2192699.906	897920.209	894182.862	16927191.623	.013	C	GPS - STATIC			2024	HTH108
2192699.924	897920.201	894182.880	16927191.615	.131	3	GPS - RTRN			2023	RTRN2023
2192699.912	897920.176	894182.868	16927191.590	.131	3	GPS - RTRN			2022	RTRN2022
2192699.928	897920.203	894182.884	16927191.616	.131	3	GPS - RTRN			2014	RTRN2014

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>				<u>Year</u>	<u>Reference</u>
2192699.867	897920.190	894182.823	16927191.605	.033	C	GPS - STATIC			2024	HTH108



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/CROW-DR9944-3S-31JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/CROW-DR9944-2-31JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/CROW-DR9944-1-31JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Jul 31, 2023
	Jul 31, 2023
	Jul 31, 2023



Mn/DOT Name: D 100

NGS Name: D 100

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0122](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	33	133 N	44 W	461707.00	961411.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	2010	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 12 IN.	MARKER IS STEEL ROD

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	CGS

Description: (2008) **Stamping:** D 100 1934

5.8 MILES WEST OF FERGUS FALLS, 65.4 FEET SOUTH OF TRUNK HIGHWAY 210, 29.1 FEET NORTH OF THE NORTH RAIL OF A RAILROAD (ABANDONED), 23.0 FEET WEST OF A ROAD SOUTH, AT TRUNK HIGHWAY 210 MILEPOINT 18.65, AT TRUNK HIGHWAY 210 STATION 881+31, 1.0 FOOT NORTH OF A STEEL WITNESS POST.

Station Notes

REPORTED THE DISK WAS REMOVED 10-9-2008.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1074.407	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1073.932	.033	3				VERTICAL CONTROL SURVEY	1978	CS8401
1073.607	.007	1				VERTICAL CONTROL SURVEY	1941	Q460962
1073.607	.007	1				VERTICAL CONTROL SURVEY	1934	L97 MINN

Geoid Separations(ft): GEOID18 = -88.307 12B = -88.287 09 = -88.186 03 = -88.136

* No Horizontal Positions in the Database *



Mn/DOT Name: D 4

NGS Name: D 4

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0109](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	21	134 N	44 W	462411.00	961338.00	1	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
WALL	DRILL HOLE	NGS

Description: (1969)

Stamping:

3.0 MILES NORTHWEST ON A RAILROAD FROM CARLISLE, 61.1 FEET EAST OF RAILROAD MILEPOST 198, ON THE NORTH SIDE OF A RAILROAD CATTLE PASS, IN THE TOP OF THE CENTER OF A COPING STONE, 2.0 INCH DIAMETER FROM THE NORTH EDGE OF A COPING STONE. THE STATION IS THE BOTTOM OF A SQUARE HOLE.

Station Notes

NEW CULVERT.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1224.647	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1223.751	.007	1				VERTICAL CONTROL SURVEY	1972	Q460962
1223.751	.007	1				VERTICAL CONTROL SURVEY	1972	L22167-A
1223.751	.007	1				VERTICAL CONTROL SURVEY	1971	L22167-A
1223.751	.007	1				VERTICAL CONTROL SURVEY	1929	Q460962
1223.751	.007	1				VERTICAL CONTROL SURVEY	1905	L36 MINN

GA1912

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1224.217	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -88.291 12B = -88.291 09 = -88.179 03 = -88.120

* No Horizontal Positions in the Database *



Mn/DOT Name: D 4 A

NGS Name: D 4 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0110](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	21	134 N	44 W	462411.00	961337.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1969	2009	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	SEE DESCRIPTION

Monument Type

CONCRETE FOOTING - SMALL

Disk Type

CHISELED SQUARE

Mon. Agency

MNDT

Description: (1969)

Stamping:

3.0 MILES NORTHWEST FROM CARLISLE. THE STATION IS LOCATED ABOUT 1.0 MILE SOUTHWEST OF INTERSTATE HIGHWAY 94. THE STATION IS A CHISELED SQUARE IN THE SOUTHWEST CORNER OF A BOX CULVERT UNDER TRUNK HIGHWAY 52, 100.0 FEET NORTHEAST OF GREAT NORTHERN RAILROAD CULVERT (STONE-ARCH) NUMBER 185-77, 600.0 FEET SOUTH OF RAILROAD MILEPOST 198, 0.5 MILE NORTHWEST OF THE HEDEMARKEN LUTHERAN CHURCH, 0.2 MILE NORTHWEST ON COUNTY ROAD 10.

Station Notes

THE SET DATE IS UNKNOWN.
NEW CULVERT.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1222.773	.016	2/0				VERTICAL ADJUSTMENT	1991 00000025

Geoid Separations(ft): GEOID18 = -88.287 12B = -88.291 09 = -88.179 03 = -88.120

* No Horizontal Positions in the Database *



Mn/DOT Name: DAHL

NGS Name: DAHL

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2050](#) [Get Map](#)
NGS Quad / Sta Num : 46096121/
USGS Quad: CORMORANT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	30	137 N	42 W	463920.53	960154.19	2	C	2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 39 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: DAHL 2014

6.3 MILES NORTH OF PELICAN RAPIDS, 6.65 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAYS 59 AND 108 WEST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 247.35, 88.0 FEET SOUTHEAST OF TRUNK HIGHWAY 59, 95.0 FEET SOUTHWEST OF SEIFERT BEACH ROAD, 1.5 FEET NORTHWEST OF A WITNESS POST.

Station Pair: PRAXL - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1334.728	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1334.728			1247.498	.022	2011	HORIZONTAL ADJUSTMENT	2024	GPS3671
1334.728			1247.442	.022	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1334.728	.131		1247.550	.066	1996	GPS - STATIC	2023	HTH59
1334.728	.131		1247.606	.066	1996	GPS - STATIC	2023	HTH9
1334.728			1247.498	.022	2011	GPS - STATIC	2023	HTH9
1334.728			1247.442	.022	2011	GPS - STATIC	2023	HTH59
1334.810	.262		1247.478	.197	2011	GPS - RTRN	2022	RTRN2022
1334.718	.262		1247.386	.197	2011	GPS - RTRN	2022	RTRN2022
1334.705	.262		1247.389	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.333 12B = -87.319 09 = -87.211 03 = -87.077

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Year</u>	<u>Reference</u>
46 39 20.53369	96 01 54.19027	420877.574	300500.437	.013		2024	GPS3671
46 39 20.53370	96 01 54.18984	420877.604	300500.438	.013		2024	GPS3672
46 39 20.53369	96 01 54.19027	420877.574	300500.437	.013	C	2023	HTH9
46 39 20.53370	96 01 54.18984	420877.604	300500.438	.013	C	2023	HTH59
46 39 20.53450	96 01 54.19047	420877.560	300500.519	.131	3	2022	RTRN2022
46 39 20.53398	96 01 54.19035	420877.569	300500.466	.131	3	2022	RTRN2022
46 39 20.53398	96 01 54.19078	420877.538	300500.466	.131	3	2014	RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Year</u>	<u>Reference</u>
46 39 20.53348	96 01 54.19033	420877.570	300500.416	.033	C	2023	HTH59
46 39 20.53346	96 01 54.19066	420877.547	300500.414	.033	C	2023	HTH9

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2177297.211	936878.008	879399.484	16966402.752	.013		ADJUSTMENT	2024	GPS3671
2177297.241	936878.008	879399.514	16966402.752	.013		ADJUSTMENT	2024	GPS3672
2177297.211	936878.008	879399.484	16966402.752	.013	C	GPS - STATIC	2023	HTH9
2177297.241	936878.008	879399.514	16966402.752	.013	C	GPS - STATIC	2023	HTH59
2177297.199	936878.090	879399.473	16966402.835	.131	3	GPS - RTRN	2022	RTRN2022
2177297.206	936878.038	879399.479	16966402.782	.131	3	GPS - RTRN	2022	RTRN2022
2177297.176	936878.038	879399.450	16966402.783	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2177297.206	936877.987	879399.479	16966402.731	.033	C	GPS - STATIC	2023	HTH59
2177297.183	936877.985	879399.456	16966402.730	.033	C	GPS - STATIC	2023	HTH9

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DAHL-DQ2050-3SE-12OCT2022.jpg	SE	Oct 12, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DAHL-DQ2050-2-12OCT2022.jpg		Oct 12, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DAHL-DQ2050-1-12OCT2022.jpg		Oct 12, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: DALTON

NGS Name: DALTON

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0478](#) [Get Map](#)
NGS Quad / Sta Num : 46095334/1001
USGS Quad: DALTON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	10	131 N	42 W	461022.45	955611.76	1	1

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1904	2015	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
PIPE (TILE OR CLAY) FILLED WITH CONCRETE	NAIL	NGS

Description: (1988) **Stamping:** DALTON

1.0 MILE WEST OF DALTON, 1.0 MILE WEST ON COUNTY ROAD 82 FROM THE POST OFFICE, IN A CULTIVATED FIELD, 315.0 FEET SOUTH OF COUNTY ROAD 82, 241.20 FEET SOUTH OF STATION DALTON RM 2, UNDERGROUND STATION WAS FOUND 3.5 FEET BELOW GROUND IN 1979-A STEEL ROD WAS BURIED ADJACENT TO THE STATION TO MAKE IT MAGNETIC, THE UNDERGROUND STATION FOUND 2.5 FEET BELOW THE GROUND IN 1988, STATION DALTON RM 3 AND STATION DALTON RM 4 WERE FOUND IN GOOD CONDITION IN 1988.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1387.638	.007	1/2					VERTICAL ADJUSTMENT	1991	00000025

NGVD29				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1386.923	.016	2					VERTICAL CONTROL SURVEY	1972	Q460953
1386.923	.016	2					VERTICAL CONTROL SURVEY	1972	L22167-A
1386.923	.016	2					VERTICAL CONTROL SURVEY	1971	L22167-A
1386.992	.007	1					VERTICAL CONTROL SURVEY	1929	Q460953
1386.992	.007	1					VERTICAL CONTROL SURVEY	1905	L36 MINN

GA1912				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1387.425	.007	1					VERTICAL ADJUSTMENT	1914	GA1912

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1387.628	.131			1300.490	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.352 12B = -87.362 09 = -87.231 03 = -87.191

Lat/Lon and County Coordinates (Feet)

NAD83(1996)				Otter Tail County				Project Info	
Geodetic Position									
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
46 10 22.44703	95 56 11.76053	444276.179	124334.878	.033	1	ADJUSTMENT	1999	17648	
46 10 22.44727	95 56 11.76012	444276.208	124334.902	.033	1	ADJUSTMENT	1998	17655	

NAD83(1986)				Otter Tail County				Project Info	
Geodetic Position									
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
46 10 22.44592	95 56 11.74902	444276.989	124334.763	.033	1	ADJUSTMENT	1986	17289	

NAD27								Project Info	
Geodetic Position									
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
46 10 22.59500	95 56 10.55600			.100	1	CLASSICAL SURVEY	1963	13276	

USSD								Project Info	
Geodetic Position									
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
46 10 22.77000	95 56 10.92600				3	CLASSICAL SURVEY		17389-73	



State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2197428.064	760332.383	896735.456	16789503.575	.033	1	ADJUSTMENT	1999	17648
2197428.093	760332.407	896735.485	16789503.598	.033	1	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2197428.872	760332.254	896736.261	16789503.432	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		<u>X</u>	<u>Y</u>	Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1572833.525	432259.423			.100	1	CLASSICAL SURVEY	1963	13276



Mn/DOT Name: DALTON ASTRONOMICAL RM

NGS Name: DALTON ASTRO RM

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP3588](#) [Get Map](#)
NGS Quad / Sta Num : 46095334/1002
USGS Quad: DALTON

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	11	131 N	42 W	461024.25	955500.44		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1904	1957	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BLANK	REFERENCE MARK DISK	NGS

Description:

Stamping:

ON THE NORTH SIDE OF THE STREET AT THE SOUTH END OF A LOT BELONGING TO JOHN RORANG OF DALTON AND LEADING BACK FROM A STORE BUILDING JUST WEST OF THE BANK OF DALTON, 300.0 FEET EAST OF THE RAILWAY STATION, 97.63 FEET NORTHWEST FROM "DALTON ASTRONOMICAL STA".

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.339 12B = -87.352 09 = -87.221 03 = -87.178



Mn/DOT Name: DALTON ASTRONOMICAL STA

NGS Name: DALTON ASTRO STA

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R00788](#) [Get Map](#)
NGS Quad / Sta Num : 46095334/1002
USGS Quad: DALTON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	11	131 N	42 W	461023.29	955500.43	1	1

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1904	1957	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
PIPE (TILE OR CLAY) FILLED WITH CONCRETE	NAIL	NGS

Description: (1957)

Stamping:

IN DALTON, NEAR THE GREAT NORTHERN RAILWAY STATION, AND ON A PROMINENT SMALL KNOLL. THE SURFACE AND UNDERGROUND MARKS ARE NAILS IN TERRA-COTTA PIPES FILLED WITH AND SET IN CONCRETE. DALTON RM IS A NAIL IN A TERRA-COTTA PIPE FILLED WITH AND SET IN CONCRETE. ON THE NORTH SIDE OF THE STREET AT THE SOUTH END OF A LOT BELONGING TO JOHN RORANG OF DALTON AND LEADING BACK FROM A STORE BUILDING JUST WEST OF THE BANK OF DALTON, 540.0 FEET EAST OF THE RAILWAY STATION, AND 97.63 FEET FROM THE STATION N 00 DEG 34 MIN W. FOLLOWING DISTANCES AND BEARINGS ARE FROM THE STATION--DALTON LUMBER CO. S BUILDING, GABLE, ABOUT 300.0 FEET, S 06 DEG 48 MIN W. MINNEAPOLIS AND NORTHERN, ELEVATOR, NORTHEAST CORNER, 263.0 FEET, S 59 DEG 00 MIN W. BANK OF DALTON, CHIMNEY, ABOUT 175.0 FEET, N 07 DEG 05 MIN E. AND OLIVER RUSTADTS HOUSE, SMALL GABLE OVER THE WEST ENTRANCE, ABOUT 200.0 FEET, S 86 DEG 52 MIN E. STATIONS DALTON AND LEAF (SEE DESCRIPTIONS THEREOF) ARE BOTH VISIBLE FROM THE GROUND. IN 1935, A CREAMERY WAS REPORTED TO HAVE BEEN BUILT OVER THE STATION. STATION LOST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference	
1377.008	.007	1				VERTICAL CONTROL SURVEY	1993	POSTED	

GA1912			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference	
1376.716	.007	1				VERTICAL ADJUSTMENT	1914	GA1912	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference	
1376.999	.131		1289.866	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648	

Geoid Separations(ft): GEOID18 = -87.342 12B = -87.355 09 = -87.221 03 = -87.182

Lat/Lon and County Coordinates (Feet)

NAD83(1996)		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 10 23.29050	95 55 00.42526	449296.935	124406.995	.033	1	ADJUSTMENT	1999	17648
46 10 23.29078	95 55 00.42443	449296.993	124407.023	.033	1	ADJUSTMENT	1998	17655

NAD83(1986)		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 10 23.28940	95 55 00.41443	449297.697	124406.882	.033	1	ADJUSTMENT	1986	17289

NAD27		Determination Method			Project Info			
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 10 23.43800	95 54 59.22300			.100	1	CLASSICAL SURVEY	1932	00967

USSD		Determination Method			Project Info			
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 10 23.61300	95 54 59.59200				3	CLASSICAL SURVEY		17389-73



State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2202448.613	760311.543	901756.572	16789403.900	.033	1	ADJUSTMENT	1999	17648
2202448.672	760311.570	901756.632	16789403.926	.033	1	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2202449.373	760311.416	901757.330	16789403.760	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		<u>X</u>	<u>Y</u>	Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1577854.062	432238.557			.100	1	CLASSICAL SURVEY	1932	00967



Mn/DOT Name: DALTON MUNICIPAL TANK

NGS Name: DALTON MUNICIPAL TANK

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: R01119	Get Map
NW	12	131 N	42 W	461029.47	955447.12		4	NGS Quad / Sta Num : 46095334/1019	
								USGS Quad: DALTON	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	1994	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION
<u>Monument Type</u>				<u>Disk Type</u>			<u>Mon. Agency</u>
BLANK				STANDPIPE TANK			MNDT

Description: (1978)

Stamping:

IN THE NORTHEAST PART OF DALTON, 1.0 BLOCK WEST OF MAIN EAST-WEST STREET, 0.1 MILE NORTHEAST OF THE POST OFFICE. THE INTERSECTED STATION IS THE FINIAL ATOP THE 60.0 FOOT CYLINDRICAL WOODEN WATER TANK IN THE TOWN OF DALTON.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.352 12B = -87.362 09 = -87.231 03 = -87.188

Lat/Lon and County Coordinates (Feet)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 10 29.46514	95 54 47.11912	450234.964	125030.175	.328	4	ADJUSTMENT	1999	17648
46 10 29.46536	95 54 47.11883	450234.984	125030.198	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 10 29.46431	95 54 47.10727	450235.797	125030.089	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>							<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 10 29.61300	95 54 45.91900			.100	4	CLASSICAL SURVEY	1963	13276

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2203397.889	760917.169	902715.523	16789994.725	.328	4	ADJUSTMENT	1999	17648
2203397.910	760917.191	902715.544	16789994.746	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2203398.721	760917.067	902716.353	16789994.610	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - Central Zone</u>							<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1578803.213	432844.222			.100	4	CLASSICAL SURVEY	1963	13276



Mn/DOT Name: DALTON RM

NGS Name: DALTON RM

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP3587](#) [Get Map](#)
NGS Quad / Sta Num : 46095334/1001
USGS Quad: DALTON

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	10	131 N	42 W	461025.21	955611.68		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1904	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	NAIL	NGS

Description: (2010)

Stamping:

1.0 MILE WEST OF DALTON, 1.0 MILE WEST ON COUNTY ROAD 82 FROM THE POST OFFICE, IN A CULTIVATED FIELD, IN A CORNER OF A PASTURE, ABOUT 10.0 FEET SOUTH OF A ROAD WHICH LEADS FROM DALTON WESTWARD ALONG A HALF-SECTION LINE, 1.0 FOOT WEST OF AN EAST FENCE, 1.0 FOOT SOUTH OF A NORTH FENCE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.355 12B = -87.369 09 = -87.237 03 = -87.198



Mn/DOT Name: DALTON RM 2

NGS Name: DALTON RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0479](#) [Get Map](#)
NGS Quad / Sta Num : 46095334/1001
USGS Quad: DALTON

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SE	10	131 N	42 W	461024.82	955611.62	2	3	1962	2009	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 3 IN.	SEE DESCRIPTION
				<u>Monument Type</u>					<u>Disk Type</u>					<u>Mon. Agency</u>	
				CONCRETE MONUMENT (CAST-IN-PLACE)					SURVEY DISK					NGS	

Description: (1979)

Stamping: DALTON NO. 2 1904 1962

1.0 MILE WEST OF DALTON, 1.0 MILE WEST ON COUNTY ROAD 82 FROM THE POST OFFICE, 73.0 FEET SOUTH OF COUNTY ROAD 82, 13.0 FEET SOUTH OF THE TOP OF THE BACK SLOPE, 2.0 FEET WEST OF A RIGHT-OF-WAY POST, 3.8 FEET NORTH OF A WITNESS POST, 241.20 FEET NORTH OF STATION DALTON.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1379.239	.016	2/0					VERTICAL ADJUSTMENT	1991	00000025
<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1378.524	.016	2					VERTICAL CONTROL SURVEY	1972	Q460953
1378.524	.016	2					VERTICAL CONTROL SURVEY	1972	L22167-A
1378.524	.016	2					VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1379.230	.262			1292.087	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.355 12B = -87.369 09 = -87.234 03 = -87.195

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Lat/Lon and County Coordinates (Feet)</u>				<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>							
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 10 24.82322	95 56 11.62113	444286.659	124575.572	.131	3	ADJUSTMENT	1999	17648	
46 10 24.82346	95 56 11.62073	444286.688	124575.597	.131	3	ADJUSTMENT	1998	17655	
<u>NAD83(1986)</u>				<u>Lat/Lon and County Coordinates (Feet)</u>				<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>							
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 10 24.82210	95 56 11.60962	444287.469	124575.457	.131	3	ADJUSTMENT	1986	17289	
<u>NAD27</u>				<u>Lat/Lon and County Coordinates (Feet)</u>				<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>							
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 10 24.97119	95 56 10.41654			.100	3	CLASSICAL SURVEY	1981	16333	

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>State Plane and UTM Coordinates (Feet)</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>							
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
2197442.996	760572.810	896754.166	16789743.811	.131	3	ADJUSTMENT	1999	17648	
2197443.025	760572.834	896754.195	16789743.834	.131	3	ADJUSTMENT	1998	17655	
<u>NAD83(1986)</u>				<u>State Plane and UTM Coordinates (Feet)</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>							
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
2197443.804	760572.679	896754.971	16789743.667	.131	3	ADJUSTMENT	1986	17289	
<u>NAD27</u>				<u>State Plane and UTM Coordinates (Feet)</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>							
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
1572848.461	432499.849			.100	3	CLASSICAL SURVEY	1981	16333	



Mn/DOT Name: DALTON RM 3

NGS Name: DALTON RM 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R00600](#) [Get Map](#)
NGS Quad / Sta Num : 46095334/1001
USGS Quad: DALTON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	10	131 N	42 W	461026.42	955659.03	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1962	2009	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	NGS

Description: (1979)

Stamping: DALTON NO.3 1904 1962

1.0 MILE WEST OF DALTON, 1.0 MILE WEST ON COUNTY ROAD 82 FROM THE POST OFFICE, 49.0 FEET SOUTH OF COUNTY ROAD 82, 112.0 FEET EAST-NORTHEAST OF A TELEPHONE POLE, 90.5 FEET WEST-NORTHWEST OF A TELEPHONE POLE, 4.5 FEET SOUTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1336.861	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1336.149	.016	2				VERTICAL CONTROL SURVEY	1967	Q460953

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1336.874	.197		1249.715	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.372 12B = -87.382 09 = -87.247 03 = -87.208

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 10 26.42316	95 56 59.02976	440950.584	124747.209	.066	2	ADJUSTMENT	1999	17648
46 10 26.42337	95 56 59.02935	440950.613	124747.230	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 10 26.42204	95 56 59.01817	440951.399	124747.093	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 10 26.57162	95 56 57.82342			.100	2	CLASSICAL SURVEY	1981	16333

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2194111.122	760806.145	893425.338	16790029.506	.066	2	ADJUSTMENT	1999	17648
2194111.151	760806.165	893425.368	16790029.526	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2194111.935	760806.014	893426.149	16790029.362	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1569516.612	432733.218			.100	2	CLASSICAL SURVEY	1981	16333



Mn/DOT Name: DANE MNDT

NGS Name: DANE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0970](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	36	132 N	43 W	461227.96	960109.86		2	1978	2005	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MNDT

Description: (1978) Stamping: DANE 1978

5.5 MILES SOUTHEAST OF FERGUS FALLS, NEAR THE SOUTHWEST CORNER OF TRUNK HIGHWAY 59 BRIDGE OVER INTERSTATE HIGHWAY 94, 19.6 FEET WEST OF TRUNK HIGHWAY 59, 18.3 FEET SOUTH OF THE SOUTHWEST CORNER OF A BRIDGE, 14.2 FEET EAST OF A TELEPHONE POLE, 3.4 FEET WEST OF A WITNESS POST, 19.10 FEET SOUTH OF DANE MNDT RM 1, 39.80 FEET WEST OF DANE MNDT RM 2.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>							<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1273.948	.197		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	HORIZONTAL ADJUSTMENT	1999	17648
			1186.481	.131	1996			

<u>NGVD29</u>							<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1273.324			<u>Height</u>	<u>Acc</u>	<u>Adj</u>	LEVELING	1979	HORZ

Geoid Separations(ft): GEOID18 = -87.723 12B = -87.713 09 = -87.585 03 = -87.529

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>							<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>					
46 12 27.95585	96 01 09.85677	423345.027	137118.954	.066	2	ADJUSTMENT	1999	17648
46 12 27.95587	96 01 09.85649	423345.046	137118.956	.066	2	ADJUSTMENT	1998	17655

<u>NAD83(1986)</u>							<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>					
46 12 27.95460	96 01 09.84480	423345.868	137118.824	.066	2	ADJUSTMENT	1986	17289

<u>NAD27</u>							<u>Project Info</u>	
<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
<u>Latitude</u>	<u>Longitude</u>							
46 12 28.10314	96 01 08.63964			.100	2	CLASSICAL SURVEY	1981	16333

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>							<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>					
2176739.954	773499.962	876250.084	16802998.848	.066	2	ADJUSTMENT	1999	17648
2176739.973	773499.964	876250.104	16802998.850	.066	2	ADJUSTMENT	1998	17655

<u>NAD83(1986)</u>							<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>					
2176740.792	773499.817	876250.920	16802998.690	.066	2	ADJUSTMENT	1986	17289

<u>NAD27</u>							<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
<u>X</u>	<u>Y</u>							
1552145.622	445426.768			.100	2	CLASSICAL SURVEY	1981	16333



Mn/DOT Name: DANE MNDT RESET

NGS Name: DANE RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DI3792](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	36	132 N	43 W	461224.42	960107.22	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1990	2016	GOOD	Horz=NO Vert=YES	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 10 FT)	HORIZONTAL CONTROL DISK	MNDT

Description: (2015) **Stamping:** DANE 1978 RESET 1990

6.0 MILES SOUTHEAST OF FERGUS FALLS, 7.55 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 61.90, IN THE SOUTHEAST QUADRANT OF THE SOUTHEAST JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59, 81.0 FEET SOUTHWEST OF EASTBOUND ENTRANCE RAMP TO INTERSTATE HIGHWAY 94 FROM TRUNK HIGHWAY 59 AND COUNTY ROAD 82, 23.0 FEET NORTH OF A RIGHT-OF-WAY POST, 15.5 FEET NORTHEAST OF A RIGHT-OF-WAY FENCE, 15.4 FEET NORTH-NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1274.591	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1274.591	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1274.627	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1274.600	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1274.600	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1274.709	.016	2/1				VERTICAL ADJUSTMENT	2016	00000869
1274.709	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1274.725	.016	2/1				VERTICAL CONTROL SURVEY	2012	VTENN
1274.607	.016	2/1				VERTICAL ADJUSTMENT	2007	00000425-15
1274.610	.016	2/1				VERTICAL CONTROL SURVEY	2005	VFAUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1274.578	.262		1186.874	.197	2011	GPS - RTRN	2015	RTRN2015
1274.518	.262		1186.996	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.713 12B = -87.707 09 = -87.575 03 = -87.523

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 12 24.42204	96 01 07.22077	423529.062	136760.249	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 12 24.42225	96 01 07.21979	423529.131	136760.270	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2176917.293	773137.961	876421.771	16802633.980	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2176917.362	773137.981	876421.840	16802633.999	.131	3	GPS - RTRN	2009	RTRN2009



<u>Station Photos</u>		<u>Dir</u>	<u>Date</u>
<u>Type</u>	<u>File Name</u>	SW	Sep 14, 2015
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DANE_RESET-DI3792-3SW-14SEP2015.jpg		Sep 14, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DANE_RESET-DI3792-2-14SEP2015.jpg		Sep 14, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DANE_RESET-DI3792-1-14SEP2015.jpg		Sep 14, 2015
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: DANE MNDT RM 1

NGS Name: DANE RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP3589](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	36	132 N	43 W	461228.00	960109.00			1978	2005	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	REFERENCE MARK DISK	MNDT

Description: **Stamping:** DANE NO 1 1978

5.5 MILES SOUTHEAST OF FERGUS FALLS, NEAR THE SOUTHWEST CORNER OF A TRUNK HIGHWAY 59 BRIDGE OVER INTERSTATE HIGHWAY 94, 19.2 FEET WEST OF THE CENTERLINE OF TRUNK HIGHWAY 59, 23.4 FEET NORTHEAST OF A POWER POLE, 20.4 FEET NORTH OF A STEEL WITNESS POST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.723 12B = -87.713 09 = -87.585 03 = -87.529



Mn/DOT Name: DANE MNDT RM 2

NGS Name: DANE RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP3590](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	36	132 N	43 W	461228.00	960109.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1978	2005	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	REFERENCE MARK DISK	MNDT

Description: Stamping: 5680 BB 1966

5.5 MILES SOUTHEAST OF FERGUS FALLS, NEAR THE SOUTHWEST CORNER OF TRUNK HIGHWAY 59 BRIDGE OVER INTERSTATE HIGHWAY 94, 19.5 FEET EAST OF THE CENTERLINE OF TRUNK HIGHWAY 59, 36.6 FEET EAST OF A STEEL WITNESS POST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.723 12B = -87.713 09 = -87.585 03 = -87.529



Mn/DOT Name: DANIEL MNDT

NGS Name: DANIEL

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0528](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/1041
USGS Quad: BATTLE LAKE

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NW	11	133 N	40 W	462117.87	954151.19	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2024	GOOD	Horz=YES Vert=YES	YES		PROJECTS 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MNDT

Description: (1975) **Stamping:** DANIEL 1975

5.0 MILES NORTH-NORTHEAST OF BATTLE LAKE, 6.7 MILES NORTH AND EAST ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 27.9, 137.4 FEET SOUTH OF TRUNK HIGHWAY 78, 78.5 FEET EAST OF 380TH AVENUE, 3.9 FEET NORTHWEST OF A WITNESS POST.

Station Pair: ZORNS - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1342.136	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1342.150	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1342.133	.016	2/1				VERTICAL CONTROL SURVEY	2016 VOTTE
1342.150	.016	2/1				VERTICAL ADJUSTMENT	1991 00000025
NGVD29			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1341.359	.016	2/1				UNKNOWN/APPROXIMATE	1992 UNCHECKD
1341.359	.016	2				VERTICAL CONTROL SURVEY	1976 L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1342.136			1254.223	.010	2011	HORIZONTAL ADJUSTMENT	2024 GPS3764
1342.136			1254.223	.011	2011	HORIZONTAL ADJUSTMENT	2024 GPS3771
1342.136	.131		1254.377	.066	1996	GPS - STATIC	2024 HTH78B
1342.136			1254.223	.011	2011	GPS - STATIC	2024 HTH78B
1342.136	.131		1254.377	.066	1996	GPS - STATIC	2024 HTH78A
1342.136			1254.223	.010	2011	GPS - STATIC	2024 HTH78A
1342.123	.262		1254.253	.197	2011	GPS - RTRN	2023 RTRN2023
1342.136	.131		1254.377	.066	1996	GPS - STATIC	2021 HOTTE
1342.136			1254.223	.022	2011	HORIZONTAL ADJUSTMENT	2020 GPS3384
1342.136			1254.223	.022	2011	GPS - STATIC	2020 HOTTE
1342.041	.262		1254.174	.197	2011	GPS - OPUS	2020 GPSBM
1342.038	.262		1254.171	.197	2011	GPS - OPUS	2020 GPSBM
1342.054	.262		1254.187	.197	2011	GPS - OPUS	2020 GPSBM
1342.035	.262		1254.174	.197	2011	GPS - RTRN	2015 RTRN2015
1342.035	.262		1254.174	.197	2011	GPS - RTRN	2015 RTRN2015
1341.887	.262		1254.259	.197	1996	GPS - RTRN	2009 RTRN2009
1342.156	.197		1254.489	.131	1996	HORIZONTAL ADJUSTMENT	1999 17648

Geoid Separations(ft): GEOID18 = -87.867 12B = -87.861 09 = -87.746 03 = -87.631

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 21 17.87402	95 41 51.19403	504826.501	190657.571	.007		ADJUSTMENT	2024	GPS3764
46 21 17.87402	95 41 51.19403	504826.501	190657.571	.007		ADJUSTMENT	2024	GPS3771
46 21 17.87402	95 41 51.19403	504826.501	190657.571	.007	C	GPS - STATIC	2024	HTH78B
46 21 17.87402	95 41 51.19403	504826.501	190657.571	.007	C	GPS - STATIC	2024	HTH78A
46 21 17.87357	95 41 51.19436	504826.478	190657.525	.131	3	GPS - RTRN	2023	RTRN2023
46 21 17.87402	95 41 51.19403	504826.501	190657.571	.016		ADJUSTMENT	2020	GPS3384
46 21 17.87402	95 41 51.19403	504826.501	190657.571	.016	C	GPS - STATIC	2020	HOTTE
46 21 17.87371	95 41 51.19422	504826.488	190657.539	.131	3	GPS - OPUS	2020	GPSBM
46 21 17.87378	95 41 51.19404	504826.500	190657.547	.131	3	GPS - OPUS	2020	GPSBM
46 21 17.87386	95 41 51.19458	504826.462	190657.555	.131	3	GPS - OPUS	2020	GPSBM
46 21 17.87366	95 41 51.19498	504826.434	190657.534	.131	3	GPS - RTRN	2015	RTRN2015
46 21 17.87366	95 41 51.19498	504826.434	190657.534	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 21 17.87374	95 41 51.19454	504826.465	190657.542	.033	C	GPS - STATIC	2024	HTH78B
46 21 17.87374	95 41 51.19454	504826.465	190657.542	.033	C	GPS - STATIC	2024	HTH78A
46 21 17.87374	95 41 51.19454	504826.465	190657.542	.033	C	GPS - STATIC	2021	HOTTE
46 21 17.87432	95 41 51.19551	504826.397	190657.601	.131	3	GPS - RTRN	2009	RTRN2009
46 21 17.87389	95 41 51.19342	504826.544	190657.558	.066	2	ADJUSTMENT	1999	17648
46 21 17.87375	95 41 51.19345	504826.542	190657.544	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 21 17.87116	95 41 51.18349	504827.240	190657.281	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 21 18.01600	95 41 50.01563			.100	2	CLASSICAL SURVEY	1977	15945

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2259187.705	825513.945	959530.300	16853720.673	.007		ADJUSTMENT	2024	GPS3764
2259187.705	825513.945	959530.300	16853720.673	.007		ADJUSTMENT	2024	GPS3771
2259187.705	825513.945	959530.300	16853720.673	.007	C	GPS - STATIC	2024	HTH78B
2259187.705	825513.945	959530.300	16853720.673	.007	C	GPS - STATIC	2024	HTH78A
2259187.681	825513.899	959530.275	16853720.628	.131	3	GPS - RTRN	2023	RTRN2023
2259187.705	825513.945	959530.300	16853720.673	.016		ADJUSTMENT	2020	GPS3384
2259187.705	825513.945	959530.300	16853720.673	.016	C	GPS - STATIC	2020	HOTTE
2259187.692	825513.914	959530.286	16853720.642	.131	3	GPS - OPUS	2020	GPSBM
2259187.704	825513.920	959530.299	16853720.648	.131	3	GPS - OPUS	2020	GPSBM
2259187.667	825513.929	959530.261	16853720.658	.131	3	GPS - OPUS	2020	GPSBM
2259187.638	825513.910	959530.233	16853720.638	.131	3	GPS - RTRN	2015	RTRN2015
2259187.638	825513.910	959530.233	16853720.638	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2259187.669	825513.917	959530.264	16853720.646	.033	C	GPS - STATIC	2024	HTH78B
2259187.669	825513.917	959530.264	16853720.646	.033	C	GPS - STATIC	2024	HTH78A
2259187.669	825513.917	959530.264	16853720.646	.033	C	GPS - STATIC	2021	HOTTE
2259187.602	825513.977	959530.197	16853720.707	.131	3	GPS - RTRN	2009	RTRN2009
2259187.748	825513.931	959530.343	16853720.658	.066	2	ADJUSTMENT	1999	17648
2259187.746	825513.917	959530.340	16853720.644	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2259188.439	825513.642	959531.029	16853720.358	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1634592.829	497440.271			.100	2	CLASSICAL SURVEY	1977	15945

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DANIEL-RO0528-3S-17OCT2023.jpg	S	Oct 17, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DANIEL-RO0528-2-17OCT2023.jpg		Oct 17, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DANIEL-RO0528-1-17OCT2023.jpg		Oct 17, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: DANIEL MNDT AZ MK

NGS Name: DANIEL AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R00526](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/1042
USGS Quad: BATTLE LAKE

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	10	133 N	40 W	462037.01	954152.85	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2015	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	MNDT

Description: (1975) **Stamping:** DANIEL 1975

5.0 MILES NORTH-NORTHEAST OF BATTLE LAKE, 6.7 MILES NORTH AND EAST ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE TO TRUNK HIGHWAY 78 MILEPOINT 27.9, THEN 0.8 MILE SOUTH ON 380TH AVENUE, 41.0 FEET WEST OF 380TH AVENUE, 3.3 FEET WEST OF A POWER POLE, 3.3 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1354.174	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1354.184	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1354.171	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1354.184	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1353.393	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1353.393	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1354.079	.262		1266.257	.197	2011	GPS - RTRN	2015	RTRN2015
1354.079	.262		1266.257	.197	2011	GPS - RTRN	2015	RTRN2015
1354.006	.262		1266.408	.197	1996	GPS - RTRN	2009	RTRN2009
1354.197	.197		1266.559	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.825 12B = -87.821 09 = -87.710 03 = -87.598

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 20 37.01371	95 41 52.84982	504711.329	186518.044	.131	3	GPS - RTRN	2015	RTRN2015
46 20 37.01371	95 41 52.84982	504711.329	186518.044	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 20 37.01369	95 41 52.85070	504711.267	186518.042	.131	3	GPS - RTRN	2009	RTRN2009
46 20 37.01274	95 41 52.84957	504711.347	186517.946	.066	2	ADJUSTMENT	1999	17648
46 20 37.01259	95 41 52.84970	504711.338	186517.931	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 20 37.01005	95 41 52.83933	504712.065	186517.674	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 20 37.15451	95 41 51.67125			.100	2	CLASSICAL SURVEY	1977	15945

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2258995.928	821377.804	959273.137	16849587.220	.131	3	GPS - RTRN	2015	RTRN2015
2258995.928	821377.804	959273.137	16849587.220	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2258995.867	821377.803	959273.075	16849587.220	.131	3	GPS - RTRN	2009	RTRN2009
2258995.944	821377.705	959273.151	16849587.121	.066	2	ADJUSTMENT	1999	17648
2258995.935	821377.690	959273.141	16849587.107	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2258996.657	821377.420	959273.860	16849586.825	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		<u>X</u>	<u>Y</u>	Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1634401.076	493304.031			.100	2	CLASSICAL SURVEY	1977	15945

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DANIEL_AZ_MK-RO0526-3W-27AUG2015.jpg	W	Aug 27, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DANIEL_AZ_MK-RO0526-2-27AUG2015.jpg		Aug 27, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DANIEL_AZ_MK-RO0526-1-27AUG2015.jpg		Aug 27, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: DANIEL MNDT RM 1

NGS Name: DANIEL RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0527](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	10	133 N	40 W	462117.05	954152.83	2		1975	2015	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 3 IN.	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	REFERENCE MARK DISK	MNDT

Description: (1975)

Stamping: DANIEL NO 1 1975

6.7 MILES NORTH AND EAST ON TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 AT BATTLE LAKE, ON THE SOUTH SIDE OF TRUNK HIGHWAY 78, AT TRUNK HIGHWAY 78 MILEPOINT 28.05, 29.0 FEET WEST OF A TOWNSHIP ROAD, 142.5 FEET WEST-SOUTHWEST OF STATION DANIEL MNDT, 189.0 FEET SOUTHWEST OF DANIEL MNDT RM 2, 2.7 FEET EAST OF A POWER POLE, 142.0 FEET SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1341.999	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1341.205	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Geoid Separations(ft): GEOID18 = -87.867 12B = -87.864 09 = -87.746 03 = -87.631

* No Horizontal Positions in the Database *



Mn/DOT Name: DANIEL MNDT RM 2

NGS Name: DANIEL RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0529](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	2	133 N	40 W	462118.80	954151.93	2		1975	2015	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 2 IN.	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	REFERENCE MARK DISK	MNDT

Description: (1975)

Stamping: DANIEL NO 2 1975

6.7 MILES NORTH AND EAST ON TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 AT BATTLE LAKE, ON THE SOUTH SIDE OF TRUNK HIGHWAY 78, AT TRUNK HIGHWAY 78 MILEPOINT 28.05, 107.5 FEET NORTH OF STATION DANIEL MNDT, 189.0 FEET NORTHEAST OF DANIEL MNDT RM 1, 23.8 FEET EAST-NORTHEAST OF A REFERENCE POINT POST, 111.5 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1338.980	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1338.186	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Geoid Separations(ft): GEOID18 = -87.867 12B = -87.861 09 = -87.746 03 = -87.628

* No Horizontal Positions in the Database *



Mn/DOT Name: DATA MNDT

NGS Name: DATA

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AB9900](#) [Get Map](#)
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	21	136 N	41 W	463443.56	955120.50	2	B

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1994	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
STEEL ROD (NO SLEEVE) (DEPTH 60 FT)	METAL ROD	MNDT

Description: (2005)

Stamping: DATA 1994

10.5 MILES EAST OF PELICAN RAPIDS, 11.65 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 IN PELICAN RAPIDS TO TRUNK HIGHWAY 108 MILEPOINT 24.1 THEN 2.9 MILES NORTH ON COUNTY ROAD 41, 71.0 FEET SOUTH OF 425TH STREET, 183.0 FEET WEST OF COUNTY ROAD 41, 135.6 FEET WEST-SOUTHWEST OF A POWER POLE, 113.7 FEET EAST-SOUTHEAST OF A POWER POLE, 3.0 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1395.847	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1395.873	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1395.890	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1395.847	.131		1308.902	.066	1996	GPS - STATIC	2021	HOTTE
1395.798			1308.738	.009	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1395.798			1308.738	.009	2011	GPS - STATIC	2020	HOTTE
1395.873			1308.738	.010	2011	HORIZONTAL ADJUSTMENT	2018	GPS3119
1395.873	.131		1308.902	.066	1996	GPS - STATIC	2017	HMNCORS07
1395.873			1308.738	.010	2011	GPS - STATIC	2017	HMNPH
1395.886	.262		1308.701	.197	2011	GPS - RTRN	2015	RTRN2015
1395.870	.262		1308.688	.197	2011	GPS - RTRN	2013	RTRN2013
			1308.738	.011	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1395.621	.262		1308.711	.197	1996	GPS - RTRN	2009	RTRN2009
			1308.843	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1395.798	.098		1308.902	.049	1996	GPS - STATIC	2005	GPS2036
1395.896	.131		1308.902	.066	1996	HORIZONTAL ADJUSTMENT	2005	GPS2123
1395.896	.131		1308.902	.066	1996	GPS - STATIC	2005	HPERH
1395.906	.098		1308.902	.049	1996	GPS - STATIC	1997	GPS805-B
1395.906	.131		1308.902	.066	1996	GPS - STATIC	1997	GPS805-C

Geoid Separations(ft): GEOID18 = -87.168 12B = -87.182 09 = -87.077 03 = -86.906

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 34 43.56195	95 51 20.49943	465035.183	272312.507	.007		ADJUSTMENT	2020	GPS3384
46 34 43.56195	95 51 20.49943	465035.183	272312.507	.007	C	GPS - STATIC	2020	HOTTE
46 34 43.56195	95 51 20.49943	465035.183	272312.507	.007		ADJUSTMENT	2018	GPS3119
46 34 43.56195	95 51 20.49943	465035.183	272312.507	.007	C	GPS - STATIC	2017	HMNPH
46 34 43.56241	95 51 20.49882	465035.226	272312.554	.131	3	GPS - RTRN	2015	RTRN2015
46 34 43.56251	95 51 20.49943	465035.184	272312.564	.131	3	GPS - RTRN	2013	RTRN2013
46 34 43.56195	95 51 20.49943	465035.183	272312.507	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 34 43.56189	95 51 20.50033	465035.121	272312.501	.007		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 34 43.56152	95 51 20.50009	465035.138	272312.464	.033	C	GPS - STATIC	2021	HOTTE
46 34 43.56152	95 51 20.50009	465035.138	272312.464	.033	C	GPS - STATIC	2017	HMNCORS07
46 34 43.56205	95 51 20.50037	465035.118	272312.517	.131	3	GPS - RTRN	2009	RTRN2009
46 34 43.56152	95 51 20.50009	465035.138	272312.464	.016	B	GPS - STATIC	2005	GPS2036
46 34 43.56152	95 51 20.50009	465035.138	272312.464	.033	C	ADJUSTMENT	2005	GPS2123
46 34 43.56152	95 51 20.50009	465035.138	272312.464	.033	C	GPS - STATIC	2005	HPERH
46 34 43.56152	95 51 20.50009	465035.138	272312.464	.016	B	GPS - STATIC	1997	GPS805-B
46 34 43.56152	95 51 20.50009	465035.138	272312.464	.033	C	GPS - STATIC	1997	GPS805-C

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2220919.989	907881.058	922566.106	16936704.160	.007		ADJUSTMENT	2020	GPS3384
2220919.989	907881.058	922566.106	16936704.160	.007	C	GPS - STATIC	2020	HOTTE
2220919.989	907881.058	922566.106	16936704.160	.007		ADJUSTMENT	2018	GPS3119
2220919.989	907881.058	922566.106	16936704.160	.007	C	GPS - STATIC	2017	HMNPH
2220920.033	907881.104	922566.150	16936704.206	.131	3	GPS - RTRN	2015	RTRN2015
2220919.990	907881.114	922566.108	16936704.217	.131	3	GPS - RTRN	2013	RTRN2013
2220919.989	907881.058	922566.106	16936704.160	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2220919.926	907881.053	922566.043	16936704.157	.007		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2220919.942	907881.015	922566.058	16936704.119	.033	C	GPS - STATIC	2021	HOTTE
2220919.942	907881.015	922566.058	16936704.119	.033	C	GPS - STATIC	2017	HMNCORS07
2220919.924	907881.069	922566.040	16936704.173	.131	3	GPS - RTRN	2009	RTRN2009
2220919.942	907881.015	922566.058	16936704.119	.016	B	GPS - STATIC	2005	GPS2036
2220919.942	907881.015	922566.058	16936704.119	.033	C	ADJUSTMENT	2005	GPS2123
2220919.942	907881.015	922566.058	16936704.119	.033	C	GPS - STATIC	2005	HPERH
2220919.942	907881.015	922566.058	16936704.119	.016	B	GPS - STATIC	1997	GPS805-B
2220919.942	907881.015	922566.058	16936704.119	.033	C	GPS - STATIC	1997	GPS805-C

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DATA-AB9900-3S-04AUG2009.jpg	S	Aug 4, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DATA-AB9900-2-04AUG2009.jpg		Aug 4, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DATA-AB9900-1-10DEC2008.jpg		Dec 10, 2008

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: DAVID

NGS Name: DAVID

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DO8460](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	18	131 N	42 W	460916.60	960032.97	2	C	2009	2025	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) Stamping: DAVID 2009

9.8 MILES SOUTH-SOUTHEAST OF FERGUS FALLS, 3.85 MILES SOUTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 SOUTH AND INTERSTATE HIGHWAY 94, AT TRUNK HIGHWAY 59 MILEPOINT 208.4, 93.0 FEET SOUTHWEST OF TRUNK HIGHWAY 59, 7.6 FEET NORTHEAST OF A RIGHT-OF-WAY POST, 1.0 FOOT NORTHEAST OF A WITNESS POST.

Station Pair: BROOKE - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1224.207	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1224.263	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1224.325	.016	2/1				VERTICAL ADJUSTMENT	2016	00000869
1224.325	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1224.345	.016	2/1				VERTICAL CONTROL SURVEY	2012	VTENN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1224.207			1136.976	.011	2011	HORIZONTAL ADJUSTMENT	2026	GPS3900
1224.207			1136.976	.011	2011	GPS - STATIC	2026	HTH55N
1224.181	.262		1136.897	.197	2011	GPS - OPUS	2022	GPSBM
1224.263	.262		1136.983	.197	2011	GPS - RTRN	2021	RTRN2021

Geoid Separations(ft): GEOID18 = -87.283 12B = -87.280 09 = -87.139 03 = -87.119

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>									
Geodetic Position		Otter Tail County				Project Info			
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
46 09 16.60379	96 00 32.96771	425867.919	117724.146	.007		ADJUSTMENT	2026	GPS3900	
46 09 16.60379	96 00 32.96771	425867.919	117724.146	.007	C	GPS - STATIC	2026	HTH55N	
46 09 16.60342	96 00 32.96758	425867.928	117724.108	.131	3	GPS - OPUS	2022	GPSBM	
46 09 16.60396	96 00 32.96748	425867.936	117724.163	.131	3	GPS - RTRN	2021	RTRN2021	

<u>NAD83(1996)</u>									
Geodetic Position		Otter Tail County				Project Info			
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 09 16.60326	96 00 32.96831	425867.877	117724.092	.066		NCAT	2026	HTH55N	

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>								
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2178903.099	754064.409	878108.444	16783525.114	.007		ADJUSTMENT	2026	GPS3900
2178903.099	754064.409	878108.444	16783525.114	.007	C	GPS - STATIC	2026	HTH55N
2178903.107	754064.371	878108.452	16783525.077	.131	3	GPS - OPUS	2022	GPSBM
2178903.116	754064.426	878108.461	16783525.131	.131	3	GPS - RTRN	2021	RTRN2021

<u>NAD83(1996)</u>								
MN State Plane - Central Zone		UTM - Zone 15		Project Info				
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2178903.056	754064.356	878108.400	16783525.062	.066		NCAT	2026	HTH55N



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DAVID-DO8460-3SW-22JUN2021.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DAVID-DO8460-2-22JUN2021.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DAVID-DO8460-1-22JUN2021.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
SW	Jun 22, 2021
	Jun 22, 2021
	Jun 22, 2021



Mn/DOT Name: DEAD

NGS Name: DEAD

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR9945](#) [Get Map](#)
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	19	136 N	43 W	463422.82	960852.53	2	C	2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 42 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: DEAD 2014

3.0 MILES WEST OF PELICAN RAPIDS, 3.1 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 108 MILEPOINT 8.95, 38.8 FEET NORTH OF TRUNK HIGHWAY 108, 0.55 MILE WEST OF COUNTY ROAD 113 AND 170TH AVENUE, 17.3 FEET EAST OF A FIELD ENTRANCE, 5.0 FEET EAST OF A WITNESS POST.

Station Pair: MAN - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1313.659	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1325.473			1226.149	.024	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1313.636	.131		1226.248	.066	1996	GPS - STATIC	2024	HTH108
1325.473			1226.149	.024	2011	GPS - STATIC	2024	HTH108
1313.678	.262		1226.080	.197	2011	GPS - RTRN	2022	RTRN2022
1313.518	.262		1225.933	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -99.396 12B = -87.585 09 = -87.470 03 = -87.365

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>								
Geodetic Position		Otter Tail County				Project Info		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 34 22.81951	96 08 52.52731	391529.695	270476.007	.013		ADJUSTMENT	2024	GPS3689
46 34 22.81951	96 08 52.52731	391529.695	270476.007	.013	C	GPS - STATIC	2024	HTH108
46 34 22.81915	96 08 52.52754	391529.679	270475.971	.131	3	GPS - RTRN	2022	RTRN2022
46 34 22.81894	96 08 52.52745	391529.684	270475.949	.131	3	GPS - RTRN	2014	RTRN2014

<u>NAD83(1996)</u>								
Geodetic Position		Otter Tail County				Project Info		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 34 22.81931	96 08 52.52786	391529.656	270475.987	.033	C	GPS - STATIC	2024	HTH108

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>								
MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2147402.338	907405.624	849026.698	16937401.592	.013		ADJUSTMENT	2024	GPS3689
2147402.338	907405.624	849026.698	16937401.592	.013	C	GPS - STATIC	2024	HTH108
2147402.321	907405.588	849026.680	16937401.557	.131	3	GPS - RTRN	2022	RTRN2022
2147402.327	907405.567	849026.685	16937401.535	.131	3	GPS - RTRN	2014	RTRN2014

<u>NAD83(1996)</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>				
<u>MN State Plane - Central Zone</u>								
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2147402.299	907405.605	849026.658	16937401.574	.033	C	GPS - STATIC	2024	HTH108



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DEAD-DR9945-3N-27JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DEAD-DR9945-2-27JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DEAD-DR9945-1-27JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Jul 27, 2023
	Jul 27, 2023
	Jul 27, 2023



Mn/DOT Name: DENT TEMP

NGS Name: DENT TEMP

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9298](#)
NGS Quad / Sta Num : 46095423/
USGS Quad: DENT

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	33	136 N	40 W	463322.11	954338.80		2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1982	2023	GOOD	Horz=NO Vert=NO	NO		FLUSH	MARKER IS STEEL ROD

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	SURVEY DISK	MNDT

Description: (2007) Stamping: DENT 1982

0.5 MILE EAST OF DENT, 0.5 MILE EAST OF DENT ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 35 IN DENT. THE STATION, A 2.0 INCH DIAMETER BY 2.0 INCH DIAMETER ALUMINUM CAP RIVETED TO A DRIVEN 30.0 INCH TELSPAR.

Station Notes

THE SURVEY MARK IS UNSUITABLE FOR MNDOT GEODETIC SURVEYS.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order / (Class)	Height	Acc	Adj		Year	Reference	
1396.464	.262		1309.144	.197	2011	GPS - RTRN	2023	RTRN2023	
1395.371	.197		1308.229	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648	

Geoid Separations(ft): GEOID18 = -87.319 12B = -87.310 09 = -87.195 03 = -87.083

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 22.10631	95 43 38.79890	497288.389	264029.471	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 22.10547	95 43 38.79936	497288.356	264029.386	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 22.10248	95 43 38.80092	497288.248	264029.083	.066	2	ADJUSTMENT	1997	16997

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2253010.265	899003.389	954518.306	16927314.210	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2253010.232	899003.305	954518.271	16927314.126	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2253010.117	899003.004	954518.151	16927313.827	.066	2	ADJUSTMENT	1997	16997

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DENT_TEMP-AD9298-3S-31JUL2023.jpg	S	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DENT_TEMP-AD9298-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DENT_TEMP-AD9298-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: DOCK

NGS Name: DOCK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7115](#) [Get Map](#)
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	32	135 N	43 W	462722.32	960716.83	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 37 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** DOCK 2009

2.1 MILES SOUTHWEST OF ERHARD, 2.35 MILES SOUTHWEST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 24 IN ERHARD, AT TRUNK HIGHWAY 59 MILEPOINT 232.10, 76.0 FEET EAST OF TRUNK HIGHWAY 59, 21.2 FEET NORTH OF EXTENDED 340TH STREET, 28.8 FEET NORTH OF A POWER POLE, 1.3 FEET WEST OF A WITNESS POST.

Station Pair: FLOE - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1283.331	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1283.364	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1283.367	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1283.331			1195.283	.020	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1283.331	.131		1195.395	.066	1996	GPS - STATIC	2023	HTH59
1283.331			1195.283	.020	2011	GPS - STATIC	2023	HTH59
1283.400	.262		1195.306	.197	2011	GPS - RTRN	2022	RTRN2022

Geoid Separations(ft): GEOID18 = -88.094 12B = -88.090 09 = -87.969 03 = -87.867

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y						Year	Reference
46 27 22.32214	96 07 16.82822	397997.881	227839.976	.010		ADJUSTMENT			2024	GPS3672
46 27 22.32214	96 07 16.82822	397997.881	227839.976	.010	C	GPS - STATIC			2023	HTH59
46 27 22.32226	96 07 16.82890	397997.833	227839.989	.131	3	GPS - RTRN			2022	RTRN2022

NAD83(1996)		Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y						Year	Reference
46 27 22.32191	96 07 16.82871	397997.846	227839.953	.033	C	GPS - STATIC			2023	HTH59

State Plane and UTM Coordinates (Feet)

NAD83(2011)		MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y						Year	Reference
2153079.537	864662.614	854024.691	16894557.193	.010		ADJUSTMENT			2024	GPS3672
2153079.537	864662.614	854024.691	16894557.193	.010	C	GPS - STATIC			2023	HTH59
2153079.489	864662.627	854024.644	16894557.207	.131	3	GPS - RTRN			2022	RTRN2022

NAD83(1996)		MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y						Year	Reference
2153079.502	864662.591	854024.655	16894557.171	.033	C	GPS - STATIC			2023	HTH59



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DOCK-DO7115-3E-17OCT2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DOCK-DO7115-2-17OCT2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DOCK-DO7115-1-17OCT2022.jpg

<u>Dir</u>	<u>Date</u>
E	Oct 17, 2022
	Oct 17, 2022
	Oct 17, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: DORA

NGS Name: DORA

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5764](#) [Get Map](#)
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	1	135 N	42 W	463234.42	955423.15	2	C	2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 44 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: DORA 2014

9.0 MILES WEST OF DENT, 9.4 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 22.05, 24.3 FEET SOUTH OF TRUNK HIGHWAY 108, 91.5 FEET WEST OF WEST EXTENDED SILENT DRIVE, 60.2 FEET WEST OF 280TH AVENUE, 13.2 FEET EAST-NORTHEAST OF A CABLE BOX, 1.5 NORTH OF A WITNESS POST.

Station Pair: BERRY - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1382.858	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1382.904			1295.453	.016	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1382.786	.131		1295.604	.066	1996	GPS - STATIC	2024	HTH108
1382.904			1295.453	.016	2011	GPS - STATIC	2024	HTH108
1382.875	.262		1295.398	.197	2011	GPS - RTRN	2023	RTRN2023
1382.861	.262		1295.385	.197	2011	GPS - RTRN	2022	RTRN2022
1382.832	.131		1295.604	.066	1996	GPS - STATIC	2021	HOTTE
1382.917			1295.453	.021	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1382.917			1295.453	.021	2011	GPS - STATIC	2020	HOTTE
1382.809	.262		1295.332	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.477 12B = -87.477 09 = -87.375 03 = -87.201

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Year</u>	<u>Reference</u>
46 32 34.41835	95 54 23.15422	452243.578	259255.196	.010		2024	GPS3689
46 32 34.41835	95 54 23.15422	452243.578	259255.196	.010	C	2024	HTH108
46 32 34.41867	95 54 23.15422	452243.578	259255.229	.131	3	2023	RTRN2023
46 32 34.41804	95 54 23.15379	452243.608	259255.165	.131	3	2022	RTRN2022
46 32 34.41835	95 54 23.15422	452243.578	259255.196	.013		2020	GPS3384
46 32 34.41835	95 54 23.15422	452243.578	259255.196	.013	C	2020	HOTTE
46 32 34.41804	95 54 23.15393	452243.598	259255.165	.131	3	2014	RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Year</u>	<u>Reference</u>
46 32 34.41802	95 54 23.15472	452243.543	259255.163	.033	C	2024	HTH108
46 32 34.41802	95 54 23.15472	452243.543	259255.163	.033	C	2021	HOTTE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2207890.482	895064.418	909330.483	16924093.340	.010		ADJUSTMENT	2024	GPS3689
2207890.482	895064.418	909330.483	16924093.340	.010	C	GPS - STATIC	2024	HTH108
2207890.482	895064.450	909330.484	16924093.373	.131	3	GPS - RTRN	2023	RTRN2023
2207890.511	895064.386	909330.512	16924093.308	.131	3	GPS - RTRN	2022	RTRN2022
2207890.482	895064.418	909330.483	16924093.340	.013		ADJUSTMENT	2020	GPS3384
2207890.482	895064.418	909330.483	16924093.340	.013	C	GPS - STATIC	2020	HOTTE
2207890.501	895064.386	909330.503	16924093.308	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2207890.446	895064.385	909330.447	16924093.308	.033	C	GPS - STATIC	2024	HTH108
2207890.446	895064.385	909330.447	16924093.308	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DORA-DR5764-3S-31JUL2023.jpg	S	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DORA-DR5764-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DORA-DR5764-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: DUNS

NGS Name: DUNS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2051](#) [Get Map](#)
NGS Quad / Sta Num : 46096121/
USGS Quad: CORMORANT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	20	137 N	42 W	463952.37	960048.29	2	C	1999	2023	GOOD	Horz=YES Vert=YES	YES		PROJECTS 1 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2014) Stamping: DUNS 1999

7.8 MILES NORTH OF PELICAN RAPIDS, 7.83 MILES NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 248.4, 120.0 FEET NORTHWEST OF TRUNK HIGHWAY 59, 1.0 FOOT SOUTHWEST OF A WITNESS POST.

Station Notes

THE ROD DEPTH IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1412.087	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1412.087			1324.797	.022	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1412.087	.131		1324.905	.066	1996	GPS - STATIC	2023	HTH59
1412.087			1324.797	.022	2011	GPS - STATIC	2023	HTH59
1412.136	.262		1324.837	.197	2011	GPS - RTRN	2022	RTRN2022
1412.290	.262		1324.991	.197	2011	GPS - RTRN	2022	RTRN2022
1412.094	.262		1324.810	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.300 12B = -87.287 09 = -87.175 03 = -87.041

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>									
Geodetic Position		Otter Tail County				Project Info			
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
46 39 52.37214	96 00 48.28624	425487.195	303708.344	.013		ADJUSTMENT	2024	GPS3672	
46 39 52.37214	96 00 48.28624	425487.195	303708.344	.013	C	GPS - STATIC	2023	HTH59	
46 39 52.37135	96 00 48.28635	425487.187	303708.264	.131	3	GPS - RTRN	2022	RTRN2022	
46 39 52.37128	96 00 48.28645	425487.180	303708.257	.131	3	GPS - RTRN	2022	RTRN2022	
46 39 52.37188	96 00 48.28706	425487.138	303708.318	.131	3	GPS - RTRN	2014	RTRN2014	

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 39 52.37191	96 00 48.28672	425487.161	303708.321	.033	C	GPS - STATIC	2023	HTH59

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>								
MN State Plane - Central Zone		UTM - Zone 15				Project Info		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2181964.847	939999.651	884117.988	16969450.266	.013		ADJUSTMENT	2024	GPS3672
2181964.847	939999.651	884117.988	16969450.266	.013	C	GPS - STATIC	2023	HTH59
2181964.838	939999.571	884117.977	16969450.186	.131	3	GPS - RTRN	2022	RTRN2022
2181964.831	939999.564	884117.970	16969450.179	.131	3	GPS - RTRN	2022	RTRN2022
2181964.790	939999.626	884117.929	16969450.241	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2181964.814	939999.628	884117.953	16969450.244	.033	C	GPS - STATIC	2023	HTH59



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DUNS-DQ2051-3NW-12OCT2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DUNS-DQ2051-2-12OCT2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/DUNS-DQ2051-1-12OCT2022.jpg

<u>Dir</u>	<u>Date</u>
NW	Oct 12, 2022
	Oct 12, 2022
	Oct 12, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: E 100

NGS Name: E 100

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0123](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	34	133 N	44 W	461716.00	961203.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	1973	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1973) **Stamping:** E-100 1934

6.1 MILES WEST OF FERGUS FALLS, 5.1 MILES WEST ALONG WEST LINCOLN AVENUE FROM THE JUNCTION OF WEST LINCOLN AVENUE AND NORTH UNION AVENUE IN FERGUS FALLS, THEN 1.0 MILE WEST ALONG TRUNK HIGHWAY 210, THEN 230.0 FEET SOUTH ALONG TRUNK HIGHWAY 138TH AVENUE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1111.395	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1110.588	.007	1				VERTICAL CONTROL SURVEY	1941	Q460962
1110.588	.007	1				VERTICAL CONTROL SURVEY	1934	L97 MINN

Geoid Separations(ft): GEOID18 = -88.287 12B = -88.271 09 = -88.166 03 = -88.113

* No Horizontal Positions in the Database *



Mn/DOT Name: E 4

NGS Name: E 4

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	10	134 N	44 W	462608.45	961305.04	1	2

NGS ACRN: RP0111	Get Map
NGS Quad / Sta Num : 46096214/1011	
USGS Quad: ELIZABETH	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1906	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION
<u>Monument Type</u>				<u>Disk Type</u>	<u>Mon. Agency</u>		
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)				PIPE CAP	NGS		

Description: (2005)

Stamping:

4.5 MILES SOUTHEAST OF ROTHSA, 0.1 MILE SOUTH-SOUTHEAST ALONG RAILROAD DRIVE FROM THE JUNCTION OF RAILROAD DRIVE AND 1ST AVENUE SOUTHWEST IN ROTHSA, THEN 3.0 MILES EAST ALONG COUNTY ROAD 26 (3RD AVENUE SOUTHWEST), THEN 420.0 FEET EAST-SOUTHEAST ALONG 330TH STREET, THEN 2.7 MILES SOUTH ALONG 130TH AVENUE, 1.0 FOOT EAST OF A FENCE, ON THE EAST SIDE OF A ROAD, IN A FENCE CORNER.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1383.521	.007	1					VERTICAL CONTROL SURVEY	1993	POSTED
<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1382.609	.007	1					VERTICAL CONTROL SURVEY	1929	Q460962
1382.609	.007	1					VERTICAL CONTROL SURVEY	1905	L36 MINN
<u>GA1912</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1383.078	.007	1					VERTICAL ADJUSTMENT	1914	GA1912

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1383.527	.197			1295.634	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648
<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1382.609							RECIPROCAL VERTICAL ANGLE	1906	HORZ

Geoid Separations(ft): GEOID18 = -88.218 12B = -88.215 09 = -88.110 03 = -88.035

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Geodetic Position</u>				<u>Project Info</u>			
				<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
				46 26 08.44524	96 13 05.03738	373570.319	220495.283	.066	2	ADJUSTMENT	1999 17648
				46 26 08.44520	96 13 05.03728	373570.326	220495.279	.066	2	ADJUSTMENT	1998 17655
<u>NAD83(1986)</u>				<u>Geodetic Position</u>				<u>Project Info</u>			
				<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
				46 26 08.44470	96 13 05.02864	373570.931	220495.225	.066	2	ADJUSTMENT	1986 17289
<u>NAD27</u>				<u>Geodetic Position</u>				<u>Project Info</u>			
				<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
				46 26 08.59000	96 13 03.81000			.100	2	CLASSICAL SURVEY	1928 00155
<u>USSD</u>				<u>Geodetic Position</u>				<u>Project Info</u>			
				<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
				46 26 08.78000	96 13 04.19000				3	CLASSICAL SURVEY	17389-73



State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2128523.386	857772.186	829352.267	16888054.825	.066	2	ADJUSTMENT	1999	17648
2128523.393	857772.181	829352.274	16888054.820	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2128523.996	857772.116	829352.877	16888054.745	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1503927.909	529698.097			.100	2	CLASSICAL SURVEY	1928	00155



Mn/DOT Name: EAGLE

NGS Name: EAGLE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7771](#) [Get Map](#)
NGS Quad / Sta Num : 46095324/
USGS Quad: EAGLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	3	131 N	40 W	461114.01	954228.58	2	C	2000	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 10 FT)	SURVEY DISK	MN-111

Description: (2000) Stamping: EAGLE 2000

6.4 MILES SOUTH OF BATTLE LAKE, 6.10 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 15.45, 71.0 FEET EAST OF TRUNK HIGHWAY 78, 45.5 FEET SOUTH OF A POWER POLE, 136.0 FEET NORTH OF AN ENTRANCE TO RADIO TOWER ENTRANCE NUMBER 15462, 5.0 FEET WEST OF A RIGHT-OF-WAY POST, 83.5 FEET NORTHWEST OF THE NORTHWEST CORNER OF A TOWER FENCE, 2.2 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1401.116	.016	2/1				VERTICAL ADJUSTMENT	2013 00000792
1401.119	.016	2/1				VERTICAL CONTROL SURVEY	2012 VASHB

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1401.116			1313.980	.013	2011	HORIZONTAL ADJUSTMENT	2024 GPS3771
1401.116	.131		1314.095	.066	1996	GPS - STATIC	2024 HTH78B
1401.116			1313.980	.013	2011	GPS - STATIC	2024 HTH78B
1401.054	.262		1313.954	.197	2011	GPS - RTRN	2023 RTRN2023
1400.962	.262		1313.993	.197	1996	GPS - RTRN	2009 RTRN2009

Geoid Separations(ft): GEOID18 = -87.100 12B = -87.109 09 = -87.004 03 = -86.965

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 11 14.00999	95 42 28.58416	502210.462	129481.182	.010		ADJUSTMENT	2024 GPS3771
46 11 14.00999	95 42 28.58416	502210.462	129481.182	.010	C	GPS - STATIC	2024 HTH78B
46 11 14.00979	95 42 28.58475	502210.420	129481.162	.131	3	GPS - RTRN	2023 RTRN2023

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 11 14.00986	95 42 28.58446	502210.441	129481.169	.033	C	GPS - STATIC	2024 HTH78B
46 11 14.00920	95 42 28.58499	502210.404	129481.102	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2255439.837	764404.628	954819.002	16792665.169	.010		ADJUSTMENT	2024 GPS3771
2255439.837	764404.628	954819.002	16792665.169	.010	C	GPS - STATIC	2024 HTH78B
2255439.795	764404.608	954818.960	16792665.150	.131	3	GPS - RTRN	2023 RTRN2023

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2255439.815	764404.615	954818.980	16792665.156	.033	C	GPS - STATIC	2024 HTH78B
2255439.777	764404.549	954818.941	16792665.090	.131	3	GPS - RTRN	2009 RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/EAGLE-DO7771-3E-16OCT2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/EAGLE-DO7771-2-16OCT2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/EAGLE-DO7771-1-16OCT2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Oct 16, 2023
	Oct 16, 2023
	Oct 16, 2023



Mn/DOT Name: EDDY

NGS Name: EDDY

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R01126](#) [Get Map](#)
NGS Quad / Sta Num : 46095344/1009
USGS Quad: HEILBERGER LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	28	135 N	42 W	462857.43	955816.01		1	1935	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (1982) Stamping: EDDY 1935

6.0 MILES EAST OF ERHARD, ON A PROMINENT TIMBERED HILL, 6.2 MILES EAST ON COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND TRUNK HIGHWAY 59 THEN 0.15 MILE SOUTH ON 250TH AVENUE TO A HOUSE WEST, THEN WALK 700.0 FEET WEST OF A HOUSE, 2.5 FEET NORTHWEST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1668.140	.131			1580.545	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1669.911							RECIPROCAL VERTICAL ANGLE	1935	HORZ

Geoid Separations(ft): GEOID18 = -87.861 12B = -87.844 09 = -87.752 03 = -87.602

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 28 57.42980	95 58 16.00594			435895.230	237317.574	.033	1	ADJUSTMENT	1999 17648
46 28 57.42916	95 58 16.00677			435895.172	237317.509	.033	1	ADJUSTMENT	1998 17655

<u>NAD83(1986)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 28 57.43085	95 58 15.99980			435895.660	237317.679	.033	1	ADJUSTMENT	1986 17289

<u>NAD27</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>
<u>Geodetic Position</u>									<u>Year</u> <u>Reference</u>
<u>Latitude</u>	<u>Longitude</u>								
46 28 57.57700	95 58 14.80900					.100	1	CLASSICAL SURVEY	1944 05937

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2191140.945	873435.956			892233.941	16902727.677	.033	1	ADJUSTMENT	1999 17648
2191140.886	873435.893			892233.881	16902727.615	.033	1	ADJUSTMENT	1998 17655

<u>NAD83(1986)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2191141.378	873436.053			892234.375	16902727.768	.033	1	ADJUSTMENT	1986 17289

<u>NAD27</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>
<u>MN State Plane - Central Zone</u>									<u>Year</u> <u>Reference</u>
<u>X</u>	<u>Y</u>								
1566545.125	545362.300					.100	1	CLASSICAL SURVEY	1944 05937



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/EDDY-RO1126-3E-19AUG2009.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/EDDY-RO1126-2-19AUG2009.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/EDDY-RO1126-1-19AUG2009.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Aug 19, 2009
	Aug 19, 2009
	Aug 19, 2009



Mn/DOT Name: EDDY AZ MK

NGS Name: EDDY AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP3689](#) [Get Map](#)
NGS Quad / Sta Num : 46095344/1009
USGS Quad: HEILBERGER LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	34	135 N	42 W	462806.00	955800.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	2009	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	STEEL ROD ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	NGS

Description: Stamping: EDDY 1935

6.0 MILES EAST OF ERHARD, ON A PROMINENT TIMBERED HILL, 6.2 MILES EAST ON COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND TRUNK HIGHWAY 59 THEN 0.15 MILE SOUTH ON A TOWNSHIP ROAD TO A HOUSE WEST, 1.0 FOOT NORTHEAST OF THE NORTHEAST CORNER OF A HOUSE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.903 12B = -87.894 09 = -87.795 03 = -87.644



Mn/DOT Name: EDDY RM 1

NGS Name: EDDY RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9313](#) [Get Map](#)
NGS Quad / Sta Num : 46095344/
USGS Quad: HEILBERGER LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	28	135 N	42 W	462856.98	955817.46		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	NGS

Description: (2007)

Stamping: EDDY NO 1 1935

6.0 MILES EAST OF ERHARD, 6.2 MILES EAST ALONG TRUNK HIGHWAY 24 FROM THE JUNCTION OF TRUNK HIGHWAY 24 AND TRUNK HIGHWAY 59 IN ERHARD, THEN 0.15 MILE SOUTH ON 250TH AVENUE, THEN WALK 800.0 FEET WEST ON THE TOP OF A HILL, 111.36 FEET SOUTH-SOUTHWEST OF STATION EDDY.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	
1667.976	.262			1580.381	.197	1996	HORIZONTAL ADJUSTMENT	1999 17648

Geoid Separations(ft): GEOID18 = -87.861 12B = -87.844 09 = -87.752 03 = -87.605

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Lat/Lon</u>		<u>County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 28 56.97685	95 58 17.45585	435793.614	237272.012	.131	3	ADJUSTMENT	1999	17648	
46 28 56.97621	95 58 17.45668	435793.555	237271.947	.131	3	ADJUSTMENT	1998	17655	

<u>NAD83(1986)</u>		<u>Geodetic Position</u>		<u>Lat/Lon</u>		<u>County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 28 56.97791	95 58 17.44964	435794.048	237272.118	.131	3	ADJUSTMENT	1997	16997	

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
2191038.516	873392.289	892130.799	16902685.630	.131	3	ADJUSTMENT	1999 17648
2191038.457	873392.225	892130.738	16902685.568	.131	3	ADJUSTMENT	1998 17655

<u>NAD83(1986)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
2191038.953	873392.387	892131.237	16902685.721	.131	3	ADJUSTMENT	1997 16997

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/EDDY_RM_1-AD9313-3SW-19AUG2009.jpg	SW	Aug 19, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/EDDY_RM_1-AD9313-2-19AUG2009.jpg		Aug 19, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/EDDY_RM_1-AD9313-1-19AUG2009.jpg		Aug 19, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: EDDY RM 2

NGS Name: EDDY RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9314](#) [Get Map](#)
NGS Quad / Sta Num : 46095344/
USGS Quad: HEILBERGER LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	28	125 N	42 W	462858.04	955816.37		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	NGS

Description: (2007)

Stamping: EDDY NO 2 1935

6.0 MILES EAST OF ERHARD, 6.2 MILES EAST ALONG TRUNK HIGHWAY 24 FROM THE JUNCTION OF TRUNK HIGHWAY 24 AND TRUNK HIGHWAY 59 IN ERHARD, THEN 0.15 MILE SOUTH ON 250TH AVENUE, THEN WALK 800.0 FEET TO THE WEST ON THE TOP OF A HILL, 66.94 FEET NORTHWEST OF STATION EDDY.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1667.976	.262			1580.381	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.861 12B = -87.844 09 = -87.752 03 = -87.602

Lat/Lon and County Coordinates (Feet)

NAD83(1996)		Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference		
46 28 58.03948	95 58 16.37481	435869.614	237379.424	.131	3	ADJUSTMENT	1999	17648		
46 28 58.03885	95 58 16.37563	435869.557	237379.360	.131	3	ADJUSTMENT	1998	17655		

NAD83(1986)		Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference		
46 28 58.04052	95 58 16.36867	435870.044	237379.528	.131	3	ADJUSTMENT	1997	16997		

State Plane and UTM Coordinates (Feet)

NAD83(1996)		MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference		
2191116.482	873498.262	892210.464	1690279.384	.131	3	ADJUSTMENT	1999	17648		
2191116.424	873498.199	892210.404	1690279.322	.131	3	ADJUSTMENT	1998	17655		

NAD83(1986)		MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference		
2191116.914	873498.358	892210.897	1690279.473	.131	3	ADJUSTMENT	1997	16997		

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/EDDY_RM_2-AD9314-3E-19AUG2009.jpg	E	Aug 19, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/EDDY_RM_2-AD9314-2-19AUG2009.jpg		Aug 19, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/EDDY_RM_2-AD9314-1-19AUG2009.jpg		Aug 19, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: ELKS

NGS Name: ELKS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4345](#) [Get Map](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	34	133 N	42 W	461658.54	955705.14	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 34 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: ELKS 2014

5.5 MILES EAST OF FERGUS FALLS, 7.3 MILES EAST-NORTHEAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 33.8, 63.4 FEET SOUTH-SOUTHWEST OF TRUNK HIGHWAY 210, 28.5 FEET SOUTH-SOUTHEAST OF CABLE BOX NUMBER 635, 1.5 FEET NORTH-NORTHEAST OF A WITNESS POST.

Station Pair: WEGGE - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1291.884	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1291.874	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1291.867	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1291.884			1203.734	.017	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1291.782	.131		1203.859	.066	1996	GPS - STATIC	2024	HTH210A
1291.884			1203.734	.017	2011	GPS - STATIC	2024	HTH210A
1291.881	.262		1203.794	.197	2011	GPS - RTRN	2023	RTRN2023
1291.763	.262		1203.679	.197	2011	GPS - OPUS	2022	GPSBM
1291.818	.262		1203.734	.197	2011	GPS - OPUS	2022	GPSBM
1291.812	.262		1203.728	.197	2011	GPS - RTRN	2021	RTRN2021
1291.782	.262		1203.679	.197	2011	GPS - RTRN	2015	RTRN2015
1291.782	.262		1203.679	.197	2011	GPS - RTRN	2015	RTRN2015
1291.776	.262		1203.669	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -88.084 12B = -88.103 09 = -87.979 03 = -87.854

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
46 16 58.53688	95 57 05.13700	440638.669	164472.128	.010		ADJUSTMENT			2025	GPS3793
46 16 58.53688	95 57 05.13700	440638.669	164472.128	.010	C	GPS - STATIC			2024	HTH210A
46 16 58.53659	95 57 05.13579	440638.754	164472.098	.131	3	GPS - RTRN			2023	RTRN2023
46 16 58.53655	95 57 05.13644	440638.708	164472.094	.131	3	GPS - OPUS			2022	GPSBM
46 16 58.53662	95 57 05.13677	440638.685	164472.102	.131	3	GPS - OPUS			2022	GPSBM
46 16 58.53717	95 57 05.13650	440638.704	164472.157	.131	3	GPS - RTRN			2021	RTRN2021
46 16 58.53580	95 57 05.13680	440638.683	164472.018	.131	3	GPS - RTRN			2015	RTRN2015
46 16 58.53580	95 57 05.13680	440638.683	164472.018	.131	3	GPS - RTRN			2015	RTRN2015
46 16 58.53675	95 57 05.13648	440638.706	164472.115	.131	3	GPS - RTRN			2014	RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
46 16 58.53657	95 57 05.13736	440638.644	164472.097	.033	C	GPS - STATIC			2024	HTH210A

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2194534.604	800524.696	894473.908	16829748.890	.010		ADJUSTMENT	2025	GPS3793
2194534.604	800524.696	894473.908	16829748.890	.010	C	GPS - STATIC	2024	HTH210A
2194534.689	800524.664	894473.991	16829748.857	.131	3	GPS - RTRN	2023	RTRN2023
2194534.643	800524.661	894473.946	16829748.855	.131	3	GPS - OPUS	2022	GPSBM
2194534.620	800524.669	894473.923	16829748.863	.131	3	GPS - OPUS	2022	GPSBM
2194534.640	800524.724	894473.944	16829748.918	.131	3	GPS - RTRN	2021	RTRN2021
2194534.616	800524.586	894473.917	16829748.780	.131	3	GPS - RTRN	2015	RTRN2015
2194534.616	800524.586	894473.917	16829748.780	.131	3	GPS - RTRN	2015	RTRN2015
2194534.640	800524.682	894473.944	16829748.876	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2194534.578	800524.665	894473.881	16829748.859	.033	C	GPS - STATIC	2024	HTH210A

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ELKS-DQ4345-3S-21FEB2024.jpg	S	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ELKS-DQ4345-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ELKS-DQ4345-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: ELLIOT

NGS Name: ELLIOT

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2716](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

Reference		Reference		Vert	Horz		
1/4	Sec	Twp	Rng	Latitude	Longitude	Order	Order
SE	7	133 N	43 W	462040.57	960814.48	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 24 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) **Stamping:** ELLIOT 2014

5.5 MILES NORTHWEST OF FERGUS FALLS, 0.6 MILE NORTHWEST ALONG WESTBOUND INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 (THE JUNCTION IS 4.5 MILES NORTHWEST OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 50.15, 63.2 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 20.8 FEET SOUTHWEST OF A RIGHT-OF-WAY FENCE, 1.5 FEET SOUTHWEST OF A WITNESS POST.

Station Pair: GUS MNDT - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1237.183	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1237.176	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1237.206	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1237.183			1148.895	.012	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1237.183			1148.895	.012	2011	GPS - STATIC	2025	HTH94B
1238.495	.262		1150.204	.197	2011	GPS - RTRN	2023	RTRN2023
1237.202	.262		1148.908	.197	2011	GPS - RTRN	2022	RTRN2022
1237.101	.262		1148.817	.197	2011	GPS - RTRN	2015	RTRN2015
1237.124	.262		1148.840	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -88.294 12B = -88.284 09 = -88.179 03 = -88.110

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 40.56942	96 08 14.47816	393744.991	187160.279	.007		ADJUSTMENT	2025	GPS3847
46 20 40.56942	96 08 14.47816	393744.991	187160.279	.007	C	GPS - STATIC	2025	HTH94B
46 20 40.56946	96 08 14.47788	393745.011	187160.283	.131	3	GPS - RTRN	2023	RTRN2023
46 20 40.56986	96 08 14.47828	393744.984	187160.324	.131	3	GPS - RTRN	2022	RTRN2022
46 20 40.56872	96 08 14.47803	393745.000	187160.208	.131	3	GPS - RTRN	2015	RTRN2015
46 20 40.56943	96 08 14.47805	393744.999	187160.280	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 40.56895	96 08 14.47883	393744.944	187160.232	.066		NCAT	2025	HTH94B

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2148075.077	824073.882	848375.612	16854037.103	.007		ADJUSTMENT	2025	GPS3847
2148075.077	824073.882	848375.612	16854037.103	.007	C	GPS - STATIC	2025	HTH94B
2148075.097	824073.885	848375.632	16854037.106	.131	3	GPS - RTRN	2023	RTRN2023
2148075.069	824073.926	848375.605	16854037.148	.131	3	GPS - RTRN	2022	RTRN2022
2148075.084	824073.811	848375.618	16854037.032	.131	3	GPS - RTRN	2015	RTRN2015
2148075.084	824073.882	848375.620	16854037.104	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2148075.029	824073.835	848375.563	16854037.057	.066		NCAT	2025	HTH94B

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ELLIOT-DQ2716-3NE-14AUG2023.jpg	NE	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ELLIOT-DQ2716-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ELLIOT-DQ2716-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: ERHARD

NGS Name: ERHARD

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7125](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	9	135 N	43 W	463117.52	960541.49	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1998	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	SURVEY DISK	MNDT

Description: (1998) **Stamping:** ERHARD 1998

2.4 MILES NORTH OF ERHARD, 2.65 MILES NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 24 IN ERHARD TO TRUNK HIGHWAY 59 MILEPOINT 273.15, THEN 0.3 MILE WEST ALONG COUNTY ROAD 28, 43.0 FEET SOUTH OF COUNTY ROAD 28, 10.0 FEET WEST OF A FIELD ENTRANCE, 29.5 FEET WEST OF A RIGHT-OF-WAY POST, 7.2 FEET EAST OF A WITNESS POST.

Station Pair: 5617 N - OTTER TAIL, MN

Station Notes

SET BY DISTRICT 4 SURVEYS.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1364.164	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1364.220	.016	2/1				VERTICAL ADJUSTMENT	2013 00000792
1364.230	.016	2/1				VERTICAL CONTROL SURVEY	2012 VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1364.164			1276.336	.020	2011	HORIZONTAL ADJUSTMENT	2024 GPS3672
1364.164	.131		1276.448	.066	1996	GPS - STATIC	2023 HTH59
1364.164			1276.336	.020	2011	GPS - STATIC	2023 HTH59
1364.144	.262		1276.336	.197	2011	GPS - RTRN	2022 RTRN2022
1364.088	.262		1276.280	.197	2011	GPS - OPUS	2022 GPSBM
1364.167	.262		1276.359	.197	2011	GPS - OPUS	2022 GPSBM
1364.148	.262		1276.339	.197	2011	GPS - RTRN	2021 RTRN2021

Geoid Separations(ft): GEOID18 = -87.808 12B = -87.805 09 = -87.680 03 = -87.562

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County		Project Info		
Latitude	Longitude	X	Y	Acc	Order	Reference
46 31 17.51884	96 05 41.48713	404787.214	251634.694	.013		ADJUSTMENT 2024 GPS3672
46 31 17.51884	96 05 41.48713	404787.214	251634.694	.013	C	GPS - STATIC 2023 HTH59
46 31 17.51922	96 05 41.48769	404787.175	251634.732	.131	3	GPS - RTRN 2022 RTRN2022
46 31 17.51833	96 05 41.48768	404787.175	251634.642	.131	3	GPS - OPUS 2022 GPSBM
46 31 17.51837	96 05 41.48768	404787.175	251634.646	.131	3	GPS - OPUS 2022 GPSBM
46 31 17.51855	96 05 41.48721	404787.208	251634.664	.131	3	GPS - RTRN 2021 RTRN2021

NAD83(1996)		Otter Tail County		Project Info		
Latitude	Longitude	X	Y	Acc	Order	Reference
46 31 17.51862	96 05 41.48764	404787.178	251634.672	.033	C	GPS - STATIC 2023 HTH59



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2160307.214	888324.562	861630.525	16918110.030	.013		ADJUSTMENT	2024	GPS3672
2160307.214	888324.562	861630.525	16918110.030	.013	C	GPS - STATIC	2023	HTH59
2160307.176	888324.601	861630.487	16918110.070	.131	3	GPS - RTRN	2022	RTRN2022
2160307.174	888324.511	861630.484	16918109.979	.131	3	GPS - OPUS	2022	GPSBM
2160307.174	888324.515	861630.485	16918109.983	.131	3	GPS - OPUS	2022	GPSBM
2160307.208	888324.532	861630.518	16918110.000	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2160307.178	888324.540	861630.488	16918110.009	.033	C	GPS - STATIC	2023	HTH59

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ERHARD-DO7125-3S-17OCT2022.jpg	S	Oct 17, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ERHARD-DO7125-2-17OCT2022.jpg		Oct 17, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ERHARD-DO7125-1-17OCT2022.jpg		Oct 17, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: ERICKSON RESET

NGS Name: ERICKSON RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	34	132 N	42 W	461235.62	955722.12		3	2009	2009	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009)

Stamping: ERICKSON 1998 2009

3.0 MILES NORTHWEST OF DALTON, 0.15 MILE WEST ALONG COUNTY ROAD 12 FROM THE JUNCTION OF COUNTY ROAD 12 AND COUNTY ROAD 35 IN DALTON, THEN 0.15 MILE NORTH ALONG CEDAR AVENUE, THEN 2.85 MILES NORTH AND NORTHWEST ALONG DALTON ROAD, THEN 0.5 MILE WEST ALONG 170TH STREET, 19.5 FEET SOUTH OF 170TH STREET, 12.0 FEET NORTH OF A WITNESS POST

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1362.169	.262			1274.692	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.667 12B = -87.670 09 = -87.542 03 = -87.477

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 12 35.61521	95 57 22.11821			439365.291	137839.992	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2192768.659	773924.258			892288.748	16803171.202	.131	3	GPS - RTRN	2009 RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ERICKSON_RESET-3S-23SEP2009.jpg	S	Sep 23, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ERICKSON_RESET-2-23SEP2009.jpg		Sep 23, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ERICKSON_RESET-1-23SEP2009.jpg		Sep 23, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: EVIL

NGS Name: EVIL

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2720](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	26	134 N	44 W	462345.30	961143.07	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 28 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: EVIL 2014

7.0 MILES SOUTHEAST OF ROTHSA, 7.3 MILES SOUTHEAST ALONG EASTBOUND INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 11 IN ROTHSA, AT INTERSTATE HIGHWAY 94 MILEPOINT 45.55, 114.5 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94 FOG LINE, 17.5 FEET NORTHEAST OF A RIGHT-OF-WAY FENCE, 1.5 FEET NORTHEAST OF A WITNESS POST.

Station Pair: REED - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1299.345	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1299.400	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1299.397	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1299.345			1211.120	.015	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1299.345			1211.120	.015	2011	GPS - STATIC	2025	HTH94B
1300.654	.262		1212.379	.197	2011	GPS - RTRN	2023	RTRN2023
1299.345	.131		1211.267	.066	1996	GPS - STATIC	2021	HOTTE
1299.345			1211.120	.024	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1299.345			1211.120	.024	2011	GPS - STATIC	2020	HOTTE
1299.279	.262		1211.015	.197	2011	GPS - RTRN	2015	RTRN2015
1299.348	.262		1211.080	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -88.271 12B = -88.268 09 = -88.159 03 = -88.094

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 23 45.29864	96 11 43.07405	379223.425	205957.848	.010		ADJUSTMENT		2025	GPS3847	
46 23 45.29864	96 11 43.07405	379223.425	205957.848	.010	C	GPS - STATIC		2025	HTH94B	
46 23 45.29894	96 11 43.07339	379223.471	205957.878	.131	3	GPS - RTRN		2023	RTRN2023	
46 23 45.29864	96 11 43.07405	379223.425	205957.848	.016		ADJUSTMENT		2020	GPS3384	
46 23 45.29864	96 11 43.07405	379223.425	205957.848	.016	C	GPS - STATIC		2020	HOTTE	
46 23 45.29809	96 11 43.07375	379223.446	205957.792	.131	3	GPS - RTRN		2015	RTRN2015	
46 23 45.29840	96 11 43.07405	379223.425	205957.824	.131	3	GPS - RTRN		2014	RTRN2014	

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 23 45.29817	96 11 43.07474	379223.376	205957.801	.066		NCAT		2025	HTH94B	
46 23 45.29834	96 11 43.07455	379223.390	205957.818	.033	C	GPS - STATIC		2021	HOTTE	



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2133905.768	843134.512	834504.058	16873327.412	.010		ADJUSTMENT	2025	GPS3847
2133905.768	843134.512	834504.058	16873327.412	.010	C	GPS - STATIC	2025	HTH94B
2133905.815	843134.541	834504.105	16873327.441	.131	3	GPS - RTRN	2023	RTRN2023
2133905.768	843134.512	834504.058	16873327.412	.016		ADJUSTMENT	2020	GPS3384
2133905.768	843134.512	834504.058	16873327.412	.016	C	GPS - STATIC	2020	HOTTE
2133905.787	843134.455	834504.077	16873327.356	.131	3	GPS - RTRN	2015	RTRN2015
2133905.767	843134.487	834504.057	16873327.388	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2133905.718	843134.465	834504.007	16873327.366	.066		NCAT	2025	HTH94B
2133905.732	843134.482	834504.022	16873327.383	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/EVIL-DQ2720-3SW-03AUG2023.jpg	SW	Aug 3, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/EVIL-DQ2720-2-03AUG2023.jpg		Aug 3, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/EVIL-DQ2720-1-03AUG2023.jpg		Aug 3, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: F 100

NGS Name: F 100

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0124](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	36	133 N	44 W	461735.00	960939.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	2011	NOT FOUND	Horz=NO Vert=NO	NO		FLUSH	MARKER IS STEEL ROD

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	BENCH MARK DISK	NGS

Description: (1934)

Stamping: F 100 1934

2.1 MILES EAST OF FRENCH, 33.0 FEET EAST OF RAILROAD MILEPOST 54, 60.0 FEET SOUTH OF TRUNK HIGHWAY 210, 34.0 FEET NORTH OF A RAILROAD.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1165.434	.016	2/0				VERTICAL ADJUSTMENT	1991 00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1164.614	.016	2/0				UNKNOWN/APPROXIMATE	1992 UNCHECKD
1164.614	.007	1				VERTICAL CONTROL SURVEY	1941 Q460962
1164.614	.007	1				VERTICAL CONTROL SURVEY	1934 L97 MINN

Geoid Separations(ft): GEOID18 = -88.271 12B = -88.258 09 = -88.149 03 = -88.087

* No Horizontal Positions in the Database *



Mn/DOT Name: FAIR

NGS Name: FAIR

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DP2118](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SE	33	133 N	44 W	461712.38	961321.58	2	C	2011	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2011) Stamping: FAIR 2011

6.6 MILES WEST OF FERGUS FALLS, 4.95 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 19.3, 75.1 FEET NORTH OF TRUNK HIGHWAY 210, 20.3 FEET WEST OF THE ENTRANCE TO A GRASS PARKING AREA, 1.5 FEET EAST OF A WITNESS POST.

Station Pair: CLOUGH - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u> <u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1088.761	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1088.771	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1088.817	.016	2/1				VERTICAL ADJUSTMENT	2015	00000821-R
1088.817	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1088.817	.016	2/1				VERTICAL CONTROL SURVEY	2013	VBREC

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u> <u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1088.761			1000.497	.021	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1088.761	.131		1000.615	.066	1996	GPS - STATIC	2024	HTH210A
1088.761			1000.497	.021	2011	GPS - STATIC	2024	HTH210A
1088.774	.262		1000.474	.197	2011	GPS - RTRN	2023	RTRN2023
1088.672	.262		1000.372	.197	2011	GPS - OPUS	2022	GPSBM
1088.731	.262		1000.431	.197	2011	GPS - OPUS	2022	GPSBM
1088.695	.262		1000.395	.197	2011	GPS - RTRN	2021	RTRN2021

Geoid Separations(ft): GEOID18 = -88.300 12B = -88.284 09 = -88.179 03 = -88.130

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u> <u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 17 12.37619	96 13 21.58247	372064.055	166195.277	.013		ADJUSTMENT	2025	GPS3793
46 17 12.37619	96 13 21.58247	372064.055	166195.277	.013	C	GPS - STATIC	2024	HTH210A
46 17 12.37620	96 13 21.58244	372064.057	166195.278	.131	3	GPS - RTRN	2023	RTRN2023
46 17 12.37618	96 13 21.58338	372063.991	166195.277	.131	3	GPS - OPUS	2022	GPSBM
46 17 12.37628	96 13 21.58345	372063.986	166195.287	.131	3	GPS - OPUS	2022	GPSBM
46 17 12.37604	96 13 21.58206	372064.083	166195.262	.131	3	GPS - RTRN	2021	RTRN2021

<u>NAD83(1996)</u> <u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 17 12.37590	96 13 21.58284	372064.029	166195.248	.033	C	GPS - STATIC	2024	HTH210A



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2126012.741	803516.466	825982.177	16833822.190	.013		ADJUSTMENT	2025	GPS3793
2126012.741	803516.466	825982.177	16833822.190	.013	C	GPS - STATIC	2024	HTH210A
2126012.743	803516.467	825982.179	16833822.191	.131	3	GPS - RTRN	2023	RTRN2023
2126012.677	803516.467	825982.113	16833822.192	.131	3	GPS - OPUS	2022	GPSBM
2126012.673	803516.477	825982.109	16833822.202	.131	3	GPS - OPUS	2022	GPSBM
2126012.770	803516.450	825982.205	16833822.174	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2126012.715	803516.437	825982.150	16833822.162	.033	C	GPS - STATIC	2024	HTH210A

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FAIR-DP2118-3N-21FEB2024.jpg	N	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FAIR-DP2118-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FAIR-DP2118-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: FALLPORT

NGS Name: FALLPORT

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP1208](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	36	133 N	44 W	461718.48	960928.42	2	B

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1989	2013	GOOD	Horz=NO Vert=NO	YES		RECESSED 4 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
STEEL ROD (IN SLEEVE) (DEPTH 32 FT)	METAL ROD	NGS

Description: (2008)

Stamping: FALLPORT 1989

2.0 MILES WEST OF FERGUS FALLS, 0.25 MILE NORTHWEST OF THE AIRPORT OFFICE, 1.4 MILES WEST ON TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 AT TRUNK HIGHWAY 210 MILEPOST 22.9, THEN 0.45 MILE SOUTH ON THE AIRPORT ENTRANCE, THEN 0.1 MILE NORTHWEST AROUND THE HANGERS TO THE TARMAC, THEN 0.2 MILE SOUTH TO A TAXIWAY, THEN 0.3 MILE NORTHWEST ON A TAXIWAY, 113.0 FEET NORTHEAST OF THE NORTHEAST EDGE OF A TAXIWAY, 17.5 FEET NORTHWEST OF A ROAD TO VOR, 4.3 FEET SOUTHWEST OF A WITNESS POST.

Station Notes

CONTACT THE AIRPORT MANAGER BEFORE USE. FERGUS FALLS MUNICIPAL AIRPORT.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1179.801	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1179.801	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1179.830	.016	2/1				VERTICAL ADJUSTMENT	2015	00000821-R
1179.830	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1179.830	.016	2/1				VERTICAL CONTROL SURVEY	2013	VBREC
1179.830	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1179.830	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFALL

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1179.830			1091.622	.016	2011	HORIZONTAL ADJUSTMENT	2015	GPS3080
1179.830	.131		1091.766	.066	1996	GPS - STATIC	2015	HWILK
1179.830			1091.605	.016	2011	GPS - STATIC	2015	HWILK
1179.702	.262		1091.455	.197	2011	GPS - RTRN	2013	RTRN2013
			1091.622	.021	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1179.755	.262		1091.681	.197	1996	GPS - RTRN	2009	RTRN2009
			1091.704	.022	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1179.722	.098		1091.766	.049	1996	HORIZONTAL ADJUSTMENT	1999	17648
1179.798	.098		1091.766	.049	1996	GPS - STATIC	1997	GPS805-B

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1179.099						GPS - STATIC	1991	HORZ

Geoid Separations(ft): GEOID18 = -88.258 12B = -88.248 09 = -88.133 03 = -88.074

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 18.47620	96 09 28.41778	388443.270	166715.190	.010		ADJUSTMENT	2015	GPS3080
46 17 18.47632	96 09 28.41779	388443.270	166715.202	.010	C	GPS - STATIC	2015	HWILK
46 17 18.47633	96 09 28.41730	388443.304	166715.203	.131	3	GPS - RTRN	2013	RTRN2013
46 17 18.47620	96 09 28.41778	388443.270	166715.190	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 18.47614	96 09 28.41870	388443.206	166715.185	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 18.47569	96 09 28.41844	388443.224	166715.139	.033	C	GPS - STATIC	2015	HWILK
46 17 18.47541	96 09 28.41937	388443.158	166715.111	.131	3	GPS - RTRN	2009	RTRN2009
46 17 18.47569	96 09 28.41844	388443.224	166715.139	.016	B	ADJUSTMENT	1999	17648
46 17 18.47569	96 09 28.41844	388443.224	166715.139	.016	B	GPS - STATIC	1997	GPS805-B

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 18.47684	96 09 28.41352	388443.570	166715.254	.066	2	ADJUSTMENT	1991	GPS194

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 17 18.62212	96 09 27.19522			.100	2	CLASSICAL SURVEY	1991	17504

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2142396.597	803733.112	842374.296	16833780.426	.010		ADJUSTMENT	2015	GPS3080
2142396.597	803733.124	842374.296	16833780.438	.010	C	GPS - STATIC	2015	HWILK
2142396.632	803733.124	842374.330	16833780.437	.131	3	GPS - RTRN	2013	RTRN2013
2142396.597	803733.112	842374.296	16833780.426	.013		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2142396.533	803733.107	842374.231	16833780.422	.013		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2142396.550	803733.061	842374.247	16833780.376	.033	C	GPS - STATIC	2015	HWILK
2142396.484	803733.034	842374.181	16833780.350	.131	3	GPS - RTRN	2009	RTRN2009
2142396.550	803733.061	842374.247	16833780.376	.016	B	ADJUSTMENT	1999	17648
2142396.550	803733.061	842374.247	16833780.376	.016	B	GPS - STATIC	1997	GPS805-B

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2142396.898	803733.169	842374.597	16833780.478	.066	2	ADJUSTMENT	1991	GPS194

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1517801.475	475659.483			.100	2	CLASSICAL SURVEY	1991	17504

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FALLPORT-RP1208-3NE-10DEC2008.jpg	NE	Dec 10, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FALLPORT-RP1208-2-10DEC2008.jpg		Dec 10, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FALLPORT-RP1208-1-10DEC2008.jpg		Dec 10, 2008

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: FALLPORT AZ MK

NGS Name: FALLPORT AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP1209](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	1	132 N	44 W	461646.49	960841.35	2	2

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1989	2013	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	STEEL SPIKE ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STEEL ROD (IN SLEEVE) (DEPTH 32 FT)	METAL ROD	NGS

Description: (1989) **Stamping:** FALLPORT AZ MK 1989

2.0 MILES WEST OF FERGUS FALLS, AT THE AIRPORT, AT THE SOUTHEAST END OF RUNWAY 31, 1.4 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 THEN 0.45 MILE SOUTH, 0.6 MILE SOUTHEAST OF THE AIRPORT OFFICE, 14.7 FEET NORTHEAST OF THE NORTHEAST EDGE OF A TAXIWAY, 187.6 FEET NORTH-NORTHEAST OF RUNWAY 31 SIGN, 140.8 FEET EAST-THE SOUTHEAST OF THE NORTHEAST END OF A CONCRETE CULVERT, 438.8 FEET NORTHEAST OF A RUNWAY, 41.5 FEET SOUTHWEST OF A WITNESS POST.

Station Notes

CONTACT THE AIRPORT MANAGER BEFORE USE. FERGUS FALLS MUNICIPAL AIRPORT.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1173.715	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1173.715	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1173.748	.016	2/1				VERTICAL ADJUSTMENT	2015	00000821-R
1173.748	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1173.748	.016	2/1				VERTICAL CONTROL SURVEY	2013	VBREC
1173.748	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1173.744	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFALL

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1173.731	.262		1085.693	.197	1996	GPS - RTRN	2009	RTRN2009
1173.620	.197		1085.703	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1172.898						GPS - STATIC	1991	HORZ

Geoid Separations(ft): GEOID18 = -88.228 12B = -88.218 09 = -88.100 03 = -88.038

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 16 46.48568	96 08 41.35278	391731.134	163456.189	.131	3	GPS - RTRN	2009	RTRN2009
46 16 46.48666	96 08 41.35386	391731.058	163456.289	.066	2	ADJUSTMENT	1999	17648
46 16 46.48666	96 08 41.35387	391731.057	163456.289	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 16 46.48819	96 08 41.34900	391731.400	163456.442	.066	2	ADJUSTMENT	1991	GPS194

NAD27

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 16 46.63345	96 08 40.13198			.100	2	CLASSICAL SURVEY	1991	17504



State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2145623.148	800414.256	845549.394	16830409.755	.131	3	GPS - RTRN	2009	RTRN2009
2145623.074	800414.357	845549.322	16830409.857	.066	2	ADJUSTMENT	1999	17648
2145623.074	800414.357	845549.321	16830409.857	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2145623.419	800414.503	845549.669	16830409.999	.066	2	ADJUSTMENT	1991	GPS194

NAD27

MN State Plane - Central Zone							Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1521028.019	472340.847			.100	2	CLASSICAL SURVEY	1991	17504

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FALLPORT_AZ_MK-RP1209-3NE-07AUG2013.jpg	NE	Aug 7, 2013
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FALLPORT_AZ_MK-RP1209-2-07AUG2013.jpg		Aug 7, 2013
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FALLPORT_AZ_MK-RP1209-1-07AUG2013.jpg		Aug 7, 2013

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: FALLS MNDT

NGS Name: FALLS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0161](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/1046
USGS Quad: FERGUS FALLS

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	5	132 N	43 W	461628.18	960641.12	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1962	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRAVERSE STATION DISK	MNDT

Description: (2015) **Stamping:** FALLS 1962

2.0 MILES WEST OF FERGUS FALLS, 1.2 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 IN FERGUS FALLS, AT THE INTERSTATE HIGHWAY 94 MILEPOINT 55.50, 118.6 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, AT TOP OF A BACK SLOPE, 22.0 FEET NORTH-NORTHWEST OF A FENCE BRACE POST, 6.0 FEET EAST-NORTHEAST OF A RIGHT-OF-WAY FENCE, 47.55 FEET NORTH-NORTHWEST OF STATION FALLS MNDT RM 1, 49.16 FEET SOUTH-SOUTHEAST OF STATION FALLS MNDT RM 2, 5.0 FEET EAST-NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1226.451	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1226.487	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1226.467	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1226.497	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1226.497	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFALL
1226.520	.016	2				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1225.706	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1225.706	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1225.706	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1225.706	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1226.451			1138.265	.020	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1226.451	.131		1138.384	.066	1996	GPS - STATIC	2024	HTH210A
1226.451			1138.265	.020	2011	GPS - STATIC	2024	HTH210A
1227.701	.262		1139.512	.197	2011	GPS - RTRN	2023	RTRN2023
1226.356	.262		1138.170	.197	2011	GPS - RTRN	2015	RTRN2015
1226.346	.262		1138.357	.197	1996	GPS - RTRN	2009	RTRN2009
1226.507	.197		1138.633	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -88.189 12B = -88.186 09 = -88.067 03 = -87.992

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 28.17603	96 06 41.12007	400167.280	161557.375	.010		ADJUSTMENT	2025	GPS3793
46 16 28.17603	96 06 41.12007	400167.280	161557.375	.010	C	GPS - STATIC	2024	HTH210A
46 16 28.17781	96 06 41.11734	400167.473	161557.555	.131	3	GPS - RTRN	2023	RTRN2023
46 16 28.17579	96 06 41.12121	400167.200	161557.351	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 28.17574	96 06 41.12043	400167.254	161557.346	.033	C	GPS - STATIC	2024	HTH210A
46 16 28.17648	96 06 41.12133	400167.191	161557.421	.131	3	GPS - RTRN	2009	RTRN2009
46 16 28.17282	96 06 41.12440	400166.974	161557.052	.066	2	ADJUSTMENT	1999	17648
46 16 28.17275	96 06 41.12435	400166.978	161557.045	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 28.17126	96 06 41.11119	400167.901	161556.889	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 16 28.32010	96 06 39.89710			.100	2	CLASSICAL SURVEY	1963	13276

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2154021.585	798359.893	853917.682	1682822.415	.010		ADJUSTMENT	2025	GPS3793
2154021.585	798359.893	853917.682	1682822.415	.010	C	GPS - STATIC	2024	HTH210A
2154021.782	798360.069	853917.881	1682822.588	.131	3	GPS - RTRN	2023	RTRN2023
2154021.505	798359.871	853917.601	1682822.394	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2154021.559	798359.865	853917.656	1682822.387	.033	C	GPS - STATIC	2024	HTH210A
2154021.498	798359.941	853917.595	1682822.464	.131	3	GPS - RTRN	2009	RTRN2009
2154021.274	798359.576	853917.365	1682822.102	.066	2	ADJUSTMENT	1999	17648
2154021.277	798359.568	853917.369	1682822.095	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2154022.198	798359.396	853918.287	1682821.908	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1529426.859	470286.147			.100	2	CLASSICAL SURVEY	1963	13276

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FALLS-RP0161-3SW-21FEB2024.jpg	SW	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FALLS-RP0161-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FALLS-RP0161-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: FALLS MNDT AZ MK

NGS Name: FALLS AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP3749](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/1046
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	5	132 N	43 W	461610.00	960613.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2015	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	AZIMUTH MARK DISK	MNDT

Description: (1962)

Stamping: FALLS 1962

2.0 MILES SOUTHWEST OF FERGUS FALLS, 1.7 MILES SOUTH ON INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210, SET IN THE SOUTHWEST CORNER OF BRIDGE NUMBER 9699.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.163 12B = -88.163 09 = -88.044 03 = -87.966



Mn/DOT Name: FALLS MNDT RM 1

NGS Name: FALLS RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0162](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	5	132 N	43 W	461627.76	960640.82	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1962	2015	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2015)

Stamping: FALLS NO 1 1962

2.0 MILES WEST OF FERGUS FALLS, 1.2 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 55.50, 122.9 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 96.2 FEET SOUTH-SOUTHEAST OF STATION FALLS MNDT 2, 47.55 FEET SOUTH-SOUTHEAST OF STATION FALLS MNDT, 25.0 FEET SOUTH-SOUTHEAST OF A BRACE POST, 1.0 FOOT EAST-NORTHEAST OF A RIGHT-OF-WAY FENCE, 1.0 FOOT NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1228.977	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1229.017	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1228.994	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1229.017	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1229.017	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFALL
1229.017	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1228.200	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1228.200	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1228.200	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1228.200	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1228.938	.262		1140.752	.197	2011	GPS - RTRN	2015	RTRN2015
1228.856	.262		1140.864	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.189 12B = -88.186 09 = -88.067 03 = -87.989

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 27.75706	96 06 40.82061	400188.105	161514.826	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 27.75707	96 06 40.82079	400188.092	161514.827	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2154041.616	798316.972	853937.042	16828179.166	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2154041.604	798316.973	853937.029	16828179.168	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FALLS_RM_1-RP0162-3SW-15SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FALLS_RM_1-RP0162-2-15SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FALLS_RM_1-RP0162-1-15SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
SW	Sep 15, 2015
	Sep 15, 2015
	Sep 15, 2015



Mn/DOT Name: FALLS MNDT RM 2

NGS Name: FALLS RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0163](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

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1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	5	132 N	43 W	461628.57	960641.53	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1962	2015	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2015)

Stamping: FALLS NO 2 1962

2.0 MILES WEST OF FERGUS FALLS, 1.2 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 55.50, 122.1 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 96.2 FEET NORTH-NORTHWEST OF STATION FALLS MNDT RM 1, 49.16 FEET NORTH-NORTHWEST OF STATION FALLS MNDT, 2.3 FEET EAST-NORTHEAST OF A RIGHT-OF-WAY FENCE, 1.0 FOOT NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1224.473	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1224.509	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1224.489	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1224.509	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1224.509	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFALL
1224.509	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1223.695	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1223.695	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1223.695	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1223.695	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1224.387	.262		1136.202	.197	2011	GPS - RTRN	2015	RTRN2015
1224.358	.262		1136.366	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.192 12B = -88.186 09 = -88.067 03 = -87.992

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 28.56921	96 06 41.53070	400138.632	161597.351	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 28.56895	96 06 41.53140	400138.583	161597.325	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2153993.687	798400.387	853890.415	16828263.359	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2153993.637	798400.362	853890.364	16828263.335	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FALLS_RM_2-RP0163-3SW-15SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FALLS_RM_2-RP0163-2-15SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FALLS_RM_2-RP0163-1-15SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
SW	Sep 15, 2015
	Sep 15, 2015
	Sep 15, 2015



Mn/DOT Name: FAUNCE MNDT

NGS Name: FAUNCE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AB9901](#)
NGS Quad / Sta Num : 46096224/
USGS Quad: ORWELL LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	15	131 N	44 W	460907.85	961103.02	2	B

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1994	2025	GOOD	Horz=YES Vert=YES	YES		RECESSED 6 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
STEEL ROD (NO SLEEVE) (DEPTH 24 FT)	METAL ROD	MNDT

Description: (1994)

Stamping: FAUNCE 1994

10.0 MILES SOUTHWEST OF FERGUS FALLS, 2.2 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 IN FERGUS FALLS TO TRUNK HIGHWAY 210 MILEPOST 22.0, THEN 1.2 MILES SOUTH ON COUNTY ROAD 86, THEN 9.2 MILES SOUTH ON COUNTY ROAD 15 THEN 0.05 MILE WEST ON 130TH STREET, 33.0 FEET NORTH OF 130TH STREET, 28.2 FEET WEST-SOUTHWEST OF A FENCE CORNER, 16.0 FEET WEST OF THE IMMANUEL LUTHERAN CEMETERY ENTRANCE, 8.0 FEET SOUTHWEST OF A GATE POST, 4.0 FEET SOUTH OF A FENCE, 3.8 FEET SOUTH OF A WITNESS POST.

Station Notes

PLASTIC STABILIZER SLEEVE, NO GREASE SLEEVE

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1102.862	.016	2/1				VERTICAL ADJUSTMENT	2007	00000425-15
1102.882	.016	2/1				VERTICAL CONTROL SURVEY	2005	VFAUN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1102.862			1015.513	.008	2011	HORIZONTAL ADJUSTMENT	2026	GPS3900
1102.862			1015.513	.008	2011	GPS - STATIC	2026	HTH55N
1102.862			1015.513	.009	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1102.862			1015.513	.009	2011	GPS - STATIC	2025	HTH94B
1102.862	.131		1015.690	.066	1996	GPS - STATIC	2021	HOTTE
1102.862			1015.513	.011	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1102.862			1015.513	.011	2011	GPS - STATIC	2020	HOTTE
1102.862			1015.513	.012	2011	HORIZONTAL ADJUSTMENT	2018	GPS3119
1102.862	.131		1015.690	.066	1996	GPS - STATIC	2017	HMNCORS07
1102.862			1015.513	.012	2011	GPS - STATIC	2017	HMNPH
1102.829	.262		1015.461	.197	2011	GPS - RTRN	2015	RTRN2015
1102.862			1015.513	.014	2011	HORIZONTAL ADJUSTMENT	2015	GPS3080
1102.882	.131		1015.690	.066	1996	GPS - STATIC	2015	HWILK
1102.862			1015.523	.014	2011	GPS - STATIC	2015	HWILK
1102.862			1015.513	.017	2011	HORIZONTAL ADJUSTMENT	2015	GPS3067
1102.862	.131		1015.690	.066	1996	GPS - STATIC	2015	HTRAV
1102.862			1015.503	.017	2011	GPS - STATIC	2015	HTRAV
1102.862			1015.513	.015	2011	HORIZONTAL ADJUSTMENT	2014	GPS3028
1102.882	.131		1015.690	.066	1996	GPS - STATIC	2014	HGRAN
1102.862			1015.516	.015	2011	GPS - STATIC	2014	HGRAN
1102.682	.262		1015.313	.197	2011	GPS - RTRN	2013	RTRN2013
			1015.513	.013	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1102.754	.262		1015.497	.197	1996	GPS - RTRN	2009	RTRN2009
			1015.608	.014	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1102.918	.098		1015.690	.049	1996	GPS - STATIC	2005	GPS2036
1102.878	.098		1015.690	.049	1996	GPS - STATIC	1997	GPS805-B
1102.878	.131		1015.690	.066	1996	GPS - STATIC	1997	GPS805-C

Geoid Separations(ft): GEOID18 = -87.418 12B = -87.369 09 = -87.257 03 = -87.257

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 09 07.85001	96 11 03.02113	381505.450	117050.454	.007		ADJUSTMENT	2026	GPS3900
46 09 07.85001	96 11 03.02113	381505.450	117050.454	.007	C	GPS - STATIC	2026	HTH55N
46 09 07.85001	96 11 03.02113	381505.450	117050.454	.007		ADJUSTMENT	2025	GPS3847
46 09 07.85001	96 11 03.02113	381505.450	117050.454	.007	C	GPS - STATIC	2025	HTH94B
46 09 07.85001	96 11 03.02113	381505.450	117050.454	.007		ADJUSTMENT	2020	GPS3384
46 09 07.85001	96 11 03.02113	381505.450	117050.454	.007	C	GPS - STATIC	2020	HOTTE
46 09 07.85001	96 11 03.02113	381505.450	117050.454	.007		ADJUSTMENT	2018	GPS3119
46 09 07.85001	96 11 03.02113	381505.450	117050.454	.007	C	GPS - STATIC	2017	HMNPH
46 09 07.84933	96 11 03.02069	381505.480	117050.384	.131	3	GPS - RTRN	2015	RTRN2015
46 09 07.85001	96 11 03.02113	381505.450	117050.454	.010		ADJUSTMENT	2015	GPS3080
46 09 07.84987	96 11 03.02101	381505.458	117050.439	.010	C	GPS - STATIC	2015	HWILK
46 09 07.85001	96 11 03.02113	381505.450	117050.454	.010		ADJUSTMENT	2015	GPS3067
46 09 07.84999	96 11 03.02107	381505.454	117050.452	.010	C	GPS - STATIC	2015	HTRAV
46 09 07.85001	96 11 03.02113	381505.450	117050.454	.010		ADJUSTMENT	2014	GPS3028
46 09 07.84996	96 11 03.02112	381505.450	117050.448	.010	C	GPS - STATIC	2014	HGRAN
46 09 07.85020	96 11 03.02122	381505.443	117050.473	.131	3	GPS - RTRN	2013	RTRN2013
46 09 07.85001	96 11 03.02113	381505.450	117050.454	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 09 07.84994	96 11 03.02203	381505.386	117050.447	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 09 07.84960	96 11 03.02177	381505.404	117050.412	.066		NCAT	2026	HTH55N
46 09 07.84960	96 11 03.02177	381505.404	117050.412	.066		NCAT	2025	HTH94B
46 09 07.84960	96 11 03.02177	381505.404	117050.412	.033	C	GPS - STATIC	2021	HOTTE
46 09 07.84960	96 11 03.02177	381505.404	117050.412	.033	C	GPS - STATIC	2017	HMNCORS07
46 09 07.84960	96 11 03.02177	381505.404	117050.412	.033	C	GPS - STATIC	2015	HWILK
46 09 07.84960	96 11 03.02177	381505.404	117050.412	.033	C	GPS - STATIC	2015	HTRAV
46 09 07.84960	96 11 03.02177	381505.404	117050.412	.033	C	GPS - STATIC	2014	HGRAN
46 09 07.85040	96 11 03.02274	381505.337	117050.494	.131	3	GPS - RTRN	2009	RTRN2009
46 09 07.84960	96 11 03.02177	381505.404	117050.412	.016	B	GPS - STATIC	2005	GPS2036
46 09 07.84960	96 11 03.02177	381505.404	117050.412	.016	B	GPS - STATIC	1997	GPS805-B
46 09 07.84960	96 11 03.02177	381505.404	117050.412	.033	C	GPS - STATIC	1997	GPS805-C

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2134541.801	754211.953	833738.232	16784368.597	.007		ADJUSTMENT	2026	GPS3900
2134541.801	754211.953	833738.232	16784368.597	.007	C	GPS - STATIC	2026	HTH55N
2134541.801	754211.953	833738.232	16784368.597	.007		ADJUSTMENT	2025	GPS3847
2134541.801	754211.953	833738.232	16784368.597	.007	C	GPS - STATIC	2025	HTH94B
2134541.801	754211.953	833738.232	16784368.597	.007		ADJUSTMENT	2020	GPS3384
2134541.801	754211.953	833738.232	16784368.597	.007	C	GPS - STATIC	2020	HOTTE
2134541.801	754211.953	833738.232	16784368.597	.007		ADJUSTMENT	2018	GPS3119
2134541.801	754211.953	833738.232	16784368.597	.007	C	GPS - STATIC	2017	HMNPH
2134541.830	754211.883	833738.260	16784368.527	.131	3	GPS - RTRN	2015	RTRN2015
2134541.801	754211.953	833738.232	16784368.597	.010		ADJUSTMENT	2015	GPS3080
2134541.809	754211.938	833738.240	16784368.582	.010	C	GPS - STATIC	2015	HWILK
2134541.801	754211.953	833738.232	16784368.597	.010		ADJUSTMENT	2015	GPS3067
2134541.805	754211.950	833738.236	16784368.595	.010	C	GPS - STATIC	2015	HTRAV
2134541.801	754211.953	833738.232	16784368.597	.010		ADJUSTMENT	2014	GPS3028
2134541.801	754211.947	833738.233	16784368.592	.010	C	GPS - STATIC	2014	HGRAN
2134541.795	754211.972	833738.227	16784368.617	.131	3	GPS - RTRN	2013	RTRN2013
2134541.801	754211.953	833738.232	16784368.597	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2134541.737	754211.947	833738.168	16784368.593	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2134541.755	754211.912	833738.186	16784368.558	.066		NCAT	2026	HTH55N
2134541.755	754211.912	833738.186	16784368.558	.066		NCAT	2025	HTH94B
2134541.755	754211.912	833738.186	16784368.558	.033	C	GPS - STATIC	2021	HOTTE
2134541.755	754211.912	833738.186	16784368.558	.033	C	GPS - STATIC	2017	HMNCORS07
2134541.755	754211.912	833738.186	16784368.558	.033	C	GPS - STATIC	2015	HWILK
2134541.755	754211.912	833738.186	16784368.558	.033	C	GPS - STATIC	2015	HTRAV
2134541.755	754211.912	833738.186	16784368.558	.033	C	GPS - STATIC	2014	HGRAN
2134541.688	754211.995	833738.121	16784368.641	.131	3	GPS - RTRN	2009	RTRN2009
2134541.755	754211.912	833738.186	16784368.558	.016	B	GPS - STATIC	2005	GPS2036
2134541.755	754211.912	833738.186	16784368.558	.016	B	GPS - STATIC	1997	GPS805-B
2134541.755	754211.912	833738.186	16784368.558	.033	C	GPS - STATIC	1997	GPS805-C

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FAUNCE-AB9901-3N-10AUG2009.jpg	N	Aug 10, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FAUNCE-AB9901-2-10AUG2009.jpg		Aug 10, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FAUNCE-AB9901-1-10DEC2008.jpg		Dec 10, 2008

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: FERG

NGS Name: FERG

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DK2683](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
SW	2	132 N	43 W	461625.90	960321.20	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2003	2015	DESTROYED	Horz=NO Vert=NO	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	SURVEY DISK	MNDT

Description: (2004)

Stamping: FERG 2003

0.5 MILE SOUTHEAST OF FERGUS FALLS, 0.2 MILE NORTH-NORTHWEST ALONG COUNTY ROAD 82 FROM THE JUNCTION OF COUNTY ROAD 82 AND TRUNK HIGHWAY 210 IN FERGUS FALLS, THEN 0.1 MILE SOUTHEAST ALONG DOUGLAS AVENUE, THEN 0.1 MILE NORTH THROUGH AN ACCESS A GATE AT THE MINNESOTA DEPARTMENT OF TRANSPORTATION BUILDING AND AROUND A BUILDING TO THE FAR NORTHWEST CORNER GRASS AREA OF A PARKING LOT, 14.0 FEET SOUTHEAST OF A POWER POLE, 13.5 FEET EAST OF A CHAIN LINK FENCE, 1.0 FOOT WEST OF A WITNESS POST.

Station Notes

THE DISK WAS TURNED IN TO THE OFFICE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1222.304	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1222.340	.016	2/1				VERTICAL ADJUSTMENT	2011	00000690
1222.340	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1222.343	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFGUS
1222.343	.016	2/1				VERTICAL CONTROL SURVEY	2004	VFERG

Geoid Separations(ft): GEOID18 = -88.153 12B = -88.153 09 = -88.035 03 = -87.946

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERG-DK2683-3W-03DEC2004.jpg	W	Dec 3, 2004
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERG-DK2683-2-03DEC2004.jpg		Dec 3, 2004
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERG-DK2683-1-03DEC2004.jpg		Dec 3, 2004

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: FERG RESET

NGS Name: FERG RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4350](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	2	132 N	43 W	461625.79	960321.13	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2015	2015	GOOD	Horz=NO Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015)

Stamping: FERG 2003 2015

IN FERGUS FALLS, 0.2 MILE NORTH-NORTHWEST ALONG COUNTY ROAD 82 FROM THE JUNCTION OF COUNTY ROAD 82 AND TRUNK HIGHWAY 210 IN FERGUS FALLS, THEN 0.1 MILE SOUTHEAST ON DOUGLAS AVENUE, THEN 0.1 MILE NORTH THROUGH AN ACCESS A GATE AT THE MINNESOTA DEPARTMENT OF TRANSPORTATION BUILDING, AROUND THE BUILDING TO THE FAR NORTHWEST CORNER OF A PARKING LOT, 79.5 FEET NORTH OF THE NORTH FACE OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION BUILDING, 13.5 FEET EAST OF A CHAIN LINK FENCE, 14.0 EAST-SOUTHEAST OF A POWER POLE, 1.0 FOOT WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1222.101	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941
1222.127	.016	2/1					VERTICAL ADJUSTMENT	2017	00000911
1222.107	.016	2/1					VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1221.996	.262			1133.840	.197	2011	GPS - RTRN	2015	RTRN2015
1221.996	.262			1133.840	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -88.153 12B = -88.153 09 = -88.035 03 = -87.946

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County						Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
46 16 25.78886	96 03 21.12801	414215.456	161250.356	.131	3	GPS - RTRN	2015	RTRN2015	
46 16 25.78886	96 03 21.12801	414215.456	161250.356	.131	3	GPS - RTRN	2015	RTRN2015	

State Plane and UTM Coordinates (Feet)

NAD83(2011)		UTM - Zone 15						Project Info	
MN State Plane - Central Zone X	Y	X	Y	Acc	Order	Determination Method	Year	Reference	
2168059.802	797792.970	867950.431	16827434.028	.131	3	GPS - RTRN	2015	RTRN2015	
2168059.802	797792.970	867950.431	16827434.028	.131	3	GPS - RTRN	2015	RTRN2015	

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERG_RESET-DQ4350-3W-09SEP2015.jpg	W	Sep 9, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERG_RESET-DQ4350-2-09SEP2015.jpg		Sep 9, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERG_RESET-DQ4350-1-09SEP2015.jpg		Sep 9, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: FERGAIR

NGS Name: FERGAIR

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0964](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/1054
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SE	36	133 N	44 W	461721.09	960924.19	2	1	1974	2013	NOT FOUND	Horz=YES Vert=YES	NO		FLUSH	STEEL SPIKE ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	TRIANGULATION STATION DISK	NGS

Description: (1974)

Stamping: FERGAIR 1974

4.0 MILES WEST OF FERGUS FALLS, AT THE AIRPORT, 2.0 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210, 50.2 FEET SOUTHEAST OF THE SOUTHEAST LEG OF A RADAR BASE, 31.65 FEET SOUTHWEST OF FERGAIR RM 1, 23.36 FEET SOUTH-SOUTHEAST OF FERGAIR RM 2.

Station Notes

CONTACT THE AIRPORT MANAGER BEFORE USE. FERGUS FALLS MUNICIPAL AIRPORT.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1200.614	.016	2/1							VERTICAL ADJUSTMENT	2019	00000941
1200.644	.016	2/1							VERTICAL ADJUSTMENT	2008	00000425-25
1200.644	.016	2/1							VERTICAL CONTROL SURVEY	2006	VFALL

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1200.444	.262					1112.370	.197	1996	GPS - RTRN	2009	RTRN2009
1200.358	.131					1112.399	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1199.998						RECIPROCAL VERTICAL ANGLE	1974	HORZ

Geoid Separations(ft): GEOID18 = -88.261 12B = -88.248 09 = -88.136 03 = -88.074

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>								
Geodetic Position		Otter Tail County		Project Info				
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 17 21.08805	96 09 24.18742	388741.843	166978.132	.131	3	GPS - RTRN	2009	RTRN2009
46 17 21.08535	96 09 24.19087	388741.599	166977.859	.033	1	ADJUSTMENT	1999	17648
46 17 21.08534	96 09 24.19089	388741.598	166977.858	.033	1	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Year</u>	<u>Reference</u>
46 17 21.08558	96 09 24.17866	388742.457	166977.878	1986	17289

NAD27

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Year</u>	<u>Reference</u>
46 17 21.23087	96 09 22.96051			1991	17504
46 17 21.23194	96 09 22.95921			1977	15955



State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2142699.946	803990.447	842681.789	16834033.048	.131	3	GPS - RTRN	2009	RTRN2009
2142699.697	803990.180	842681.536	16834032.784	.033	1	ADJUSTMENT	1999	17648
2142699.696	803990.179	842681.534	16834032.783	.033	1	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2142700.554	803990.182	842682.394	16834032.773	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1518105.129	475916.498			.100	1	CLASSICAL SURVEY	1991	17504
1518105.223	475916.604			.100	1	CLASSICAL SURVEY	1977	15955



Mn/DOT Name: FERGAIR RM 1

NGS Name: FERGAIR RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0963](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/1055
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SE	36	133 N	44 W	461721.24	960923.80		1	1974	2013	NOT FOUND	Horz=YES Vert=YES	NO		FLUSH	STEEL SPIKE IMBED IN MON
				<u>Monument Type</u>					<u>Disk Type</u>					<u>Mon. Agency</u>	
				UNKNOWN					REFERENCE MARK DISK					NGS	

Description: (1974)

Stamping: FERGAIR NO 1 1974

4.0 MILES WEST OF FERGUS FALLS, AT THE AIRPORT, 2.0 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210, 31.65 FEET NORTHEAST OF STATION FERGAIR.

Station Notes

CONTACT THE AIRPORT MANAGER BEFORE USE. FERGUS FALLS MUNICIPAL AIRPORT.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1200.552	.262		1112.478	.197	1996	GPS - RTRN		2009	RTRN2009
1201.113	.131		1113.167	.066	1996	HORIZONTAL ADJUSTMENT		1999	17648

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1199.998						RECIPROCAL VERTICAL ANGLE		1974	HORZ

Geoid Separations(ft): GEOID18 = -88.261 12B = -88.248 09 = -88.136 03 = -88.074

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 17 21.24466	96 09 23.79957	388769.170	166993.845	.131	3	GPS - RTRN	2009	RTRN2009
46 17 21.24291	96 09 23.80176	388769.015	166993.669	.033	1	ADJUSTMENT	1999	17648
46 17 21.24291	96 09 23.80178	388769.014	166993.669	.033	1	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 17 21.24309	96 09 23.78970	388769.863	166993.683	.033	1	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>							<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 17 21.38945	96 09 22.57025			.100	1	CLASSICAL SURVEY	1977	15955

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2142727.555	804005.651	842709.646	16834047.820	.131	3	GPS - RTRN	2009	RTRN2009
2142727.397	804005.477	842709.485	16834047.649	.033	1	ADJUSTMENT	1999	17648
2142727.396	804005.477	842709.484	16834047.649	.033	1	ADJUSTMENT	1998	17655

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2142728.244	804005.475	842710.332	16834047.633	.033	1	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - Central Zone</u>							<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1518132.913	475931.897			.100	1	CLASSICAL SURVEY	1977	15955



Mn/DOT Name: FERGAIR RM 2

NGS Name: FERGAIR RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CO9511](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	36	133 N	44 W	461721.31	960924.28	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1974	2009	NOT FOUND	Horz=YES Vert=YES	YES			NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	REFERENCE MARK DISK	NGS

Description: (1974)

Stamping: FERGAIR NO 2 1974

4.0 MILES WEST OF FERGUS FALLS, AT THE AIRPORT, 2.0 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, 27.6 FEET SOUTHEAST OF THE SOUTHEAST CORNER OF A RADAR BASE, 23.4 FEET NORTH-NORTHWEST OF FERGAIR.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1201.093	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1201.123	.016	2/1				VERTICAL ADJUSTMENT	2008 00000425-25
1201.123	.016	2/1				VERTICAL CONTROL SURVEY	2006 VFALL

Geoid Separations(ft): GEOID18 = -88.261 12B = -88.248 09 = -88.136 03 = -88.074

* No Horizontal Positions in the Database *



Mn/DOT Name: FERGUS FALLS

NGS Name: FERGUS FALLS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0954](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/1050
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	1	132 N	43 W	461627.27	960209.79	2	A	1974	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MNDT

Description: (1994) Stamping: FERGUS FALLS 1974

2.0 MILES EAST-SOUTHEAST OF FERGUS FALLS, 1.0 MILE EAST ALONG TRUNK HIGHWAY 210 FROM THE EAST JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 82 IN SOUTHEAST FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 29.30, 150.8 FEET NORTH OF TRUNK HIGHWAY 210, ALONG THE NORTH RIGHT-OF-WAY OF TRUNK HIGHWAY 210, 80.61 FEET WEST-SOUTHWEST OF FERGUS FALLS RM 1, 63.36 FEET EAST OF FERGUS FALLS RM 2, 11.8 FEET SOUTH OF A FENCE, 11.8 FEET SOUTH OF A WITNESS POST.

Station Pair: ANDS - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1310.903	.016	2/1							VERTICAL ADJUSTMENT	2019	00000941
1310.932	.016	2/1							VERTICAL ADJUSTMENT	2017	00000911
1310.909	.016	2/1							VERTICAL CONTROL SURVEY	2016	VOTTE
1310.932	.016	2/1							VERTICAL ADJUSTMENT	2008	00000425-25
1310.939	.016	2/1							VERTICAL CONTROL SURVEY	2006	VFGUS

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1310.903						1222.737	.009	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1310.903						1222.737	.009	2011	GPS - STATIC	2025	HTH94B
1310.903						1222.737	.010	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1310.903	.131					1222.934	.066	1996	GPS - STATIC	2024	HTH210A
1310.903						1222.737	.010	2011	GPS - STATIC	2024	HTH210A
1310.886	.262					1222.750	.197	2011	GPS - RTRN	2023	RTRN2023
1310.903	.131					1222.934	.066	1996	GPS - STATIC	2021	HOTTE
1310.903						1222.737	.011	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1310.903						1222.737	.011	2011	GPS - STATIC	2020	HOTTE
1310.932						1222.737	.011	2011	HORIZONTAL ADJUSTMENT	2018	GPS3119
1310.909	.131					1222.934	.066	1996	GPS - STATIC	2017	HMNCORS07
1310.932						1222.737	.011	2011	GPS - STATIC	2017	HMNPH
1310.834	.262					1222.694	.197	2011	GPS - RTRN	2015	RTRN2015
1310.791	.262					1222.652	.197	2011	GPS - RTRN	2015	RTRN2015
1310.791	.262					1222.652	.197	2011	GPS - RTRN	2015	RTRN2015
						1222.737	.011	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1310.975	.262					1223.045	.197	1996	GPS - RTRN	2009	RTRN2009
						1222.862	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1311.152	.066					1222.934	.033	1996	HORIZONTAL ADJUSTMENT	1999	17648
1310.900	.098					1222.934	.049	1996	GPS - STATIC	1997	GPS805-B
1310.900	.131					1222.934	.066	1996	GPS - STATIC	1997	GPS805-C

<u>NGVD29</u>			<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1308.987									RECIPROCAL VERTICAL ANGLE	1974	HORZ

Geoid Separations(ft): GEOID18 = -88.136 12B = -88.140 09 = -88.028 03 = -87.930

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 27.27412	96 02 09.79121	419227.463	161379.959	.007		ADJUSTMENT	2025	GPS3847
46 16 27.27412	96 02 09.79121	419227.463	161379.959	.007	C	GPS - STATIC	2025	HTH94B
46 16 27.27412	96 02 09.79121	419227.463	161379.959	.007		ADJUSTMENT	2025	GPS3793
46 16 27.27412	96 02 09.79121	419227.463	161379.959	.007	C	GPS - STATIC	2024	HTH210A
46 16 27.27330	96 02 09.79134	419227.454	161379.876	.131	3	GPS - RTRN	2023	RTRN2023
46 16 27.27412	96 02 09.79121	419227.463	161379.959	.007		ADJUSTMENT	2020	GPS3384
46 16 27.27412	96 02 09.79121	419227.463	161379.959	.007	C	GPS - STATIC	2020	HOTTE
46 16 27.27412	96 02 09.79121	419227.463	161379.959	.007		ADJUSTMENT	2018	GPS3119
46 16 27.27412	96 02 09.79121	419227.463	161379.959	.007	C	GPS - STATIC	2017	HMNPH
46 16 27.27349	96 02 09.79091	419227.484	161379.895	.131	3	GPS - RTRN	2015	RTRN2015
46 16 27.27293	96 02 09.79158	419227.437	161379.839	.131	3	GPS - RTRN	2015	RTRN2015
46 16 27.27293	96 02 09.79158	419227.437	161379.839	.131	3	GPS - RTRN	2015	RTRN2015
46 16 27.27412	96 02 09.79121	419227.463	161379.959	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 27.27390	96 02 09.79195	419227.411	161379.937	.007		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 27.27350	96 02 09.79171	419227.428	161379.897	.066		NCAT	2025	HTH94B
46 16 27.27340	96 02 09.79180	419227.421	161379.887	.033	C	GPS - STATIC	2024	HTH210A
46 16 27.27340	96 02 09.79180	419227.421	161379.887	.033	C	GPS - STATIC	2021	HOTTE
46 16 27.27340	96 02 09.79180	419227.421	161379.887	.033	C	GPS - STATIC	2017	HMNCORS07
46 16 27.27359	96 02 09.79133	419227.455	161379.906	.131	3	GPS - RTRN	2009	RTRN2009
46 16 27.27340	96 02 09.79180	419227.421	161379.887	.003	A	ADJUSTMENT	1999	17648
46 16 27.27337	96 02 09.79182	419227.420	161379.884	.016	B	GPS - STATIC	1997	GPS805-B
46 16 27.27337	96 02 09.79182	419227.420	161379.884	.033	C	GPS - STATIC	1997	GPS805-C

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 27.27165	96 02 09.78084	419228.191	161379.706	.033	1	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 16 27.41739	96 02 08.57469			.100	1	CLASSICAL SURVEY	1977	15955

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2173072.682	797829.770	872965.045	16827391.808	.007		ADJUSTMENT	2025	GPS3847
2173072.682	797829.770	872965.045	16827391.808	.007	C	GPS - STATIC	2025	HTH94B
2173072.682	797829.770	872965.045	16827391.808	.007		ADJUSTMENT	2025	GPS3793
2173072.682	797829.770	872965.045	16827391.808	.007	C	GPS - STATIC	2024	HTH210A
2173072.671	797829.688	872965.033	16827391.725	.131	3	GPS - RTRN	2023	RTRN2023
2173072.682	797829.770	872965.045	16827391.808	.007		ADJUSTMENT	2020	GPS3384
2173072.682	797829.770	872965.045	16827391.808	.007	C	GPS - STATIC	2020	HOTTE
2173072.682	797829.770	872965.045	16827391.808	.007		ADJUSTMENT	2018	GPS3119
2173072.682	797829.770	872965.045	16827391.808	.007	C	GPS - STATIC	2017	HMNPH
2173072.702	797829.706	872965.064	16827391.743	.131	3	GPS - RTRN	2015	RTRN2015
2173072.654	797829.651	872965.015	16827391.688	.131	3	GPS - RTRN	2015	RTRN2015
2173072.654	797829.651	872965.015	16827391.688	.131	3	GPS - RTRN	2015	RTRN2015
2173072.682	797829.770	872965.045	16827391.808	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2173072.630	797829.749	872964.993	16827391.788	.007		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2173072.646	797829.708	872965.008	16827391.746	.066		NCAT	2025	HTH94B
2173072.639	797829.699	872965.001	16827391.737	.033	C	GPS - STATIC	2024	HTH210A
2173072.639	797829.699	872965.001	16827391.737	.033	C	GPS - STATIC	2021	HOTTE
2173072.639	797829.699	872965.001	16827391.737	.033	C	GPS - STATIC	2017	HMNCORS07
2173072.673	797829.717	872965.035	16827391.755	.131	3	GPS - RTRN	2009	RTRN2009
2173072.639	797829.699	872965.001	16827391.737	.003	A	ADJUSTMENT	1999	17648
2173072.638	797829.696	872964.999	16827391.734	.016	B	GPS - STATIC	1997	GPS805-B
2173072.638	797829.696	872964.999	16827391.734	.033	C	GPS - STATIC	1997	GPS805-C

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2173073.405	797829.504	872965.764	16827391.530	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1548478.068	469756.022			.100	1	CLASSICAL SURVEY	1977	15955

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_FALLS-RP0954-3N-21FEB2024.jpg	N	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_FALLS-RP0954-2-09OCT2023.jpg		Oct 9, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_FALLS-RP0954-1-09OCT2023.jpg		Oct 9, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: FERGUS FALLS AIRPORT BCN

NGS Name: FERGUS FALLS AIRPORT BCN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0962](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/1056
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	36	133 N	44 W	461731.85	960930.41		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1974	1974	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	AIRPORT BEACON	NGS

Description: (1974)

Stamping:

4.0 MILES WEST OF FERGUS FALLS, AT THE AIRPORT, 2.0 MILES WEST ON TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94. STATION FERGUS FALLS AIRPORT BCN IS THE BEACON LIGHT ATOP THE 4-LEGGED STEEL STRUCTURE, PAINTED RED AND WHITE, ABOUT 50.0 FEET HIGH AND LOCATED AT THE FERGUS FALLS MUNICIPAL AIRPORT.

Station Notes

CONTACT THE AIRPORT MANAGER BEFORE USE. FERGUS FALLS MUNICIPAL AIRPORT.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.268 12B = -88.254 09 = -88.143 03 = -88.084

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 17 31.85458	96 09 30.41413	388310.635	168071.284	.328	4	ADJUSTMENT	1999	17648
46 17 31.85457	96 09 30.41415	388310.634	168071.283	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 17 31.85427	96 09 30.40141	388311.528	168071.248	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>						<u>Year</u>	<u>Reference</u>
46 17 32.00022	96 09 29.18152			.100	4	CLASSICAL SURVEY	1977	15955

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2142289.099	805091.248	842288.195	16835140.639	.328	4	ADJUSTMENT	1999	17648
2142289.098	805091.247	842288.194	16835140.638	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2142289.991	805091.195	842289.087	16835140.572	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1517694.671	477017.567			.100	4	CLASSICAL SURVEY	1977	15955



Mn/DOT Name: FERGUS FALLS ASYLUM STACK

NGS Name: FERGUS FALLS ASYLUM STACK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0949](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/1024
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	27	133 N	43 W	461801.47	960457.38		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1906	1943	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	STACK	NGS

Description: (1906) Stamping:
IN THE NORTHWEST PART OF FERGUS FALLS.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.231 12B = -88.228 09 = -88.123 03 = -88.035

Lat/Lon and County Coordinates (Feet)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 18 01.46907	96 04 57.38475	407498.288	170973.530	.328	4	ADJUSTMENT	1999	17648
46 18 01.46928	96 04 57.38510	407498.263	170973.551	.328	4	ADJUSTMENT	1998	17655

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 18 01.46869	96 04 57.37515	407498.962	170973.488	.328	4	ADJUSTMENT	1986	17289

<u>Geodetic Position</u>							<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 18 01.62000	96 04 56.18000			.100	4	CLASSICAL SURVEY	1932	00967

<u>Geodetic Position</u>							<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 18 01.79700	96 04 56.55700				3	CLASSICAL SURVEY		17389-73

State Plane and UTM Coordinates (Feet)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2161524.632	807637.507	861568.976	16837384.017	.328	4	ADJUSTMENT	1999	17648
2161524.608	807637.528	861568.953	16837384.040	.328	4	ADJUSTMENT	1998	17655

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2161525.305	807637.453	861569.649	16837383.953	.328	4	ADJUSTMENT	1986	17289

<u>MN State Plane - Central Zone</u>							<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1536928.817	479564.460			.100	4	CLASSICAL SURVEY	1932	00967



Mn/DOT Name: FERGUS FALLS CABLE TV MAST

NGS Name: FERGUS FALLS CABLE TV MAST

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0955](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/1051
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	36	133 N	43 W	461707.18	960151.71		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1974	1978	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	RADIO/TV MAST	NGS

Description: (1978) Stamping:
1.5 MILES EAST-NORTHEAST OF FERGUS FALLS.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.169 12B = -88.172 09 = -88.061 03 = -87.962

Lat/Lon and County Coordinates (Feet)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 17 07.17741	96 01 51.71052	420513.687	165417.343	.328	4	ADJUSTMENT	1999	17648
46 17 07.17738	96 01 51.71057	420513.683	165417.340	.328	4	ADJUSTMENT	1998	17655

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 17 07.17556	96 01 51.69969	420514.447	165417.152	.328	4	ADJUSTMENT	1986	17289

<u>Geodetic Position</u>								<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 17 07.32339	96 01 50.49141			.100	4	CLASSICAL SURVEY	1977	15955	

State Plane and UTM Coordinates (Feet)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2174433.240	801842.119	874389.179	16831383.604	.328	4	ADJUSTMENT	1999	17648
2174433.236	801842.116	874389.175	16831383.601	.328	4	ADJUSTMENT	1998	17655

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2174433.996	801841.915	874389.932	16831383.388	.328	4	ADJUSTMENT	1986	17289

<u>MN State Plane - Central Zone</u>								<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
1549838.834	473768.624			.100	4	CLASSICAL SURVEY	1977	15955	



Mn/DOT Name: FERGUS FALLS COURTHOUSE CUPOLA

NGS Name: FERGUS FALLS COURTHOUSE CUPOLA

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0951](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/1025
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	3	132 N	43 W	461648.30	960431.68		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1906	1957	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	CUPOLA	NGS

Description: (1957)

Stamping:

IN FERGUS FALLS, 308.0 FEET WEST ALONG JUNIUS AVENUE FROM THE JUNCTION OF JUNIUS AVENUE AND MILL STREET
IN FERGUS FALLS.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.189 12B = -88.186 09 = -88.071 03 = -87.982

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 16 48.29515	96 04 31.68414	409269.246	163552.259	.328	4	ADJUSTMENT	1999	17648
46 16 48.29514	96 04 31.68408	409269.250	163552.258	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 16 48.29488	96 04 31.67408	409269.953	163552.228	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>						<u>Year</u>	<u>Reference</u>
46 16 48.44000	96 04 30.45100			.100	4	CLASSICAL SURVEY	1932	00967

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2163157.702	800185.716	863084.885	16829904.639	.328	4	ADJUSTMENT	1999	17648
2163157.706	800185.715	863084.890	16829904.638	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2163158.407	800185.672	863085.591	16829904.585	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1538563.952	472112.053			.100	4	CLASSICAL SURVEY	1932	00967



Mn/DOT Name: FERGUS FALLS GRAVITY

NGS Name: FERGUS FALLS GRAVITY

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	3	132 N	43 W	461647.70	960428.50		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2009	NOT FOUND	Horz=NO Vert=?	NO		FLUSH	NO MAG MATERIAL

Monument Type

SEE DESCRIPTIVE TEXT

Disk Type

SEE DESCRIPTION

Mon. Agency

MNDT

Description: (1973)

Stamping:

IN FERGUS FALLS, AT THE EAST EDGE OF THE COUNTY COURTHOUSE, 180.0 FEET SOUTH FROM THE JUNCTION OF SOUTH MILL STREET AND SOUTH COURT STREET AND ON THE SOUTH SIDE OF JUNIUS AVENUE, 24.0 FEET SOUTH OF THE NORTHEAST CORNER OF THE OLDER SECTION, 20.0 FEET NORTH OF SOUTH MILL STREET SIDE ENTRANCE ON THE LAWN, 1.0 FOOT EAST OF A WALL AND 1.0 FOOT BELOW STATION J 61.

Station Notes

GRAVITY VALUE: G=980 601.08 +/-0.1 MGAL

NOAA 07-01-1973.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.186 12B = -88.186 09 = -88.067 03 = -87.982



Mn/DOT Name: FERGUS FALLS GRAVITY CAVOUR

NGS Name: FERGUS FALLS GRAVITY CAVOUR

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	34	133 N	43 W	461700.00	960500.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2008	NOT FOUND	Horz=? Vert=?	NO			SEE DESCRIPTION

Monument Type

SEE DESCRIPTIVE TEXT

Disk Type

SEE DESCRIPTION

Mon. Agency

UNK

Description: (1973)

Stamping:

STATION FERGUS FALLS GRAVITY CAVOUR IS LOCATED AT THE HIGH SCHOOL ON CAVOUR STREET BETWEEN COURT AND UNION STREET, IN THE GIRLS ENTRANCE ROOM TO THE BASEMENT FROM THE NORTH SIDE.

Station Notes

GRAVITY VALUE: G=980 601.00 +/-0.6 MGAL

NOAA 07-01-1973.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.202 12B = -88.199 09 = -88.084 03 = -87.999



Mn/DOT Name: FERGUS FALLS HOSP NEW STACK

NGS Name: FERGUS FALLS HOSP NEW STACK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0953](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/1024
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	27	133 N	43 W	461801.70	960457.54		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1974	1974	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	STACK	NGS

Description: (1974) Stamping:
IN THE NORTHWEST PART OF FERGUS FALLS.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.231 12B = -88.228 09 = -88.123 03 = -88.035

Lat/Lon and County Coordinates (Feet)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 18 01.69901	96 04 57.53860	407487.593	170996.874	.328	4	ADJUSTMENT	1999	17648
46 18 01.69898	96 04 57.53863	407487.591	170996.871	.328	4	ADJUSTMENT	1998	17655

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 18 01.69735	96 04 57.52749	407488.372	170996.703	.328	4	ADJUSTMENT	1986	17289

<u>Geodetic Position</u>								<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 18 01.84391	96 04 56.31652			.100	4	CLASSICAL SURVEY	1977	15955	

State Plane and UTM Coordinates (Feet)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2161514.372	807661.042	861559.086	16837407.720	.328	4	ADJUSTMENT	1999	17648
2161514.370	807661.039	861559.084	16837407.718	.328	4	ADJUSTMENT	1998	17655

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2161515.148	807660.856	861559.859	16837407.522	.328	4	ADJUSTMENT	1986	17289

<u>MN State Plane - Central Zone</u>								<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
1536919.760	479587.356			.100	4	CLASSICAL SURVEY	1977	15955	



Mn/DOT Name: FERGUS FALLS MUN RWY 13

NGS Name: FERGUS FALLS MUN RWY 13

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP1212](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	36	133 N	44 W	461721.40	960944.20		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	1991	GOOD	Horz=YES Vert=?	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	UNMONUMENTED	UNK

Description: (2007)

Stamping:

2.0 MILES WEST OF FERGUS FALLS, 2.16 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 94 WEST OF FERGUS FALLS, THEN 0.2 MILE SOUTH ON COUNTY ROAD 86 TO THE MARK.

Station Notes

CONTACT THE AIRPORT MANAGER BEFORE USE. FERGUS FALLS MUNICIPAL AIRPORT.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>
1181.100	.262		1093.161	.197	1996	HORIZONTAL ADJUSTMENT	17648

Geoid Separations(ft): GEOID18 = -88.264 12B = -88.251 09 = -88.140 03 = -88.081

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
46 17 21.43784	96 09 44.15481	387339.739	167021.418	.131	3	ADJUSTMENT

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
2141299.069	804059.669	841281.610	16834124.390	.131	3	ADJUSTMENT



Mn/DOT Name: FERGUS FALLS MUN RWY 17

NGS Name: FERGUS FALLS MUN RWY 17

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP1213](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	36	133 N	44 W	461722.00	960939.00		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2009	NOT FOUND	Horz=YES Vert=?	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	UNMONUMENTED	UNK

Description: (2007)

Stamping:

2.0 MILES WEST OF FERGUS FALLS, 2.16 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 94 WEST OF FERGUS FALLS, THEN 0.2 MILE SOUTH ON COUNTY ROAD 86 TO THE MARK.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1182.150	.262		1094.194	.197	1996	HORIZONTAL ADJUSTMENT	1999 17648

Geoid Separations(ft): GEOID18 = -88.264 12B = -88.251 09 = -88.140 03 = -88.081

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
46 17 22.56037	96 09 40.07817	387626.679	167133.527	.131	3	ADJUSTMENT

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
2141587.996	804166.433	841572.303	16834226.625	.131	3	ADJUSTMENT



Mn/DOT Name: FERGUS FALLS MUN RWY 31

NGS Name: FERGUS FALLS MUN RWY 31

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP1214](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	1	132 N	44 W	461643.00	960845.00		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2009	NOT FOUND	Horz=YES Vert=?	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	UNMONUMENTED	UNK

Description: (2007)

Stamping:

1.4 MILES WEST OF FERGUS FALLS, 1.34 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 94 WEST OF FERGUS FALLS, THEN 0.5 MILE SOUTH ON AIRPORT ROAD, THEN 0.6 MILE SOUTHWEST TO STATION FERGUS FALLS MUN RWY 31 NEAR THE SOUTHEAST END OF A RUNWAY.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>
1175.030	.262		1087.114	.197	1996	HORIZONTAL ADJUSTMENT	17648

Geoid Separations(ft): GEOID18 = -88.225 12B = -88.218 09 = -88.100 03 = -88.035

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Reference</u>
46 16 43.33308	96 08 45.63630	391428.516	163138.443	.131	3	17648

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Reference</u>
2145314.742	800102.207	845235.982	16830102.483	.131	3	17648



Mn/DOT Name: FERGUS FALLS MUN RWY 35

NGS Name: FERGUS FALLS MUN RWY 35

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP1215](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	1	132 N	44 W	461649.00	960940.00		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2009	NOT FOUND	Horz=YES Vert=?	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	UNMONUMENTED	UNK

Description: (2007)

Stamping:

2.0 MILES WEST OF FERGUS FALLS, 2.16 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 94 WEST OF FERGUS FALLS, THEN 0.8 MILE SOUTH ON COUNTY ROAD 86 TO STATION FERGUS FALLS MUN RWY 35 AT THE SOUTH END OF A RUNWAY.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1157.281	.262		1069.348	.197	1996	HORIZONTAL ADJUSTMENT	1999 17648

Geoid Separations(ft): GEOID18 = -88.238 12B = -88.231 09 = -88.113 03 = -88.054

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>	
46 16 49.97790	96 09 39.46278	387651.356	163832.484	.131	3	ADJUSTMENT	1999 17648	

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>	
2141551.576	800865.937	841483.811	16830925.773	.131	3	ADJUSTMENT	1999 17648	



Mn/DOT Name: FERGUS FALLS NORTHWEST COL TWR

NGS Name: FERGUS FALLS NORTHWEST COL TWR

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0950](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/1027
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	3	132 N	43 W	461633.01	960404.26		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1906	1957	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	TOWER	NGS

Description: (1957)

Stamping:

IN FERGUS FALLS, 0.2 MILE EAST ALONG ALCOTT AVENUE FROM THE JUNCTION OF ALCOTT AVENUE AND CASCADE STREET IN FERGUS FALLS.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.166 12B = -88.166 09 = -88.051 03 = -87.962

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 16 33.01059	96 04 04.25721	411188.887	161995.187	.328	4	ADJUSTMENT	1999	17648
46 16 33.01058	96 04 04.25714	411188.892	161995.186	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 16 33.01035	96 04 04.24712	411189.596	161995.159	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>							<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 16 33.15700	96 04 03.03300			.100	4	CLASSICAL SURVEY	1932	00967

USSD

<u>Geodetic Position</u>							<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 16 33.33500	96 04 03.40700				3	CLASSICAL SURVEY		17389-73

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2165047.940	798593.589	864950.476	16828282.323	.328	4	ADJUSTMENT	1999	17648
2165047.945	798593.589	864950.481	16828282.322	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2165048.648	798593.549	864951.183	16828282.271	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - Central Zone</u>							<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1540453.631	470520.115			.100	4	CLASSICAL SURVEY	1932	00967



Mn/DOT Name: FERGUS FALLS OTTER TL PWR MAST

NGS Name: FERGUS FALLS OTTER TL PWR MAST

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0957](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/1052
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	36	133 N	43 W	461731.08	960219.59		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1974	1978	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	RADIO/TV MAST	NGS

Description: (1978) Stamping:
1.5 MILES EAST-NORTHEAST OF FERGUS FALLS.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.192 12B = -88.192 09 = -88.087 03 = -87.985

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>							<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>					
46 17 31.08027	96 02 19.59259	418565.246	167846.744	.328	4	ADJUSTMENT	1999	17648
46 17 31.08023	96 02 19.59265	418565.242	167846.740	.328	4	ADJUSTMENT	1998	17655
<u>NAD83(1986)</u>							<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>					
46 17 31.07880	96 02 19.58174	418566.008	167846.592	.328	4	ADJUSTMENT	1986	17289
<u>NAD27</u>							<u>Project Info</u>	
<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
<u>Latitude</u>	<u>Longitude</u>							
46 17 31.22451	96 02 18.37584			.100	4	CLASSICAL SURVEY	1977	15955

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>							<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>					
2172530.356	804306.845	872524.746	16833878.901	.328	4	ADJUSTMENT	1999	17648
2172530.352	804306.841	872524.742	16833878.897	.328	4	ADJUSTMENT	1998	17655
<u>NAD83(1986)</u>							<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>					
2172531.115	804306.679	872525.502	16833878.723	.328	4	ADJUSTMENT	1986	17289
<u>NAD27</u>							<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
<u>X</u>	<u>Y</u>							
1547935.711	476233.157			.100	4	CLASSICAL SURVEY	1977	15955



Mn/DOT Name: FERGUS FALLS RM 1

NGS Name: FERGUS FALLS RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CO9512](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	1	132 N	43 W	461627.58	960208.73	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	2015	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2010) **Stamping:** FERGUS FALLS NO 1 1974

2.0 MILES EAST-SOUTHEAST OF FERGUS FALLS, 1.0 MILE EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 82 IN SOUTHEAST FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 29.3, 159.8 FEET NORTH OF TRUNK HIGHWAY 210, 0.8 FOOT SOUTH-SOUTHEAST OF AN EAST/WEST FENCE LINE, 142.8 FEET EAST OF FERGUS FALLS RM 2, 80.61 FEET EAST-NORTHEAST OF STATION FERGUS FALLS, 1.7 FEET WEST-SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1309.558	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1309.584	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1309.564	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1309.584	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1309.594	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFGUS

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1309.449	.262		1221.307	.197	2011	GPS - RTRN	2015	RTRN2015
1309.449	.262		1221.307	.197	2011	GPS - RTRN	2015	RTRN2015
1309.584	.262		1221.651	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.140 12B = -88.140 09 = -88.028 03 = -87.930

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 27.58104	96 02 08.73132	419302.045	161410.752	.131	3	GPS - RTRN	2015	RTRN2015
46 16 27.58104	96 02 08.73132	419302.045	161410.752	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 27.58023	96 02 08.73260	419301.955	161410.670	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2173147.812	797859.173	873040.655	16827420.033	.131	3	GPS - RTRN	2015	RTRN2015
2173147.812	797859.173	873040.655	16827420.033	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2173147.720	797859.093	873040.562	16827419.954	.131	3	GPS - RTRN	2009	RTRN2009



<u>Station Photos</u>			
<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_FALLS_RM_1-CO9512-3N-09SEP2015.jpg	N	Sep 9, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_FALLS_RM_1-CO9512-2-09SEP2015.jpg		Sep 9, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_FALLS_RM_1-CO9512-1-09SEP2015.jpg		Sep 9, 2015
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: FERGUS FALLS RM 2

NGS Name: FERGUS FALLS RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CO9513](#)

[Get Map](#)

NGS Quad / Sta Num : 46096212/

USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	1	132 N	43 W	461627.19	960210.68	2	3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1974	2015	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1974)

Stamping: FERGUS FALLS NO 2 1974

2.0 MILES EAST-SOUTHEAST OF FERGUS FALLS, 1.0 MILE EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAYS 210 AND COUNTY ROAD 82 IN SOUTHEAST FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 29.3, 160.0 FEET NORTH OF TRUNK HIGHWAY 210, 0.9 FOOT SOUTH-SOUTHEAST OF AN EAST/WEST FENCE LINE, 142.8 FEET WEST OF FERGUS FALLS RM 1, 63.36 FEET WEST OF STATION FERGUS FALLS, 2.0 FEET EAST-NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1306.894	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1306.923	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1306.904	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1306.923	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1306.930	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFGUS

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1306.782	.262		1218.639	.197	2011	GPS - RTRN	2015	RTRN2015
1306.782	.262		1218.639	.197	2011	GPS - RTRN	2015	RTRN2015
1307.002	.262		1219.072	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.140 12B = -88.140 09 = -88.028 03 = -87.930

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 16 27.18601	96 02 10.68318	419164.767	161371.286	.131	3	GPS - RTRN	2015	RTRN2015
46 16 27.18601	96 02 10.68318	419164.767	161371.286	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 16 27.18565	96 02 10.68512	419164.631	161371.250	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2173009.845	797822.261	872902.075	16827385.287	.131	3	GPS - RTRN	2015	RTRN2015
2173009.845	797822.261	872902.075	16827385.287	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2173009.707	797822.227	872901.937	16827385.256	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_FALLS_RM_2-CO9513-3N-09SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_FALLS_RM_2-CO9513-2-09SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_FALLS_RM_2-CO9513-1-09SEP2015.jpg

<u>Dir</u>	<u>Date</u>
N	Sep 9, 2015
	Sep 9, 2015
	Sep 9, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: FERGUS FALLS STATE HOSP SPIRE

NGS Name: FERGUS FALLS STATE HOSP SPIRE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0952](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/1026
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	27	133 N	43 W	461757.41	960452.12		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	1982	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	SPIRE	NGS

Description: (1982) Stamping:
IN THE NORTHWEST PART OF FERGUS FALLS.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.228 12B = -88.228 09 = -88.120 03 = -88.031

Lat/Lon and County Coordinates (Feet)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 17 57.41390	96 04 52.11541	407866.385	170561.005	.328	4	ADJUSTMENT	1999	17648
46 17 57.41389	96 04 52.11553	407866.377	170561.004	.328	4	ADJUSTMENT	1998	17655

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 17 57.41226	96 04 52.10338	407867.229	170560.835	.328	4	ADJUSTMENT	1986	17289

<u>Geodetic Position</u>								<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 17 57.56200	96 04 50.89500			.100	4	CLASSICAL SURVEY	1963	13276	

State Plane and UTM Coordinates (Feet)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2161884.982	807218.295	861922.799	16836959.016	.328	4	ADJUSTMENT	1999	17648
2161884.974	807218.294	861922.791	16836959.015	.328	4	ADJUSTMENT	1998	17655

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2161885.823	807218.109	861923.637	16836958.817	.328	4	ADJUSTMENT	1986	17289

<u>MN State Plane - Central Zone</u>								<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
1537290.273	479144.940			.100	4	CLASSICAL SURVEY	1963	13276	



Mn/DOT Name: FERGUS MNDT

NGS Name: FERGUS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0169](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/1045
USGS Quad: FERGUS FALLS

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NW	29	133 N	43 W	461837.11	960723.37	2	1

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1962	2015	GOOD	Horz=NO Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRAVERSE STATION DISK	MNDT

Description: (2015) **Stamping:** FERGUS 1962

3.0 MILES NORTHWEST OF FERGUS FALLS, 1.4 MILES NORTH ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 52.75, 0.15 MILE SOUTH OF A RAILROAD BRIDGE, 92.0 FEET WEST OF EASTBOUND INTERSTATE HIGHWAY 94, 74.14 FEET SOUTH OF STATION FERGUS RM 3, 70.73 FEET NORTH OF STATION FERGUS RM 2, 3.0 FEET EAST OF A FENCE, 4.0 FEET SOUTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1246.293	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1246.293	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1246.320	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1246.310	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1246.320	.016	2/1				VERTICAL ADJUSTMENT	2015	00000821-R
1246.320	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1246.320	.016	2/1				VERTICAL CONTROL SURVEY	2013	VBREC
1246.320	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1246.320	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR
1246.320	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1246.320	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFALL
1246.320	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1245.480	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1245.480	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1245.480	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1245.480	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1246.274	.262		1158.190	.197	1996	GPS - RTRN	2009	RTRN2009
1245.995	.131		1158.016	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -88.271 12B = -88.261 09 = -88.156 03 = -88.081

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 18 37.11394	96 07 23.36214	397266.958	174634.637	.131	3	GPS - RTRN	2009	RTRN2009
46 18 37.11158	96 07 23.36777	397266.561	174634.400	.033	1	ADJUSTMENT	1999	17648
46 18 37.11158	96 07 23.36778	397266.561	174634.400	.033	1	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 18 37.11050	96 07 23.35519	397267.444	174634.287	.033	1	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 18 37.25593	96 07 22.14138			.100	1	CLASSICAL SURVEY	1991	17504
46 18 37.25720	96 07 22.13970			.100	1	CLASSICAL SURVEY	1963	13276

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2151364.166	811486.856	851466.686	16841394.746	.131	3	GPS - RTRN	2009	RTRN2009
2151363.766	811486.627	851466.281	16841394.523	.033	1	ADJUSTMENT	1999	17648
2151363.765	811486.627	851466.281	16841394.523	.033	1	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2151364.646	811486.496	851467.160	16841394.378	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1526769.134	483412.822			.100	1	CLASSICAL SURVEY	1991	17504
1526769.255	483412.948			.100	1	CLASSICAL SURVEY	1963	13276

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS-RP0169-3W-15SEP2015.jpg	W	Sep 15, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS-RP0169-2-15SEP2015.jpg		Sep 15, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS-RP0169-1-15SEP2015.jpg		Sep 15, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: FERGUS MNDT A POINT

NGS Name: FERGUS A POINT

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0958](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	29	133 N	43 W	461836.69	960722.86		1

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	2015	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	UNMONUMENTED	MNDT

Description: (1974) **Stamping:**

2.88 MILES NORTHWEST OF FERGUS FALLS.

Station Notes

THE REFERENCE POSITION IS 43.0 FEET NORTHEAST OF FERGUS RM 2, AND 56.0 FEET SOUTHEAST OF FERGUS MNDT.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference
1248.390	.131		1160.411	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference
1247.504						RECIPROCAL VERTICAL ANGLE	1974	HORZ

Geoid Separations(ft): GEOID18 = -88.271 12B = -88.261 09 = -88.156 03 = -88.081

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 18 36.69060	96 07 22.85781	397302.143	174591.568	.033	1	ADJUSTMENT	1999	17648
46 18 36.69059	96 07 22.85783	397302.142	174591.567	.033	1	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 18 36.68961	96 07 22.84536	397303.016	174591.463	.033	1	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 18 36.83628	96 07 21.62985			.100	1	CLASSICAL SURVEY	1977	15955

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2151398.543	811443.149	851500.382	16841350.485	.033	1	ADJUSTMENT	1999	17648
2151398.542	811443.148	851500.381	16841350.484	.033	1	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2151399.415	811443.028	851501.252	16841350.350	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1526804.027	483369.477			.100	1	CLASSICAL SURVEY	1977	15955



Mn/DOT Name: FERGUS RM 1

NGS Name: FERGUS RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0172](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NW	20	133 N	43 W	461911.53	960723.76	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1962	2015	GOOD	Horz=NO Vert=YES	YES		PROJECTS 5 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2015)

Stamping: FERGUS NO 1 1962

3.5 MILES NORTHWEST OF FERGUS FALLS, 2.1 MILES NORTH ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 52.08, 0.65 MILE NORTH OF STATION FERGUS MNDT, 97.5 FEET WEST OF EASTBOUND INTERSTATE HIGHWAY 94, 1.8 FEET EAST OF A FENCE, 4.5 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1256.628	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1256.638	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1256.641	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1256.654	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1256.654	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR
1256.654	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1256.654	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFALL
1256.625	.016	2				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1255.782	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1255.782	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1255.782	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1255.782	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1256.326	.262		1168.055	.197	2011	GPS - RTRN	2015	RTRN2015
1256.490	.262		1168.397	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.281 12B = -88.271 09 = -88.166 03 = -88.090

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 19 11.53017	96 07 23.75909	397257.014	178121.375	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 19 11.52918	96 07 23.75870	397257.041	178121.275	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2151418.754	814972.720	851576.341	16844880.668	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2151418.779	814972.619	851576.364	16844880.567	.131	3	GPS - RTRN	2009	RTRN2009



<u>Station Photos</u>		<u>Dir</u>	<u>Date</u>
<u>Type</u>	<u>File Name</u>	W	Sep 15, 2015
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_RM_1-RP0172-3W-15SEP2015.jpg		Sep 15, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_RM_1-RP0172-2-15SEP2015.jpg		Sep 15, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_RM_1-RP0172-1-15SEP2015.jpg		Sep 15, 2015
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: FERGUS RM 2

NGS Name: FERGUS RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0170](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	29	133 N	43 W	461836.42	960723.37	2	3	1962	2015	GOOD	Horz=NO Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2015)

Stamping: FERGUS NO 2 1962

3.0 MILES NORTHWEST OF FERGUS FALLS, 1.4 MILES NORTH ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 52.75, 0.15 MILE SOUTH OF A RAILROAD BRIDGE, 93.0 FEET WEST OF EASTBOUND INTERSTATE HIGHWAY 94, 145.1 FEET SOUTH OF STATION FERGUS RM 3, 70.73 FEET SOUTH OF STATION FERGUS MNDT, 2.0 FEET EAST OF A RIGHT-OF-WAY FENCE, 1.6 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1246.303	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1246.303	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1246.333	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1246.316	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1246.333	.016	2/1				VERTICAL ADJUSTMENT	2015	00000821-R
1246.333	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1246.336	.016	2/1				VERTICAL CONTROL SURVEY	2013	VBREC
1246.333	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1246.336	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR
1246.336	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1246.336	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFALL
1246.316	.016	2				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1245.477	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1245.477	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1245.477	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1245.477	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1246.198	.262		1157.934	.197	2011	GPS - RTRN	2015	RTRN2015
1246.185	.262		1158.105	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.271 12B = -88.261 09 = -88.156 03 = -88.081

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 18 36.41639	96 07 23.37340	397265.804	174563.975	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 18 36.41592	96 07 23.37297	397265.834	174563.927	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2151361.705	811416.237	851463.109	16841324.147	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2151361.734	811416.188	851463.137	16841324.098	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_RM_2-RP0170-3SW-15SEP2015.jpg	SW	Sep 15, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_RM_2-RP0170-2-15SEP2015.jpg		Sep 15, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_RM_2-RP0170-1-15SEP2015.jpg		Sep 15, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: FERGUS RM 3

NGS Name: FERGUS RM 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CO9514](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	29	133 N	43 W	461837.85	960723.39	2	3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1974	2015	GOOD	Horz=NO Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2015)

Stamping: FERGUS MHD RM 3 1974

3.0 MILES NORTHWEST OF FERGUS FALLS, 1.4 MILES NORTH ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 52.75, 0.15 MILE SOUTH OF A RAILROAD BRIDGE, 94.0 FEET WEST OF EASTBOUND INTERSTATE HIGHWAY 94, 145.1 FEET NORTH OF STATION FERGUS RM 2, 74.14 FEET NORTH OF STATION FERGUS MNDT, 3.0 FEET EAST OF A FENCE, 1.0 FOOT EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1245.965	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1245.965	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1245.995	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1245.982	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1245.995	.016	2/1				VERTICAL ADJUSTMENT	2015	00000821-R
1245.995	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1245.995	.016	2/1				VERTICAL CONTROL SURVEY	2013	VBREC
1245.995	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1245.995	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1245.634	.262		1157.373	.197	2011	GPS - RTRN	2015	RTRN2015
1245.841	.262		1157.760	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.271 12B = -88.261 09 = -88.156 03 = -88.081

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u> <u>Order</u> <u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 18 37.84879	96 07 23.39034	397265.361	174709.093	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u> <u>Order</u> <u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 18 37.84639	96 07 23.39068	397265.336	174708.850	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u> <u>Order</u> <u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2151363.947	811561.318	851467.643	16841469.232	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u> <u>Order</u> <u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2151363.918	811561.076	851467.609	16841468.990	.131	3	GPS - RTRN	2009	RTRN2009



<u>Station Photos</u>		<u>Dir</u>	<u>Date</u>
<u>Type</u>	<u>File Name</u>	W	Sep 15, 2015
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_RM_3-CO9514-3W-15SEP2015.jpg		Sep 15, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_RM_3-CO9514-2-15SEP2015.jpg		Sep 15, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_RM_3-CO9514-1-15SEP2015.jpg		Sep 15, 2015
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: FISH

NGS Name: FISH

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095434/
USGS Quad: LAKE FRANKLIN

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	9	137 N	42 W	464125.51	955950.22		3	1999	2009	GOOD	Horz=NO Vert=YES	NO		RECESSED 3 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (1999)

Stamping: FISH 1999

2.10 MILES NORTHEAST OF DUNVILLA, 1.25 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 34 IN DUNVILLA TO TRUNK HIGHWAY 59 MILEPOINT 248.80, THEN 2.15 MILES NORTHEAST AND NORTHWEST ALONG FISH LAKE ROAD, 43.0 FEET SOUTHEAST OF FISH LAKE ROAD, 8.0 FEET NORTHEAST OF EXTENDED DRIVEWAY NUMBER 49841, 2.0 FEET NORTHEAST OF A WITNESS POST.

Station Notes

THE ROD DEPTH IS UNKNOWN.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1387.658	.262		1300.693	.197	1996	GPS - RTRN		2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.221 12B = -87.214 09 = -87.100 03 = -86.965

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 41 25.51368	95 59 50.21539	429571.089	313130.171	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2186221.929	949343.114	888525.510	16978727.231	.131	3	GPS - RTRN	2009	RTRN2009



Mn/DOT Name: FISKE

NGS Name: FISKE

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DR5765	Get Map
NW	22	132 N	40 W	461417.07	954230.01		C	NGS Quad / Sta Num : 46095324/ USGS Quad: EAGLE LAKE	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 94 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: FISKE 2014

3.0 MILES SOUTH OF BATTLE LAKE, 2.5 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 18.97, 71.4 FEET EAST OF TRUNK HIGHWAY 78, 61.3 FEET SOUTH OF 190TH STREET, 1.5 FEET NORTH OF A WITNESS POST.

Station Pair: 5619 C - OTTER TAIL, MN

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1364.269			1276.940	.011	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1364.426	.131		1277.091	.066	1996	GPS - STATIC	2024	HTH78B
1364.269			1276.940	.011	2011	GPS - STATIC	2024	HTH78B
1364.374	.262		1277.038	.197	2011	GPS - RTRN	2023	RTRN2023
1364.302	.131		1277.091	.066	1996	GPS - STATIC	2021	HOTTE
1364.275			1276.940	.026	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1364.275			1276.940	.026	2011	GPS - STATIC	2020	HOTTE
1364.358	.262		1277.009	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.339 12B = -87.352 09 = -87.244 03 = -87.172

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 14 17.07094	95 42 30.01432	502107.881	148026.471	.007		ADJUSTMENT	2024	GPS3771
46 14 17.07094	95 42 30.01432	502107.881	148026.471	.007	C	GPS - STATIC	2024	HTH78B
46 14 17.07096	95 42 30.01493	502107.838	148026.473	.131	3	GPS - RTRN	2023	RTRN2023
46 14 17.07094	95 42 30.01432	502107.881	148026.471	.016		ADJUSTMENT	2020	GPS3384
46 14 17.07094	95 42 30.01432	502107.881	148026.471	.016	C	GPS - STATIC	2020	HOTTE
46 14 17.07083	95 42 30.01453	502107.866	148026.460	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 14 17.07064	95 42 30.01484	502107.845	148026.440	.033	C	GPS - STATIC	2024	HTH78B
46 14 17.07064	95 42 30.01484	502107.845	148026.440	.033	C	GPS - STATIC	2021	HOTTE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255680.634	782946.139	955351.426	16811204.533	.007		ADJUSTMENT	2024	GPS3771
2255680.634	782946.139	955351.426	16811204.533	.007	C	GPS - STATIC	2024	HTH78B
2255680.592	782946.142	955351.383	16811204.536	.131	3	GPS - RTRN	2023	RTRN2023
2255680.634	782946.139	955351.426	16811204.533	.016		ADJUSTMENT	2020	GPS3384
2255680.634	782946.139	955351.426	16811204.533	.016	C	GPS - STATIC	2020	HOTTE
2255680.620	782946.128	955351.411	16811204.522	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255680.597	782946.109	955351.389	16811204.504	.033	C	GPS - STATIC	2024	HTH78B
2255680.597	782946.109	955351.389	16811204.504	.033	C	GPS - STATIC	2021	HOTTE



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FISKE-DR5765-3E-16OCT2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FISKE-DR5765-2-16OCT2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FISKE-DR5765-1-16OCT2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Oct 16, 2023
	Oct 16, 2023
	Oct 16, 2023



Mn/DOT Name: FLAD

NGS Name: FLAD

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR9946](#) [Get Map](#)
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	34	136 N	41 W	463236.36	955001.20	2	C	2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 89 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: FLAD 2014

5.5 MILES WEST OF DENT, 6.0 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND THE WEST JUNCTION OF COUNTY ROAD 35 IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 25.6, 38.5 FEET NORTH OF TRUNK HIGHWAY 108, 65.1 FEET EAST OF DRIVEWAY NUMBER 31463, 1.5 FEET SOUTH OF A WITNESS POST.

Station Pair: MARK - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1345.890	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPPEL12

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1345.886			1258.593	.024	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1345.854	.131		1258.688	.066	1996	GPS - STATIC	2024	HTH108
1345.886			1258.593	.024	2011	GPS - STATIC	2024	HTH108
1345.923	.262		1258.580	.197	2011	GPS - RTRN	2023	RTRN2023
1345.936	.262		1258.597	.197	2011	GPS - RTRN	2022	RTRN2022
1345.804	.262		1258.469	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.342 12B = -87.336 09 = -87.228 03 = -87.086

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Ellipsoid (NAD83)</u>		<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 32 36.36211	95 50 01.19739	470556.146	259416.612	.013		ADJUSTMENT	2024	GPS3689
46 32 36.36211	95 50 01.19739	470556.146	259416.612	.013	C	GPS - STATIC	2024	HTH108
46 32 36.36236	95 50 01.19684	470556.184	259416.637	.131	3	GPS - RTRN	2023	RTRN2023
46 32 36.36162	95 50 01.19743	470556.143	259416.562	.131	3	GPS - RTRN	2022	RTRN2022
46 32 36.36259	95 50 01.19820	470556.089	259416.661	.131	3	GPS - RTRN	2014	RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Ellipsoid (NAD83)</u>		<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 32 36.36188	95 50 01.19792	470556.109	259416.588	.033	C	GPS - STATIC	2024	HTH108

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2226200.583	894886.795	927640.317	16923624.096	.013		ADJUSTMENT	2024	GPS3689
2226200.583	894886.795	927640.317	16923624.096	.013	C	GPS - STATIC	2024	HTH108
2226200.622	894886.819	927640.356	16923624.120	.131	3	GPS - RTRN	2023	RTRN2023
2226200.579	894886.745	927640.312	16923624.046	.131	3	GPS - RTRN	2022	RTRN2022
2226200.528	894886.844	927640.262	16923624.146	.131	3	GPS - RTRN	2014	RTRN2014

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2226200.546	894886.772	927640.279	16923624.074	.033	C	GPS - STATIC	2024	HTH108



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FLAD-DR9946-3N-31JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FLAD-DR9946-2-31JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FLAD-DR9946-1-31JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Jul 31, 2023
	Jul 31, 2023
	Jul 31, 2023



Mn/DOT Name: FLOE

NGS Name: FLOE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7116](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	32	135 N	43 W	462724.12	960740.92	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2009	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 30 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) Stamping: FLOE 2009

2.25 MILES SOUTHWEST OF ERHARD, 2.35 MILES SOUTHWEST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 24 IN ERHARD TO TRUNK HIGHWAY 59 MILEPOINT 232.10, THEN 0.3 MILE WEST ALONG 340TH STREET, 32.0 FEET NORTH OF 340TH STREET, 10.0 FEET WEST OF A FIELD ENTRANCE, 64.9 FEET EAST-SOUTHEAST OF A POWER POLE, 4.2 FEET SOUTH OF A WITNESS POST.

Station Pair: DOCK - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1315.299	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1315.329	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1315.332	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1315.299			1227.245	.016	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1315.299	.131		1227.396	.066	1996	GPS - STATIC	2023	HTH59
1315.299			1227.245	.016	2011	GPS - STATIC	2023	HTH59
1315.325	.262		1227.229	.197	2011	GPS - RTRN	2022	RTRN2022
1315.299	.131		1227.396	.066	1996	GPS - STATIC	2021	HOTTE
1315.299			1227.245	.024	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1315.299			1227.245	.024	2011	GPS - STATIC	2020	HOTTE

Geoid Separations(ft): GEOID18 = -88.097 12B = -88.094 09 = -87.972 03 = -87.874

Lat/Lon and County Coordinates (Feet)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 27 24.12175	96 07 40.91594	396312.304	228030.993	.010		ADJUSTMENT	2024	GPS3672
46 27 24.12175	96 07 40.91594	396312.304	228030.993	.010	C	GPS - STATIC	2023	HTH59
46 27 24.12098	96 07 40.91616	396312.288	228030.915	.131	3	GPS - RTRN	2022	RTRN2022
46 27 24.12175	96 07 40.91594	396312.304	228030.993	.016		ADJUSTMENT	2020	GPS3384
46 27 24.12175	96 07 40.91594	396312.304	228030.993	.016	C	GPS - STATIC	2020	HOTTE

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 27 24.12145	96 07 40.91644	396312.269	228030.963	.033	C	GPS - STATIC	2023	HTH59
46 27 24.12145	96 07 40.91644	396312.269	228030.963	.033	C	GPS - STATIC	2021	HOTTE



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2151398.001	864884.768	852346.251	16894806.117	.010		ADJUSTMENT	2024	GPS3672
2151398.001	864884.768	852346.251	16894806.117	.010	C	GPS - STATIC	2023	HTH59
2151397.984	864884.690	852346.233	16894806.039	.131	3	GPS - RTRN	2022	RTRN2022
2151398.001	864884.768	852346.251	16894806.117	.016		ADJUSTMENT	2020	GPS3384
2151398.001	864884.768	852346.251	16894806.117	.016	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2151397.965	864884.738	852346.215	16894806.088	.033	C	GPS - STATIC	2023	HTH59
2151397.965	864884.738	852346.215	16894806.088	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FLOE-DO7116-3N-17OCT2022.jpg	N	Oct 17, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FLOE-DO7116-2-17OCT2022.jpg		Oct 17, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FLOE-DO7116-1-17OCT2022.jpg		Oct 17, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: FOELS

NGS Name: FOELS

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DQ2045 NGS Quad / Sta Num : 46096122/ USGS Quad: PELICAN RAPIDS Get Map
NW	12	136 N	43 W	463636.64	960310.51	2	C	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 69 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: FOELS 2014

2.9 MILES NORTH OF PELICAN RAPIDS, 3.2 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAYS 59 AND 108 WEST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 243.85, 152.3 FEET NORTH OF 210TH AVENUE, 38.1 FEET EAST OF TRUNK HIGHWAY 59, 36.4 FEET SOUTH OF A GUARD RAIL, 1.5 FEET WEST OF A WITNESS POST.

Station Pair: BREESE - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1319.207	.016	2/1				VERTICAL ADJUSTMENT		2019	00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1319.207			1231.782	.021	2011	HORIZONTAL ADJUSTMENT		2024	GPS3672
1319.207	.131		1231.891	.066	1996	GPS - STATIC		2023	HTH59
1319.207			1231.782	.021	2011	GPS - STATIC		2023	HTH59
1319.223	.262		1231.753	.197	2011	GPS - RTRN		2022	RTRN2022
1319.135	.262		1231.684	.197	2011	GPS - RTRN		2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.470 12B = -87.454 09 = -87.346 03 = -87.211

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>				<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
46 36 36.64037	96 03 10.51275			415482.672	283917.779	.013		ADJUSTMENT	2024 GPS3672
46 36 36.64037	96 03 10.51275			415482.672	283917.779	.013	C	GPS - STATIC	2023 HTH59
46 36 36.64034	96 03 10.51235			415482.700	283917.776	.131	3	GPS - RTRN	2022 RTRN2022
46 36 36.64035	96 03 10.51262			415482.681	283917.777	.131	3	GPS - RTRN	2014 RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>				<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
46 36 36.64014	96 03 10.51323			415482.638	283917.756	.033	C	GPS - STATIC	2023 HTH59

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
2171596.984	920400.102			873434.552	16950012.667	.013		ADJUSTMENT	2024 GPS3672
2171596.984	920400.102			873434.552	16950012.667	.013	C	GPS - STATIC	2023 HTH59
2171597.012	920400.099			873434.580	16950012.663	.131	3	GPS - RTRN	2022 RTRN2022
2171596.993	920400.100			873434.561	16950012.665	.131	3	GPS - RTRN	2014 RTRN2014

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
2171596.950	920400.079			873434.518	16950012.646	.033	C	GPS - STATIC	2023 HTH59



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FOELS-DQ2045-3E-12OCT2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FOELS-DQ2045-2-12OCT2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FOELS-DQ2045-1-12OCT2022.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Oct 12, 2022
	Oct 12, 2022
	Oct 12, 2022



Mn/DOT Name: FORMOE

NGS Name: FORMOE

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DQ2697 NGS Quad / Sta Num : 46095334/ USGS Quad: DALTON	Get Map
NW	15	131 N	42 W	460945.26	955722.93	2	C		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 34 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015)

Stamping: FORMOE 2014

10.0 MILES SOUTHEAST OF FERGUS FALLS, 4.2 MILES SOUTHEAST ALONG EASTBOUND INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 (THE JUNCTION IS 6.0 MILES SOUTHEAST OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 66.10, 69.3 FEET WEST-SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 16.7 FEET EAST-NORTHEAST OF A RIGHT-OF-WAY FENCE, 1.5 FEET EAST-NORTHEAST OF A WITNESS POST.

Station Pair: TUMULI RM 3 - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1238.150	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1238.173	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1238.157	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1238.150			1150.939	.017	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1238.150			1150.939	.017	2011	GPS - STATIC	2025	HTH94B
1239.496	.262		1152.193	.197	2011	GPS - RTRN	2023	RTRN2023
1238.134	.262		1150.831	.197	2011	GPS - OPUS	2022	GPSBM
1238.144	.262		1150.844	.197	2011	GPS - RTRN	2021	RTRN2021
1238.121	.262		1150.811	.197	2011	GPS - RTRN	2015	RTRN2015
1238.104	.262		1150.795	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.303 12B = -87.313 09 = -87.172 03 = -87.136

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>								
Geodetic Position		Otter Tail County				Project Info		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 09 45.26277	95 57 22.93381	439255.628	120582.453	.013		ADJUSTMENT	2025	GPS3847
46 09 45.26277	95 57 22.93381	439255.628	120582.453	.013	C	GPS - STATIC	2025	HTH94B
46 09 45.26257	95 57 22.93385	439255.625	120582.433	.131	3	GPS - RTRN	2023	RTRN2023
46 09 45.26240	95 57 22.93384	439255.626	120582.415	.131	3	GPS - OPUS	2022	GPSBM
46 09 45.26248	95 57 22.93330	439255.664	120582.423	.131	3	GPS - RTRN	2021	RTRN2021
46 09 45.26213	95 57 22.93472	439255.564	120582.388	.131	3	GPS - RTRN	2015	RTRN2015
46 09 45.26253	95 57 22.93429	439255.594	120582.429	.131	3	GPS - RTRN	2014	RTRN2014

<u>NAD83(1996)</u>		<u>Otter Tail County</u>		<u>Project Info</u>				
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 09 45.26224	95 57 22.93442	439255.585	120582.399	.066		NCAT	2025	HTH94B



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2192339.598	756674.041	891588.611	16785924.429	.013		ADJUSTMENT	2025	GPS3847
2192339.598	756674.041	891588.611	16785924.429	.013	C	GPS - STATIC	2025	HTH94B
2192339.595	756674.020	891588.607	16785924.409	.131	3	GPS - RTRN	2023	RTRN2023
2192339.595	756674.003	891588.607	16785924.392	.131	3	GPS - OPUS	2022	GPSBM
2192339.633	756674.011	891588.646	16785924.399	.131	3	GPS - RTRN	2021	RTRN2021
2192339.533	756673.977	891588.545	16785924.367	.131	3	GPS - RTRN	2015	RTRN2015
2192339.564	756674.017	891588.576	16785924.406	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2192339.554	756673.988	891588.566	16785924.377	.066		NCAT	2025	HTH94B

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FORMOE-DQ2697-3SW-14AUG2023.jpg	SW	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FORMOE-DQ2697-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FORMOE-DQ2697-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: FRANK

NGS Name: FRANK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5766](#) [Get Map](#)
NGS Quad / Sta Num : 46095434/
USGS Quad: LAKE FRANKLIN

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	27	137 N	42 W	463930.46	955757.94		C	1999	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 6 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2015) Stamping: FRANK 1999

2.7 MILES EAST OF DUNVILLA, 3.35 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 34 IN DUNVILLA, TO TRUNK HIGHWAY 59 MILEPOINT 250.95, THENCE 1.25 MILES SOUTH ALONG COUNTY ROAD 31, THENCE 0.20 MILE WEST ALONG FRANKLIN LAKE ROAD, 49.0 FEET SOUTH OF FRANKLIN LAKE ROAD, 84.0 FEET WEST OF A POWER POLE, 80.0 FEET EAST OF A FIELD ENTRANCE, 1.0 FOOT EAST OF A WITNESS POST.

Station Notes

DISTRICT 4 DISK USED; THE ROD DEPTH IS UNKNOWN.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order</u> (/Class)	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1438.580			1351.306	.016	2011	HORIZONTAL ADJUSTMENT		2024	GPS3672
1438.468	.131		1351.457	.066	1996	GPS - STATIC		2023	HTH59
1438.580			1351.306	.016	2011	GPS - STATIC		2023	HTH59
1438.603	.262		1351.319	.197	2011	GPS - RTRN		2022	RTRN2022
1438.498	.131		1351.457	.066	1996	GPS - STATIC		2021	HOTTE
1438.573			1351.306	.023	2011	HORIZONTAL ADJUSTMENT		2020	GPS3384
1438.573			1351.306	.023	2011	GPS - STATIC		2020	HOTTE
1438.337	.262		1351.316	.197	1996	GPS - RTRN		2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.283 12B = -87.264 09 = -87.172 03 = -87.018

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 39 30.46298	95 57 57.94421	437361.483	301447.608	.010		ADJUSTMENT	2024	GPS3672
46 39 30.46298	95 57 57.94421	437361.483	301447.608	.010	C	GPS - STATIC	2023	HTH59
46 39 30.46306	95 57 57.94407	437361.493	301447.616	.131	3	GPS - RTRN	2022	RTRN2022
46 39 30.46298	95 57 57.94421	437361.483	301447.608	.016		ADJUSTMENT	2020	GPS3384
46 39 30.46298	95 57 57.94421	437361.483	301447.608	.016	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 39 30.46265	95 57 57.94471	437361.448	301447.575	.033	C	GPS - STATIC	2023	HTH59
46 39 30.46265	95 57 57.94471	437361.448	301447.575	.033	C	GPS - STATIC	2021	HOTTE
46 39 30.46311	95 57 57.94429	437361.478	301447.621	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2193793.790	937519.796	895909.325	16966780.624	.010		ADJUSTMENT	2024	GPS3672
2193793.790	937519.796	895909.325	16966780.624	.010	C	GPS - STATIC	2023	HTH59
2193793.800	937519.804	895909.335	16966780.632	.131	3	GPS - RTRN	2022	RTRN2022
2193793.790	937519.796	895909.325	16966780.624	.016		ADJUSTMENT	2020	GPS3384
2193793.790	937519.796	895909.325	16966780.624	.016	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2193793.754	937519.763	895909.289	16966780.592	.033	C	GPS - STATIC	2023	HTH59
2193793.754	937519.763	895909.289	16966780.592	.033	C	GPS - STATIC	2021	HOTTE
2193793.784	937519.809	895909.320	16966780.638	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FRANK-DR5766-3S-12OCT2022.jpg	S	Oct 12, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FRANK-DR5766-2-12OCT2022.jpg		Oct 12, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FRANK-DR5766-1-12OCT2022.jpg		Oct 12, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: FRENCH

NGS Name: FRENCH

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DP2117](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	34	133 N	44 W	461716.83	961211.05	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2000	2013	GOOD	Horz=NO Vert=NO	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2008)

Stamping: FRENCH 2000

6.0 MILES WEST OF FERGUS FALLS, 4.1 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 20.25, 91.5 FEET SOUTH OF TRUNK HIGHWAY 210, 50.0 FEET NORTH OF THE RAILROAD TRACKS, 10.5 FEET NORTH OF THE NORTH LEG OF A FRENCH SIGNPOST, 10.3 FEET SOUTH OF A TRAIL ROAD, 3.9 FEET NORTH OF A WITNESS POST.

Station Notes

THE ROD DEPTH IS UNKNOWN. THE SURVEY MARK IS ON RAILROAD PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order / (Class)	Height	Acc	Adj		Year	Reference
1109.096	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1109.102	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1109.148	.016	2/1				VERTICAL ADJUSTMENT	2015	00000821-R
1109.148	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1109.145	.016	2/1				VERTICAL CONTROL SURVEY	2013	VBREC

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order / (Class)	Height	Acc	Adj		Year	Reference
1109.036	.262		1020.871	.197	2007	GPS - RTRN	2011	RTRN2011
1109.151	.262		1021.035	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.291 12B = -88.271 09 = -88.166 03 = -88.117

Lat/Lon and County Coordinates (Feet)

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 16.83153	96 12 11.05163	377020.388	166615.553	.131	3	GPS - RTRN	2011	RTRN2011

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 16.83295	96 12 11.05063	377020.459	166615.696	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2130975.344	803844.896	830951.481	16834072.428	.131	3	GPS - RTRN	2011	RTRN2011

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2130975.418	803845.038	830951.558	16834072.569	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FRENCH-DP2117-3W-09OCT2008.jpg	W	Oct 9, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FRENCH-DP2117-2-09OCT2008.jpg		Oct 9, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FRENCH-DP2117-1-09OCT2008.jpg		Oct 9, 2008

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: FRIBERG

NGS Name: FRIBERG

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	33	134 N	42 W	462215.30	955918.60			2000	2014	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2015)

Stamping: FRIBERG 2000

7.0 MILES EAST OF ELIZABETH, 7.0 MILES EAST ALONG COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND TRUNK HIGHWAY 59 IN ELIZABETH, TO TRUNK HIGHWAY 59 MILEPOINT 226.75, THENCE 0.10 MILE NORTH ALONG COUNTY ROAD 3, 33.6 FEET EAST OF COUNTY ROAD 3, 15.6 FEET NORTH OF AN ENTRANCE, 21.6 FEET WEST OF A WATERFOWL PROTECTION AREA SIGN, 21.6 FEET WEST OF A WITNESS POST.

Station Notes

UNKNOWN ROD DEPTH

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.159 12B = -88.163 09 = -88.051 03 = -87.923

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FRIBERG-3E-30SEP2014.jpg	E	Sep 30, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FRIBERG-2-30SEP2014.jpg		Sep 30, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FRIBERG-1-30SEP2014.jpg		Sep 30, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: FRODL

NGS Name: FRODL

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ1975](#) [Get Map](#)
NGS Quad / Sta Num : 46096124/
USGS Quad: ROLLAG

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	20	137 N	43 W	463937.00	960902.83	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 39 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: FRODL 2014

7.1 MILES NORTHWEST OF PELICAN RAPIDS, 6.05 MILES WEST ALONG TRUNK HIGHWAY 34 FROM THE JUNCTION OF TRUNK HIGHWAYS 34 AND 59 (THE JUNCTION IS 6.0 MILES NORTH OF PELICAN RAPIDS), AT TRUNK HIGHWAY 34 MILEPOINT 12.8, 59.9 FEET NORTH OF TRUNK HIGHWAY 34, 98.2 FEET WEST OF A DRIVEWAY NUMBER 16606 EXTENDED, 1.5 FEET SOUTH OF A WITNESS POST.

Station Pair: NEIDT - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1375.919	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1375.919			1288.734	.020	2011	HORIZONTAL ADJUSTMENT	2024	GPS3671
1375.919	.131		1288.846	.066	1996	GPS - STATIC	2023	HTH9
1375.919			1288.734	.020	2011	GPS - STATIC	2023	HTH9
1375.913	.262		1288.619	.197	2011	GPS - RTRN	2022	RTRN2022
1375.847	.262		1288.587	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.293 12B = -87.260 09 = -87.162 03 = -87.073

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Ellipsoid (NAD83)</u>		<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 39 37.00022	96 09 02.83358	390984.336	302310.329	.013		ADJUSTMENT	2024	GPS3671
46 39 37.00022	96 09 02.83358	390984.336	302310.329	.013	C	GPS - STATIC	2023	HTH9
46 39 37.00040	96 09 02.83289	390984.384	302310.347	.131	3	GPS - RTRN	2022	RTRN2022
46 39 36.99981	96 09 02.83332	390984.354	302310.287	.131	3	GPS - RTRN	2014	RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Ellipsoid (NAD83)</u>		<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 39 36.99998	96 09 02.83401	390984.306	302310.304	.033	C	GPS - STATIC	2023	HTH9

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2147446.285	939240.619	849579.780	16969243.930	.013		ADJUSTMENT	2024	GPS3671
2147446.285	939240.619	849579.780	16969243.930	.013	C	GPS - STATIC	2023	HTH9
2147446.334	939240.636	849579.829	16969243.946	.131	3	GPS - RTRN	2022	RTRN2022
2147446.303	939240.577	849579.796	16969243.888	.131	3	GPS - RTRN	2014	RTRN2014

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2147446.255	939240.595	849579.749	16969243.907	.033	C	GPS - STATIC	2023	HTH9



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FRODL-DQ1975-3N-13SEP2022.jpg	N	Sep 13, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FRODL-DQ1975-2-13SEP2022.jpg		Sep 13, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FRODL-DQ1975-1-13SEP2022.jpg		Sep 13, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: G 100

NGS Name: G 100

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0125](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	31	133 N	43 W	461725.60	960819.60	2	3	1934	2009	DESTROYED	Horz=NO Vert=NO	NO			STEEL SPIKE ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (2005) Stamping: G 100 1934

3.5 MILES WEST OF THE BANK AT FERGUS FALLS, 0.2 MILE WEST OF THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 116, AT RAILROAD MILEPOST 53, NORTH OF THE KORBY CONSTRUCTION BUILDING, 62.0 FEET SOUTH OF TRUNK HIGHWAY 210, AT TRUNK HIGHWAY MILEPOST 23.4, 24.0 FEET NORTH OF A RAILROAD, 1.0 FOOT NORTH OF A WITNESS POST.

Station Notes

THE DISK WAS TURNED IN TO THE OFFICE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1138.436	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1138.472	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1138.469	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFALL
1138.610	.016	2				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1137.796	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1137.796	.007	1				VERTICAL CONTROL SURVEY	1941	Q460962
1137.796	.007	1				VERTICAL CONTROL SURVEY	1934	L97 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1138.344	.262		1050.280	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.254 12B = -88.241 09 = -88.130 03 = -88.061

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 17 25.53984	96 08 19.59648	393280.456	167404.403	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2147245.066	804332.595	847233.562	16834303.582	.131	3	GPS - RTRN	2009	RTRN2009



Mn/DOT Name: G 55

NGS Name: G 55

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0621](#) [Get Map](#)
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	2	137 N	40 W	464222.30	954121.80	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	2009	GOOD	Horz=NO Vert=YES	YES		PROJECTS 4 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	NGS

Description: (2004)

Stamping: G 55 1934

2.0 MILES SOUTHEAST OF FRAZEE, 1.5 MILES SOUTHEAST ALONG TRUNK HIGHWAY 10 FROM THE JUNCTION OF TRUNK HIGHWAY 10 AND TRUNK HIGHWAY 87 (THE JUNCTION IS 1.0 MILE SOUTHWEST OF FRAZEE), 0.05 MILE NORTH ON COUNTY ROAD 10, 0.15 MILE SOUTHEAST ON OLD COUNTY ROAD 10, 0.05 MILE EAST ON A DRIVEWAY, 21.0 FEET NORTHWEST OF A ROAD, 45.0 FEET NORTHEAST OF THE NORTHEAST RAILROAD TRACK, 0.6 FOOT NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1387.714	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1387.753	.016	2/1				VERTICAL ADJUSTMENT	2010	00000640
1387.753	.016	2/1				VERTICAL CONTROL SURVEY	2005	VPERH
1387.753	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1386.720	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1386.720	.033	3				VERTICAL CONTROL SURVEY	1968	USGS-VERT
1386.720	.007	1				VERTICAL CONTROL SURVEY	1941	L35 MINN
1386.720	.007	1				VERTICAL CONTROL SURVEY	1941	Q460954

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1387.707	.262		1300.640	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.300 12B = -87.303 09 = -87.198 03 = -87.067

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 42 22.25492	95 41 21.81746	506842.997	318755.210	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2263575.251	953536.050	965954.577	16981681.765	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/G_55-RO0621-3E-05AUG2009.jpg	E	Aug 5, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/G_55-RO0621-2-05AUG2009.jpg		Aug 5, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/G_55-RO0621-1-05AUG2009.jpg		Aug 5, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: GATE MNDT

NGS Name: GATE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9846](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	20	136 N	42 W	463426.50	960038.60	2		1999	2022	DESTROYED	Horz=NO Vert=NO	YES		RECESSED 5 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2001)

Stamping: GATE 1999

3.5 MILES EAST OF PELICAN RAPIDS, 3.6 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, TO TRUNK HIGHWAY 108 MILEPOINT 15.8, THEN 0.15 MILE NORTH ON 230TH AVENUE, 28.0 FEET EAST OF 230TH AVENUE, 14.0 FEET SOUTH OF AN ENTRANCE, 4.0 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1400.466	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1400.525	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1400.512	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPOLI

Geoid Separations(ft): GEOID18 = -87.569 12B = -87.562 09 = -87.451 03 = -87.300

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GATE-DG9846-3E-04AUG2009.jpg	E	Aug 4, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GATE-DG9846-2-04AUG2009.jpg		Aug 4, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GATE-DG9846-1-04AUG2009.jpg		Aug 4, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: GRAY

NGS Name: GRAY

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DH4046](#)
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	1	137 N	40 W	464206.90	954116.77	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2004	2021	GOOD	Horz=YES Vert=YES	YES		PROJECTS 1 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 35 FT)	SURVEY DISK	MNDT

Description: (2004)

Stamping: GRAY 2004

3.5 MILES NORTHEAST OF LUCE, 3.45 MILES NORTHEAST ALONG TRUNK HIGHWAY 10 FROM THE JUNCTION OF TRUNK HIGHWAY 10 AND TRUNK HIGHWAY 228 IN LUCE, AT TRUNK HIGHWAY 10 MILEPOINT 56.40, 67.0 FEET SOUTHWEST EASTBOUND TRUNK HIGHWAY 10, 85.8 FEET SOUTHEAST OF BLACK DIAMOND ROAD, 23.3 FEET SOUTHEAST OF A TELEPHONE PEDESTAL, 35.0 FEET EAST-SOUTHEAST OF A POWER POLE, 12.5 FEET NORTHEAST OF AN UNDERGROUND POWER MARKER, 2.2 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1371.674	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1371.710	.016	2/1				VERTICAL ADJUSTMENT	2010	00000640
1371.707	.016	2/1				VERTICAL CONTROL SURVEY	2005	VPERH

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1371.730	.262		1284.423	.197	2011	GPS - RTRN	2021	RTRN2021
			1284.361	.010	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1371.497	.262		1284.423	.197	1996	GPS - RTRN	2009	RTRN2009
			1284.466	.011	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1371.716	.131		1284.532	.066	1996	HORIZONTAL ADJUSTMENT	2005	GPS2123
1371.716	.131		1284.532	.066	1996	GPS - STATIC	2005	HPERH

Geoid Separations(ft): GEOID18 = -87.303 12B = -87.306 09 = -87.201 03 = -87.070

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 42 06.90023	95 41 16.76971	507195.373	317199.657	.131	3	GPS - RTRN	2021	RTRN2021
46 42 06.90052	95 41 16.77040	507195.325	317199.687	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 42 06.90044	95 41 16.77124	507195.266	317199.679	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 42 06.90045	95 41 16.77149	507195.249	317199.680	.131	3	GPS - RTRN	2009	RTRN2009
46 42 06.90010	95 41 16.77113	507195.274	317199.644	.033	C	ADJUSTMENT	2005	GPS2123
46 42 06.90010	95 41 16.77113	507195.274	317199.644	.033	C	GPS - STATIC	2005	HPERH

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2263898.723	951974.431	966253.072	16980114.893	.131	3	GPS - RTRN	2021	RTRN2021
2263898.675	951974.461	966253.025	16980114.924	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2263898.617	951974.454	966252.966	16980114.918	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2263898.599	951974.455	966252.948	16980114.920	.131	3	GPS - RTRN	2009	RTRN2009
2263898.623	951974.419	966252.972	16980114.884	.033	C	ADJUSTMENT	2005	GPS2123
2263898.623	951974.419	966252.972	16980114.884	.033	C	GPS - STATIC	2005	HPERH

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GRAY-DH4046-3SW-29JUN2021.jpg	SW	Jun 29, 2021
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GRAY-DH4046-2-29JUN2021.jpg		Jun 29, 2021
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GRAY-DH4046-1-29JUN2021.jpg		Jun 29, 2021

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: GRAY CHURCH 7 MI S STA TANSEM

NGS Name: TANSEM GRAY CHURCH 7 MI SOUTH

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0904](#) [Get Map](#)
NGS Quad / Sta Num : 46096123/1017
USGS Quad: LAKE OLAF

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	16	136 N	44 W	463604.24	961338.15		4

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1906	1906	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	CHURCH SPIRE	NGS

Description: (1906)

Stamping:

7.13 MILES NORTHWEST OF PELICAN RAPIDS.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.444 12B = -87.431 09 = -87.319 03 = -87.237

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 36 04.23998	96 13 38.15236	371640.537	280869.834	.328	4	ADJUSTMENT	1999	17648
46 36 04.23982	96 13 38.15240	371640.534	280869.818	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 36 04.23810	96 13 38.14558	371641.009	280869.640	.328	4	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 36 04.40000	96 13 36.92000			.100	4	CLASSICAL SURVEY	1928	00155

USSD

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 36 04.60000	96 13 37.30000				3	CLASSICAL SURVEY		17389-73

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2127711.427	918164.435	829502.281	16948477.935	.328	4	ADJUSTMENT	1999	17648
2127711.424	918164.419	829502.277	16948477.919	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2127711.896	918164.233	829502.746	16948477.725	.328	4	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1503116.000	590091.579			.100	4	CLASSICAL SURVEY	1928	00155



Mn/DOT Name: GRENA

NGS Name: GRENA

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5768](#)
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	1	135 N	44 W	463157.57	961036.12		C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1998	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2015)

Stamping: GRENA 1998

4.8 MILES NORTHWEST OF ERHARD, 3.7 MILES WEST ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND TRUNK HIGHWAY 59 IN ERHARD, AT TRUNK HIGHWAY 59 MILEPOINT 234.5, THENCE 2.0 MILES NORTH ALONG 150TH AVENUE, THENCE 0.35 MILE NORTH ALONG COUNTY ROAD 28, THENCE 0.8 MILE NORTH ALONG 150TH AVENUE, 21.5 FEET EAST OF 150TH AVENUE, 15.0 FEET NORTH OF A FIELD ENTRANCE, 10.8 FEET SOUTH OF A WITNESS POST.

Station Notes

UNKNOWN ROD DEPTH

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1388.613	.131		1300.975	.066	1996	GPS - STATIC		2021	HOTTE
1388.636			1300.821	.020	2011	HORIZONTAL ADJUSTMENT		2020	GPS3384
1388.636			1300.821	.020	2011	GPS - STATIC		2020	HOTTE

Geoid Separations(ft): GEOID18 = -87.821 12B = -87.798 09 = -87.697 03 = -87.608

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 31 57.57332	96 10 36.12399	384206.208	255801.797	.013		ADJUSTMENT	2020	GPS3384
46 31 57.57332	96 10 36.12399	384206.208	255801.797	.013	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 31 57.57301	96 10 36.12448	384206.174	255801.766	.033	C	GPS - STATIC	2021	HOTTE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2139809.464	892871.311	841199.960	16922984.532	.013		ADJUSTMENT	2020	GPS3384
2139809.464	892871.311	841199.960	16922984.532	.013	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2139809.429	892871.281	841199.924	16922984.502	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GRENA-DR5768-3N-09OCT2008.jpg	N	Oct 9, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GRENA-DR5768-2-09OCT2008.jpg		Oct 9, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GRENA-DR5768-1-09OCT2008.jpg		Oct 9, 2008

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: GROVELAKE LUTH CH SPIRE

NGS Name: GROVELAKE LUTH CH SPIRE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0906](#) [Get Map](#)
NGS Quad / Sta Num : 46096124/1018
USGS Quad: ROLLAG

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	28	137 N	43 W	463843.63	960748.45		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	1935	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	CHURCH SPIRE	NGS

Description: (1935) Stamping:

4.5 MILES WEST AND 0.5 MILE SOUTH OF DUNVILLA.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.339 12B = -87.313 09 = -87.208 03 = -87.109

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 38 43.63087	96 07 48.45399	396144.382	296875.502	.328	4	ADJUSTMENT	1999	17648
46 38 43.63019	96 07 48.45359	396144.409	296875.433	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 38 43.63097	96 07 48.44839	396144.773	296875.510	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>								<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 38 43.78000	96 07 47.24000			.100	4	CLASSICAL SURVEY	1944	05937	

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2152504.228	933711.900	854550.412	16963632.855	.328	4	ADJUSTMENT	1999	17648
2152504.254	933711.830	854550.437	16963632.785	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2152504.619	933711.901	854550.802	16963632.850	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - Central Zone</u>								<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
1527908.150	605637.982			.100	4	CLASSICAL SURVEY	1944	05937	



Mn/DOT Name: GUS MNDT

NGS Name: GUS

County: OTTER TAIL, MN (Sheet 1)

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>	NGS ACRN: RP0177	Get Map
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>	NGS Quad / Sta Num : 46096213/1044	
NW	17	133 N	43 W	462019.97	960754.99	2	B	USGS Quad: CARLISLE	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1961	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	TRAVERSE STATION DISK	MNDT

Description: (2015) Stamping: GUS U. S. C. AND G. S. 1961

5.2 MILES NORTHWEST OF FERGUS FALLS, 3.6 MILES NORTH AND NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 50.65, 118.3 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 33.33 FEET NORTHWEST OF STATION GUS MNDT RM 3, 26.71 FEET SOUTHEAST OF STATION GUS MNDT RM 4, 1.0 FOOT NORTHEAST OF A FENCE, 4.1 FEET SOUTHEAST OF A WITNESS POST.

Station Pair: ELLIOT - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1247.527	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1247.514	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1247.550	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1247.520	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1247.520	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR
1247.501	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

<u>NGVD29</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1246.648	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1246.648	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1246.648	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1247.527			1159.253	.009	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1247.527			1159.253	.009	2011	GPS - STATIC	2025	HTH94B
1247.527			1159.253	.010	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1247.527	.131		1159.437	.066	1996	GPS - STATIC	2023	HTH59
1247.527			1159.253	.010	2011	GPS - STATIC	2023	HTH59
1248.869	.262		1160.578	.197	2011	GPS - RTRN	2023	RTRN2023
1247.491	.262		1159.197	.197	2011	GPS - RTRN	2022	RTRN2022
1247.520			1159.253	.011	2011	HORIZONTAL ADJUSTMENT	2018	GPS3119
1247.550	.131		1159.437	.066	1996	GPS - STATIC	2017	HMNCORS07
1247.520			1159.253	.011	2011	GPS - STATIC	2017	HMNPH
1247.452	.262		1159.168	.197	2011	GPS - RTRN	2015	RTRN2015
1247.415	.262		1159.132	.197	2011	GPS - RTRN	2015	RTRN2015
1247.520			1159.253	.010	2011	HORIZONTAL ADJUSTMENT	2015	GPS3080
1247.520	.131		1159.437	.066	1996	GPS - STATIC	2015	HWILK
1247.520			1159.253	.010	2011	GPS - STATIC	2015	HWILK
1247.452	.262		1159.168	.197	2011	GPS - RTRN	2013	RTRN2013
			1159.253	.010	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1247.297	.262		1159.191	.197	1996	GPS - RTRN	2009	RTRN2009
			1159.355	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1247.504	.098		1159.437	.049	1996	GPS - STATIC	2005	GPS2036
1247.504	.098		1159.502	.049	1996	HORIZONTAL ADJUSTMENT	1999	17648
1247.501	.098		1159.437	.049	1996	GPS - STATIC	1997	GPS805-B

Geoid Separations(ft): GEOID18 = -88.294 12B = -88.284 09 = -88.179 03 = -88.107

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 20 19.97177	96 07 54.99239	395101.135	185066.368	.007		ADJUSTMENT	2025	GPS3847
46 20 19.97177	96 07 54.99239	395101.135	185066.368	.007	C	GPS - STATIC	2025	HTH94B
46 20 19.97177	96 07 54.99239	395101.135	185066.368	.007		ADJUSTMENT	2024	GPS3672
46 20 19.97177	96 07 54.99239	395101.135	185066.368	.007	C	GPS - STATIC	2023	HTH59
46 20 19.97184	96 07 54.99337	395101.066	185066.375	.131	3	GPS - RTRN	2023	RTRN2023
46 20 19.97179	96 07 54.99161	395101.189	185066.370	.131	3	GPS - RTRN	2022	RTRN2022
46 20 19.97177	96 07 54.99239	395101.135	185066.368	.007		ADJUSTMENT	2018	GPS3119
46 20 19.97177	96 07 54.99239	395101.135	185066.368	.007	C	GPS - STATIC	2017	HMNPH
46 20 19.97184	96 07 54.99258	395101.122	185066.375	.131	3	GPS - RTRN	2015	RTRN2015
46 20 19.97134	96 07 54.99317	395101.080	185066.325	.131	3	GPS - RTRN	2015	RTRN2015
46 20 19.97177	96 07 54.99239	395101.135	185066.368	.010		ADJUSTMENT	2015	GPS3080
46 20 19.97179	96 07 54.99242	395101.133	185066.370	.010	C	GPS - STATIC	2015	HWILK
46 20 19.97162	96 07 54.99154	395101.194	185066.352	.131	3	GPS - RTRN	2013	RTRN2013
46 20 19.97177	96 07 54.99239	395101.135	185066.368	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 20 19.97169	96 07 54.99328	395101.072	185066.360	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 20 19.97130	96 07 54.99306	395101.087	185066.320	.066		NCAT	2025	HTH94B
46 20 19.97130	96 07 54.99306	395101.087	185066.320	.033	C	GPS - STATIC	2023	HTH59
46 20 19.97130	96 07 54.99306	395101.087	185066.320	.033	C	GPS - STATIC	2017	HMNCORS07
46 20 19.97130	96 07 54.99306	395101.087	185066.320	.033	C	GPS - STATIC	2015	HWILK
46 20 19.97222	96 07 54.99324	395101.075	185066.414	.131	3	GPS - RTRN	2009	RTRN2009
46 20 19.97130	96 07 54.99306	395101.087	185066.320	.016	B	GPS - STATIC	2005	GPS2036
46 20 19.97130	96 07 54.99306	395101.087	185066.320	.016	B	ADJUSTMENT	1999	17648
46 20 19.97130	96 07 54.99306	395101.087	185066.320	.016	B	GPS - STATIC	1997	GPS805-B

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 20 19.96669	96 07 54.98537	395101.625	185065.851	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 20 20.11790	96 07 53.77850			.100	2	CLASSICAL SURVEY	1963	13276

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2149392.058	821955.506	849659.453	16851897.336	.007		ADJUSTMENT	2025	GPS3847
2149392.058	821955.506	849659.453	16851897.336	.007	C	GPS - STATIC	2025	HTH94B
2149392.058	821955.506	849659.453	16851897.336	.007		ADJUSTMENT	2024	GPS3672
2149392.058	821955.506	849659.453	16851897.336	.007	C	GPS - STATIC	2023	HTH59
2149391.989	821955.515	849659.384	16851897.346	.131	3	GPS - RTRN	2023	RTRN2023
2149392.113	821955.507	849659.508	16851897.336	.131	3	GPS - RTRN	2022	RTRN2022
2149392.058	821955.506	849659.453	16851897.336	.007		ADJUSTMENT	2018	GPS3119
2149392.058	821955.506	849659.453	16851897.336	.007	C	GPS - STATIC	2017	HMNPH
2149392.045	821955.514	849659.440	16851897.344	.131	3	GPS - RTRN	2015	RTRN2015
2149392.002	821955.464	849659.396	16851897.295	.131	3	GPS - RTRN	2015	RTRN2015
2149392.058	821955.506	849659.453	16851897.336	.010		ADJUSTMENT	2015	GPS3080
2149392.056	821955.509	849659.451	16851897.338	.010	C	GPS - STATIC	2015	HWILK
2149392.117	821955.490	849659.512	16851897.319	.131	3	GPS - RTRN	2013	RTRN2013
2149392.058	821955.506	849659.453	16851897.336	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2149391.995	821955.500	849659.390	16851897.331	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2149392.010	821955.460	849659.404	16851897.291	.066		NCAT	2025	HTH94B
2149392.010	821955.460	849659.404	16851897.291	.033	C	GPS - STATIC	2023	HTH59
2149392.010	821955.460	849659.404	16851897.291	.033	C	GPS - STATIC	2017	HMNCORS07
2149392.010	821955.460	849659.404	16851897.291	.033	C	GPS - STATIC	2015	HWILK
2149391.999	821955.553	849659.395	16851897.384	.131	3	GPS - RTRN	2009	RTRN2009
2149392.010	821955.460	849659.404	16851897.291	.016	B	GPS - STATIC	2005	GPS2036
2149392.010	821955.460	849659.404	16851897.291	.016	B	ADJUSTMENT	1999	17648
2149392.010	821955.460	849659.404	16851897.291	.016	B	GPS - STATIC	1997	GPS805-B

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2149392.538	821954.980	849659.925	16851896.803	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1524796.442	493881.840			.100	2	CLASSICAL SURVEY	1963	13276

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GUS-RP0177-3SW-14AUG2023.jpg	SW	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GUS-RP0177-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GUS-RP0177-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: GUS MNDT AZ MK

NGS Name: GUS AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0176](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/1044
USGS Quad: CARLISLE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	7	133 N	43 W	462025.69	960826.71	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	1991	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE FOOTING - SMALL	SURVEY DISK	MNDT

Description: (1991)

Stamping: GUS AZIMUTH MARK 1961

5.5 MILES NORTHWEST OF FERGUS FALLS, 0.6 MILE WEST ON COUNTY ROAD 52 FROM THE JUNCTION OF COUNTY ROAD 52 AND TRUNK HIGHWAY 59, 0.4 MILE WEST OF INTERSTATE HIGHWAY 94, 55.0 FEET NORTH OF COUNTY ROAD 52, 61.0 FEET WEST OF A FARM ENTRANCE, 4.0 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1223.616	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1222.763	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1222.763	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1222.763	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1223.620	.197		1135.615	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -88.297 12B = -88.287 09 = -88.182 03 = -88.113

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 20 25.69077	96 08 26.71110	392878.661	185657.551	.066	2	ADJUSTMENT	1999	17648
46 20 25.69078	96 08 26.71116	392878.657	185657.552	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 20 25.68632	96 08 26.70331	392879.205	185657.098	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 20 25.83790	96 08 25.49520			.100	2	CLASSICAL SURVEY	1962	12924

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2147181.198	822587.641	847457.992	16852564.594	.066	2	ADJUSTMENT	1999	17648
2147181.194	822587.643	847457.988	16852564.596	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2147181.734	822587.178	847458.520	16852564.122	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1522585.657	494514.061			.100	2	CLASSICAL SURVEY	1962	12924



Mn/DOT Name: GUS MNDT AZ MK RESET

NGS Name: GUS MNDT AZ MK RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2715](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	7	133 N	43 W	462025.62	960826.32	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2015	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARK IS STEEL PIPE

Monument Type	Disk Type	Mon. Agency
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	AZIMUTH MARK DISK	MNDT

Description: (2015) **Stamping:** GUS AZIMUTH 1961 RESET 1975

5.5 MILES NORTHWEST OF FERGUS FALLS, 0.2 MILE NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94 (THE JUNCTION IS 4.5 MILES NORTHWEST OF FERGUS FALLS) TO TRUNK HIGHWAY 59 MILEPOINT 224.10, THEN 0.6 MILE WEST ON COUNTY ROAD 88, 49.5 FEET NORTH OF COUNTY ROAD 88, 39.5 FEET WEST OF A FIELD ENTRANCE, 1.2 FEET EAST OF A WITNESS POST.

Station Notes

THE ROD DEPTH IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj			Year	Reference
1217.563	.016	2/1					VERTICAL ADJUSTMENT		2019	00000941
1217.550	.016	2/1					VERTICAL ADJUSTMENT		2017	00000911
1217.586	.016	2/1					VERTICAL CONTROL SURVEY		2016	VI94D4

NGVD29				Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj			Year	Reference
1216.690	.033	3					VERTICAL CONTROL SURVEY		1991	CS5680

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj			Year	Reference
1217.511	.262			1129.214	.197	2011	GPS - RTRN		2022	RTRN2022
1217.498	.262			1129.210	.197	2011	GPS - RTRN		2015	RTRN2015

Geoid Separations(ft): GEOID18 = -88.297 12B = -88.287 09 = -88.182 03 = -88.113

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County		Geodetic Position			Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 20 25.62102	96 08 26.32231	392905.903	185650.339	.131	3	GPS - RTRN	2022	RTRN2022
46 20 25.62212	96 08 26.32144	392905.964	185650.450	.131	3	GPS - RTRN	2015	RTRN2015

State Plane and UTM Coordinates (Feet)

NAD83(2011)		UTM - Zone 15		MN State Plane - Central Zone			Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2147208.298	822579.927	847484.977	16852556.450	.131	3	GPS - RTRN	2022	RTRN2022
2147208.361	822580.037	847485.042	16852556.559	.131	3	GPS - RTRN	2015	RTRN2015

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GUS_MNDT_AZ_MK_RESET-DQ2715-3N-17OCT2022.jpg	N	Oct 17, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GUS_MNDT_AZ_MK_RESET-DQ2715-2-17OCT2022.jpg		Oct 17, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GUS_MNDT_AZ_MK_RESET-DQ2715-1-17OCT2022.jpg		Oct 17, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: GUS MNDT RM 1

NGS Name: GUS RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CO9653](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/1044
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	17	133 N	43 W	462022.14	960751.71		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1961	2015	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	REFERENCE MARK DISK	MNDT

Description:

Stamping: GUS NO 1 1961

5.2 MILES NORTHWEST OF FERGUS FALLS, 3.6 MILES NORTH AND NORTHWEST ON INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210, 112.0 FEET EAST OF THE CENTERLINE OF THE NORTHBOUND LANE OF INTERSTATE HIGHWAY 94 AND 807.0 FEET NORTHWEST OF THE NORTH EDGE OF THE NORTH CORNER OF A BRIDGE WHICH IS OVER THE NORTHBOUND LANE OF INTERSTATE HIGHWAY 94 ABOUT 0.25 MILE SOUTH OF TRUNK HIGHWAY 52.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.291 12B = -88.284 09 = -88.176 03 = -88.103



Mn/DOT Name: GUS MNDT RM 2

NGS Name: GUS RM 2

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	17	133 N	43 W	462019.51	960754.39		

NGS ACRN:	CO9654	Get Map
NGS Quad / Sta Num :	46096213/1044	
USGS Quad:	CARLISLE	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1961	2015	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	SEE DESCRIPTION

Monument Type
UNKNOWN

Disk Type
REFERENCE MARK DISK

Mon. Agency
MNDT

Description:

Stamping: GUS NO 2 1961

5.2 MILES NORTHWEST OF FERGUS FALLS, 3.6 MILES NORTH AND NORTHWEST ON INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210, 120.0 FEET WEST OF THE CENTERLINE OF SOUTHBOUND LANE OF INTERSTATE HIGHWAY 94, 621.0 FEET SOUTHEAST OF THE RIGHT-OF-WAY FENCE CORNER WHICH IS SOUTHWEST OF THE CROSSING OF INTERSTATE HIGHWAY 94 OVER TRUNK HIGHWAY 52.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.294 12B = -88.284 09 = -88.179 03 = -88.107



Mn/DOT Name: GUS MNDT RM 3

NGS Name: GUS RM 3

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: CO9655 NGS Quad / Sta Num : 46096213/1044 USGS Quad: CARLISLE	Get Map
NW	17	133 N	43 W	462019.72	960754.69	2	3		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1969	2015	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2015)

Stamping: GUS 1961 MHD NO 3 1969

5.2 MILES NORTHWEST OF FERGUS FALLS, 3.6 MILES NORTH AND NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 50.65, 118.6 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 60.0 FEET SOUTHEAST OF STATION GUS MNDT RM 4, 33.33 FEET SOUTHEAST OF STATION GUS MNDT, 1.0 FOOT NORTHEAST OF A FENCE, 1.0 FOOT NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1245.129	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1245.116	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1245.148	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1245.129	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1245.132	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1245.122	.262		1156.828	.197	2011	GPS - RTRN	2022	RTRN2022
1244.981	.262		1156.697	.197	2011	GPS - RTRN	2015	RTRN2015
1244.971	.262		1156.864	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.294 12B = -88.284 09 = -88.179 03 = -88.107

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Reference</u>
		46 20 19.71829	96 07 54.68862	395122.314	185040.577	.131	3	RTRN2022
		46 20 19.71837	96 07 54.68969	395122.239	185040.585	.131	3	RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Reference</u>
		46 20 19.71825	96 07 54.68957	395122.248	185040.573	.131	3	RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Reference</u>
		2149412.754	821929.331	849679.741	16851870.827	.131	3	RTRN2022
		2149412.679	821929.341	849679.666	16851870.838	.131	3	RTRN2015

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Reference</u>
		2149412.687	821929.329	849679.674	16851870.826	.131	3	RTRN2009



<u>Station Photos</u>		<u>Dir</u>	<u>Date</u>
<u>Type</u>	<u>File Name</u>	SW	
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GUS_RM_3-CO9655-3SW-17OCT2022.jpg		Oct 17, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GUS_RM_3-CO9655-2-17OCT2022.jpg		Oct 17, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GUS_RM_3-CO9655-1-17OCT2022.jpg		Oct 17, 2022
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: GUS MNDT RM 4

NGS Name: GUS RM 4

County: OTTER TAIL, MN (Sheet 1)

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>	NGS ACRN: CO9656		Get Map
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>	NGS Quad / Sta Num : 46096213/1044		
NW	17	133 N	43 W	462020.17	960755.24	2	3	USGS Quad: CARLISLE		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1969	2015	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2015)

Stamping: GUS 1961 MHD NO 4 1969

5.2 MILES NORTHWEST OF FERGUS FALLS, 3.6 MILES NORTH AND NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 50.65, 118.8 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 60.0 FEET NORTHWEST OF STATION GUS RM 3, 26.71 FEET NORTHWEST OF STATION GUS, 1.0 FOOT NORTHEAST OF A FENCE, 1.0 FOOT NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			<u>Determination Method</u>	Project Info	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1243.994	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1243.980	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1244.013	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1243.980	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1243.984	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			<u>Determination Method</u>	Project Info	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1243.967	.262		1155.674	.197	2011	GPS - RTRN	2022	RTRN2022
1243.875	.262		1155.592	.197	2011	GPS - RTRN	2015	RTRN2015
1243.797	.262		1155.690	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.294 12B = -88.284 09 = -88.179 03 = -88.107

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 20 20.17327	96 07 55.23690	395084.086	185086.871	.131	3	GPS - RTRN	2022	RTRN2022
46 20 20.17301	96 07 55.23848	395083.975	185086.846	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)		Otter Tail County					Project Info	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 20 20.17326	96 07 55.23807	395084.003	185086.871	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2149375.393	821976.319	849643.113	16851918.418	.131	3	GPS - RTRN	2022	RTRN2022
2149375.282	821976.295	849643.001	16851918.396	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2149375.311	821976.320	849643.031	16851918.420	.131	3	GPS - RTRN	2009	RTRN2009



<u>Station Photos</u>		<u>Dir</u>	<u>Date</u>
<u>Type</u>	<u>File Name</u>	SW	
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GUS_RM_4-CO9656-3SW-17OCT2022.jpg		Oct 17, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GUS_RM_4-CO9656-2-17OCT2022.jpg		Oct 17, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/GUS_RM_4-CO9656-1-17OCT2022.jpg		Oct 17, 2022
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: H 100

NGS Name: H 100

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	4	132 N	43 W	461649.00	960551.00	2	

NGS ACRN:	RP0126	Get Map
NGS Quad / Sta Num :	46096212/	
USGS Quad:	FERGUS FALLS	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	2009	NOT FOUND	Horz=? Vert=YES	NO		PROJECTS 6 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	BENCH MARK DISK	NGS

Description: (1934)

Stamping: H 100 1934

1.4 MILES WEST OF FERGUS FALLS, 1.0 MILE WEST ON A RAILROAD FROM THE RAILROAD STATION, 300.0 FEET
SOUTHWEST OF A PACKING PLANT, 26.5 FEET SOUTH OF A RAILROAD, 29.0 FEET SOUTHWEST OF A SWITCHING POST, 21.0
FEET SOUTHEAST OF A SIGNPOST, 1.0 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1175.221	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1174.397	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1174.397	.007	1				VERTICAL CONTROL SURVEY	1972	Q460962
1174.397	.007	1				VERTICAL CONTROL SURVEY	1972	L22167-A
1174.397	.007	1				VERTICAL CONTROL SURVEY	1971	L22167-A
1174.397	.007	1				VERTICAL CONTROL SURVEY	1941	Q460962
1174.394	.007	1				VERTICAL CONTROL SURVEY	1934	L97 MINN

Geoid Separations(ft): GEOID18 = -88.202 12B = -88.195 09 = -88.081 03 = -87.999

* No Horizontal Positions in the Database *



Mn/DOT Name: H 4

NGS Name: H 4

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0113](#) [Get Map](#)
NGS Quad / Sta Num : 46096241/
USGS Quad: ROTHSA

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	25	135 N	45 W	462828.00	961648.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1937	NOT FOUND	Horz=? Vert=YES	NO		PROJECTS 8 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STRUCTURE (MASSIVE)	BENCH MARK DISK	CGS

Description: (1903)

Stamping:

IN ROTHSA. 0.1 MILE EAST ALONG 1ST AVENUE SOUTHWEST FROM THE JUNCTION OF 1ST AVENUE SOUTHWEST AND RAILROAD DRIVE IN ROTHSA, THEN 354.0 FEET NORTH ALONG COUNTY ROAD 11 (CENTER STREET), THEN 164.0 FEET EAST ALONG MAIN AVENUE EAST, AT ROTHSA ABOUT 80.0 FEET EAST OF THE GREAT NORTHERN RAILROAD TRACKS, ON THE PUBLIC SCHOOL BUILDING CONCRETE WATER TABLE AT THE SOUTH SIDE OF THE ENTRANCE, 0.6 FOOT ABOVE THE GROUND.

Station Notes

THE SET DATE IS UNKNOWN. THE MARK IS ON THE SCHOOL BUILDING CONCRETE.

Leveling-Derived Orthometric Heights (Feet)

GA1912

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1209.210	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -88.172 12B = -88.166 09 = -88.064 03 = -87.982

* No Horizontal Positions in the Database *



Mn/DOT Name: H 4 RESET

NGS Name: H 4 RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0114](#) [Get Map](#)
NGS Quad / Sta Num : 46096241/
USGS Quad: ROTHSA

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	30	135 N	44 W	462828.00	961648.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1937	1978	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STRUCTURE (MASSIVE)	BENCH MARK DISK	NGS

Description: Stamping: 1208.736 H 4 RESET 1937

IN ROTHSA, 0.1 MILE EAST ALONG 1ST AVENUE SOUTHWEST FROM THE JUNCTION OF 1ST AVENUE SOUTHWEST AND RAILROAD DRIVE IN ROTHSA, THEN 354.0 FEET NORTH ALONG COUNTY ROAD 11 (CENTER STREET), THEN 164.0 FEET EAST ALONG MAIN AVENUE EAST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.172 12B = -88.166 09 = -88.064 03 = -87.982



Mn/DOT Name: H 55

NGS Name: H 55

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0622](#) [Get Map](#)
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	13	137 N	40 W	464047.00	954012.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	2004	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1934) Stamping: H 55 1934

3.8 MILES SOUTHEAST ON A RAILROAD FROM THE FRAZEE RAILROAD STATION, 54.0 FEET NORTHWEST OF A ROAD, 33.0 FEET NORTHEAST OF THE NORTHEAST RAILROAD TRACK.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1372.537	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1371.506	.007	1				VERTICAL CONTROL SURVEY	1941	L35 MINN
1371.506	.007	1				VERTICAL CONTROL SURVEY	1941	Q460954

Geoid Separations(ft): GEOID18 = -87.346 12B = -87.339 09 = -87.244 03 = -87.116

* No Horizontal Positions in the Database *



Mn/DOT Name: H 61

NGS Name: H 61

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0134](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	3	132 N	43 W	461654.00	960426.00	2	3	1934	2009	GOOD	Horz=NO Vert=YES	NO		FLUSH	STEEL SPIKE IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1980)

Stamping: H-61 1934

IN FERGUS FALLS, AT THE SOUTHEAST CORNER OF CITY HALL SQUARE, 47.0 FEET EAST OF MILL STREET, 46.0 FEET NORTH OF WASHINGTON AVENUE, 1.0 FOOT EAST OF A FLAGPOLE.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1194.483	.016	2/0					VERTICAL ADJUSTMENT	1991	00000025

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1193.659	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD
1193.659	.016	2					VERTICAL CONTROL SURVEY	1972	Q460962
1193.659	.016	2					VERTICAL CONTROL SURVEY	1972	L22167-A
1193.659	.016	2					VERTICAL CONTROL SURVEY	1971	L22167-A
1193.869	.007	1					VERTICAL CONTROL SURVEY	1941	Q460962
1193.869	.007	1					VERTICAL CONTROL SURVEY	1934	L40 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1194.302	.262			1106.313	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.192 12B = -88.192 09 = -88.074 03 = -87.985

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								<u>Reference</u>
46 16 53.63047	96 04 27.81060			409543.775	164091.529	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								<u>Reference</u>
2163442.128	800719.741			863377.802	16830434.309	.131	3	GPS - RTRN	2009 RTRN2009



Mn/DOT Name: HAL MNDT

NGS Name: HAL

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0186](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/1041
USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>					
NE	27	134 N	44 W	462353.14	961217.09	2	2					
<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>		<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>				
1961	2019	GOOD	Horz=YES Vert=YES		YES		RECESSED 3 IN.	STEEL SPIKE IMBED IN MON				

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	TRAVERSE STATION DISK	MNDT

Description: (1968) Stamping: HAL U.S.C.&G.S. 1961

2.17 MILES NORTH-NORTHWEST OF CARLISLE, 0.8 MILE EAST OF COUNTY ROAD 88 ALONG 300TH STREET, 0.3 MILE
SOUTHWEST OF INTERSTATE HIGHWAY 94, 201.0 FEET EAST OF A FIELD ROAD SOUTH, 187.29 FEET EAST OF HAL RM 2,
45.85 FEET SOUTH OF HAL RM 1, 32.0 FEET SOUTH OF 300TH STREET, 1.8 FEET SOUTHWEST OF A POWER POLE, 4.0 FEET
EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1301.320	.016	2/0					VERTICAL ADJUSTMENT	1991	00000025
<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1300.417	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD
1300.417	.016	2					VERTICAL CONTROL SURVEY	1972	Q460962
1300.417	.016	2					VERTICAL CONTROL SURVEY	1972	L22167-A
1300.417	.016	2					VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1301.231	.262			1212.957	.197	2011	GPS - OPUS	2020	GPSBM
1301.159	.262			1212.885	.197	2011	GPS - OPUS	2020	GPSBM
1301.264	.262			1212.990	.197	2011	GPS - OPUS	2020	GPSBM
1301.310	.197			1213.357	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -88.274 12B = -88.271 09 = -88.163 03 = -88.100

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>				<u>Project Info</u>		
<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Year</u>	<u>Reference</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>			
46 23 53.13887	96 12 17.08549	376844.370	206766.690	.131	3	GPS - OPUS
46 23 53.13934	96 12 17.08582	376844.347	206766.738	.131	3	GPS - OPUS
46 23 53.13941	96 12 17.08582	376844.347	206766.745	.131	3	GPS - OPUS
<u>NAD83(1996)</u>				<u>Project Info</u>		
<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Year</u>	<u>Reference</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>			
46 23 53.13972	96 12 17.08985	376844.065	206766.778	.066	2	ADJUSTMENT
46 23 53.13979	96 12 17.08995	376844.058	206766.785	.066	2	ADJUSTMENT
<u>NAD83(1986)</u>				<u>Project Info</u>		
<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Year</u>	<u>Reference</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>			
46 23 53.13728	96 12 17.08090	376844.691	206766.527	.066	2	ADJUSTMENT
<u>NAD27</u>				<u>Project Info</u>		
<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Year</u>	<u>Reference</u>	
<u>Latitude</u>	<u>Longitude</u>					
46 23 53.28770	96 12 15.86150			.100	2	CLASSICAL SURVEY

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2131542.397	843987.136	832153.502	16874217.748	.131	3	GPS - OPUS	2020	GPSBM
2131542.376	843987.183	832153.481	16874217.796	.131	3	GPS - OPUS	2020	GPSBM
2131542.376	843987.191	832153.482	16874217.803	.131	3	GPS - OPUS	2020	GPSBM

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2131542.094	843987.229	832153.201	16874217.846	.066	2	ADJUSTMENT	1999	17648
2131542.087	843987.236	832153.194	16874217.853	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2131542.715	843986.967	832153.818	16874217.573	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		<u>X</u>	<u>Y</u>	Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1506946.854	515913.547			.100	2	CLASSICAL SURVEY	1962	12924

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HAL-RP0186-3S-23DEC2019.jpg	S	Dec 23, 2019
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HAL-RP0186-2-23DEC2019.jpg		Dec 23, 2019
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HAL-RP0186-1-23DEC2019.jpg		Dec 23, 2019

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: HAL MNDT AZ MK

NGS Name: HAL AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0967](#)[Get Map](#)

NGS Quad / Sta Num : 46096214/1041

USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	27	134 N	44 W	462344.25	961152.81		2

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1961	1968	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	AZIMUTH MARK DISK	MNDT

Description: (1968)Stamping: HAL 1961

2.6 MILES NORTHWEST OF ELIZABETH, 0.6 MILE NORTH ALONG STATE STREET FROM THE JUNCTION OF STATE STREET AND PLEASANT AVENUE IN ELIZABETH, THEN 2.5 MILES WEST ALONG TRUNK HIGHWAY 10, THEN 0.8 MILE NORTH ALONG TRUNK HIGHWAY 21.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)**NAVD88**

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1295.929	.197		1207.967	.131	1996	HORIZONTAL ADJUSTMENT		1999	17648

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1295.896						RECIPROCAL VERTICAL ANGLE		1961	HORZ

Geoid Separations(ft): GEOID18 = -88.274 12B = -88.268 09 = -88.159 03 = -88.097

Lat/Lon and County Coordinates (Feet)**NAD83(1996)**

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 23 44.25449	96 11 52.80928	378540.412	205856.209	.066	2	ADJUSTMENT	1999	17648
46 23 44.25455	96 11 52.80934	378540.408	205856.215	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 23 44.25198	96 11 52.80044	378541.030	205855.951	.066	2	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>							<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 23 44.40240	96 11 51.58170			.100	2	CLASSICAL SURVEY	1962	12924

State Plane and UTM Coordinates (Feet)**NAD83(1996)**

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2133221.079	843045.543	833817.758	16873249.269	.066	2	ADJUSTMENT	1999	17648
2133221.075	843045.548	833817.754	16873249.275	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2133221.693	843045.273	833818.367	16873248.989	.066	2	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - Central Zone</u>							<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1508625.840	514971.865			.100	2	CLASSICAL SURVEY	1962	12924



Mn/DOT Name: HAL RM 1

NGS Name: HAL RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0187](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	27	134 N	44 W	462353.59	961217.01	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1961	2009	NOT FOUND	Horz=NO Vert=NO	NO		PROJECTS 3 IN.	SEE DESCRIPTION

Monument Type

SEE DESCRIPTIVE TEXT

Disk Type

SURVEY DISK

Mon. Agency

NGS

Description: (1961)

Stamping: HAL RM. NO. 1-1961

2.0 MILES NORTH OF CARLISLE, 0.9 MILE EAST ON A GRAVEL ROAD FROM COUNTY ROAD 52, 0.15 MILE WEST OF INTERSTATE HIGHWAY 94, 46.0 FEET NORTH OF STATION HAL MNDT, 45.0 FEET NORTH OF A POWER POLE, 14.0 FEET NORTH OF A GRAVEL ROAD, 6.5 FEET SOUTH OF A FENCE LINE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1301.096	.016	2/0				VERTICAL ADJUSTMENT	1991 00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1300.194	.016	2/0				UNKNOWN/APPROXIMATE	1992 UNCHECKD
1300.194	.016	2				VERTICAL CONTROL SURVEY	1972 Q460962
1300.194	.016	2				VERTICAL CONTROL SURVEY	1972 L22167-A
1300.194	.016	2				VERTICAL CONTROL SURVEY	1971 L22167-A

Geoid Separations(ft): GEOID18 = -88.274 12B = -88.271 09 = -88.163 03 = -88.100

* No Horizontal Positions in the Database *



Mn/DOT Name: HAL RM 2

NGS Name: HAL RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0188](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	27	134 N	44 W	462353.14	961219.76	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1961	2009	GOOD	Horz=YES Vert=?	NO		FLUSH	STEEL SPIKE IMBED IN MON

Monument Type

CONCRETE MONUMENT (CAST-IN-PLACE)

Disk Type

SURVEY DISK

Mon. Agency

NGS

Description: (1961)

Stamping: HAL RM. NO. 2-1961

2.2 MILES NORTH OF CARLISLE, 0.8 MILE EAST ALONG 300TH STREET FROM THE JUNCTION OF 300TH STREET AND COUNTY ROAD 88 IN CARLISLE, 0.15 MILE WEST OF INTERSTATE HIGHWAY 94, 187.0 FEET WEST OF STATION HAL MNDT, 40.8 FEET EAST OF A POWER POLE, 35.0 FEET EAST OF A POWER POLE, 31.0 FEET SOUTH OF 300TH STREET, 14.0 FEET EAST OF A FIELD ENTRANCE, 2.3 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1305.732	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1304.833	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1304.833	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1304.833	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1304.833	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Geoid Separations(ft): GEOID18 = -88.277 12B = -88.271 09 = -88.163 03 = -88.103

* No Horizontal Positions in the Database *



Mn/DOT Name: HANS MNDT

NGS Name: HANS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0592](#) [Get Map](#)
NGS Quad / Sta Num : 46095333/1012
USGS Quad: FOURMILE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	25	131 N	42 W	460724.81	955452.21	2	B	1962	2025	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	TRAVERSE STATION DISK	MNDT

Description: (2013) Stamping: HANS 1962

3.4 MILES SOUTH OF DALTON, 2.0 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 35 (THE JUNCTION IS 2.5 MILES SOUTH OF DALTON), AT INTERSTATE HIGHWAY 94 MILEPOINT 69.60, 100.0 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 374.68 FEET NORTHEAST OF STATION HANS MNDT RM 1, 55.67 FEET SOUTHEAST OF HANS MNDT RM 2, 1.0 FOOT SOUTHWEST OF A RIGHT-OF-WAY FENCE, 5.3 FEET NORTHWEST OF A WITNESS POST.

Station Pair: BEEBE - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1333.826	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1333.826	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1333.839	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1333.839	.016	2/1				VERTICAL ADJUSTMENT	2011	00000690
1333.839	.016	2/1				VERTICAL CONTROL SURVEY	2005	VEVAN
1333.839	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1333.147	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1333.150	.016	2				VERTICAL CONTROL SURVEY	1972	Q460953
1333.150	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1333.826			1246.766	.008	2011	HORIZONTAL ADJUSTMENT	2026	GPS3900
1333.826			1246.766	.008	2011	GPS - STATIC	2026	HTH55N
1333.826			1246.766	.010	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1333.849	.262		1246.727	.197	2011	GPS - RTRN	2025	RTRN2025
1333.826			1246.766	.010	2011	GPS - STATIC	2025	HTH94B
1335.047	.262		1247.927	.197	2011	GPS - RTRN	2023	RTRN2023
1333.826	.131		1246.900	.066	1996	GPS - STATIC	2021	HOTTE
1333.826			1246.766	.010	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1333.826			1246.766	.010	2011	GPS - STATIC	2020	HOTTE
1333.839			1246.766	.010	2011	HORIZONTAL ADJUSTMENT	2018	GPS3119
1333.839	.131		1246.900	.066	1996	GPS - STATIC	2017	HMNCORS07
1333.839			1246.766	.010	2011	GPS - STATIC	2017	HMNPH
1333.708	.262		1246.595	.197	2011	GPS - RTRN	2015	RTRN2015
1333.678	.262		1246.566	.197	2011	GPS - RTRN	2015	RTRN2015
1333.839			1246.766	.009	2011	HORIZONTAL ADJUSTMENT	2015	GPS3061
1333.839			1246.766	.009	2011	HORIZONTAL ADJUSTMENT	2014	GPS3028
1333.839	.131		1246.851	.066	1996	GPS - STATIC	2014	HGRAN
1333.839			1246.763	.009	2011	GPS - STATIC	2014	HGRAN
1333.839			1246.759	.009	2011	GPS - STATIC	2014	HDOUG
1333.856	.131		1246.851	.066	1996	GPS - STATIC	2012	HDOUG
			1246.766	.008	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1333.747	.262		1246.776	.197	1996	GPS - RTRN	2009	RTRN2009
			1246.874	.009	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1333.856	.098		1246.900	.049	1996	GPS - STATIC	2005	GPS2036
1333.856	.131		1246.900	.066	1996	HORIZONTAL ADJUSTMENT	2005	GPS2096
1333.856	.131		1246.900	.066	1996	GPS - STATIC	2005	HEVAN
1333.856	.098		1246.907	.049	1996	HORIZONTAL ADJUSTMENT	1999	17648
1333.839	.098		1246.900	.049	1996	GPS - STATIC	1997	GPS805-B

Geoid Separations(ft): GEOID18 = -87.123 12B = -87.113 09 = -86.988 03 = -86.972

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 07 24.80816	95 54 52.21134	449829.799	106324.262	.007		ADJUSTMENT	2026	GPS3900
46 07 24.80816	95 54 52.21134	449829.799	106324.262	.007	C	GPS - STATIC	2026	HTH55N
46 07 24.80816	95 54 52.21134	449829.799	106324.262	.007		ADJUSTMENT	2025	GPS3847
46 07 24.80757	95 54 52.21153	449829.785	106324.203	.131	3	GPS - RTRN	2025	RTRN2025
46 07 24.80816	95 54 52.21134	449829.799	106324.262	.007	C	GPS - STATIC	2025	HTH94B
46 07 24.80794	95 54 52.21023	449829.877	106324.240	.131	3	GPS - RTRN	2023	RTRN2023
46 07 24.80816	95 54 52.21134	449829.799	106324.262	.007		ADJUSTMENT	2020	GPS3384
46 07 24.80816	95 54 52.21134	449829.799	106324.262	.007	C	GPS - STATIC	2020	HOTTE
46 07 24.80816	95 54 52.21134	449829.799	106324.262	.007		ADJUSTMENT	2018	GPS3119
46 07 24.80816	95 54 52.21134	449829.799	106324.262	.007	C	GPS - STATIC	2017	HMNPH
46 07 24.80853	95 54 52.21140	449829.795	106324.300	.131	3	GPS - RTRN	2015	RTRN2015
46 07 24.80830	95 54 52.21175	449829.770	106324.277	.131	3	GPS - RTRN	2015	RTRN2015
46 07 24.80816	95 54 52.21134	449829.799	106324.262	.007		ADJUSTMENT	2015	GPS3061
46 07 24.80816	95 54 52.21134	449829.799	106324.262	.007		ADJUSTMENT	2014	GPS3028
46 07 24.80814	95 54 52.21134	449829.799	106324.260	.007	C	GPS - STATIC	2014	HGRAN
46 07 24.80817	95 54 52.21136	449829.798	106324.263	.007	C	GPS - STATIC	2014	HDOUG
46 07 24.80816	95 54 52.21134	449829.799	106324.262	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 07 24.80811	95 54 52.21226	449829.734	106324.257	.007		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 07 24.80764	95 54 52.21199	449829.753	106324.210	.066		NCAT	2026	HTH55N
46 07 24.80764	95 54 52.21199	449829.753	106324.210	.066		NCAT	2025	HTH94B
46 07 24.80764	95 54 52.21199	449829.753	106324.210	.033	C	GPS - STATIC	2021	HOTTE
46 07 24.80764	95 54 52.21199	449829.753	106324.210	.033	C	GPS - STATIC	2017	HMNCORS07
46 07 24.80764	95 54 52.21199	449829.753	106324.210	.033	C	GPS - STATIC	2014	HGRAN
46 07 24.80764	95 54 52.21199	449829.753	106324.210	.033	C	GPS - STATIC	2012	HDOUG
46 07 24.80848	95 54 52.21222	449829.737	106324.295	.131	3	GPS - RTRN	2009	RTRN2009
46 07 24.80764	95 54 52.21199	449829.753	106324.210	.016	B	GPS - STATIC	2005	GPS2036
46 07 24.80764	95 54 52.21199	449829.753	106324.210	.033	C	ADJUSTMENT	2005	GPS2096
46 07 24.80764	95 54 52.21199	449829.753	106324.210	.033	C	GPS - STATIC	2005	HEVAN
46 07 24.80764	95 54 52.21199	449829.753	106324.210	.016	B	ADJUSTMENT	1999	17648
46 07 24.80764	95 54 52.21199	449829.753	106324.210	.016	B	GPS - STATIC	1997	GPS805-B

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 07 24.80696	95 54 52.20020	449830.584	106324.139	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 07 24.95460	95 54 51.00840			.100	2	CLASSICAL SURVEY	1963	13276

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2202646.595	742224.510	901670.864	16771310.633	.007		ADJUSTMENT	2026	GPS3900
2202646.595	742224.510	901670.864	16771310.633	.007	C	GPS - STATIC	2026	HTH55N
2202646.595	742224.510	901670.864	16771310.633	.007		ADJUSTMENT	2025	GPS3847
2202646.580	742224.451	901670.848	16771310.574	.131	3	GPS - RTRN	2025	RTRN2025
2202646.595	742224.510	901670.864	16771310.633	.007	C	GPS - STATIC	2025	HTH94B
2202646.672	742224.486	901670.941	16771310.608	.131	3	GPS - RTRN	2023	RTRN2023
2202646.595	742224.510	901670.864	16771310.633	.007		ADJUSTMENT	2020	GPS3384
2202646.595	742224.510	901670.864	16771310.633	.007	C	GPS - STATIC	2020	HOTTE
2202646.595	742224.510	901670.864	16771310.633	.007		ADJUSTMENT	2018	GPS3119
2202646.595	742224.510	901670.864	16771310.633	.007	C	GPS - STATIC	2017	HMNPH
2202646.591	742224.548	901670.861	16771310.671	.131	3	GPS - RTRN	2015	RTRN2015
2202646.566	742224.525	901670.835	16771310.649	.131	3	GPS - RTRN	2015	RTRN2015
2202646.595	742224.510	901670.864	16771310.633	.007		ADJUSTMENT	2015	GPS3061
2202646.595	742224.510	901670.864	16771310.633	.007		ADJUSTMENT	2014	GPS3028
2202646.595	742224.508	901670.864	16771310.631	.007	C	GPS - STATIC	2014	HGRAN
2202646.593	742224.511	901670.862	16771310.634	.007	C	GPS - STATIC	2014	HDOUG
2202646.595	742224.510	901670.864	16771310.633	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2202646.530	742224.506	901670.799	16771310.631	.007		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2202646.548	742224.458	901670.816	16771310.582	.066		NCAT	2026	HTH55N
2202646.548	742224.458	901670.816	16771310.582	.066		NCAT	2025	HTH94B
2202646.548	742224.458	901670.816	16771310.582	.033	C	GPS - STATIC	2021	HOTTE
2202646.548	742224.458	901670.816	16771310.582	.033	C	GPS - STATIC	2017	HMNCORS07
2202646.548	742224.458	901670.816	16771310.582	.033	C	GPS - STATIC	2014	HGRAN
2202646.548	742224.458	901670.816	16771310.582	.033	C	GPS - STATIC	2012	HDOUG
2202646.534	742224.544	901670.803	16771310.668	.131	3	GPS - RTRN	2009	RTRN2009
2202646.548	742224.458	901670.816	16771310.582	.016	B	GPS - STATIC	2005	GPS2036
2202646.548	742224.458	901670.816	16771310.582	.033	C	ADJUSTMENT	2005	GPS2096
2202646.548	742224.458	901670.816	16771310.582	.033	C	GPS - STATIC	2005	HEVAN
2202646.548	742224.458	901670.816	16771310.582	.016	B	ADJUSTMENT	1999	17648
2202646.548	742224.458	901670.816	16771310.582	.016	B	GPS - STATIC	1997	GPS805-B

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2202647.377	742224.372	901671.644	16771310.483	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1578052.185	414151.520			.100	2	CLASSICAL SURVEY	1963	13276

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HANS-RO0592-3SW-30JUL2025.jpg	SW	Jul 30, 2025
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HANS-RO0592-2-30JUL2025.jpg		Jul 30, 2025
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HANS-RO0592-1-30JUL2025.jpg		Jul 30, 2025

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: HANS MNDT RM 1

NGS Name: HANS RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CO9680](#) [Get Map](#)
NGS Quad / Sta Num : 46095333/1012
USGS Quad: FOURMILE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	25	131 N	42 W	460724.00	955454.00	2		1962	2015	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2015) Stamping: HANS NO 1 1962

3.4 MILES SOUTH OF DALTON, 2.0 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 35 (THE JUNCTION IS 2.5 MILES SOUTH OF DALTON), AT INTERSTATE HIGHWAY 94 MILEPOINT 69.60, 32.0 FEET EAST OF THE CENTER OF 275TH AVENUE, 374.68 FEET SOUTHWEST OF STATION HANS MNDT, 1.5 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1310.621	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1310.621	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1310.631	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Geoid Separations(ft): GEOID18 = -87.123 12B = -87.113 09 = -86.988 03 = -86.972

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HANS_RM_1-CO9680-3E-14SEP2015.jpg	E	Sep 14, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HANS_RM_1-CO9680-2-14SEP2015.jpg		Sep 14, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HANS_RM_1-CO9680-1-14SEP2015.jpg		Sep 14, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: HANS MNDT RM 2

NGS Name: HANS RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CO9681](#) [Get Map](#)
NGS Quad / Sta Num : 46095333/1012
USGS Quad: FOURMILE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	25	131 N	42 W	460725.19	955452.78	2	3	1962	2025	GOOD	Horz=YES Vert=YES	YES		RECESSED 6 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2009) **Stamping:** HANS NO 2 1962

3.4 MILES SOUTH OF DALTON, 2.0 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 35 (THE JUNCTION IS 2.5 MILES SOUTH OF DALTON), AT INTERSTATE HIGHWAY 94 MILEPOINT 69.60, 100.5 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94 AT MILEPOINT 69.6, 1.0 FOOT SOUTHWEST OF THE NORTH RIGHT-OF-WAY FENCE, 55.67 FEET NORTHWEST OF STATION HANS MNDT.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1330.132	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1330.132	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1330.145	.016	2/1				VERTICAL CONTROL SURVEY	2016 VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1330.125	.262		1243.003	.197	2011	GPS - RTRN	2025 RTRN2025
1330.004	.262		1242.891	.197	2011	GPS - RTRN	2015 RTRN2015
1330.024	.262		1243.052	.197	1996	GPS - RTRN	2009 RTRN2009

Geoid Separations(ft): GEOID18 = -87.123 12B = -87.113 09 = -86.988 03 = -86.972

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 07 25.19043	95 54 52.77873	449789.928	106363.088	.131	3	GPS - RTRN	2025 RTRN2025
46 07 25.19056	95 54 52.77872	449789.928	106363.102	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 07 25.19114	95 54 52.77905	449789.905	106363.160	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2202607.454	742264.062	901632.336	16771350.806	.131	3	GPS - RTRN	2025 RTRN2025
2202607.455	742264.075	901632.337	16771350.819	.131	3	GPS - RTRN	2015 RTRN2015

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2202607.433	742264.135	901632.316	16771350.878	.131	3	GPS - RTRN	2009 RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HANS_RM_2-CO9681-3SW-30JUL2025.jpg	SW	Jul 30, 2025
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HANS_RM_2-CO9681-2-30JUL2025.jpg		Jul 30, 2025
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HANS_RM_2-CO9681-1-30JUL2025.jpg		Jul 30, 2025

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: HCP A 91

NGS Name: HCP A 91

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AA9002](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	33	133 N	43 W	461716.00	960613.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	1991	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	RADIO/TV MAST	NGS

Description:

Stamping:

2.3 MILES EAST OF THE AIRPORT AND IS THE NORTHEASTERLY OF THREE RADIO MASTS WHICH FORM A TRI-ANGLE, STATION HCP A 91 IS THE HIGHEST ONE OF THE MASTS WHICH IS A TRIANGULAR STEEL STRUCTURE GUY ANCHORED AND IS PAINTED ALTERNATELY RED AND WHITE.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -88.225 12B = -88.218 09 = -88.107 03 = -88.025



Mn/DOT Name: HEALTHY

NGS Name: HEALTHY

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095214/
USGS Quad: WADENA

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	1	134 N	36 W	462701.58	950935.91		3	2023	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 5 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 54 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2023)

Stamping: HEALTHY 2023

1.2 MILES NORTHWEST OF WADENA, 1.25 NORTHWEST ALONG TRUNK HIGHWAY 10 FROM THE JUNCTION OF HIGHWAY 10 AND TRUNK HIGHWAY 71 IN WADENA, AT TRUNK HIGHWAY 10 MILEPOINT 88.7, 51.6 FEET SOUTHWEST OF THE CENTER LINE OF EAST BOUND LANE TRUNK HIGHWAY 10, 30.4 FEET SOUTHEAST OF AN ENTRANCE, 1.5 FEET NORTH OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1345.660	.262		1257.281	.197	2011	GPS - RTRN	2023	RTRN2023

No Geoid Separations Available

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
46 27 01.58169	95 09 35.91430	640333.455	225971.664	.131	3	2023	RTRN2023

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
2395307.786	858307.952	1096166.953	16884359.907	.131	3	2023	RTRN2023

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HEALTHY-3S-11JUL2024.jpg	S	Jul 11, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HEALTHY-2-11JUL2024.jpg		Jul 11, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HEALTHY-1-11JUL2024.jpg		Jul 11, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: HEDERMARKEN LUTH CH SPIRE

NGS Name: HEDERMARKEN LUTH CH SPIRE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0966](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/1035
USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	27	134 N	44 W	462350.63	961249.77		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1906	1906	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	CHURCH SPIRE	NGS

Description: (1906)

Stamping:

10.2 MILES NORTHWEST OF FERGUS FALLS, 3.3 MILES NORTH ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 (LINCOLN AVENUE) IN FERGUS FALLS, THEN 1.9 MILES WEST ALONG COUNTY ROAD 88, THEN 4.5 MILES NORTHWEST ALONG COUNTY ROAD 88 (OLD HIGHWAY 52), THEN 0.2 MILE NORTH ALONG 130TH AVENUE, THEN 0.2 MILE EAST ALONG 300TH STREET.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.284 12B = -88.281 09 = -88.172 03 = -88.113

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 23 50.63197	96 12 49.76853	374552.021	206526.990	.328	4	ADJUSTMENT	1999	17648
46 23 50.63204	96 12 49.76858	374552.017	206526.997	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 23 50.62961	96 12 49.75956	374552.648	206526.747	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>							<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 23 50.78000	96 12 48.53800			.100	4	CLASSICAL SURVEY	1962	12924

USSD

<u>Geodetic Position</u>							<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 23 50.96300	96 12 48.91600				3	CLASSICAL SURVEY		17389-73

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2129246.304	843789.928	829853.594	16874056.876	.328	4	ADJUSTMENT	1999	17648
2129246.301	843789.935	829853.591	16874056.883	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2129246.926	843789.674	829854.213	16874056.611	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - Central Zone</u>							<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1504651.150	515716.241			.100	4	CLASSICAL SURVEY	1962	12924



Mn/DOT Name: HELENA TWIN CITIES AWY BCN 81

NGS Name: HELENA TWIN CITIES AWY BCN 81

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0918](#) [Get Map](#)
NGS Quad / Sta Num : 46096132/1021
USGS Quad: LAWNDALE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	5	135 N	44 W	463238.63	961535.02		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	2023	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	AIRWAY BEACON	NGS

Description: (1935)

Stamping:

APPROXIMATELY 5.0 MILES NORTH AND 1.1 MILES EAST OF ROTHSA. THE POINT OBSERVED UPON WAS THE LIGHT ON AN AIR BEACON. STATION HELENA TWIN CITIES AWY BCN 81 WAS NOT VISITED BUT THE BEACON IS EVIDENTLY ON THE LINE, FERGUS FALLS TO FARGO, NORTH DAKOTA.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.785 12B = -87.769 09 = -87.674 03 = -87.592

Lat/Lon and County Coordinates (Feet)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 32 38.63002	96 15 35.01655	363336.934	260093.752	.328	4	ADJUSTMENT	1999	17648
46 32 38.62968	96 15 35.01602	363336.971	260093.717	.328	4	ADJUSTMENT	1998	17655

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 32 38.62923	96 15 35.00931	363337.440	260093.668	.328	4	ADJUSTMENT	1986	17289

<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>						<u>Year</u>	<u>Reference</u>
46 32 38.77500	96 15 33.78200			.100	4	CLASSICAL SURVEY	1944	05937

State Plane and UTM Coordinates (Feet)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2119025.831	897548.181	820484.809	16927994.186	.328	4	ADJUSTMENT	1999	17648
2119025.867	897548.146	820484.845	16927994.150	.328	4	ADJUSTMENT	1998	17655

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2119026.334	897548.088	820485.312	16927994.085	.328	4	ADJUSTMENT	1986	17289

<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1494430.367	569473.868			.100	4	CLASSICAL SURVEY	1944	05937



Mn/DOT Name: HELENA TWIN CITIES AWY BN 82 A

NGS Name: HELENA TWIN CITIES AWY BN 82 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0948](#) [Get Map](#)
NGS Quad / Sta Num : 46096211/1031
USGS Quad: ERHARD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	16	134 N	43 W	462459.67	960647.68		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	AIRWAY BEACON	NGS

Description: (1935)

Stamping:

5.4 MILES SOUTHWEST OF ERHARD, 0.7 MILE EAST ALONG 310TH STREET FROM THE JUNCTION OF 310TH STREET AND TRUNK HIGHWAY 59 IN ERHARD, THEN 0.3 MILE NORTH ON A TEE-ROAD.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.186 12B = -88.189 09 = -88.064 03 = -87.969

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 24 59.67230	96 06 47.68364	399966.008	213377.961	.328	4	ADJUSTMENT	1999	17648
46 24 59.67236	96 06 47.68417	399965.971	213377.967	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 24 59.67231	96 06 47.67722	399966.458	213377.960	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>						<u>Year</u>	<u>Reference</u>
46 24 59.82000	96 06 46.47000			.100	4	CLASSICAL SURVEY	1944	05937

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2154779.423	850168.519	855494.956	16880032.414	.328	4	ADJUSTMENT	1999	17648
2154779.386	850168.526	855494.919	16880032.422	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2154779.873	850168.509	855495.405	16880032.397	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1530183.810	522094.881			.100	4	CLASSICAL SURVEY	1944	05937



Mn/DOT Name: HERFORD MNDT

NGS Name: HERFORD

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R00522](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/1039
USGS Quad: BATTLE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	16	133 N	40 W	461941.90	954306.91	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2015	DESTROYED	Horz=NO Vert=NO	NO		RECESSED 20 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1975) **Stamping:** HERFORD 1975

3.0 MILES NORTH OF BATTLE LAKE, 3.65 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 25.3, 26.8 FEET WEST OF TRUNK HIGHWAY 78, 8.5 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1370.060	.016	2/1					VERTICAL ADJUSTMENT	1991	00000025

NGVD29				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1369.269	.016	2					VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1367.054	.262			1279.240	.197	2011	GPS - RTRN	2015	RTRN2015
1370.076	.197			1282.445	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.815 12B = -87.815 09 = -87.703 03 = -87.588

Lat/Lon and County Coordinates (Feet)

NAD83(2011)				Otter Tail County				Project Info	
Geodetic Position				X	Y	Acc	Order	Determination Method	Year Reference
Latitude	Longitude								
46 19 41.89543	95 43 06.91322			499514.825	180933.553	.131	3	GPS - RTRN	2015 RTRN2015

NAD83(1996)				Otter Tail County				Project Info	
Geodetic Position				X	Y	Acc	Order	Determination Method	Year Reference
Latitude	Longitude								
46 19 41.89569	95 43 06.91294			499514.845	180933.579	.066	2	ADJUSTMENT	1999 17648
46 19 41.89560	95 43 06.91319			499514.827	180933.570	.066	2	ADJUSTMENT	1998 17655

NAD83(1986)				Otter Tail County				Project Info	
Geodetic Position				X	Y	Acc	Order	Determination Method	Year Reference
Latitude	Longitude								
46 19 41.89281	95 43 06.90229			499515.593	180933.287	.066	2	ADJUSTMENT	1986 17289

NAD27								Project Info	
Geodetic Position				X	Y	Acc	Order	Determination Method	Year Reference
Latitude	Longitude								
46 19 42.03658	95 43 05.73222					.100	2	CLASSICAL SURVEY	1977 15945



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2253697.608	815891.213	953887.679	16844183.850	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2253697.628	815891.239	953887.700	16844183.876	.066	2	ADJUSTMENT	1999	17648
2253697.610	815891.230	953887.682	16844183.867	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2253698.370	815890.934	953888.437	16844183.559	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		<u>X</u>	<u>Y</u>	Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1629102.796	487817.484			.100	2	CLASSICAL SURVEY	1977	15945



Mn/DOT Name: HERFORD UNDERGROUND

NGS Name: HERFORD UNDERGROUND

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4327](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/1039
USGS Quad: BATTLE LAKE

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
SE	16	133 N	40 W	461941.90	954306.91	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	2015	GOOD	Horz=NO Vert=YES	YES		RECESSED 20 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MNDT

Description: (1975) **Stamping:** HERFORD 1975

3.0 MILES NORTH OF BATTLE LAKE, 3.65 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 25.3, 26.8 FEET WEST OF TRUNK HIGHWAY 78, 8.5 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1367.251	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941	
1367.245	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911	
1367.248	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE	

Geoid Separations(ft): GEOID18 = -87.815 12B = -87.815 09 = -87.703 03 = -87.588

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HERFORD_UNDERGROUND-DQ4327-3W-08SEP2015.jpg	W	Sep 8, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HERFORD_UNDERGROUND-DQ4327-2-08SEP2015.jpg		Sep 8, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HERFORD_UNDERGROUND-DQ4327-1-08SEP2015.jpg		Sep 8, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: HEXUM

NGS Name: HEXUM

County: OTTER TAIL, MN (Sheet 1)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	34	136 N	40 W	463324.01	954251.33	2	C

NGS ACRN: [DR9947](#)
NGS Quad / Sta Num : 46095423/
USGS Quad: DENT

[Get Map](#)

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 94 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) **Stamping:** HEXUM 2014

0.25 MILE EAST OF DENT, 0.25 MILE EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND THE WEST JUNCTION OF COUNTY ROAD 35 IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 31, 75, 26.6 FEET SOUTH OF TRUNK HIGHWAY 108, 118.9 FEET WEST OF A DRIVEWAY NUMBERS 37308 AND 37310, 11.8 FEET EAST OF EXTENDED DRIVEWAY NUMBER 37291 TO CEMETERY NUMBER 37291, 1.5 FEET NORTH OF A WITNESS POST.

Station Pair: WOLF - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Year	Reference
1357.835	.016	2/1				2024	VPELI2

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Year	Reference
1357.789			1270.490	.023	2011	2024	GPS3689
1357.770	.131		1270.581	.066	1996	2024	HTH108
1357.789			1270.490	.023	2011	2024	HTH108
1357.852	.262		1270.499	.197	2011	2023	RTRN2023
1357.875	.262		1270.522	.197	2011	2022	RTRN2022
1357.714	.262		1270.378	.197	2011	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.352 12B = -87.336 09 = -87.228 03 = -87.119

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County		Project Info		
Latitude	Longitude	X	Y	Acc	Order	Reference
46 33 24.01243	95 42 51.32891	500606.007	264222.410	.013		GPS3689
46 33 24.01243	95 42 51.32891	500606.007	264222.410	.013	C	HTH108
46 33 24.01192	95 42 51.32861	500606.028	264222.358	.131	3	RTRN2023
46 33 24.01230	95 42 51.32864	500606.026	264222.396	.131	3	RTRN2022
46 33 24.01212	95 42 51.32938	500605.974	264222.378	.131	3	RTRN2014

NAD83(1996)		Otter Tail County		Project Info		
Latitude	Longitude	X	Y	Acc	Order	Reference
46 33 24.01220	95 42 51.32944	500605.970	264222.386	.033	C	HTH108

State Plane and UTM Coordinates (Feet)

NAD83(2011)		UTM - Zone 15		Project Info		
MN State Plane - Central Zone		X	Y	Acc	Order	Reference
2256330.468	899134.848	957840.863	16927392.811	.013		GPS3689
2256330.468	899134.848	957840.863	16927392.811	.013	C	HTH108
2256330.488	899134.796	957840.882	16927392.758	.131	3	RTRN2023
2256330.487	899134.834	957840.881	16927392.797	.131	3	RTRN2022
2256330.435	899134.817	957840.829	16927392.780	.131	3	RTRN2014

NAD83(1996)		UTM - Zone 15		Project Info		
MN State Plane - Central Zone		X	Y	Acc	Order	Reference
2256330.431	899134.825	957840.825	16927392.789	.033	C	HTH108



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HEXUM-DR9947-3S-31JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HEXUM-DR9947-2-31JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HEXUM-DR9947-1-31JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Jul 31, 2023
	Jul 31, 2023
	Jul 31, 2023



Mn/DOT Name: HODENFIELD

NGS Name: HODENFIELD

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5770](#)

[Get Map](#)

NGS Quad / Sta Num : 46095431/

USGS Quad: VERGAS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	9	137 N	41 W	464142.24	955159.38		C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1999	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (1999)

Stamping: HODENFIELD 1999

4.65 MILES NORTHWEST OF VERGAS, 4.65 MILES NORTHWEST ALONG COUNTY ROAD 17 FROM THE JUNCTION OF COUNTY ROAD 17 AND COUNTY ROAD 4 IN VERGAS, 29.0 FEET NORTH OF COUNTY ROAD 17, 15.0 FEET WEST OF A FIELD ENTRANCE, 75.0 FEET EAST-SOUTHEAST OF A POWER POLE, 3.0 FEET EAST OF A WITNESS POST.

Station Notes

A DISTRICT 4 DISK WAS USED.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1411.887	.131		1324.984	.066	1996	GPS - STATIC		2021	HOTTE
1411.953			1324.833	.021	2011	HORIZONTAL ADJUSTMENT		2020	GPS3384
1411.953			1324.833	.021	2011	GPS - STATIC		2020	HOTTE
1411.661	.262		1324.778	.197	1996	GPS - RTRN		2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.136 12B = -87.129 09 = -87.037 03 = -86.880

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 41 42.24246	95 51 59.37911	462399.408	314735.741	.013		ADJUSTMENT	2020	GPS3384
46 41 42.24246	95 51 59.37911	462399.408	314735.741	.013	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 41 42.24212	95 51 59.37961	462399.373	314735.706	.033	C	GPS - STATIC	2021	HOTTE
46 41 42.24297	95 51 59.38195	462399.210	314735.792	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2219070.313	950340.547	921394.736	16979198.548	.013		ADJUSTMENT	2020	GPS3384
2219070.313	950340.547	921394.736	16979198.548	.013	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2219070.277	950340.514	921394.700	16979198.515	.033	C	GPS - STATIC	2021	HOTTE
2219070.116	950340.603	921394.540	16979198.606	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HODENFIELD-DR5770-3N-07OCT2014.jpg	N	Oct 7, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HODENFIELD-DR5770-2-07OCT2014.jpg		Oct 7, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HODENFIELD-DR5770-1-07OCT2014.jpg		Oct 7, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: HOLLO

NGS Name: HOLLO

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095331/
USGS Quad: STALKER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	30	132 N	40 W	461319.20	954531.55		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2000	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type

ALUMINUM ALLOY ROD (NO SLEEVE)

Disk Type

SURVEY DISK

Mon. Agency

MN-111

Description: (2000)

Stamping: HOLLO 2000

4.4 MILES SOUTHWEST OF BATTLE LAKE, 1.85 MILES WEST AND SOUTHWEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 IN BATTLE LAKE, TO TRUNK HIGHWAY 210 MILEPOINT 43.75, THENCE 2.45 MILES SOUTH AND WEST ALONG COUNTY ROAD 47, THENCE 1.3 MILES SOUTH AND WEST ALONG TREFOLDIGHED ROAD, 32.3 FEET EAST OF TREFOLDIGHED ROAD, 10.0 FEET NORTH OF A FIELD ENTRANCE, 3.5 FEET SOUTH OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1460.942	.262		1373.747	.197	1996	GPS - RTRN	2009	RTRN2009	

Geoid Separations(ft): GEOID18 = -87.359 12B = -87.385 09 = -87.273 03 = -87.191

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
46 13 19.19697	95 45 31.55304	489343.269	142166.164	.131	3	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
2242811.428	777323.941	942392.473	16805784.303	.131	3	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HOLLO-3E-01OCT2014.jpg	E	Oct 1, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HOLLO-2-01OCT2014.jpg		Oct 1, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HOLLO-1-01OCT2014.jpg		Oct 1, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: HOLTZ

NGS Name: HOLTZ

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4341](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	5	132 N	41 W	461650.63	955219.21	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 19 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) **Stamping:** HOLTZ 2014

AT THE SOUTH EDGE OF THE UNDERWOOD CITY LIMITS, 0.1 MILE EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN UNDERWOOD, AT TRUNK HIGHWAY 210 MILEPOINT 37.6, 63.8 FEET SOUTH OF TRUNK HIGHWAY 210, 30.6 FEET WEST OF A FIELD ENTRANCE, 9.5 FEET NORTH OF A WITNESS POST.

Station Pair: SEWELL - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1359.243	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1359.236	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1359.236	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1359.151	.262		1271.195	.197	2011	GPS - RTRN	2023	RTRN2023
1359.249	.262		1271.293	.197	2011	GPS - OPUS	2020	GPSBM
1359.131	.262		1271.175	.197	2011	GPS - OPUS	2020	GPSBM
1359.111	.262		1271.126	.197	2011	GPS - RTRN	2015	RTRN2015
1359.111	.262		1271.126	.197	2011	GPS - RTRN	2015	RTRN2015
1359.138	.262		1271.156	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.956 12B = -87.982 09 = -87.867 03 = -87.726

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 50.62564	95 52 19.20594	460720.491	163621.137	.131	3	GPS - RTRN	2023	RTRN2023
46 16 50.62606	95 52 19.20619	460720.474	163621.179	.131	3	GPS - OPUS	2020	GPSBM
46 16 50.62649	95 52 19.20630	460720.466	163621.223	.131	3	GPS - OPUS	2020	GPSBM
46 16 50.62699	95 52 19.20663	460720.443	163621.273	.131	3	GPS - RTRN	2015	RTRN2015
46 16 50.62699	95 52 19.20663	460720.443	163621.273	.131	3	GPS - RTRN	2015	RTRN2015
46 16 50.62594	95 52 19.20573	460720.506	163621.167	.131	3	GPS - RTRN	2014	RTRN2014

State Plane and UTM Coordinates (Feet)

NAD83(2011)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Year	Reference
2214594.562	799302.238	914518.036	16828209.905	.131	3	GPS - RTRN	2023	RTRN2023
2214594.546	799302.281	914518.020	16828209.948	.131	3	GPS - OPUS	2020	GPSBM
2214594.539	799302.325	914518.014	16828209.991	.131	3	GPS - OPUS	2020	GPSBM
2214594.517	799302.376	914517.993	16828210.043	.131	3	GPS - RTRN	2015	RTRN2015
2214594.517	799302.376	914517.993	16828210.043	.131	3	GPS - RTRN	2015	RTRN2015
2214594.578	799302.268	914518.052	16828209.934	.131	3	GPS - RTRN	2014	RTRN2014



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HOLTZ-DQ4341-3S-09OCT2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HOLTZ-DQ4341-2-09OCT2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HOLTZ-DQ4341-1-09OCT2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Oct 9, 2023
	Oct 9, 2023
	Oct 9, 2023



Mn/DOT Name: HOOK

NGS Name: HOOK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095434/
USGS Quad: LAKE FRANKLIN

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	30	137 N	41 W	463839.82	955444.06		3	1999	2014	GOOD	Horz=NO Vert=NO	NO		RECESSED 3 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (1999)

Stamping: HOOK 1999

5.1 MILES SOUTHEAST OF DUNVILLA, 3.35 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 34 IN DUNVILLA, TO TRUNK HIGHWAY 59 MILEPOINT 250.95, THENCE 2.25 MILES SOUTH ALONG COUNTY ROAD 31, THENCE 2.25 MILES NORTHEAST ALONG 470TH STREET, 109.0 FEET NORTH OF 470TH STREET, 76.7 FEET NORTHEAST OF A POWER POLE, 1.0 FOOT EAST OF A WITNESS POST.

Station Notes

THE SURVEY MARK IS ON PRIVATE PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE. THE ROD DEPTH IS UNKNOWN.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1459.521	.262		1372.550	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.218 12B = -87.182 09 = -87.119 03 = -86.972

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 38 39.81845	95 54 44.06169	450873.562	296278.543	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2207206.201	932102.144	909237.173	16961147.574	.131	3	GPS - RTRN	2009	RTRN2009



Mn/DOT Name: HORSE

NGS Name: HORSE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7127](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	34	136 N	43 W	463256.74	960501.73	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2009	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 30 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** HORSE 2009

1.45 MILES SOUTH OF PELICAN RAPIDS, 1.45 MILES SOUTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 EAST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 239.10, 53.0 FEET WEST OF TRUNK HIGHWAY 59, 9.0 FEET SOUTH OF A FIELD ENTRANCE, 55.0 FEET SOUTHEAST OF A POWER POLE, 5.8 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1316.523	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941	
1316.589	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792	
1316.592	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1316.523			1228.935	.022	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672	
1316.523	.131		1229.040	.066	1996	GPS - STATIC	2023	HTH59	
1316.523			1228.935	.022	2011	GPS - STATIC	2023	HTH59	
1316.572	.262		1228.889	.197	2011	GPS - RTRN	2022	RTRN2022	
1316.425	.262		1228.748	.197	2011	GPS - RTRN	2014	RTRN2014	

Geoid Separations(ft): GEOID18 = -87.684 12B = -87.677 09 = -87.556 03 = -87.428

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Lat/Lon</u>		<u>County Coordinates</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 32 56.73911	96 05 01.72569	407614.487	261673.689	.013		ADJUSTMENT	2024	GPS3672	
46 32 56.73911	96 05 01.72569	407614.487	261673.689	.013	C	GPS - STATIC	2023	HTH59	
46 32 56.73886	96 05 01.72611	407614.458	261673.664	.131	3	GPS - RTRN	2022	RTRN2022	
46 32 56.73908	96 05 01.72561	407614.493	261673.686	.131	3	GPS - RTRN	2014	RTRN2014	

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Lat/Lon</u>		<u>County Coordinates</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 32 56.73891	96 05 01.72619	407614.452	261673.669	.033	C	GPS - STATIC	2023	HTH59	

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>	
2163319.442	898308.240	864802.551	16928048.052	.013		ADJUSTMENT	2024	GPS3672	
2163319.442	898308.240	864802.551	16928048.052	.013	C	GPS - STATIC	2023	HTH59	
2163319.413	898308.216	864802.521	16928048.028	.131	3	GPS - RTRN	2022	RTRN2022	
2163319.448	898308.237	864802.556	16928048.049	.131	3	GPS - RTRN	2014	RTRN2014	

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>	
2163319.407	898308.221	864802.515	16928048.033	.033	C	GPS - STATIC	2023	HTH59	



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HORSE-DO7127-3W-12OCT2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HORSE-DO7127-2-12OCT2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/HORSE-DO7127-1-12OCT2022.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
W	Oct 12, 2022
	Oct 12, 2022
	Oct 12, 2022



Mn/DOT Name: INDIAN

NGS Name: INDIAN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0965](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/1011
USGS Quad: ELIZABETH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	9	134 N	44 W	462617.29	961313.22		1

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2009	GOOD	Horz=NO Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (1961)

Stamping: INDIAN 1935 906T

3.8 MILES SOUTHEAST OF ROTHSA, ON THE NORTH SLOPE OF INDIAN MOUNTAIN, 2.35 MILES SOUTHEAST ALONG COUNTY ROAD 88 FROM THE JUNCTION OF COUNTY ROAD 88 AND COUNTY ROAD 24 IN ROTHSA, THEN 1.75 MILES EAST ON 330TH STREET, THEN 0.25 MILE SOUTH ON 130TH AVENUE, 500.0 FEET NORTH OF A RELAY TOWER, 492.0 FEET WEST OF 130TH AVENUE, 28.5 FEET NORTHWEST OF A CORNER TELEPHONE POLE, 176.22 FEET SOUTHWEST OF INDIAN RM 2, 171.23 FEET EAST OF INDIAN RM 1, 19.0 FEET NORTH OF A FENCE.

Station Notes

IT WAS REPORTED THAT RECENT MEASUREMENTS SHOW A DIFFERENCE FROM CURRENT PUBLISHED POSITIONS OF 0.08 FOOT HORIZONTAL AND 2.0 FEET VERTICAL. USE WITH CAUTION. (2018)

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference
1398.291	.131		1310.404	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference
1397.012						RECIPROCAL VERTICAL ANGLE	1961	HORZ

Geoid Separations(ft): GEOID18 = -88.218 12B = -88.215 09 = -88.107 03 = -88.031

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 26 17.29269	96 13 13.22134	373002.808	221395.243	.033	1	ADJUSTMENT	1999	17648
46 26 17.29265	96 13 13.22123	373002.816	221395.238	.033	1	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 26 17.29210	96 13 13.21258	373003.421	221395.179	.033	1	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 26 17.43900	96 13 11.99000			.100	1	CLASSICAL SURVEY	1962	12924

USSD

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 26 17.62700	96 13 12.37100				3	CLASSICAL SURVEY		17389-73



State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2127972.699	858682.377	828815.866	16888974.034	.033	1	ADJUSTMENT	1999	17648
2127972.706	858682.373	828815.873	16888974.030	.033	1	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2127973.311	858682.302	828816.476	16888973.949	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		<u>X</u>	<u>Y</u>	Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1503377.482	530608.432			.100	1	CLASSICAL SURVEY	1962	12924

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/INDIAN-RP0965-3SE-18AUG2009.jpg	SE	Aug 18, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/INDIAN-RP0965-2-18AUG2009.jpg		Aug 18, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/INDIAN-RP0965-1-18AUG2009.jpg		Aug 18, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: INDIAN AZ MK

NGS Name: INDIAN AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CO9812](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/1011
USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	9	134 N	44 W	462630.00	961308.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	1961	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 6 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	NGS

Description:

Stamping:

0.1 MILE NORTH OF THE CROSSROADS WHICH ARE NORTHEAST OF THE STATION, 30.0 FEET WEST OF A NORTH AND SOUTH ROAD, IN THE WEST RIGHT-OF-WAY FENCE.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -88.208 12B = -88.205 09 = -88.097 03 = -88.021



Mn/DOT Name: INDIAN MTN HIGHEST POINT

NGS Name: INDIAN MTN HIGHEST POINT

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CO9816](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	9	134 N	44 W	462617.44	961311.99		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2010	UNKNOWN	Horz=? Vert=?	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	UNSPECIFIC DISK TYPE (SEE TEXT)	UNK

Description: Stamping:
475.0 FEET SOUTHWEST OF STATION INDIAN.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.218 12B = -88.215 09 = -88.107 03 = -88.031



Mn/DOT Name: INDIAN RM

NGS Name: INDIAN RM

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CO9813](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/1011
USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	9	134 N	44 W	462617.12	961315.65		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1906	2009	NOT FOUND	Horz=NO Vert=NO	NO		RECESSED 18 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	NAIL	NGS

Description: (1961)

Stamping:

3.8 MILES SOUTHEAST OF ROTHSAY, ON THE NORTH SLOPE OF INDIAN MOUNTAIN, 2.35 MILES SOUTHEAST ALONG COUNTY ROAD 88 FROM THE JUNCTION OF COUNTY ROAD 88 AND COUNTY ROAD 24 IN ROTHSAY, THEN 1.75 MILES EAST ON 330TH STREET, THEN 0.25 MILE SOUTH ON 130TH AVENUE, THEN WALK 400.0 FEET WEST, 189.5 FEET WEST OF A CORNER TELEPHONE POLE, 0.5 FOOT SOUTH OF AN EAST AND WEST FENCE, 171.23 FEET WEST OF STATION INDIAN. THE ORIGINAL REFERENCE STATION IS A NAIL IN A 1 1/4-INCH IRON PIPE FILLED WITH AND SET IN CONCRETE, IN 1961 BURIED 1.5 FEET.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.218 12B = -88.215 09 = -88.107 03 = -88.031



Mn/DOT Name: INDIAN RM 2

NGS Name: INDIAN RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CO9815](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/1011
USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>	
NE	9	134 N	44 W	462618.69	961311.72			1935	2009	NOT FOUND	Horz=NO Vert=NO	NO		RECESSED 1 IN.	SEE DESCRIPTION	
<u>Monument Type</u> UNKNOWN												<u>Disk Type</u> REFERENCE MARK DISK			<u>Mon. Agency</u> NGS	

Description:

Stamping:

3.8 MILES SOUTHEAST OF ROTHSAY, ON THE NORTH SLOPE OF INDIAN MOUNTAIN, 2.35 MILES SOUTHEAST ALONG COUNTY ROAD 88 FROM THE JUNCTION OF COUNTY ROAD 88 AND COUNTY ROAD 24 IN ROTHSAY, THEN 1.75 MILES EAST ON 330TH STREET, THEN 0.25 MILE SOUTH ON 130TH AVENUE, THEN WALK 400.0 FEET WEST, 184.0 FEET NORTHEAST OF A CORNER TELEPHONE POLE, 160.0 FEET NORTH OF THE EAST AND WEST FENCE, 177.0 FEET NORTHWEST OF THE FIRST POLE EAST OF A CORNER POLE, 176.22 FEET NORTHEAST OF STATION INDIAN.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.215 12B = -88.212 09 = -88.107 03 = -88.028



Mn/DOT Name: IVERSON

NGS Name: IVERSON

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DQ2706	Get Map
NW	15	132 N	43 W	461505.58	960429.27	2	3	NGS Quad / Sta Num : 46096212/ USGS Quad: FERGUS FALLS	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 24 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015)

Stamping: IVERSON 2014

3.4 MILES SOUTH OF FERGUS FALLS, 0.25 MILE NORTHWEST ALONG THE ENTRANCE RAMP FROM TRUNK HIGHWAY 210 EAST TO WESTBOUND INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 (THE JUNCTION IS 2.5 MILES SOUTH OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 57.65, 150.0 FEET NORTH-NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 88.7 FEET NORTH-NORTHEAST OF THE ENTRANCE RAMP FROM TRUNK HIGHWAY 210 TO WESTBOUND INTERSTATE HIGHWAY 94, 52.9 FEET SOUTH-SOUTHWEST OF A RIGHT-OF-WAY FENCE, 1.5 FEET SOUTH-SOUTHWEST OF A WITNESS POST.

Station Pair: PEBBLE - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1259.085	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1259.105	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1259.105	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1259.105	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1259.079	.262		1171.015	.197	2011	GPS - RTRN	2023	RTRN2023
1259.039	.262		1170.972	.197	2011	GPS - RTRN	2015	RTRN2015
1259.059	.262		1170.988	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -88.064 12B = -88.067 09 = -87.939 03 = -87.864

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>									
<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>					
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 15 05.58030	96 04 29.27137	409391.609	153145.828	.131	3	GPS - RTRN	2023	RTRN2023	
46 15 05.58041	96 04 29.27042	409391.676	153145.839	.131	3	GPS - RTRN	2015	RTRN2015	
46 15 05.58061	96 04 29.27186	409391.575	153145.859	.131	3	GPS - RTRN	2014	RTRN2014	

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>									
MN State Plane - Central Zone		UTM - Zone 15				Project Info			
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
2163087.428	789780.191	862850.601	16819497.689	.131	3	GPS - RTRN	2023	RTRN2023	
2163087.495	789780.201	862850.668	16819497.698	.131	3	GPS - RTRN	2015	RTRN2015	
2163087.394	789780.223	862850.568	16819497.722	.131	3	GPS - RTRN	2014	RTRN2014	

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/IVERSON-DQ2706-3NE-15AUG2023.jpg	NE	Aug 15, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/IVERSON-DQ2706-2-15AUG2023.jpg		Aug 15, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/IVERSON-DQ2706-1-15AUG2023.jpg		Aug 15, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: J 100

NGS Name: J 100

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0127](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	3	132 N	43 W	461651.39	960451.00	2	3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	2009	GOOD	Horz=NO Vert=YES	NO		PROJECTS 4 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (2010)

Stamping: J 100 1934

IN FERGUS FALLS, 0.1 MILE WEST ALONG WEST LINCOLN AVENUE FROM THE JUNCTION OF LINCOLN AVENUE AND SOUTH UNION AVENUE IN FERGUS FALLS, THEN 0.15 MILE SOUTHWEST ON NORTH VINE STREET, THEN WALK 200.0 FEET SOUTHWEST TO THE MARK, 0.4 MILE WEST ON A RAILROAD FROM THE RAILROAD STATION, 41.2 FEET WEST OF RAILROAD MILEPOST 50, 126.0 FEET NORTHWEST OF THE RAILROAD BRIDGE, 40.0 FEET SOUTHWEST OF A RAILROAD, 6.0 FEET NORTHEAST OF A FENCE, 1.0 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1175.237	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1174.417	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1174.417	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1174.417	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1174.417	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A
1174.374	.007	1				VERTICAL CONTROL SURVEY	1941	Q460962
1174.374	.007	1				VERTICAL CONTROL SURVEY	1934	L97 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1175.165	.262		1087.173	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.192 12B = -88.192 09 = -88.074 03 = -87.989

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 16 51.39614	96 04 51.00758	407913.381	163872.612	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2161808.178	800531.066	861740.478	16830271.355	.131	3	GPS - RTRN	2009	RTRN2009



Mn/DOT Name: J 61

NGS Name: J 61

County: OTTER TAIL, MN (Sheet 1)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	3	132 N	43 W	461647.70	960428.60	2	

NGS ACRN: [RP0135](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
WALL	BENCH MARK DISK	NGS

Description: (2004)

Stamping: J 61 1934

IN FERGUS FALLS, IN THE EAST WALL OF THE COUNTY COURTHOUSE, 163.5 FEET SOUTH OF JUNIUS AVENUE, 136.0 FEET WEST OF SOUTH MILL STREET, 24.0 FEET SOUTH OF THE NORTHEAST CORNER OF A BUILDING, 15.0 FEET NORTH OF THE FRONT ENTRANCE.

Station Notes

GRAVITY VALUE: G=980 615.55 +/-? MGAL.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1206.487	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1206.517	.016	2/1				VERTICAL ADJUSTMENT	2011	00000690
1206.530	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1206.530	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFGUS
1206.530	.016	2/1				VERTICAL CONTROL SURVEY	2004	VFERG
1206.530	.016	2				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1205.713	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1205.713	.007	1				VERTICAL CONTROL SURVEY	1972	Q460962
1205.713	.007	1				VERTICAL CONTROL SURVEY	1972	L22167-A
1205.713	.007	1				VERTICAL CONTROL SURVEY	1971	L22167-A
1205.713	.007	1				VERTICAL CONTROL SURVEY	1941	Q460962
1205.713	.007	1				VERTICAL CONTROL SURVEY	1934	L40 MINN

Geoid Separations(ft): GEOID18 = -88.186 12B = -88.186 09 = -88.067 03 = -87.982

* No Horizontal Positions in the Database *

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/J_61-RP0135-3SW-26SEP2008.jpg	SW	Sep 26, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/J_61-RP0135-2-26SEP2008.jpg		Sep 26, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/J_61-RP0135-1-26SEP2008.jpg		Sep 26, 2008

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: JAKE

NGS Name: JAKE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7112](#) [Get Map](#)
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
SE	17	134 N	43 W	462446.49	960702.56	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2009	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 50 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) Stamping: JAKE 2009

2.4 MILES NORTH OF ELIZABETH, 2.3 MILES NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 10 IN ELIZABETH TO TRUNK HIGHWAY 59 MILEPOINT 229.1, THEN 0.5 MILE EAST ALONG 310TH STREET, 23.7 FEET NORTH OF 310TH STREET, 9.7 FEET SOUTH OF CABLE BOX NUMBER 100 51, 47.3 FEET WEST OF DRIVEWAY NUMBER 17833, 10.2 FEET SOUTHEAST OF A WITNESS POST.

Station Pair: SAM - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1252.396	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1252.409	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1252.419	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1252.396			1164.256	.020	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1252.396	.131		1164.371	.066	1996	GPS - STATIC	2023	HTH59
1252.396			1164.256	.020	2011	GPS - STATIC	2023	HTH59
1252.399	.262		1164.200	.197	2011	GPS - RTRN	2022	RTRN2022
1252.415	.262		1164.217	.197	2011	GPS - OPUS	2020	GPSBM
1252.438	.262		1164.240	.197	2011	GPS - OPUS	2020	GPSBM

Geoid Separations(ft): GEOID18 = -88.199 12B = -88.199 09 = -88.074 03 = -87.982

Lat/Lon and County Coordinates (Feet)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 24 46.49459	96 07 02.55813	398917.037	212048.202	.013		ADJUSTMENT	2024	GPS3672
46 24 46.49459	96 07 02.55813	398917.037	212048.202	.013	C	GPS - STATIC	2023	HTH59
46 24 46.49455	96 07 02.55872	398916.996	212048.198	.131	3	GPS - RTRN	2022	RTRN2022
46 24 46.49429	96 07 02.55868	398916.999	212048.171	.131	3	GPS - OPUS	2020	GPSBM
46 24 46.49422	96 07 02.55853	398917.009	212048.164	.131	3	GPS - OPUS	2020	GPSBM

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 24 46.49434	96 07 02.55866	398917.000	212048.176	.033	C	GPS - STATIC	2023	HTH59

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2153706.159	848858.573	854400.643	16878739.153	.013		ADJUSTMENT	2024	GPS3672
2153706.159	848858.573	854400.643	16878739.153	.013	C	GPS - STATIC	2023	HTH59
2153706.117	848858.570	854400.602	16878739.151	.131	3	GPS - RTRN	2022	RTRN2022
2153706.119	848858.543	854400.603	16878739.124	.131	3	GPS - OPUS	2020	GPSBM
2153706.130	848858.536	854400.614	16878739.117	.131	3	GPS - OPUS	2020	GPSBM

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2153706.121	848858.549	854400.605	16878739.129	.033	C	GPS - STATIC	2023	HTH59

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JAKE-DO7112-3N-17OCT2022.jpg	N	Oct 17, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JAKE-DO7112-2-17OCT2022.jpg		Oct 17, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JAKE-DO7112-1-17OCT2022.jpg		Oct 17, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: JANE MNDT

NGS Name: JANE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0191](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/1040
USGS Quad: ELIZABETH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	16	134 N	44 W	462524.86	961330.34	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1961	2009	GOOD	Horz=YES Vert=YES	NO		RECESSED 3 IN.	STEEL SPIKE IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (2015) **Stamping:** JANE USC AND GS 1961

4.4 MILES SOUTHEAST OF ROTHSA, 3.5 MILES SOUTHEAST ON COUNTY ROAD 88 FROM THE JUNCTION OF COUNTY ROAD 88 AND COUNTY ROAD 26/COUNTY ROAD 24 IN ROTHSA, THEN 0.85 MILE EAST ON A MINIMUM MAINTENANCE ROAD, THEN 0.25 MILE SOUTH-SOUTHEAST ACROSS A FIELD TO THE MARKS, 1000.0 FEET WEST OF INTERSTATE HIGHWAY 94, 93.0 FEET SOUTH OF AN 18.0 INCH DIAMETER COTTONWOOD TREE, 76.64 FEET SOUTH OF JANE RM 1, 79.75 FEET EAST OF JANE RM 2.

Station Notes

THE MARK IS EITHER REMOVED OR BURIED UNDER THE FIELD.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Project Info		
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1327.996	.016	2/0					VERTICAL ADJUSTMENT	1991	00000025

NGVD29				Ellipsoid (NAD83)			Project Info		
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1327.081	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD
1327.081	.016	2					VERTICAL CONTROL SURVEY	1972	Q460962
1327.081	.016	2					VERTICAL CONTROL SURVEY	1972	L22167-A
1327.081	.016	2					VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Project Info		
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1327.983	.197			1240.073	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -88.251 12B = -88.251 09 = -88.143 03 = -88.074

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>										
Geodetic Position		Otter Tail County							Project Info	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>		
46 25 24.85976	96 13 30.33598	371769.978	216091.045	.066	2	ADJUSTMENT	1999	17648		
46 25 24.85984	96 13 30.33603	371769.975	216091.053	.066	2	ADJUSTMENT	1998	17655		
<u>NAD83(1986)</u>										
Geodetic Position		Otter Tail County							Project Info	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>		
46 25 24.85808	96 13 30.32695	371770.610	216090.870	.066	2	ADJUSTMENT	1986	17289		
<u>NAD27</u>										
Geodetic Position									Project Info	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>		
46 25 25.00750	96 13 29.10490			.100	2	CLASSICAL SURVEY	1962	12924		



State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2126642.084	853402.586	827401.036	16883713.759	.066	2	ADJUSTMENT	1999	17648
2126642.081	853402.595	827401.034	16883713.767	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2126642.712	853402.400	827401.662	16883713.563	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1502046.841	525328.809			.100	2	CLASSICAL SURVEY	1962	12924



Mn/DOT Name: JANE RM 1

NGS Name: JANE RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0192](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	16	134 N	44 W	462525.61	961330.27	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1961	2009	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 3 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	SURVEY DISK	MNDT

Description: (1961)

Stamping: JANE R.M. NO. 1 1961

3.5 MILES SOUTHEAST ON COUNTY ROAD 52 FROM ROTHSA, THEN 0.8 MILE EAST ON A GRAVEL ROAD, 0.2 MILE WEST OF INTERSTATE HIGHWAY 94, 77.0 FEET NORTH OF STATION JANE MNDT, 77.0 FEET NORTH OF A FENCE CORNER, 58.0 FEET NORTHWEST OF A 6.0 INCH DIAMETER COTTONWOOD TREE, 3.0 FEET EAST OF A FENCE LINE.

Station Notes

THE TIES FALL IN A FIELD.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1328.774	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1327.858	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1327.858	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1327.858	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Geoid Separations(ft): GEOID18 = -88.251 12B = -88.251 09 = -88.143 03 = -88.071

* No Horizontal Positions in the Database *



Mn/DOT Name: JANE RM 2

NGS Name: JANE RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0193](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	16	134 N	44 W	462524.85	961331.47	2		1961	2009	GOOD	Horz=YES Vert=YES	NO		FLUSH	STEEL SPIKE IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1961)

Stamping: JANE R.M. NO. 2 1961

3.5 MILES SOUTHEAST OF ROTHSA, 3.5 MILES SOUTHEAST ON COUNTY ROAD 88 FROM THE JUNCTION OF COUNTY ROAD 88 AND COUNTY ROAD 26/COUNTY ROAD 24/COUNTY ROAD 11 IN ROTHSA, THEN 0.85 MILE EAST ON A MINIMUM MAINTENANCE ROAD, 0.25 MILE SOUTH-SOUTHEAST ACROSS A FIELD, 80.0 FEET WEST OF STATION JANE MNDT, 74.0 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1327.760	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1326.844	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1326.844	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1326.844	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1326.844	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Geoid Separations(ft): GEOID18 = -88.251 12B = -88.251 09 = -88.143 03 = -88.074

* No Horizontal Positions in the Database *



Mn/DOT Name: JENN

NGS Name: JENN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096124/
USGS Quad: ROLLAG

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	6	137 N	43 W	464304.50	960944.88		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1999	2009	GOOD	Horz=YES Vert=YES	NO		RECESSED 3 IN.	MARKER W/BAR MAGNET

Monument Type

ALUMINUM ALLOY ROD (NO SLEEVE)

Disk Type

SURVEY DISK

Mon. Agency

MNDT

Description: (1999)

Stamping: JENN

7.8 MILES NORTHWEST OF DUNVILLA, 5.05 MILES WEST ALONG TRUNK HIGHWAY 34 FROM THE JUNCTION OF TRUNK HIGHWAY 34 AND TRUNK HIGHWAY 59 IN DUNVILLA, TO TRUNK HIGHWAY 34 MILEPOINT 47.85, THEN 5.25 MILES NORTH AND WEST ON COUNTY ROAD 23, 32.5 FEET SOUTH OF COUNTY ROAD 23, 10.0 FEET EAST OF AN ENTRANCE, 17.0 FEET NORTH OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1426.162	.262		1339.187	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.191 12B = -87.172 09 = -87.054 03 = -86.975

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 43 04.49888	96 09 44.87829	388170.019	323349.175	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2145022.152	960325.361	847493.266	16990372.752	.131	3	GPS - RTRN	2009	RTRN2009



Mn/DOT Name: JEREMY

NGS Name: JEREMY

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2700](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	6	131 N	42 W	461142.64	960023.50	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2025	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 22 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) **Stamping:** JEREMY 2009

7.4 MILES SOUTH-SOUTHEAST OF FERGUS FALLS, 0.85 MILE SOUTH ALONG TRUNK HIGHWAY 59 FROM THE SOUTHEAST JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94 (THE JUNCTION IS 6.0 MILES SOUTH OF FERGUS FALLS) TO TRUNK HIGHWAY 59 MILEPOINT 211.35, THEN 0.65 MILE EAST ON COUNTY ROAD 82, 67.7 FEET SOUTH OF COUNTY ROAD 82, 16.7 FEET EAST OF AN ENTRANCE, 9.0 FEET NORTHEAST OF A FENCE POST, 12.2 FEET NORTHWEST OF A CABLE BOX, 1.4 FEET NORTH OF A WITNESS POST.

Station Pair: MARSHA - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1242.727	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1242.770	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1242.737	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1242.727			1155.172	.009	2011	HORIZONTAL ADJUSTMENT	2026	GPS3900
1242.727			1155.172	.009	2011	GPS - STATIC	2026	HTH55N
1242.727			1155.172	.016	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1242.727			1155.172	.016	2011	GPS - STATIC	2025	HTH94B
1242.753	.262		1155.152	.197	2011	GPS - RTRN	2023	RTRN2023
1242.727	.131		1155.290	.066	1996	GPS - STATIC	2021	HOTTE
1242.727			1155.139	.029	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1242.727			1155.139	.029	2011	GPS - STATIC	2020	HOTTE
1242.609	.262		1155.008	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -87.598 12B = -87.598 09 = -87.460 03 = -87.415

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 42.64101	96 00 23.49787	426588.837	132516.080	.007		ADJUSTMENT	2026	GPS3900
46 11 42.64101	96 00 23.49787	426588.837	132516.080	.007	C	GPS - STATIC	2026	HTH55N
46 11 42.64101	96 00 23.49787	426588.837	132516.080	.010		ADJUSTMENT	2025	GPS3847
46 11 42.64101	96 00 23.49787	426588.837	132516.080	.010	C	GPS - STATIC	2025	HTH94B
46 11 42.64059	96 00 23.49771	426588.849	132516.037	.131	3	GPS - RTRN	2023	RTRN2023
46 11 42.64167	96 00 23.49799	426588.829	132516.146	.020		ADJUSTMENT	2020	GPS3384
46 11 42.64167	96 00 23.49799	426588.829	132516.146	.020	C	GPS - STATIC	2020	HOTTE
46 11 42.64042	96 00 23.49821	426588.813	132516.020	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 11 42.64046	96 00 23.49845	426588.796	132516.024	.066		NCAT	2026	HTH55N
46 11 42.64046	96 00 23.49845	426588.796	132516.024	.066		NCAT	2025	HTH94B
46 11 42.64134	96 00 23.49851	426588.792	132516.113	.033	C	GPS - STATIC	2021	HOTTE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2179897.577	768838.459	879335.117	16798286.704	.007		ADJUSTMENT	2026	GPS3900
2179897.577	768838.459	879335.117	16798286.704	.007	C	GPS - STATIC	2026	HTH55N
2179897.577	768838.459	879335.117	16798286.704	.010		ADJUSTMENT	2025	GPS3847
2179897.577	768838.459	879335.117	16798286.704	.010	C	GPS - STATIC	2025	HTH94B
2179897.588	768838.416	879335.126	16798286.661	.131	3	GPS - RTRN	2023	RTRN2023
2179897.570	768838.526	879335.111	16798286.771	.020		ADJUSTMENT	2020	GPS3384
2179897.570	768838.526	879335.111	16798286.771	.020	C	GPS - STATIC	2020	HOTTE
2179897.552	768838.400	879335.090	16798286.645	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2179897.535	768838.404	879335.074	16798286.649	.066		NCAT	2026	HTH55N
2179897.535	768838.404	879335.074	16798286.649	.066		NCAT	2025	HTH94B
2179897.533	768838.493	879335.073	16798286.739	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JEREMY-DQ2700-3S-15AUG2023.jpg	S	Aug 15, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JEREMY-DQ2700-2-15AUG2023.jpg		Aug 15, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JEREMY-DQ2700-1-15AUG2023.jpg		Aug 15, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: JEWETT

NGS Name: JEWETT

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5772](#) [Get Map](#)
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	1	134 N	43 W	462719.39	960151.09		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 49 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) **Stamping:** JEWETT 2014

3.0 MILES SOUTHEAST OF ERHARD, 3.20 MILES EAST ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND TRUNK HIGHWAY 59 IN ERHARD, THENCE 2.0 MILES SOUTH OF COUNTY ROAD 27, 41.2 FEET WEST OF COUNTY ROAD 27, 164.0 FEET SOUTH OF 340TH STREET, 14.5 FEET SOUTH OF A FIELD ENTRANCE, 5.0 FEET NORTH OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1481.500	.131			1393.718	.066	1996	GPS - STATIC	2021	HOTTE
1481.546				1393.567	.029	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1481.546				1393.567	.029	2011	GPS - STATIC	2020	HOTTE
1481.408	.262			1393.422	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.989 12B = -87.985 09 = -87.884 03 = -87.752

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position		Otter Tail County					Project Info	
		Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 27	19.38967	96 01	51.09452	420803.320	227439.250	.020		ADJUSTMENT	2020	GPS3384
46 27	19.38967	96 01	51.09452	420803.320	227439.250	.020	C	GPS - STATIC	2020	HOTTE
46 27	19.38952	96 01	51.09420	420803.343	227439.234	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		Geodetic Position		Otter Tail County					Project Info	
		Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 27	19.38936	96 01	51.09503	420803.285	227439.218	.033	C	GPS - STATIC	2021	HOTTE

State Plane and UTM Coordinates (Feet)

NAD83(2011)		MN State Plane - Central Zone		UTM - Zone 15					Project Info	
		X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2175870.720	863839.929	876808.179	16893372.322	.020		ADJUSTMENT	2020	GPS3384		
2175870.720	863839.929	876808.179	16893372.322	.020	C	GPS - STATIC	2020	HOTTE		
2175870.742	863839.914	876808.200	16893372.306	.131	3	GPS - RTRN	2014	RTRN2014		

NAD83(1996)		MN State Plane - Central Zone		UTM - Zone 15					Project Info	
		X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2175870.683	863839.899	876808.142	16893372.292	.033	C	GPS - STATIC	2021	HOTTE		

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JEWETT-DR5772-3W-04NOV2014.jpg	W	Nov 4, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JEWETT-DR5772-2-04NOV2014.jpg		Nov 4, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JEWETT-DR5772-1-04NOV2014.jpg		Nov 4, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: JOHNSON

NGS Name: JOHNSON 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095331/
USGS Quad: STALKER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	8	131 N	41 W	461024.41	955212.61		3	2000	2014	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MN-111

Description: (2015)

Stamping: JOHNSON 2000

2.15 MILES EAST OF DALTON, 2.15 MILES EAST ALONG COUNTY ROAD 12 FROM THE JUNCTION OF COUNTY ROAD 12 AND COUNTY ROAD 35 IN DALTON, 48.0 FEET NORTH OF COUNTY ROAD 12, 3.0 FEET WEST OF A WITNESS POST.

Station Notes

THE ROD DEPTH IS UNKNOWN.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1384.170	.262		1297.028	.197	1996	GPS - RTRN		2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.313 12B = -87.326 09 = -87.195 03 = -87.145

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>			<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 10 24.40634	95 52 12.60503		461108.217	124493.635	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>			<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2214257.872	760179.520		913565.696	16789086.423	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JOHNSON_2-3N-01OCT2014.jpg	N	Oct 1, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JOHNSON_2-2-01OCT2014.jpg		Oct 1, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JOHNSON_2-1-01OCT2014.jpg		Oct 1, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: JOLLY

NGS Name: JOLLY

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095331/
USGS Quad: STALKER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	13	131 N	41 W	460909.96	954725.73		3	2000	2014	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2015)

Stamping: JOLLY 2000

6.25 MILES SOUTHEAST OF DALTON, 6.25 MILES EAST ALONG COUNTY ROAD 12 FROM THE JUNCTION OF COUNTY ROAD 12 AND COUNTY ROAD 35 IN DALTON, THENCE 1.85 MILES SOUTH ALONG COUNTY ROAD 47, 34.5 FEET EAST OF COUNTY ROAD 47, 8.4 FEET NORTH OF A FIELD ENTRANCE, 7.0 FEET SOUTH OF A WITNESS POST.

Station Notes

UNKNOWN ROD DEPTH

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order</u> (/Class)		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1340.975	.262			1253.987	.197	1996	GPS - RTRN	2009	RTRN2009
Geoid Separations(ft): GEOID18 = -87.129 12B = -87.136 09 = -87.031 03 = -86.985									

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 09 09.95651	95 47 25.72853			481291.247	116922.399	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2234294.543	752236.986			933480.445	16780828.283	.131	3	GPS - RTRN	2009 RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JOLLY-3E-01OCT2014.jpg	E	Oct 1, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JOLLY-2-01OCT2014.jpg		Oct 1, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JOLLY-1-01OCT2014.jpg		Oct 1, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: JONES

NGS Name: JONES

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	11	132 N	41 W	461600.84	954807.70	2	C

NGS ACRN: [DQ4337](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 19 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: JONES 2014

4.0 MILES WEST-SOUTHWEST OF BATTLE LAKE, 4.3 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 IN BATTLE LAKE, AT TRUNK HIGHWAY 210 MILEPOINT 41.25, 48.9 FEET SOUTH OF TRUNK HIGHWAY 210, 250.0 FEET WEST OF A DRIVEWAY NUMBER 33008, 48.2 FEET NORTHEAST OF A RIGHT-OF-WAY POST, 1.5 FEET NORTH OF A WITNESS POST.

Station Pair: 5602 J - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u> <u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1373.534	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1373.527	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1373.531	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u> <u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1373.534			1285.759	.019	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1373.534	.131		1285.887	.066	1996	GPS - STATIC	2024	HTH210A
1373.534			1285.759	.019	2011	GPS - STATIC	2024	HTH210A
1373.564	.262		1285.818	.197	2011	GPS - RTRN	2023	RTRN2023
1373.455	.262		1285.709	.197	2011	GPS - OPUS	2020	GPSBM
1373.478	.262		1285.732	.197	2011	GPS - OPUS	2020	GPSBM
1373.416	.262		1285.657	.197	2011	GPS - RTRN	2015	RTRN2015
1373.416	.262		1285.657	.197	2011	GPS - RTRN	2015	RTRN2015
1373.363	.262		1285.601	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.746 12B = -87.762 09 = -87.664 03 = -87.546

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u> <u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 16 00.84118	95 48 07.69983	478381.218	158550.711	.010		ADJUSTMENT	2025	GPS3793
46 16 00.84118	95 48 07.69983	478381.218	158550.711	.010	C	GPS - STATIC	2024	HTH210A
46 16 00.84083	95 48 07.69967	478381.229	158550.675	.131	3	GPS - RTRN	2023	RTRN2023
46 16 00.84097	95 48 07.70018	478381.193	158550.689	.131	3	GPS - OPUS	2020	GPSBM
46 16 00.84122	95 48 07.70000	478381.206	158550.715	.131	3	GPS - OPUS	2020	GPSBM
46 16 00.84060	95 48 07.69953	478381.239	158550.652	.131	3	GPS - RTRN	2015	RTRN2015
46 16 00.84060	95 48 07.69953	478381.239	158550.652	.131	3	GPS - RTRN	2015	RTRN2015
46 16 00.84133	95 48 07.69941	478381.247	158550.726	.131	3	GPS - RTRN	2014	RTRN2014

<u>NAD83(1996)</u> <u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 16 00.84085	95 48 07.70019	478381.193	158550.677	.033	C	GPS - STATIC	2024	HTH210A



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2232156.048	793906.424	931996.938	16822536.509	.010		ADJUSTMENT	2025	GPS3793
2232156.048	793906.424	931996.938	16822536.509	.010	C	GPS - STATIC	2024	HTH210A
2232156.058	793906.389	931996.947	16822536.473	.131	3	GPS - RTRN	2023	RTRN2023
2232156.023	793906.404	931996.912	16822536.489	.131	3	GPS - OPUS	2020	GPSBM
2232156.036	793906.429	931996.926	16822536.514	.131	3	GPS - OPUS	2020	GPSBM
2232156.068	793906.365	931996.957	16822536.450	.131	3	GPS - RTRN	2015	RTRN2015
2232156.068	793906.365	931996.957	16822536.450	.131	3	GPS - RTRN	2015	RTRN2015
2232156.078	793906.439	931996.968	16822536.523	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2232156.022	793906.392	931996.911	16822536.477	.033	C	GPS - STATIC	2024	HTH210A

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JONES-DQ4337-3S-21FEB2024.jpg	S	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JONES-DQ4337-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JONES-DQ4337-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: JORUD RESET

NGS Name: JORUD RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	12	133 N	43 W	462104.60	960302.30			2009	2014	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015)

Stamping: JORUD 2000 2009

4.0 MILES SOUTHEAST OF ELIZABETH, 4.0 MILES EAST ALONG COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND TRUNK HIGHWAY 59 IN ELIZABETH, THENCE 1.25 MILES SOUTH ALONG 210TH AVENUE, 34.0 FEET EAST OF 210TH AVENUE, 13.3 FEET SOUTH OF A POWER POLE, 5.0 FEET SOUTH OF A WITNESS POST.

Station Notes

ROAD CLOSED FROM THE SOUTH; USE THE NORTHERN ROUTE. THE ROD DEPTH IS UNKNOWN.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.231 12B = -88.228 09 = -88.120 03 = -88.018

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JORUD_RESET-3E-10JUN2015.jpg	E	Jun 10, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JORUD_RESET-2-10JUN2015.jpg		Jun 10, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JORUD_RESET-1-10JUN2015.jpg		Jun 10, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: JOTRAN

NGS Name: JOTRAN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5773](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	25	132 N	42 W	461247.14	955419.55		C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2000	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2015)

Stamping: JOTRAN 2000

5.10 MILES SOUTHWEST OF UNDERWOOD, 5.65 MILES SOUTH AND WEST ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 210 IN UNDERWOOD, TO TRUNK HIGHWAY 210 MILEPOINT 37.55, 34.0 FEET WEST OF COUNTY ROAD 35, 14.5 FEET SOUTHEAST OF A POWER POLE WITH GUY WIRES, 12.0 FEET NORTH OF A DRIVEWAY NUMBER 17169, 3.0 FEET SOUTH OF A WITNESS POST, UNKNOWN ROD DEPTH

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1387.569	.131		1300.086	.066	1996	GPS - STATIC	2021	HOTTE
1387.560			1299.935	.029	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1387.560			1299.935	.029	2011	GPS - STATIC	2020	HOTTE
1387.451	.262		1300.007	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.628 12B = -87.634 09 = -87.520 03 = -87.444

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>								
<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>				
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 12 47.14279	95 54 19.54541	452208.805	138973.049	.020		ADJUSTMENT	2020	GPS3384
46 12 47.14279	95 54 19.54541	452208.805	138973.049	.020	C	GPS - STATIC	2020	HOTTE

<u>NAD83(1996)</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 12 47.14250	95 54 19.54592	452208.769	138973.020	.033	C	GPS - STATIC	2021	HOTTE
46 12 47.14275	95 54 19.54607	452208.759	138973.045	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>								
MN State Plane - Central Zone		UTM - Zone 15				Project Info		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2205629.216	774819.232	905165.698	16803864.101	.020		ADJUSTMENT	2020	GPS3384
2205629.216	774819.232	905165.698	16803864.101	.020	C	GPS - STATIC	2020	HOTTE

<u>NAD83(1996)</u>								
MN State Plane - Central Zone		UTM - Zone 15				Project Info		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2205629.179	774819.204	905165.661	16803864.072	.033	C	GPS - STATIC	2021	HOTTE
2205629.169	774819.229	905165.651	16803864.098	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JOTRAN-DR5773-3W-23JUL2020.jpg	W	Jul 23, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JOTRAN-DR5773-2-23JUL2020.jpg		Jul 23, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/JOTRAN-DR5773-1-23JUL2020.jpg		Jul 23, 2020

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: K 61

NGS Name: K 61

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0137](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	3	132 N	43 W	461646.00	960421.00	2	3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1966) Stamping: K 61 1934

IN FERGUS FALLS, 0.3 MILE SOUTH ALONG COUNTY ROAD 1 (CASCADE STREET) FROM THE JUNCTION OF COUNTY ROAD 1 AND EAST LINCOLN AVENUE, ON THE NORTH SIDE OF N.P. PARK, 107.5 FEET WEST OF COUNTY ROAD 1 (CASCADE STREET), 18.3 FEET SOUTH OF THE SOUTH RAIL OF THE RAILROAD TRACKS, 4.0 FEET NORTH OF AN EAST-WEST FENCE LINE.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1182.593	.016	2/0					VERTICAL ADJUSTMENT	1991	00000025

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1181.773	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD
1181.773	.007	1					VERTICAL CONTROL SURVEY	1941	Q460962
1181.773	.007	1					VERTICAL CONTROL SURVEY	1934	L40 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1182.261	.262			1094.283	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.182 12B = -88.182 09 = -88.067 03 = -87.979

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 16 45.97162	96 04 22.22649	409932.508	163313.867	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>MN State Plane - Central Zone</u> <u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2163816.350	799935.122	863739.742	16829643.598	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/K_61-RP0137-3S-23SEP2009.jpg	S	Sep 23, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/K_61-RP0137-2-23SEP2009.jpg		Sep 23, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/K_61-RP0137-1-23SEP2009.jpg		Sep 23, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: KAREN

NGS Name: KAREN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DO8455](#)
NGS Quad / Sta Num : 46095333/
USGS Quad: FOURMILE LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	32	131 N	42 W	460630.76	955952.20	2	C	2009	2025	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009)

Stamping: KAREN 2009

12.9 MILES SOUTH-SOUTHEAST OF FERGUS FALLS, 7.3 MILES SOUTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 SOUTH AND INTERSTATE HIGHWAY 94, AT TRUNK HIGHWAY 59 MILEPOINT 204.9, 177.3 FEET EAST OF TRUNK HIGHWAY 59, 33.8 FEET NORTH OF 100TH STREET, 1.6 FEET SOUTH OF A WITNESS POST.

Station Pair: KATY - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1215.867	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1215.936	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1215.972	.016	2/1				VERTICAL ADJUSTMENT	2016	00000869
1215.972	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1215.985	.016	2/1				VERTICAL CONTROL SURVEY	2012	VTENN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1215.867			1128.777	.010	2011	HORIZONTAL ADJUSTMENT	2026	GPS3900
1215.867			1128.777	.010	2011	GPS - STATIC	2026	HTH55N
1215.775	.262		1128.669	.197	2011	GPS - OPUS	2022	GPSBM
1215.837	.262		1128.731	.197	2011	GPS - RTRN	2021	RTRN2021

Geoid Separations(ft): GEOID18 = -87.106 12B = -87.063 09 = -86.952 03 = -86.942

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>									
Geodetic Position		Otter Tail County						Project Info	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 06 30.76547	95 59 52.20406	428678.069	100913.451	.007		ADJUSTMENT	2026	GPS3900	
46 06 30.76547	95 59 52.20406	428678.069	100913.451	.007	C	GPS - STATIC	2026	HTH55N	
46 06 30.76499	95 59 52.20434	428678.049	100913.403	.131	3	GPS - OPUS	2022	GPSBM	
46 06 30.76538	95 59 52.20477	428678.019	100913.442	.131	3	GPS - RTRN	2021	RTRN2021	

<u>NAD83(1996)</u>								
Geodetic Position		Otter Tail County					Project Info	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 06 30.76494	95 59 52.20466	428678.027	100913.398	.066		NCAT	2026	HTH55N

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>									
MN State Plane - Central Zone		UTM - Zone 15				Project Info			
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
2181401.236	737206.880	880342.873	16766624.877	.007		ADJUSTMENT	2026	GPS3900	
2181401.236	737206.880	880342.873	16766624.877	.007	C	GPS - STATIC	2026	HTH55N	
2181401.216	737206.831	880342.852	16766624.829	.131	3	GPS - OPUS	2022	GPSBM	
2181401.186	737206.871	880342.823	16766624.870	.131	3	GPS - RTRN	2021	RTRN2021	

<u>NAD83(1996)</u>								
MN State Plane - Central Zone		UTM - Zone 15			Project Info			
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2181401.193	737206.827	880342.829	16766624.825	.066		NCAT	2026	HTH55N



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KAREN-DO8455-3N-22JUN2021.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KAREN-DO8455-2-22JUN2021.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KAREN-DO8455-1-22JUN2021.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Jun 22, 2021
	Jun 22, 2021
	Jun 22, 2021



Mn/DOT Name: KATCH MNDT

NGS Name: KATCH

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AB9906](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	33	134 N	41 W	462208.95	955135.56	2	B

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1994	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 6 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
STEEL ROD (NO SLEEVE) (DEPTH 52 FT)	METAL ROD	MNDT

Description: (1994) **Stamping:** KATCH 1994

5.0 MILES NORTH OF UNDERWOOD, 6.6 MILES NORTH ALONG COUNTY ROAD 35 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN UNDERWOOD, THEN 0.15 MILE EAST ON COUNTY ROAD 1, 46.5 FEET NORTH OF COUNTY ROAD 1, 16.0 FEET WEST OF A FIELD ENTRANCE, 42.3 FEET NORTHEAST OF THE JUNCTION OF A COUNTY ROAD 35 SIGNPOST, 6.5 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1379.220	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1379.207	.016	2/1				VERTICAL ADJUSTMENT	2008 00000425-26
1379.220	.016	2/1				VERTICAL CONTROL SURVEY	2006 VKATC

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1379.220			1291.165	.010	2011	HORIZONTAL ADJUSTMENT	2025 GPS3847
1379.220			1291.165	.010	2011	GPS - STATIC	2025 HTH94B
1379.220	.131		1291.343	.066	1996	GPS - STATIC	2021 HOTTE
1379.220			1291.165	.011	2011	HORIZONTAL ADJUSTMENT	2020 GPS3384
1379.220			1291.165	.011	2011	GPS - STATIC	2020 HOTTE
1379.207			1291.165	.012	2011	HORIZONTAL ADJUSTMENT	2018 GPS3119
1379.207	.131		1291.343	.066	1996	GPS - STATIC	2017 HMNCORS07
1379.207			1291.165	.012	2011	GPS - STATIC	2017 HMNPH
1379.223	.262		1291.139	.197	2011	GPS - RTRN	2015 RTRN2015
			1291.165	.013	2011	HORIZONTAL ADJUSTMENT	2012 GPS2800
1378.983	.262		1291.172	.197	1996	GPS - RTRN	2009 RTRN2009
			1291.270	.013	2007	HORIZONTAL ADJUSTMENT	2007 GPS2300
1379.164	.098		1291.343	.049	1996	GPS - STATIC	2005 GPS2036
1379.216	.098		1291.343	.049	1996	GPS - STATIC	1997 GPS805-B

Geoid Separations(ft): GEOID18 = -88.074 12B = -88.084 09 = -87.969 03 = -87.812

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 22 08.94758	95 51 35.56252	463844.459	195863.918	.007		ADJUSTMENT	2025	GPS3847
46 22 08.94758	95 51 35.56252	463844.459	195863.918	.007	C	GPS - STATIC	2025	HTH94B
46 22 08.94758	95 51 35.56252	463844.459	195863.918	.007		ADJUSTMENT	2020	GPS3384
46 22 08.94758	95 51 35.56252	463844.459	195863.918	.007	C	GPS - STATIC	2020	HOTTE
46 22 08.94758	95 51 35.56252	463844.459	195863.918	.007		ADJUSTMENT	2018	GPS3119
46 22 08.94758	95 51 35.56252	463844.459	195863.918	.007	C	GPS - STATIC	2017	HMNPH
46 22 08.94780	95 51 35.56253	463844.458	195863.940	.131	3	GPS - RTRN	2015	RTRN2015
46 22 08.94758	95 51 35.56252	463844.459	195863.918	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 22 08.94751	95 51 35.56342	463844.396	195863.911	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 22 08.94707	95 51 35.56320	463844.411	195863.866	.066		NCAT	2025	HTH94B
46 22 08.94707	95 51 35.56320	463844.411	195863.866	.033	C	GPS - STATIC	2021	HOTTE
46 22 08.94707	95 51 35.56320	463844.411	195863.866	.033	C	GPS - STATIC	2017	HMNCORS07
46 22 08.94848	95 51 35.56387	463844.365	195864.009	.131	3	GPS - RTRN	2009	RTRN2009
46 22 08.94707	95 51 35.56320	463844.411	195863.866	.016	B	GPS - STATIC	2005	GPS2036
46 22 08.94707	95 51 35.56320	463844.411	195863.866	.016	B	GPS - STATIC	1997	GPS805-B

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2218314.440	831477.412	918746.655	16860331.201	.007		ADJUSTMENT	2025	GPS3847
2218314.440	831477.412	918746.655	16860331.201	.007	C	GPS - STATIC	2025	HTH94B
2218314.440	831477.412	918746.655	16860331.201	.007		ADJUSTMENT	2020	GPS3384
2218314.440	831477.412	918746.655	16860331.201	.007	C	GPS - STATIC	2020	HOTTE
2218314.440	831477.412	918746.655	16860331.201	.007		ADJUSTMENT	2018	GPS3119
2218314.440	831477.412	918746.655	16860331.201	.007	C	GPS - STATIC	2017	HMNPH
2218314.440	831477.434	918746.655	16860331.223	.131	3	GPS - RTRN	2015	RTRN2015
2218314.440	831477.412	918746.655	16860331.201	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2218314.377	831477.406	918746.592	16860331.196	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2218314.391	831477.362	918746.605	16860331.150	.066		NCAT	2025	HTH94B
2218314.391	831477.362	918746.605	16860331.150	.033	C	GPS - STATIC	2021	HOTTE
2218314.391	831477.362	918746.605	16860331.150	.033	C	GPS - STATIC	2017	HMNCORS07
2218314.347	831477.505	918746.563	16860331.295	.131	3	GPS - RTRN	2009	RTRN2009
2218314.391	831477.362	918746.605	16860331.150	.016	B	GPS - STATIC	2005	GPS2036
2218314.391	831477.362	918746.605	16860331.150	.016	B	GPS - STATIC	1997	GPS805-B

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KATCH-AB9906-3NE-10DEC2008.jpg	NE	Dec 10, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KATCH-AB9906-2-10DEC2008.jpg		Dec 10, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KATCH-AB9906-1-10DEC2008.jpg		Dec 10, 2008

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: KATY

NGS Name: KATY

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DO8456](#) [Get Map](#)
NGS Quad / Sta Num : 46095333/
USGS Quad: FOURMILE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	32	131 N	42 W	460630.98	955921.48	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2025	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** KATY 2009

13.1 MILES SOUTH-SOUTHEAST OF FERGUS FALLS, 7.3 MILES SOUTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 SOUTH AND INTERSTATE HIGHWAY 94 TO TRUNK HIGHWAY 59 MILEPOINT 204.9, THEN 0.45 MILE EAST ALONG 100TH STREET (COUNTY ROAD 26 -OTTER TAIL-GRANT COUNTY BORDER), 58.6 FEET NORTH OF 100TH STREET, 13.3 FEET WEST OF AN ENTRANCE, 2.2 FEET EAST OF A WITNESS POST.

Station Pair: KAREN - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1242.373	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1242.442	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1242.478	.016	2/1				VERTICAL ADJUSTMENT	2016	00000869
1242.478	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1242.491	.016	2/1				VERTICAL CONTROL SURVEY	2012	VTENN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1242.373			1155.270	.011	2011	HORIZONTAL ADJUSTMENT	2026	GPS3900
1242.373			1155.270	.011	2011	GPS - STATIC	2026	HTH55N

Geoid Separations(ft): GEOID18 = -87.106 12B = -87.063 09 = -86.952 03 = -86.939

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		NAD83(1996)		OTTER TAIL COUNTY		PROJECT INFO	
Latitude	Longitude	Latitude	Longitude	X	Y	Year	Reference
46 06 30.98025	95 59 21.48338	46 06 30.98025	95 59 21.48338	430842.776	100927.631	2026	GPS3900
46 06 30.98025	95 59 21.48338	46 06 30.98025	95 59 21.48338	430842.776	100927.631	2026	HTH55N

NAD83(2011)		NAD83(1996)		OTTER TAIL COUNTY		PROJECT INFO	
Latitude	Longitude	Latitude	Longitude	X	Y	Year	Reference
46 06 30.97972	95 59 21.48398	46 06 30.97972	95 59 21.48398	430842.734	100927.578	2026	HTH55N

State Plane and UTM Coordinates (Feet)

NAD83(2011)		NAD83(1996)		OTTER TAIL COUNTY		PROJECT INFO	
Latitude	Longitude	Latitude	Longitude	X	Y	Year	Reference
46 06 30.97972	95 59 21.48398	46 06 30.97972	95 59 21.48398	430842.734	100927.578	2026	HTH55N

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KATY-DO8456-3N-05NOV2009.jpg	N	Nov 5, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KATY-DO8456-2-05NOV2009.jpg		Nov 5, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KATY-DO8456-1-05NOV2009.jpg		Nov 5, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: KERBS

NGS Name: KERBS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5774](#) [Get Map](#)
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	30	136 N	40 W	463323.70	954604.88	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 68 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) **Stamping:** KERBS 2014

2.5 MILES WEST OF DENT, 2.2 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 29.2, 50.2 FEET NORTH OF TRUNK HIGHWAY 108, 0.6 MILE EAST OF ENGSTROM BEACH ROAD AND BEAVER DAM ROAD, 15.2 FEET WEST OF A FIELD ENTRANCE, 5.0 FEET EAST OF A WITNESS POST.

Station Pair: ARCHIE MNDT AZ MK - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1406.920	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1406.920			1319.682	.017	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1406.884	.131		1319.837	.066	1996	GPS - STATIC	2024	HTH108
1406.920			1319.682	.017	2011	GPS - STATIC	2024	HTH108
1406.923	.262		1319.676	.197	2011	GPS - RTRN	2023	RTRN2023
1406.982	.262		1319.735	.197	2011	GPS - RTRN	2022	RTRN2022
1406.890	.131		1319.837	.066	1996	GPS - STATIC	2021	HOTTE
1406.923			1319.682	.023	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1406.923			1319.682	.023	2011	GPS - STATIC	2020	HOTTE
1406.811	.262		1319.571	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.247 12B = -87.241 09 = -87.126 03 = -87.014

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 33 23.69846	95 46 04.88351	487078.806	264194.786	.010		ADJUSTMENT	2024	GPS3689
46 33 23.69846	95 46 04.88351	487078.806	264194.786	.010	C	GPS - STATIC	2024	HTH108
46 33 23.69789	95 46 04.88293	487078.846	264194.728	.131	3	GPS - RTRN	2023	RTRN2023
46 33 23.69758	95 46 04.88353	487078.804	264194.697	.131	3	GPS - RTRN	2022	RTRN2022
46 33 23.69846	95 46 04.88351	487078.806	264194.786	.016		ADJUSTMENT	2020	GPS3384
46 33 23.69846	95 46 04.88351	487078.806	264194.786	.016	C	GPS - STATIC	2020	HOTTE
46 33 23.69886	95 46 04.88325	487078.824	264194.826	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 33 23.69815	95 46 04.88402	487078.770	264194.754	.033	C	GPS - STATIC	2024	HTH108
46 33 23.69815	95 46 04.88402	487078.770	264194.754	.033	C	GPS - STATIC	2021	HOTTE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2242806.781	899357.669	944319.555	16927831.014	.010		ADJUSTMENT	2024	GPS3689
2242806.781	899357.669	944319.555	16927831.014	.010	C	GPS - STATIC	2024	HTH108
2242806.820	899357.611	944319.593	16927830.955	.131	3	GPS - RTRN	2023	RTRN2023
2242806.778	899357.581	944319.550	16927830.925	.131	3	GPS - RTRN	2022	RTRN2022
2242806.781	899357.669	944319.555	16927831.014	.016		ADJUSTMENT	2020	GPS3384
2242806.781	899357.669	944319.555	16927831.014	.016	C	GPS - STATIC	2020	HOTTE
2242806.800	899357.710	944319.575	16927831.054	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2242806.745	899357.639	944319.518	16927830.984	.033	C	GPS - STATIC	2024	HTH108
2242806.745	899357.639	944319.518	16927830.984	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KERBS-DR5774-3N-31JUL2023.jpg	N	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KERBS-DR5774-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KERBS-DR5774-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: KEYES

NGS Name: KEYES

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DH4047](#) [Get Map](#)
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NW	12	137 N	40 W	464146.96	954058.39	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2004	2009	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 60 FT)	SURVEY DISK	MNDT

Description: (2004)

Stamping: KEYES 2004

3.0 MILES NORTHWEST OF LUCE, 3.0 MILES NORTHWEST ALONG TRUNK HIGHWAY 10 FROM THE JUNCTION OF TRUNK HIGHWAY 10 AND TRUNK HIGHWAY 228 IN LUCE, AT TRUNK HIGHWAY MILEPOINT 56.85, 70.0 FEET NORTHEAST OF WESTBOUND TRUNK HIGHWAY 10, 81.0 FEET SOUTHEAST OF A POWER POLE, 74.5 FEET SOUTHWEST OF THE WEST RAIL OF THE RAILROAD TRACKS, 2.6 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Determination Method			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj				Year	Reference			
1375.398	.016	2/1				VERTICAL ADJUSTMENT			2019	00000941			
1375.430	.016	2/1				VERTICAL ADJUSTMENT			2010	00000640			
1375.430	.016	2/1				VERTICAL CONTROL SURVEY			2005	VPERH			

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Determination Method			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj				Year	Reference			
			1288.081	.010	2011	HORIZONTAL ADJUSTMENT			2012	GPS2800			
1375.224	.262		1288.140	.197	1996	GPS - RTRN			2009	RTRN2009			
			1288.190	.011	2007	HORIZONTAL ADJUSTMENT			2007	GPS2300			
1375.424	.131		1288.259	.066	1996	HORIZONTAL ADJUSTMENT			2005	GPS2123			
1375.424	.131		1288.259	.066	1996	GPS - STATIC			2005	HPERH			

Geoid Separations(ft): GEOID18 = -87.316 12B = -87.316 09 = -87.218 03 = -87.083

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order			Year	Reference	
46 41 46.96023	95 40 58.38466	508477.713	315179.924	.010		ADJUSTMENT		2012	GPS2800	

NAD83(2007)		Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order			Year	Reference	
46 41 46.96016	95 40 58.38550	508477.654	315179.917	.010		ADJUSTMENT		2007	GPS2300	

NAD83(1996)		Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order			Year	Reference	
46 41 46.96037	95 40 58.38562	508477.646	315179.938	.131	3	GPS - RTRN		2009	RTRN2009	
46 41 46.95981	95 40 58.38539	508477.662	315179.881	.033	C	ADJUSTMENT		2005	GPS2123	
46 41 46.95981	95 40 58.38539	508477.662	315179.881	.033	C	GPS - STATIC		2005	HPERH	



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2265143.291	949931.549	967465.012	16978051.999	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2265143.232	949931.543	967464.953	16978051.994	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2265143.225	949931.564	967464.945	16978052.016	.131	3	GPS - RTRN	2009	RTRN2009
2265143.240	949931.507	967464.959	16978051.959	.033	C	ADJUSTMENT	2005	GPS2123
2265143.240	949931.507	967464.959	16978051.959	.033	C	GPS - STATIC	2005	HPERH

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KEYES-DH4047-3E-05AUG2009.jpg	E	Aug 5, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KEYES-DH4047-2-05AUG2009.jpg		Aug 5, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KEYES-DH4047-1-05AUG2009.jpg		Aug 5, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: KNOBEL

NGS Name: KNOBEL

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2728](#) [Get Map](#)
NGS Quad / Sta Num : 46096241/
USGS Quad: ROTHSA

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	30	135 N	44 W	462836.44	961608.32	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 24 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) **Stamping:** KNOBEL 2014

0.7 MILE EAST OF ROTHSA, 0.75 MILE SOUTHEAST ALONG EASTBOUND INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 11 IN ROTHSA, AT INTERSTATE HIGHWAY 94 MILEPOINT 38.97, 25.3 FEET SOUTHWEST OF AN INTERSTATE HIGHWAY 94 FOG LINE, 62.4 FEET NORTHEAST OF A RIGHT-OF-WAY FENCE, 1.5 FEET NORTHEAST OF A WITNESS POST.

Station Pair: ALTNER - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1252.248	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1252.347	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1252.347	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1252.248			1164.164	.013	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1252.248			1164.164	.013	2011	GPS - STATIC	2025	HTH94B
1252.307	.262		1164.154	.197	2011	GPS - RTRN	2023	RTRN2023
1252.271	.262		1164.122	.197	2011	GPS - RTRN	2015	RTRN2015
1252.202	.262		1164.053	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -88.153 12B = -88.149 09 = -88.044 03 = -87.966

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 28 36.44476	96 16 08.31847	360837.714	235574.319	.010		ADJUSTMENT	2025	GPS3847
46 28 36.44476	96 16 08.31847	360837.714	235574.319	.010	C	GPS - STATIC	2025	HTH94B
46 28 36.44456	96 16 08.31740	360837.789	235574.298	.131	3	GPS - RTRN	2023	RTRN2023
46 28 36.44502	96 16 08.31941	360837.648	235574.346	.131	3	GPS - RTRN	2015	RTRN2015
46 28 36.44486	96 16 08.31799	360837.747	235574.329	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 28 36.44432	96 16 08.31919	360837.663	235574.275	.066		NCAT	2025	HTH94B

State Plane and UTM Coordinates (Feet)

NAD83(2011)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Year	Reference
2116073.635	873082.315	817141.937	16903567.584	.010		ADJUSTMENT	2025	GPS3847
2116073.635	873082.315	817141.937	16903567.584	.010	C	GPS - STATIC	2025	HTH94B
2116073.709	873082.293	817142.011	16903567.560	.131	3	GPS - RTRN	2023	RTRN2023
2116073.570	873082.343	817141.872	16903567.612	.131	3	GPS - RTRN	2015	RTRN2015
2116073.669	873082.324	817141.971	16903567.592	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Year	Reference
2116073.583	873082.272	817141.884	16903567.541	.066		NCAT	2025	HTH94B



<u>Station Photos</u>		<u>Dir</u>	<u>Date</u>
<u>Type</u>	<u>File Name</u>		
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KNOBEL-DQ2728-3SW-14AUG2023.jpg	SW	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KNOBEL-DQ2728-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KNOBEL-DQ2728-1-14AUG2023.jpg		Aug 14, 2023
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: KOOB MNDT

NGS Name: KOOB

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0530](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/1043
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	2	133 N	40 W	462130.37	954125.10	2	C	1975	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MNDT

Description: (1975) **Stamping:** KOOB 1975

5.5 MILES NORTH-NORTHEAST OF BATTLE LAKE, 6.95 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 28.30, 33.0 FEET NORTH OF TRUNK HIGHWAY 78, 80.0 FEET SOUTHWEST OF A DRIVEWAY, 66.4 FEET NORTHEAST OF DRIVEWAY NUMBER 26477, 23.6 FEET SOUTH OF THE SOUTHEAST CORNER OF THE WOODLAND BEACH SIGN.

Station Notes

NO WITNESS POST IN THE YARD.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1327.448	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941
1327.458	.016	2/1					VERTICAL ADJUSTMENT	2017	00000911
1327.445	.016	2/1					VERTICAL CONTROL SURVEY	2016	VOTTE
1327.445	.016	2/1					VERTICAL ADJUSTMENT	1991	00000025
<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1326.651	.016	2/1					UNKNOWN/APPROXIMATE	1992	UNCHECKD
1326.651	.016	2					VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1327.448				1239.555	.011	2011	HORIZONTAL ADJUSTMENT	2024	GPS3764
1327.448	.131			1239.666	.066	1996	GPS - STATIC	2024	HTH78A
1327.448				1239.555	.011	2011	GPS - STATIC	2024	HTH78A
1327.484	.262			1239.617	.197	2011	GPS - RTRN	2023	RTRN2023
1327.396	.262			1239.535	.197	2011	GPS - RTRN	2015	RTRN2015
1327.396	.262			1239.535	.197	2011	GPS - RTRN	2015	RTRN2015
1327.245	.262			1239.617	.197	1996	GPS - RTRN	2009	RTRN2009
1327.458	.197			1239.788	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.867 12B = -87.861 09 = -87.743 03 = -87.628

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 21 30.36924	95 41 25.10355	506656.236	191923.971	.007		ADJUSTMENT	2024	GPS3764
46 21 30.36924	95 41 25.10355	506656.236	191923.971	.007	C	GPS - STATIC	2024	HTH78A
46 21 30.36931	95 41 25.10325	506656.257	191923.978	.131	3	GPS - RTRN	2023	RTRN2023
46 21 30.36923	95 41 25.10325	506656.257	191923.970	.131	3	GPS - RTRN	2015	RTRN2015
46 21 30.36923	95 41 25.10325	506656.257	191923.970	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 21 30.36908	95 41 25.10383	506656.216	191923.955	.033	C	GPS - STATIC	2024	HTH78A
46 21 30.36885	95 41 25.10548	506656.101	191923.931	.131	3	GPS - RTRN	2009	RTRN2009
46 21 30.36852	95 41 25.10336	506656.249	191923.898	.066	2	ADJUSTMENT	1999	17648
46 21 30.36840	95 41 25.10328	506656.255	191923.886	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 21 30.36588	95 41 25.09359	506656.935	191923.631	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 21 30.51120	95 41 23.92582			.100	2	CLASSICAL SURVEY	1977	15945

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2261040.334	826746.085	961402.557	16854923.625	.007		ADJUSTMENT	2024	GPS3764
2261040.334	826746.085	961402.557	16854923.625	.007	C	GPS - STATIC	2024	HTH78A
2261040.355	826746.092	961402.579	16854923.632	.131	3	GPS - RTRN	2023	RTRN2023
2261040.355	826746.084	961402.578	16854923.623	.131	3	GPS - RTRN	2015	RTRN2015
2261040.355	826746.084	961402.578	16854923.623	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2261040.314	826746.070	961402.537	16854923.610	.033	C	GPS - STATIC	2024	HTH78A
2261040.197	826746.049	961402.420	16854923.590	.131	3	GPS - RTRN	2009	RTRN2009
2261040.345	826746.012	961402.568	16854923.552	.066	2	ADJUSTMENT	1999	17648
2261040.351	826746.000	961402.573	16854923.539	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2261041.026	826745.732	961403.244	16854923.261	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1636445.459	498672.410			.100	2	CLASSICAL SURVEY	1977	15945

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KOOB-RO0530-3N-17OCT2023.jpg	N	Oct 17, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KOOB-RO0530-2-17OCT2023.jpg		Oct 17, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/KOOB-RO0530-1-17OCT2023.jpg		Oct 17, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: KVAM

NGS Name: KVAM

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095331/
USGS Quad: STALKER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	21	131 N	41 W	460844.63	955040.43		3	2000	2009	GOOD	Horz=YES Vert=YES	NO		RECESSED 3 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2000)

Stamping: KVAM 2009

3.9 MILES SOUTHEAST OF DALTON, 2.0 MILES EAST ALONG COUNTY ROAD 12 FROM THE JUNCTION OF COUNTY ROAD 12 AND COUNTY ROAD 35 IN DALTON, THENCE 2.85 MILES SOUTH AND SOUTHEAST ALONG COUNTY ROAD 117, 50.6 FEET EAST OF COUNTY ROAD 117, 43.0 FEET NORTH OF THE KVAM LUTHERAN CHURCH ENTRANCE NUMBER 12540 12564, 1.8 FEET SOUTHWEST OF A RIGHT-OF-WAY POST, 2.8 FEET NORTH OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1375.270	.262			1288.255	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.162 12B = -87.165 09 = -87.050 03 = -87.014

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 08 44.63296	95 50 40.42555			467579.365	114374.453	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2220539.712	749943.659			919687.822	16778750.452	.131	3	GPS - RTRN	2009 RTRN2009



Mn/DOT Name: L 61

NGS Name: L 61

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	2	132 N	43 W	461652.00	960329.00	2	

NGS ACRN: [RP0138](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type

UNKNOWN

Disk Type

BENCH MARK DISK

Mon. Agency

NGS

Description: (1966)

Stamping: L 61 1934

0.5 MILE EAST ON A RAILROAD FROM FERGUS FALLS, 150.0 FEET WEST OF A SEMAPHORE, 300.0 FEET EAST OF A RAILROAD CROSSING, 45.0 FEET EAST OF A ROAD, 40.0 FEET SOUTH OF A RAILROAD.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1192.117	.016	2/0				VERTICAL ADJUSTMENT	1991 00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1191.297	.016	2/0				UNKNOWN/APPROXIMATE	1992 UNCHECKD
1191.297	.007	1				VERTICAL CONTROL SURVEY	1941 Q460962
1191.297	.007	1				VERTICAL CONTROL SURVEY	1934 L40 MINN

Geoid Separations(ft): GEOID18 = -88.179 12B = -88.179 09 = -88.064 03 = -87.972

* No Horizontal Positions in the Database *



Mn/DOT Name: LACEY

NGS Name: LACEY

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5775](#)
NGS Quad / Sta Num : 46095331/
USGS Quad: STALKER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	10	131 N	41 W	461047.99	954854.97		C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2000	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2000)

Stamping: LACEY 2000

5.0 MILES EAST OF DALTON, 5.05 MILES EAST ALONG COUNTY ROAD 12 FROM THE JUNCTION OF COUNTY ROAD 12 AND COUNTY ROAD 35 IN DALTON, 25.0 FEET SOUTH OF COUNTY ROAD 12, 10.0 FEET EAST OF A FIELD ENTRANCE, 27.0 FEET NORTH-NORTHWEST OF A POWER POLE, 6.8 FEET WEST-NORTHWEST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1320.188	.131			1233.039	.066	1996	GPS - STATIC	2021	HOTTE
1320.161				1232.888	.028	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1320.161				1232.888	.028	2011	GPS - STATIC	2020	HOTTE
1319.935	.262			1232.819	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.277 12B = -87.290 09 = -87.175 03 = -87.113

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>				<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46	10	47.98561	95 48 54.97103	475020.466	126860.195	.020		ADJUSTMENT	2020 GPS3384
46	10	47.98561	95 48 54.97103	475020.466	126860.195	.020	C	GPS - STATIC	2020 HOTTE

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>				<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46	10	47.98531	95 48 54.97155	475020.430	126860.164	.033	C	GPS - STATIC	2021 HOTTE
46	10	47.98578	95 48 54.97220	475020.384	126860.212	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2228209.661	762287.815	927552.586	16790975.907	.020		ADJUSTMENT	2020	GPS3384	
2228209.661	762287.815	927552.586	16790975.907	.020	C	GPS - STATIC	2020	HOTTE	

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2228209.623	762287.785	927552.548	16790975.878	.033	C	GPS - STATIC	2021	HOTTE	
2228209.579	762287.834	927552.504	16790975.927	.131	3	GPS - RTRN	2009	RTRN2009	

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LACEY-DR5775-3S-13JUL2020.jpg	S	Jul 13, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LACEY-DR5775-2-13JUL2020.jpg		Jul 13, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LACEY-DR5775-1-13JUL2020.jpg		Jul 13, 2020

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: LAKE IDA

NGS Name: LAKE IDA

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0898](#) [Get Map](#)
NGS Quad / Sta Num : 46096121/1041
USGS Quad: CORMORANT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	3	137 N	43 W	464249.55	960610.16		C	1964	2018	GOOD	Horz=YES Vert=YES	YES		PROJECTS 2 IN.	STEEL SPIKE ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (1964) **Stamping:** LAKE IDA 1964

10.0 MILES NORTH OF PELICAN RAPIDS, 0.25 MILE SOUTH OF LAKE IDA, 9.6 MILES SOUTH AND SOUTHWEST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 10 AT DETROIT LAKES, THEN 7.6 MILES WESTERLY ON COUNTY ROAD 20, THEN 0.55 MILE NORTHWEST ON A GRAVEL ROAD TO A SIDE ROAD WEST, THEN 0.65 MILE WEST OF DUCK LAKE LANE, THEN 0.3 MILE WEST ON A MINIMUM MAINTENANCE ROAD, TO THE TOP OF A SMALL HILL, 61.49 FEET WEST OF LAKE IDA RM 1, 60.50 FEET SOUTHEAST OF LAKE IDA RM 2, 27.0 FEET NORTH OF A GRAVEL ROAD, 33.0 FEET SOUTH OF THE SOUTH EDGE OF THE WOODS, 5.6 FEET WEST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1441.388	.131		1354.410	.066	1996	GPS - STATIC	2021	HOTTE
1441.418			1354.233	.023	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1441.418			1354.233	.023	2011	GPS - STATIC	2020	HOTTE
1441.487	.262		1354.508	.197	1996	GPS - RTRN	2009	RTRN2009
			1354.410	.066	1996	GPS - STATIC	2001	DIST 4
1443.567	.197		1356.677	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1443.599						RECIPROCAL VERTICAL ANGLE	1964	HORZ

Geoid Separations(ft): GEOID18 = -87.198 12B = -87.165 09 = -87.063 03 = -86.978

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 42 49.55361	96 06 10.15915	403124.404	321756.307	.016		ADJUSTMENT	2020	GPS3384
46 42 49.55361	96 06 10.15915	403124.404	321756.307	.016	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 42 49.55298	96 06 10.15952	403124.378	321756.243	.033	C	GPS - STATIC	2021	HOTTE
46 42 49.55332	96 06 10.15988	403124.353	321756.277	.131	3	GPS - RTRN	2009	RTRN2009
46 42 49.55298	96 06 10.15952	403124.377	321756.243	.033	C	GPS - STATIC	2001	DIST 4
46 42 49.55358	96 06 10.15858	403124.444	321756.303	.066	2	ADJUSTMENT	1999	17648
46 42 49.55284	96 06 10.15733	403124.531	321756.228	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 42 49.55230	96 06 10.15606	403124.619	321756.173	.066	2	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>							<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 42 49.70089	96 06 08.94807			.100	2	CLASSICAL SURVEY	1964	13522

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2159942.670	958456.200	862387.229	16988263.596	.016		ADJUSTMENT	2020	GPS3384
2159942.670	958456.200	862387.229	16988263.596	.016	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2159942.642	958456.137	862387.201	16988263.533	.033	C	GPS - STATIC	2021	HOTTE
2159942.618	958456.172	862387.177	16988263.568	.131	3	GPS - RTRN	2009	RTRN2009
2159942.642	958456.137	862387.201	16988263.533	.033	C	GPS - STATIC	2001	DIST 4
2159942.709	958456.196	862387.269	16988263.591	.066	2	ADJUSTMENT	1999	17648
2159942.795	958456.119	862387.353	16988263.513	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2159942.882	958456.062	862387.439	16988263.455	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		<u>X</u>	<u>Y</u>	Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1535346.481	630382.009			.100	2	CLASSICAL SURVEY	1964	13522

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LAKE_IDA-RP0898-3N-30SEP2014.jpg	N	Sep 30, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LAKE_IDA-RP0898-2-30SEP2014.jpg		Sep 30, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LAKE_IDA-RP0898-1-30SEP2014.jpg		Sep 30, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: LAKE IDA AZ MK

NGS Name: LAKE IDA AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4123](#) [Get Map](#)
NGS Quad / Sta Num : 46096121/1041
USGS Quad: CORMORANT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	3	137 N	43 W	464245.00	960551.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1964	2009	NOT FOUND	Horz=? Vert=YES	NO		PROJECTS 4 IN.	SEE DESCRIPTION

Monument Type

UNKNOWN

Disk Type

AZIMUTH MARK DISK

Mon. Agency

NGS

Description: (1964)

Stamping: LAKE IDA 1964

14.0 MILES SOUTHWEST OF DETROIT LAKES, 0.25 MILE SOUTH OF LAKE IDA, 9.6 MILES SOUTH AND SOUTHWEST ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 10 AT DETROIT LAKES, THEN 7.6 MILES WESTERLY ON COUNTY ROAD 20, THEN 0.55 MILE NORTHWEST ON A GRAVEL ROAD TO A SIDE ROAD WEST, THEN 0.9 MILE WESTERLY ON A GRAVEL ROAD TO THE TOP OF A SMALL HILL, 3.7 FEET EAST OF A METAL WITNESS POST, 1.0 FOOT NORTH OF A FENCE.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -87.201 12B = -87.168 09 = -87.067 03 = -86.978



Mn/DOT Name: LAKE IDA RM 1

NGS Name: LAKE IDA RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4124](#) [Get Map](#)
NGS Quad / Sta Num : 46096121/1041
USGS Quad: CORMORANT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	3	137 N	43 W	464249.78	960609.34		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1964	2009	NOT FOUND	Horz=? Vert=YES	NO		PROJECTS 4 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	REFERENCE MARK DISK	NGS

Description: (1964)

Stamping: LAKE IDA NO 1 1964

14.0 MILES SOUTHWEST OF DETROIT LAKES, 0.25 MILE SOUTH OF LAKE IDA, 9.6 MILES SOUTH AND SOUTHWEST ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 10 AT DETROIT LAKES, THEN 7.6 MILES WESTERLY ON COUNTY ROAD 20, THEN 0.55 MILE NORTHWEST ON A GRAVEL ROAD TO A SIDE ROAD WEST, THEN 0.9 MILE WESTERLY ON A GRAVEL ROAD TO THE TOP OF A SMALL HILL, 66.0 FEET NORTH OF THE CENTER OF A GRAVEL ROAD, 58.0 FEET NORTHEAST OF A METAL WITNESS POST, 7.0 FEET SOUTH OF THE SOUTH EDGE OF THE WOODED AREA.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.198 12B = -87.165 09 = -87.067 03 = -86.978



Mn/DOT Name: LAKE IDA RM 2

NGS Name: LAKE IDA RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4125](#) [Get Map](#)
NGS Quad / Sta Num : 46096121/1041
USGS Quad: CORMORANT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	3	137 N	43 W	464249.87	960610.90		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1964	2009	NOT FOUND	Horz=? Vert=YES	NO		PROJECTS 3 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	REFERENCE MARK DISK	NGS

Description: (1964)

Stamping: LAKE IDA NO 2 1964

14.0 MILES SOUTHWEST OF DETROIT LAKES, 0.25 MILE SOUTH OF LAKE IDA, 9.6 MILES SOUTH AND SOUTHWEST ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 10 AT DETROIT LAKES, THEN 7.6 MILES WESTERLY ON COUNTY ROAD 20, THEN 0.55 MILE NORTHWEST ON A GRAVEL ROAD TO A SIDE ROAD WEST, THEN 0.9 MILE WESTERLY ON A GRAVEL ROAD TO THE TOP OF A SMALL HILL, 66.0 FEET NORTHWEST OF A METAL WITNESS POST, 43.0 FEET NORTH OF THE CENTER OF A GRAVEL ROAD, 7.0 FEET SOUTH OF THE SOUTH EDGE OF THE WOODED AREA.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.198 12B = -87.165 09 = -87.067 03 = -86.978



Mn/DOT Name: LANT MNDT

NGS Name: LANT

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0523](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/1040
USGS Quad: BATTLE LAKE

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NW	10	133 N	40 W	462051.38	954304.23	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MNDT

Description: (1975) **Stamping:** LANT 1975

4.5 MILES NORTH OF BATTLE LAKE, 5.25 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 26.6, 144.9 FEET EAST OF TRUNK HIGHWAY 78, 31.4 FEET NORTH OF A RIGHT-OF-WAY POST, IN THE CENTER OF COUNTY ROAD 72 EXTENDED, 29.27 FEET NORTH OF LANT MNDT RM 1, 6.7 FEET WEST OF A WITNESS POST.

Station Notes

THE NATIONAL GEODETIC SURVEY (NGS) ALSO HAD THIS MARK UNDER THE ACRN OF RO1088 WHICH HAS BEEN COMBINED WITH RO0523 AND BEEN DELETED.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1355.857	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1355.867	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1355.867	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1355.867	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1355.076	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1355.076	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1355.857			1267.937	.012	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1355.857	.131		1268.049	.066	1996	GPS - STATIC	2024	HTH78B
1355.857			1267.937	.012	2011	GPS - STATIC	2024	HTH78B
1355.765	.262		1267.885	.197	2011	GPS - RTRN	2023	RTRN2023
1355.680	.262		1267.803	.197	2011	GPS - RTRN	2015	RTRN2015
1355.680	.262		1267.803	.197	2011	GPS - RTRN	2015	RTRN2015
1355.594	.262		1267.950	.197	1996	GPS - RTRN	2009	RTRN2009
1354.984	.197		1267.314	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.880 12B = -87.880 09 = -87.766 03 = -87.644

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 20 51.38156	95 43 04.23087	499703.179	187973.076	.007		ADJUSTMENT	2024	GPS3771
46 20 51.38156	95 43 04.23087	499703.179	187973.076	.007	C	GPS - STATIC	2024	HTH78B
46 20 51.38149	95 43 04.23085	499703.181	187973.069	.131	3	GPS - RTRN	2023	RTRN2023
46 20 51.38111	95 43 04.23152	499703.133	187973.031	.131	3	GPS - RTRN	2015	RTRN2015
46 20 51.38111	95 43 04.23152	499703.133	187973.031	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 20 51.38142	95 43 04.23116	499703.159	187973.062	.033	C	GPS - STATIC	2024	HTH78B
46 20 51.38164	95 43 04.23231	499703.078	187973.084	.131	3	GPS - RTRN	2009	RTRN2009
46 20 51.38120	95 43 04.23090	499703.177	187973.040	.066	2	ADJUSTMENT	1999	17648
46 20 51.38112	95 43 04.23105	499703.167	187973.032	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 20 51.37828	95 43 04.22064	499703.897	187972.744	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 20 51.52288	95 43 03.05061			.100	2	CLASSICAL SURVEY	1977	15945

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2254016.233	822925.116	954317.461	16851213.361	.007		ADJUSTMENT	2024	GPS3771
2254016.233	822925.116	954317.461	16851213.361	.007	C	GPS - STATIC	2024	HTH78B
2254016.235	822925.109	954317.462	16851213.354	.131	3	GPS - RTRN	2023	RTRN2023
2254016.187	822925.072	954317.414	16851213.317	.131	3	GPS - RTRN	2015	RTRN2015
2254016.187	822925.072	954317.414	16851213.317	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2254016.213	822925.103	954317.440	16851213.347	.033	C	GPS - STATIC	2024	HTH78B
2254016.133	822925.126	954317.360	16851213.372	.131	3	GPS - RTRN	2009	RTRN2009
2254016.231	822925.080	954317.458	16851213.324	.066	2	ADJUSTMENT	1999	17648
2254016.220	822925.072	954317.447	16851213.317	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2254016.945	822924.771	954318.167	16851213.004	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1629421.345	494851.369			.100	2	CLASSICAL SURVEY	1977	15945

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LANT-RO0523-3E-17OCT2023.jpg	E	Oct 17, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LANT-RO0523-2-17OCT2023.jpg		Oct 17, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LANT-RO0523-1-17OCT2023.jpg		Oct 17, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: LANT MNDT RM 1

NGS Name: LANT RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0524](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	10	133 N	40 W	462051.09	954304.18	2	3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	2015	GOOD	Horz=YES Vert=YES	YES		PROJECTS 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (1975)

Stamping: LANT NO 1 1975

4.6 MILES NORTH OF BATTLE LAKE, 5.25 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 26.6, 148.5 FEET EAST OF TRUNK HIGHWAY 78, 29.0 FEET SOUTH OF EXTENDED COUNTY ROAD 72, 2.1 FEET NORTHWEST OF A RIGHT-OF-WAY MARKER, 29.2 FEET SOUTH OF STATION LANT MNDT, 1.0 FOOT WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1353.577	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1353.583	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1353.587	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1353.596	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1352.806	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1352.806	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1353.436	.262		1265.558	.197	2011	GPS - RTRN	2015	RTRN2015
1353.436	.262		1265.558	.197	2011	GPS - RTRN	2015	RTRN2015
1353.360	.262		1265.716	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.880 12B = -87.880 09 = -87.766 03 = -87.644

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 20 51.09451	95 43 04.17651	499706.992	187943.996	.131	3	GPS - RTRN	2015	RTRN2015
46 20 51.09451	95 43 04.17651	499706.992	187943.996	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 20 51.09489	95 43 04.17743	499706.928	187944.034	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2254019.507	822895.974	954320.274	16851184.164	.131	3	GPS - RTRN	2015	RTRN2015
2254019.507	822895.974	954320.274	16851184.164	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2254019.443	822896.013	954320.211	16851184.205	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LANT_RM_1-RO0524-3E-27AUG2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LANT_RM_1-RO0524-2-27AUG2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LANT_RM_1-RO0524-1-27AUG2015.jpg
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **	

<u>Dir</u>	<u>Date</u>
E	Aug 27, 2015
	Aug 27, 2015
	Aug 27, 2015



Mn/DOT Name: LAW MNDT

NGS Name: LAW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0919](#) [Get Map](#)
NGS Quad / Sta Num : 46096132/1040
USGS Quad: LAWNDALE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	7	135 N	44 W	463055.68	961618.44		2

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1961	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	MNDT

Description: (1971) Stamping: LAW USCGS 1961

2.5 MILES NORTH AND 0.5 MILE EAST OF ROTHSA, 2.4 MILES NORTH ON COUNTY ROAD 11 FROM THE JUNCTION OF COUNTY ROAD 11 AND INTERSTATE HIGHWAY 94, THEN 0.5 MILE EAST ON COUNTY ROAD 28, 51.0 FEET NORTH OF COUNTY ROAD 28, 3.0 FEET NORTH OF A POWER POLE, 97.0 FEET NORTH OF A TELEPHONE POLE, 81.49 FEET SOUTH OF LAW MNDT RM 1, 78.09 FEET EAST OF LAW MNDT RM 2.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1286.087	.197			1198.488	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648	

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1286.087							RECIPROCAL VERTICAL ANGLE	1961	HORZ	

Geoid Separations(ft): GEOID18 = -87.966 12B = -87.949 09 = -87.857 03 = -87.775

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 30	55.67893	96 16	18.44210	360228.172	249684.912	.066	2	ADJUSTMENT	1999	17648
46 30	55.67917	96 16	18.44208	360228.174	249684.936	.066	2	ADJUSTMENT	1998	17655

<u>NAD83(1986)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 30	55.67806	96 16	18.43333	360228.785	249684.820	.066	2	ADJUSTMENT	1986	17289

<u>NAD27</u>		<u>Geodetic Position</u>				<u>Determination Method</u>			<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 30	55.82300	96 16	17.20670			.100	2	CLASSICAL SURVEY	1962	12924

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2115725.384	887199.970	817018.335	16917695.322	.066	2	ADJUSTMENT	1999	17648		
2115725.386	887199.994	817018.337	16917695.346	.066	2	ADJUSTMENT	1998	17655		

<u>NAD83(1986)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2115725.995	887199.866	817018.944	16917695.209	.066	2	ADJUSTMENT	1986	17289		

<u>NAD27</u>		<u>MN State Plane - Central Zone</u>				<u>Determination Method</u>			<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
1491129.933	559125.604					.100	2	CLASSICAL SURVEY	1962	12924



Mn/DOT Name: LAW MNDT RM 1

NGS Name: LAW RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4151](#) [Get Map](#)
NGS Quad / Sta Num : 46096132/1040
USGS Quad: LAWNDAL

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	7	135 N	44 W	463055.00	961618.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1961	2009	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 3 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2010) Stamping: LAW NO 1 1961

2.5 MILES NORTH AND 0.5 MILE EAST OF ROTHSA, 2.4 MILES NORTH ON COUNTY ROAD 11 FROM THE JUNCTION OF COUNTY ROAD 11 AND INTERSTATE HIGHWAY 94, THEN 0.5 MILE EAST ON COUNTY ROAD 28, 131.0 FEET NORTH OF THE CENTERLINE OF A GRAVEL ROAD, 85.0 FEET NORTH OF A POWER POLE, 1.5 FEET WEST OF A FENCE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.969 12B = -87.953 09 = -87.857 03 = -87.779



Mn/DOT Name: LAW MNDT RM 2

NGS Name: LAW RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4152](#) [Get Map](#)
NGS Quad / Sta Num : 46096132/1040
USGS Quad: LAWNDALÉ

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	7	135 N	44 W	463055.00	961618.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1961	2009	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 3 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: Stamping: LAW NO 2 1961

2.5 MILES NORTH AND 0.5 MILE EAST OF ROTHSAÏ, 2.4 MILES NORTH ON COUNTY ROAD 11 FROM THE JUNCTION OF COUNTY ROAD 11 AND INTERSTATE HIGHWAY 94, THEN 0.5 MILE EAST ON COUNTY ROAD 28, 41.0 FEET NORTH OF THE CENTERLINE OF A GRAVEL ROAD, 77.0 FEET WEST OF A POWER POLE, 202.0 FEET EAST OF ANOTHER POWER POLE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.969 12B = -87.953 09 = -87.857 03 = -87.779



Mn/DOT Name: LEON

NGS Name: LEON

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095341/
USGS Quad: PHELPS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	25	134 N	41 W	462300.10	954757.40			2000	2009	GOOD	Horz=YES Vert=YES	NO		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2000)

Stamping: LEON 2000

8.5 MILES NORTHWEST OF BATTLE LAKE, 5.1 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, TO TRUNK HIGHWAY 78 MILEPOINT 26.7, THENCE 3.0 MILES WEST AND NORTH ALONG COUNTY ROAD 72, THENCE 1.0 MILE WEST ALONG COUNTY ROAD 1, THENCE 1.0 MILE NORTH ALONG 340TH AVENUE, THENCE 0.95 MILE WEST ALONG 290TH STREET, 38.0 FEET NORTH OF 290TH STREET, 5.0 FEET EAST OF A WITNESS POST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.025 12B = -88.025 09 = -87.903 03 = -87.759



Mn/DOT Name: LG RK HI PT FIELD E INDIAN

NGS Name: LG RK HI PT FIELD E INDIAN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4194](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	9	134 N	44 W	462617.44	961311.99		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2010	UNKNOWN	Horz=? Vert=?	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	UNSPECIFIC DISK TYPE (SEE TEXT)	UNK

Description: Stamping:

451.0 FEET NORTHEAST OF STATION INDIAN.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.218 12B = -88.215 09 = -88.107 03 = -88.031



Mn/DOT Name: LIDA MNDT

NGS Name: LIDA

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9320](#)
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	33	136 N	42 W	463239.53	955912.57		2

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1982	1982	GOOD	Horz=? Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MNDT

Description: (1982) **Stamping:** LIDA 1982

5.0 MILES EAST-SOUTHEAST OF PELICAN RAPIDS, 5.95 MILES EAST AND SOUTHEAST ON TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 TO THE EAST SIDE OF THE NORTHEAST END OF THE SOUTH ARM OF LAKE LIDA TO A TRAIL SOUTH, 2200.0 FEET SOUTH ON A TRAIL FROM TRUNK HIGHWAY 108 TO THE HIGHEST PART OF A WOODED HILL, ON THE NORTH SIDE OF A RIDGE, 119.0 FEET NORTHWEST OF A 12.0 INCH DIAMETER OAK TREE, 116.0 FEET WEST-NORTHWEST OF A 3.0 INCH DIAMETER PINE TREE, 43.0 FEET NORTHWEST OF A 4.0 INCH DIAMETER ELM TREE, 3.8 FEET EAST OF A WITNESS POST, 20.69 FEET NORTH-NORTHWEST OF LIDA RM 1, 25.52 FEET EAST-NORTHEAST OF LIDA RM 2.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1500.358	.197			1412.973	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648	

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1500.292							RECIPROCAL VERTICAL ANGLE	1982	HORZ	

Geoid Separations(ft): GEOID18 = -87.667 12B = -87.647 09 = -87.552 03 = -87.398

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Ellipsoid (NAD83)</u>		<u>Determination Method</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>	
46 32 39.52691	95 59 12.57024	432013.563	259831.573	.066	2	ADJUSTMENT	1999	17648	

<u>NAD83(1986)</u>		<u>Geodetic Position</u>		<u>Ellipsoid (NAD83)</u>		<u>Determination Method</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>	
46 32 39.52705	95 59 12.56902	432013.648	259831.587	.066	2	ADJUSTMENT	1997	16997	

<u>NAD27</u>		<u>Geodetic Position</u>		<u>Ellipsoid (NAD83)</u>		<u>Determination Method</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>	
46 32 39.67260	95 59 11.37320			.100	2	CLASSICAL SURVEY	1950	UNK	

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Ellipsoid (NAD83)</u>		<u>Determination Method</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>	
46 32 39.52691	95 59 12.57024	432013.563	259831.573	.066	2	ADJUSTMENT	1999	17648	

<u>NAD83(1986)</u>		<u>Geodetic Position</u>		<u>Ellipsoid (NAD83)</u>		<u>Determination Method</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>	
46 32 39.52705	95 59 12.56902	432013.648	259831.587	.066	2	ADJUSTMENT	1997	16997	

<u>NAD27</u>		<u>Geodetic Position</u>		<u>Ellipsoid (NAD83)</u>		<u>Determination Method</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>	
46 32 39.67260	95 59 11.37320			.100	2	CLASSICAL SURVEY	1950	UNK	



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LIDA-AD9320-3N-19JUN2008.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LIDA-AD9320-2-19JUN2008.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LIDA-AD9320-1-19JUN2008.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Jun 19, 2008
	Jun 19, 2008
	Jun 19, 2008



Mn/DOT Name: LIDA MNDT AZ MK

NGS Name: LIDA AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9324](#)
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

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1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	33	136 N	42 W	463259.88	955900.64	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1982	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	MNDT

Description: (2001) **Stamping:** LIDA 1982

5.0 MILES EAST-SOUTHEAST OF PELICAN RAPIDS, 5.95 MILES EAST AND SOUTHEAST ON TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 TO THE NORTHEAST SIDE OF THE SOUTH ARM OF LAKE LIDA AND A TRAIL SOUTH, AT TRUNK HIGHWAY 108 MILEPOINT 18.2, 55.0 FEET SOUTH-SOUTHWEST OF TRUNK HIGHWAY 108, 41.0 FEET WEST OF A TRAIL, 37.0 FEET EAST-NORTHEAST OF A POLE, 9.1 FEET NORTH OF A FENCE, 3.0 FEET SOUTH OF THE CENTER OF A DRIVEWAY AT FIRE NUMBER 24346, 7.2 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj		Year	Reference	
1350.791	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941	
1350.837	.016	2/1					VERTICAL ADJUSTMENT	2006	00000497	
1350.818	.016	2/1					VERTICAL CONTROL SURVEY	2001	VPELI	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj		Year	Reference	
1350.063	.197			1262.704	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648	

NGVD29				Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj		Year	Reference	
1350.063							LEVELING	1982	HORZ	

Geoid Separations(ft): GEOID18 = -87.641 12B = -87.621 09 = -87.529 03 = -87.369

Lat/Lon and County Coordinates (Feet)

NAD83(1996)		Geodetic Position		Otter Tail County		Determination Method			Project Info	
		Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 32	59.87640	95 59 00.63554		432854.797	261890.382	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)		Geodetic Position		Otter Tail County		Determination Method			Project Info	
		Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 32	59.87653	95 59 00.63429		432854.884	261890.395	.066	2	ADJUSTMENT	1997	16997

NAD27		Geodetic Position				Determination Method			Project Info	
		Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 33	00.02210	95 58 59.43910				.100	2	CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(1996)		MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
		X	Y	X	Y	Acc	Order		Year	Reference
2188556.251	898057.707			890040.637	16927395.182	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)		MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
		X	Y	X	Y	Acc	Order		Year	Reference
2188556.338	898057.719			890040.725	16927395.192	.066	2	ADJUSTMENT	1997	16997

NAD27		MN State Plane - Central Zone				Determination Method			Project Info	
		X	Y	X	Y	Acc	Order		Year	Reference
1563960.191	569983.772					.100	2	CLASSICAL SURVEY	1950	UNK



<u>Station Photos</u>			
<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LIDA_AZ_MK-AD9324-3W-04AUG2009.jpg	W	Aug 4, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LIDA_AZ_MK-AD9324-2-04AUG2009.jpg		Aug 4, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LIDA_AZ_MK-AD9324-1-04AUG2009.jpg		Aug 4, 2009
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: LIDA RM 1

NGS Name: LIDA RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9299](#) [Get Map](#)
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	33	136 N	42 W	463239.37	955912.39		3	1982	2018	DISTURBED	Horz=? Vert=?	NO		PROJECTS 2 IN.	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2007)

Stamping: LIDA NO 1 1982

5.0 MILES EAST-SOUTHEAST OF PELICAN RAPIDS, 5.95 MILES EAST-SOUTHEAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS TO A TRAIL SOUTH. THEN 0.4 MILE SOUTH ON A TRAIL, ON THE SOUTH EDGE OF A RIDGE, 21.8 FEET SOUTH-SOUTHEAST OF A WITNESS POST.

Station Notes

DISTRICT 4 SURVEYS REPORTED THAT THE DEPARTMENT OF NATURAL RESOURCES (DNR) WAS DOING TRAIL MAINTENANCE WITH A BULLDOZER BUMPED INTO THE MARK. THEY TRIED TO PUT IT BACK AS BEST THEY COULD.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order</u>	<u>(/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1500.325	.262			1412.940	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.667 12B = -87.647 09 = -87.552 03 = -87.398

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>									
Geodetic Position		Otter Tail County				Project Info			
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
46 32 39.36598	95 59 12.38790	432026.253	259815.226	.131	3	ADJUSTMENT	1999	17648	

<u>NAD83(1986)</u>									
Geodetic Position		Otter Tail County				Project Info			
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
46 32 39.36612	95 59 12.38668	432026.339	259815.240	.131	3	ADJUSTMENT	1997	16997	

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>									
MN State Plane - Central Zone		UTM - Zone 15					Project Info		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
2187689.544	895998.504	889140.953	16925349.403	.131	3	ADJUSTMENT	1999	17648	

<u>NAD83(1986)</u>									
MN State Plane - Central Zone		UTM - Zone 15					Project Info		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
2187689.630	895998.516	889141.039	16925349.414	.131	3	ADJUSTMENT	1997	16997	



Mn/DOT Name: LIDA RM 2

NGS Name: LIDA RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9300](#)
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	33	136 N	42 W	463239.38	955912.87		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1982	2009	GOOD	Horz=? Vert=?	NO		FLUSH	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	SEE DESCRIPTION	MNDT

Description: (2007)

Stamping: LIDA NO2 1982

5.0 MILES EAST-SOUTHEAST OF PELICAN RAPIDS, 5.95 MILES EAST-SOUTHEAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS TO A TRAIL SOUTH, 0.4 MILE SOUTH ON A TRAIL, ON THE NORTH SIDE OF A RIDGE, 22.0 FEET WEST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1500.325	.262		1412.940	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648	

Geoid Separations(ft): GEOID18 = -87.667 12B = -87.647 09 = -87.556 03 = -87.398

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 32 39.38113	95 59 12.86811	431992.690	259816.875	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 32 39.38127	95 59 12.86689	431992.775	259816.889	.131	3	ADJUSTMENT	1997	16997

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2187656.021	896000.774	889107.461	16925352.208	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2187656.107	896000.787	889107.546	16925352.219	.131	3	ADJUSTMENT	1997	16997



Mn/DOT Name: LILY MNDT TEMP

NGS Name: LILY TEMP

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9301](#)
NGS Quad / Sta Num : 46095423/
USGS Quad: DENT

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	28	136 N	40 W	463323.86	954400.08		2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1982	2023	GOOD	Horz=NO Vert=NO	NO		RECESSED 6 IN.	MARKER IS STEEL ROD

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	SURVEY DISK	MNDT

Description: (1982) **Stamping:** LILY 1982

0.6 MILE WEST OF DENT, 0.65 MILE WEST OF THE WEST JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35, AT TRUNK HIGHWAY 108 MILEPOINT 30.8, 15.5 FEET NORTH OF TRUNK HIGHWAY 108, 44.81 FEET SOUTH-SOUTHWEST OF A NAIL AND A DISK IN 4.0 INCH DIAMETER ASH TREE, 83.56 FEET SOUTHWEST OF A NAIL AND A DISK IN AN 8.0 INCH DIAMETER ELM TREE, 93.88 FEET WEST-SOUTHWEST OF A NAIL AND A DISK IN A CABLE MARKER POST. THE STATION, A 2.0 INCH DIAMETER BY 2.0 INCH DIAMETER ALUMINUM CAP RIVETED TO A DRIVEN 30.0 INCH TELSPAR.

Station Notes

THE SURVEY MARK IS UNSUITABLE FOR MNDOT GEODETIC SURVEYS.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1365.053	.262		1277.753	.197	2011	GPS - RTRN	2023	RTRN2023
1364.039	.197		1276.913	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1364.105						RECIPROCAL VERTICAL ANGLE	1982	HORZ

Geoid Separations(ft): GEOID18 = -87.303 12B = -87.296 09 = -87.178 03 = -87.067

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 23.85681	95 44 00.07614	495801.384	264207.077	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 23.85542	95 44 00.07739	495801.296	264206.936	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 23.85226	95 44 00.07864	495801.209	264206.616	.066	2	ADJUSTMENT	1997	16997

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 33 24.00140	95 43 58.91210			.100		CLASSICAL SURVEY	1950	UNK



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone

UTM - Zone 15

Project Info

<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2251526.991	899208.472	953038.176	16927542.930	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

MN State Plane - Central Zone

UTM - Zone 15

Project Info

<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2251526.901	899208.333	953038.083	16927542.792	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone

UTM - Zone 15

Project Info

<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2251526.808	899208.015	953037.985	16927542.475	.066	2	ADJUSTMENT	1997	16997

NAD27

MN State Plane - Central Zone

Project Info

<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1626930.535	571134.681			.100		CLASSICAL SURVEY	1950	UNK

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LILY_TEMP-AD9301-3S-31JUL2023.jpg	S	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LILY_TEMP-AD9301-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LILY_TEMP-AD9301-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: LINDEN

NGS Name: LINDEN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	17	136 N	42 W	463552.53	960021.98			1998	2009	GOOD	Horz=YES Vert=YES	NO		RECESSED 12 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (1998)

Stamping: LINDEN 1998

4.0 MILES NORTHEAST OF PELICAN RAPIDS, 2.45 MILES NORTH AND NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 WEST IN PELICAN RAPIDS, TO TRUNK HIGHWAY 59 MILEPOINT 243.05, THENCE 2.60 MILES EAST ALONG COUNTY ROAD 4, THENCE 0.20 MILE SOUTH ALONG 233RD AVENUE, 25.0 FEET WEST OF 233RD AVENUE, 13.0 FEET NORTH OF A FIELD ENTRANCE, 14.0 FEET NORTH OF EXTENDED DRIVEWAY NUMBER 43692, 1.0 FOOT EAST OF A WITNESS POST.

Station Notes

NOTE: THE STAMPING - LINDEN 1998 - IS DIFFICULT TO READ.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.493 12B = -87.483 09 = -87.372 03 = -87.221



Mn/DOT Name: LISLE

NGS Name: LISLE

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DP7079	Get Map
NW	8	133 N	44 W	462118.19	961536.30		C	NGS Quad / Sta Num : 46096242/ USGS Quad: FOXHOME	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1998	2018	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (<10 FT)	SURVEY DISK	MNDT

Description: (2008)

Stamping: LISLE 1998

5.5 MILES SOUTHWEST OF CARLISLE, 2.0 MILES SOUTH ALONG COUNTY ROAD 11 FROM THE JUNCTION OF COUNTY ROAD 11 AND COUNTY ROAD 10 IN CARLISLE, AT THE JUNCTION OF COUNTY ROAD 11 AND 270TH STREET, 51.0 FEET EAST OF COUNTY ROAD 11, 16.0 FEET SOUTH OF 270TH STREET, 7.0 FEET NORTH OF PRIM TRAVERSE STATION NUMBER 9, 6.4 FEET NORTH OF A WITNESS POST. THE ROD DEPTH IS UNKNOWN.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1123.863	.131			1035.648	.066	1996	GPS - STATIC	2021	HOTTE
1123.823				1035.480	.017	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1123.823				1035.480	.017	2011	GPS - STATIC	2020	HOTTE
1123.853				1035.480	.023	2011	HORIZONTAL ADJUSTMENT	2015	GPS3080
1123.840	.131			1035.648	.066	1996	GPS - STATIC	2015	HWILK
1123.853				1035.480	.023	2011	GPS - STATIC	2015	HWILK
1123.649	.262			1035.283	.197	2011	GPS - RTRN	2013	RTRN2013

Geoid Separations(ft): GEOID18 = -88.376 12B = -88.363 09 = -88.261 03 = -88.225

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>				<u>Lat/Lon and County Coordinates (Feet)</u>				<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>						<u>Year</u>	<u>Reference</u>
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>			
46 21 18.19153	96 15 36.30290	362773.413	191160.548	.013		ADJUSTMENT		2020	GPS3384
46 21 18.19153	96 15 36.30290	362773.413	191160.548	.013	C	GPS - STATIC		2020	HOTTE
46 21 18.19153	96 15 36.30290	362773.413	191160.548	.020		ADJUSTMENT		2015	GPS3080
46 21 18.19153	96 15 36.30290	362773.413	191160.548	.020	C	GPS - STATIC		2015	HWILK
46 21 18.19134	96 15 36.30312	362773.397	191160.529	.131	3	GPS - RTRN		2013	RTRN2013

<u>NAD83(1996)</u>				<u>Lat/Lon and County Coordinates (Feet)</u>				<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>						<u>Year</u>	<u>Reference</u>
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>			
46 21 18.19099	96 15 36.30363	362773.362	191160.494	.033	C	GPS - STATIC		2021	HOTTE
46 21 18.19099	96 15 36.30363	362773.362	191160.494	.033	C	GPS - STATIC		2015	HWILK

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>				<u>State Plane and UTM Coordinates (Feet)</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>						<u>Year</u>	<u>Reference</u>
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>			
2117186.896	828646.088	817550.562	16859099.265	.013		ADJUSTMENT		2020	GPS3384
2117186.896	828646.088	817550.562	16859099.265	.013	C	GPS - STATIC		2020	HOTTE
2117186.896	828646.088	817550.562	16859099.265	.020		ADJUSTMENT		2015	GPS3080
2117186.896	828646.088	817550.562	16859099.265	.020	C	GPS - STATIC		2015	HWILK
2117186.880	828646.069	817550.546	16859099.246	.131	3	GPS - RTRN		2013	RTRN2013

<u>NAD83(1996)</u>				<u>State Plane and UTM Coordinates (Feet)</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>						<u>Year</u>	<u>Reference</u>
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>			
2117186.844	828646.035	817550.508	16859099.212	.033	C	GPS - STATIC		2021	HOTTE
2117186.844	828646.035	817550.508	16859099.212	.033	C	GPS - STATIC		2015	HWILK



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LISLE-DP7079-3E-09OCT2008.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LISLE-DP7079-2-09OCT2008.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LISLE-DP7079-1-09OCT2008.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Oct 9, 2008
	Oct 9, 2008
	Oct 9, 2008



Mn/DOT Name: LIZZIE

NGS Name: LIZZIE

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DR9949 NGS Quad / Sta Num : 46096122/ USGS Quad: PELICAN RAPIDS Get Map
NW	25	136 N	43 W	463417.42	960237.10	2	C	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 64 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: LIZZIE 2014

2.0 MILES EAST OF PELICAN RAPIDS, 1.9 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 108 MILEPOINT 14.15, 32.0 FEET SOUTH OF TRUNK HIGHWAY 108, 73.8 FEET EAST OF A DRIVEWAY NUMBER 21399 EXTENDED, 1.5 FEET NORTH OF A WITNESS POST.

Station Pair: SAND - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1355.811	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1355.850			1268.337	.024	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1355.781	.131		1268.436	.066	1996	GPS - STATIC	2024	HTH108
1355.850			1268.337	.024	2011	GPS - STATIC	2024	HTH108
1355.821	.262		1268.232	.197	2011	GPS - RTRN	2023	RTRN2023
1355.857	.262		1268.272	.197	2011	GPS - RTRN	2022	RTRN2022
1355.713	.262		1268.131	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.585 12B = -87.579 09 = -87.467 03 = -87.323

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
46 34 17.42369	96 02 37.09848	417757.319	269803.624	.013		2024	GPS3689
46 34 17.42369	96 02 37.09848	417757.319	269803.624	.013	C	2024	HTH108
46 34 17.42287	96 02 37.09869	417757.304	269803.541	.131	3	2023	RTRN2023
46 34 17.42431	96 02 37.09792	417757.358	269803.687	.131	3	2022	RTRN2022
46 34 17.42340	96 02 37.09842	417757.323	269803.595	.131	3	2014	RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
46 34 17.42349	96 02 37.09903	417757.280	269803.604	.033	C	2024	HTH108

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
2173609.727	906248.034	875221.744	16935825.477	.013		2024	GPS3689
2173609.727	906248.034	875221.744	16935825.477	.013	C	2024	HTH108
2173609.711	906247.951	875221.726	16935825.394	.131	3	2023	RTRN2023
2173609.768	906248.096	875221.785	16935825.538	.131	3	2022	RTRN2022
2173609.731	906248.004	875221.747	16935825.447	.131	3	2014	RTRN2014

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
2173609.688	906248.014	875221.705	16935825.458	.033	C	2024	HTH108



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LIZZIE-DR9949-3S-31JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LIZZIE-DR9949-2-31JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LIZZIE-DR9949-1-31JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Jul 31, 2023
	Jul 31, 2023
	Jul 31, 2023



Mn/DOT Name: LONE MNDT

NGS Name: LONE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9817](#)
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	29	136 N	44 W	463331.66	961434.86	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1998	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	SURVEY DISK	MNDT

Description: (2001) **Stamping:** LONE 1998

5.65 MILES EAST OF LAWNSDALE, 3.65 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND INTERSTATE HIGHWAY 94 (THE JUNCTION IS 2.0 MILES EAST OF LAWNSDALE), AT TRUNK HIGHWAY 108 MILEPOINT 3.65, 72.0 FEET NORTH OF TRUNK HIGHWAY 108, 2.0 FEET WEST OF A WITNESS POST.

Station Notes

A DISTRICT 4 DISK WAS USED.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1330.010	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1330.043	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1330.129	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1330.106	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1330.043			1242.402	.021	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1330.043	.131		1242.501	.066	1996	GPS - STATIC	2024	HTH108
1330.043			1242.402	.021	2011	GPS - STATIC	2024	HTH108
1330.083	.262		1242.389	.197	2011	GPS - RTRN	2023	RTRN2023
1330.096	.262		1242.402	.197	2011	GPS - RTRN	2022	RTRN2022
1330.047	.262		1242.353	.197	2011	GPS - OPUS	2022	GPSBM
1330.043	.262		1242.350	.197	2011	GPS - OPUS	2022	GPSBM
1330.089	.262		1242.396	.197	2011	GPS - RTRN	2021	RTRN2021

Geoid Separations(ft): GEOID18 = -87.693 12B = -87.677 09 = -87.575 03 = -87.490

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 33 31.66260	96 14 34.86082	367577.738	265438.061	.013		ADJUSTMENT	2024	GPS3689
46 33 31.66260	96 14 34.86082	367577.738	265438.061	.013	C	GPS - STATIC	2024	HTH108
46 33 31.66207	96 14 34.86027	367577.776	265438.008	.131	3	GPS - RTRN	2023	RTRN2023
46 33 31.66207	96 14 34.86135	367577.701	265438.008	.131	3	GPS - RTRN	2022	RTRN2022
46 33 31.66186	96 14 34.86084	367577.736	265437.987	.131	3	GPS - OPUS	2022	GPSBM
46 33 31.66232	96 14 34.86124	367577.708	265438.033	.131	3	GPS - OPUS	2022	GPSBM
46 33 31.66187	96 14 34.86084	367577.736	265437.987	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 33 31.66240	96 14 34.86138	367577.699	265438.042	.033	C	GPS - STATIC	2024	HTH108



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2123364.268	902812.426	824908.582	16933190.819	.013		ADJUSTMENT	2024	GPS3689
2123364.268	902812.426	824908.582	16933190.819	.013	C	GPS - STATIC	2024	HTH108
2123364.305	902812.371	824908.618	16933190.764	.131	3	GPS - RTRN	2023	RTRN2023
2123364.230	902812.373	824908.542	16933190.767	.131	3	GPS - RTRN	2022	RTRN2022
2123364.265	902812.351	824908.577	16933190.744	.131	3	GPS - OPUS	2022	GPSBM
2123364.238	902812.398	824908.551	16933190.792	.131	3	GPS - OPUS	2022	GPSBM
2123364.265	902812.352	824908.577	16933190.745	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2123364.228	902812.406	824908.542	16933190.801	.033	C	GPS - STATIC	2024	HTH108

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LONE-DG9817-3N-27JUL2023.jpg	N	Jul 27, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LONE-DG9817-2-27JUL2023.jpg		Jul 27, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LONE-DG9817-1-27JUL2023.jpg		Jul 27, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: LOON

NGS Name: LOON

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5776](#) [Get Map](#)
NGS Quad / Sta Num : 46095431/
USGS Quad: VERGAS

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	4	136 N	41 W	463741.21	955036.68		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1999	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2015) **Stamping:** LOON 1999

2.7 MILES SOUTHWEST OF VERGAS, 2.85 MILES SOUTHWEST ALONG COUNTY ROAD 4 FROM THE JUNCTION OF COUNTY ROAD 4 AND COUNTY ROAD 17 NORTH IN VERGAS, 25.0 FEET NORTH OF COUNTY ROAD 4, 8.0 FEET WEST OF A FIELD ENTRANCE, 67.0 FEET SOUTHEAST OF A POWER POLE WITH A GUY WIRE, 8.0 FEET WEST OF EXTENDED DRIVEWAY NUMBER 31026, 6.0 FEET EAST OF A WITNESS POST.

Station Notes

A DISTRICT 4 DISK WAS USED, UNKNOWN ROD DEPTH.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj			Year	Reference
1413.035	.131		1326.182	.066	1996	GPS - STATIC		2021	HOTTE
1413.098			1326.031	.022	2011	HORIZONTAL ADJUSTMENT		2020	GPS3384
1413.098			1326.031	.022	2011	GPS - STATIC		2020	HOTTE
1412.917	.262		1326.096	.197	1996	GPS - RTRN		2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.080 12B = -87.077 09 = -86.972 03 = -86.821

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 37 41.20671	95 50 36.68365	468125.010	290305.160	.013		ADJUSTMENT	2020	GPS3384
46 37 41.20671	95 50 36.68365	468125.010	290305.160	.013	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 37 41.20639	95 50 36.68415	468124.975	290305.127	.033	C	GPS - STATIC	2021	HOTTE
46 37 41.20646	95 50 36.68437	468124.960	290305.135	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2224341.975	925811.180	926274.684	16954581.912	.013		ADJUSTMENT	2020	GPS3384
2224341.975	925811.180	926274.684	16954581.912	.013	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2224341.940	925811.149	926274.648	16954581.880	.033	C	GPS - STATIC	2021	HOTTE
2224341.925	925811.156	926274.633	16954581.888	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LOON-DR5776-3N-07OCT2014.jpg	N	Oct 7, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LOON-DR5776-2-07OCT2014.jpg		Oct 7, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LOON-DR5776-1-07OCT2014.jpg		Oct 7, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: LREC

NGS Name: LREC

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7122](#) [Get Map](#)
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	15	135 N	43 W	462959.49	960451.22	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 17 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) **Stamping:** LREC 2009

1.35 MILES NORTHEAST OF ERHARD, 1.15 MILES NORTH AND NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 24 IN ERHARD TO TRUNK HIGHWAY 59 MILEPOINT 235.60, THEN 0.35 MILE EAST ALONG 370TH STREET, 41.5 FEET NORTH OF 370TH STREET, 7.8 FEET SOUTH OF A POWER POLE, 27.0 FEET WEST OF DRIVEWAY NUMBER 19635, 1.5 FEET SOUTH OF A WITNESS POST.

Station Pair: SANDY - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1351.461	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1351.510	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1351.513	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1351.461			1263.587	.021	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1351.461	.131		1263.698	.066	1996	GPS - STATIC	2023	HTH59
1351.461			1263.587	.021	2011	GPS - STATIC	2023	HTH59
1351.457	.262		1263.560	.197	2011	GPS - RTRN	2022	RTRN2022

Geoid Separations(ft): GEOID18 = -87.897 12B = -87.884 09 = -87.775 03 = -87.657

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y						Year	Reference
46 29 59.48895	96 04 51.22411	408265.827	243712.956	.013		ADJUSTMENT			2024	GPS3672
46 29 59.48895	96 04 51.22411	408265.827	243712.956	.013	C	GPS - STATIC			2023	HTH59
46 29 59.48870	96 04 51.22467	408265.787	243712.931	.131	3	GPS - RTRN			2022	RTRN2022

NAD83(1996)		Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y						Year	Reference
46 29 59.48873	96 04 51.22462	408265.791	243712.934	.033	C	GPS - STATIC			2023	HTH59

State Plane and UTM Coordinates (Feet)

NAD83(2011)		MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y						Year	Reference
2163638.175	880340.809	864835.180	16910071.363	.013		ADJUSTMENT			2024	GPS3672
2163638.175	880340.809	864835.180	16910071.363	.013	C	GPS - STATIC			2023	HTH59
2163638.136	880340.785	864835.140	16910071.339	.131	3	GPS - RTRN			2022	RTRN2022

NAD83(1996)		MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y						Year	Reference
2163638.139	880340.788	864835.143	16910071.342	.033	C	GPS - STATIC			2023	HTH59



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LREC-DO7122-3N-17OCT2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LREC-DO7122-2-17OCT2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LREC-DO7122-1-17OCT2022.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Oct 17, 2022
	Oct 17, 2022
	Oct 17, 2022



Mn/DOT Name: LUCE

NGS Name: LUCE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R01142](#) [Get Map](#)
NGS Quad / Sta Num : 46095424/1017
USGS Quad: FRAZEE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	36	137 N	40 W	463835.82	954029.66		C	1964	2021	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (1975)

Stamping: LUCE 1964

6.0 MILES SOUTH OF FRAZEE, 0.65 MILE WEST ON COUNTY ROAD 60 FROM THE JUNCTION OF COUNTY ROAD 60 AND TRUNK HIGHWAY 10 (THE JUNCTION IS 5.5 MILES SOUTH OF FRAZEE), THEN 0.35 MILE SOUTH ON 395TH AVENUE, THEN .30 MILE EAST ON 475TH STREET, THEN 0.1 MILE SOUTH ON A SAND ROAD (FIRE NUMBERS 39194 AND 39208) TO A FORK, THEN 0.5 MILE SOUTH AND EAST ON THE RIGHT FORK, 250.0 FEET NORTHWEST OF A MICROWAVE TOWER, 4.0 FEET NORTH OF A FENCE LINE, 38.0 FEET SOUTH OF A SAND ROAD, 104.0 FEET SOUTHWEST OF A POWER POLE, 53.70 FEET WEST OF LUCE RM 1, 50.98 FEET EAST OF LUCE RM 2.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1484.075	.262		1396.759	.197	2011	GPS - RTRN	2021	RTRN2021
			1396.723	.012	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1483.839	.262		1396.756	.197	1996	GPS - RTRN	2009	RTRN2009
			1396.828	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1484.052	.131		1396.903	.066	1996	HORIZONTAL ADJUSTMENT	2005	GPS2123
1484.019	.131		1396.903	.066	1996	GPS - STATIC	2005	HPERH
1483.593	.197		1396.460	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1483.002						RECIPROCAL VERTICAL ANGLE	1964	HORZ

Geoid Separations(ft): GEOID18 = -87.313 12B = -87.313 09 = -87.211 03 = -87.083

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 38 35.82345	95 40 29.66401	510490.032	295815.826	.131	3	GPS - RTRN	2021	RTRN2021
46 38 35.82391	95 40 29.66418	510490.020	295815.873	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 38 35.82385	95 40 29.66504	510489.960	295815.866	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 38 35.82375	95 40 29.66538	510489.936	295815.856	.131	3	GPS - RTRN	2009	RTRN2009
46 38 35.82336	95 40 29.66487	510489.971	295815.817	.033	C	ADJUSTMENT	2005	GPS2123
46 38 35.82336	95 40 29.66487	510489.971	295815.817	.033	C	GPS - STATIC	2005	HPERH
46 38 35.82263	95 40 29.66682	510489.835	295815.743	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 38 35.82075	95 40 29.66946	510489.651	295815.552	.066	2	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 38 35.97186	95 40 28.51349			.100	2	CLASSICAL SURVEY	1964	13522



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2266796.496	930535.901	968808.279	16958628.970	.131	3	GPS - RTRN	2021	RTRN2021
2266796.485	930535.948	968808.269	16958629.017	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2266796.425	930535.942	968808.209	16958629.013	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2266796.401	930535.933	968808.185	16958629.004	.131	3	GPS - RTRN	2009	RTRN2009
2266796.436	930535.893	968808.219	16958628.964	.033	C	ADJUSTMENT	2005	GPS2123
2266796.436	930535.893	968808.219	16958628.964	.033	C	GPS - STATIC	2005	HPERH
2266796.298	930535.821	968808.080	16958628.894	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2266796.111	930535.634	968807.890	16958628.710	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		<u>X</u>	<u>Y</u>	Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1642199.413	602462.409			.100	2	CLASSICAL SURVEY	1964	13522

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LUCE-RO1142-3S-29JUN2021.jpg	S	Jun 29, 2021
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LUCE-RO1142-2-29JUN2021.jpg		Jun 29, 2021
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LUCE-RO1142-1-29JUN2021.jpg		Jun 29, 2021

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: LUCE ATT MICROWAVE TWR KAK 76

NGS Name: LUCE ATT MICROWAVE TWR KAK 76

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R01145](#) [Get Map](#)
NGS Quad / Sta Num : 46095424/1016
USGS Quad: FRAZEE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	36	137 N	40 W	463833.55	954025.74		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1964	1994	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	MICROWAVE TOWER	NGS

Description: (1982) Stamping:
0.5 MILE SOUTH OF LUCE.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.316 12B = -87.316 09 = -87.214 03 = -87.086

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		Geodetic Position		Otter Tail County					Project Info	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 38	33.54777	95 40	25.73632	510764.220	295585.413	.328	4	ADJUSTMENT	1999	17648
<u>NAD83(1986)</u>		Geodetic Position		Otter Tail County					Project Info	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 38	33.53834	95 40	25.72900	510764.731	295584.458	.328	4	ADJUSTMENT	1986	17289
<u>NAD27</u>		Geodetic Position							Project Info	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 38	33.68974	95 40	24.57719			.100	4	CLASSICAL SURVEY	1964	13522

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		MN State Plane - Central Zone		UTM - Zone 15					Project Info	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2267066.337	930300.480	969074.375	16958389.228	.328	4	ADJUSTMENT	1999	17648		
<u>NAD83(1986)</u>		MN State Plane - Central Zone		UTM - Zone 15					Project Info	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2267066.831	930299.515	969074.853	16958388.256	.328	4	ADJUSTMENT	1986	17289		
<u>NAD27</u>		MN State Plane - Central Zone							Project Info	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1642469.852	602226.327			.100	4	CLASSICAL SURVEY	1964	13522		



Mn/DOT Name: LUCE AZ MK

NGS Name: LUCE AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R01146](#) [Get Map](#)
NGS Quad / Sta Num : 46095424/1017
USGS Quad: FRAZEE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>				
SE	25	137 N	40 W	463852.58	954030.41						
<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>				
1964	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL SPIKE IMBED IN MON				

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	NGS

Description: (1975) Stamping: LUCE 1964

1.2 MILES SOUTH OF LUCE, 0.65 MILE WEST ON TRUNK HIGHWAY 228 FROM THE JUNCTION OF TRUNK HIGHWAY 228 AND TRUNK HIGHWAY 10 AT LUCE THEN 0.65 MILE SOUTH-SOUTHWEST AND WEST ON A GRAVEL ROAD TO THE HAPPEL MAILBOX THEN 0.1 MILE SOUTH ON A SAND ROAD TO A FORK THEN 0.2 MILE SOUTH ON THE RIGHT FORK, 18.0 FEET WEST OF A SAND ROAD, 3.0 FEET SOUTH OF A POWER POLE, 2.0 FEET EAST OF A WITNESS POST, 50.0 FEET NORTHWEST OF THE CORNER OF THE WOODS.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1431.428	.262			1344.295	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648
<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1430.115							DIGITIZED FROM MAP	1974	HORZ

Geoid Separations(ft): GEOID18 = -87.313 12B = -87.313 09 = -87.211 03 = -87.083

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 38 52.58116	95 40 30.41546			510436.706	297513.598	.131	3	ADJUSTMENT	1999 17648
<u>NAD83(1986)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 38 52.57926	95 40 30.41807			510436.523	297513.406	.131	3	ADJUSTMENT	1986 17289
<u>NAD27</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>
<u>Geodetic Position</u>									<u>Reference</u>
<u>Latitude</u>	<u>Longitude</u>								
46 38 52.73030	95 40 29.26227					.100	3	CLASSICAL SURVEY	1977 15945

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2266774.620	932234.159			968813.523	16960327.664	.131	3	ADJUSTMENT	1999 17648
<u>NAD83(1986)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2266774.434	932233.970			968813.334	16960327.478	.131	3	ADJUSTMENT	1986 17289
<u>NAD27</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>
<u>MN State Plane - Central Zone</u>									<u>Reference</u>
<u>X</u>	<u>Y</u>								
1642177.715	604160.730					.100	3	CLASSICAL SURVEY	1977 15945



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LUCE_AZ_MK-RO1146-3W-05AUG2009.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LUCE_AZ_MK-RO1146-2-05AUG2009.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LUCE_AZ_MK-RO1146-1-03SEP2009.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
W	Aug 5, 2009
	Aug 5, 2009
	Sep 3, 2009



Mn/DOT Name: LUCE RM 1

NGS Name: LUCE RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4229](#) [Get Map](#)
NGS Quad / Sta Num : 46095424/1017
USGS Quad: FRAZEE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	36	137 N	40 W	463835.79	954028.90		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1964	2009	NOT FOUND	Horz=? Vert=YES	NO		FLUSH	SEE DESCRIPTION

Monument Type
UNKNOWN

Disk Type
REFERENCE MARK DISK

Mon. Agency
NGS

Description: (2010)

Stamping: LUCE NO 1 1964

1.4 MILES SOUTHWEST OF LUCE, 0.65 MILE WEST ON TRUNK HIGHWAY 228 FROM THE JUNCTION OF TRUNK HIGHWAY 228 AND TRUNK HIGHWAY 10 AT LUCE, THEN 0.65 MILE SOUTH-SOUTHWEST AND WEST ON 395TH AVENUE-475TH STREET TO THE HAPPEL MAILBOX, THEN 0.1 MILE SOUTH ON A SAND ROAD (FIRE NUMBERS 39194 AND 39208) TO A FORK, THEN 0.6 MILE SOUTH AND EAST ON THE RIGHT FORK, 42.0 FEET SOUTH OF THE SAND ROAD, 78.0 FEET SOUTH OF A POWER POLE, 1.0 FOOT NORTH OF THE FENCE LINE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.313 12B = -87.313 09 = -87.211 03 = -87.083



Mn/DOT Name: LUCE RM 2

NGS Name: LUCE RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4230](#) [Get Map](#)
NGS Quad / Sta Num : 46095424/1017
USGS Quad: FRAZEE

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
NE	36	137 N	40 W	463835.81	954030.39		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1964	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	STEEL SPIKE IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2010) **Stamping:** LUCE NO 2 1964

1.4 MILES SOUTHWEST OF LUCE, 0.65 MILE WEST ON TRUNK HIGHWAY 228 FROM THE JUNCTION OF TRUNK HIGHWAY 228 AND TRUNK HIGHWAY 10 AT LUCE, THEN 0.65 MILE SOUTH-SOUTHWEST AND WEST ON 395TH AVENUE-475TH STREET TO THE HAPPEL MAILBOX, THEN 0.1 MILE SOUTH ON A SAND ROAD (FIRE NUMBERS 39194 AND 39208) TO A FORK, THEN 0.6 MILE SOUTH AND EAST ON THE RIGHT FORK, 39.0 FEET SOUTH OF THE CENTER OF THE SAND ROAD, 1.0 FOOT NORTH OF THE FENCE LINE.

Station Notes

DUE TO TREE COVER, THIS SURVEY MARK HAS BEEN ABANDONED FOR MNDOT GEODETIC HORIZONTAL SURVEYS.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.313 12B = -87.313 09 = -87.211 03 = -87.083

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LUCE_RM_2-CP4230-3S-05AUG2009.jpg	S	Aug 5, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LUCE_RM_2-CP4230-2-05AUG2009.jpg		Aug 5, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/LUCE_RM_2-CP4230-1-05AUG2009.jpg		Aug 5, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: M 61

NGS Name: M 61

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0139](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	36	133 N	43 W	461723.00	960225.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	2009	NOT FOUND	Horz=? Vert=YES	NO		RECESSED 30 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	BENCH MARK DISK	NGS

Description: (1971)

Stamping: M 61 1934

1.7 MILES EAST OF FERGUS FALLS, NEAR A POWER PLANT, 46.5 FEET SOUTH OF THE SOUTH RAIL OF THE RAILROAD TRACKS, 147.6 FEET SOUTHEAST OF THE SOUTHWEST CORNER OF A STEEL COAL SHED, 123.1 FEET SOUTH OF THE SOUTHEAST CORNER OF A SHED, 92.7 FEET EAST OF A TELEPHONE POLE, 1.2 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1201.812	.016	2/0				VERTICAL ADJUSTMENT	1991 00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1200.998	.016	2/0				UNKNOWN/APPROXIMATE	1992 UNCHECKD
1200.998	.016	2				VERTICAL CONTROL SURVEY	1972 Q460962
1200.998	.016	2				VERTICAL CONTROL SURVEY	1972 L22167-A
1200.998	.016	2				VERTICAL CONTROL SURVEY	1971 L22167-A
1200.837	.007	1				VERTICAL CONTROL SURVEY	1941 Q460962
1200.837	.007	1				VERTICAL CONTROL SURVEY	1934 L40 MINN

Geoid Separations(ft): GEOID18 = -88.189 12B = -88.189 09 = -88.081 03 = -87.982

* No Horizontal Positions in the Database *



Mn/DOT Name: MADSEN MNDT

NGS Name: MADSEN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0532](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/1045
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	1	133 N	40 W	462128.34	953955.14	2	2

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	2015	GOOD	Horz=NO Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MNDT

Description: (1975)

Stamping: MADSEN 1975

5.4 MILES NORTH-NORTHEAST OF BATTLE LAKE, 8.15 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 29.65, 47.2 FEET SOUTH OF TRUNK HIGHWAY 78, 120.0 FEET SOUTHEAST OF A POWER POLE NUMBER 15K, 115.8 FEET EAST OF A DRIVEWAY NUMBER 27102, 94.0 FEET WEST OF A DRIVEWAY NUMBER 27122, 3.0 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1331.641	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1331.634	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1331.628	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1331.753	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1330.962	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1330.962	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1331.579	.262		1243.767	.197	2011	GPS - RTRN	2015	RTRN2015
1331.546	.262		1243.964	.197	1996	GPS - RTRN	2009	RTRN2009
1331.756	.197		1244.138	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.812 12B = -87.808 09 = -87.687 03 = -87.582

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 21 28.34109	95 39 55.13664	512966.837	191721.602	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 21 28.34149	95 39 55.13641	512966.853	191721.642	.131	3	GPS - RTRN	2009	RTRN2009
46 21 28.34040	95 39 55.12845	512967.411	191721.532	.066	2	ADJUSTMENT	1999	17648
46 21 28.34016	95 39 55.12810	512967.436	191721.508	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 21 28.33822	95 39 55.11886	512968.084	191721.312	.066	2	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>						<u>Year</u>	<u>Reference</u>
46 21 28.48376	95 39 53.95303			.100	2	CLASSICAL SURVEY	1977	15945

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2267345.278	826426.939	967702.927	16854504.778	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2267345.295	826426.979	967702.945	16854504.818	.131	3	GPS - RTRN	2009	RTRN2009
2267345.851	826426.859	967703.499	16854504.689	.066	2	ADJUSTMENT	1999	17648
2267345.875	826426.834	967703.523	16854504.664	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2267346.520	826426.626	967704.164	16854504.446	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		<u>X</u>	<u>Y</u>	Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1642751.006	498353.352			.100	2	CLASSICAL SURVEY	1977	15945

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MADSEN-RO0532-3S-27AUG2015.jpg	S	Aug 27, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MADSEN-RO0532-2-27AUG2015.jpg		Aug 27, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MADSEN-RO0532-1-27AUG2015.jpg		Aug 27, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MAN

NGS Name: MAN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR9950](#) [Get Map](#)
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	25	136 N	44 W	463422.98	960938.95	2	C	2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 57 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: MAN 2014

3.5 MILES WEST OF PELICAN RAPIDS, 3.6 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 108 MILEPOINT 8.3, 57.7 FEET SOUTH OF TRUNK HIGHWAY 108, 1.15 MILES WEST OF COUNTY ROAD 113 AND 170TH AVENUE, 28.8 FEET EAST OF A DRIVEWAY NUMBER 15786, 0.75 MILE EAST OF COUNTY ROAD 30, 5.0 FEET WEST OF A WITNESS POST.

Station Pair: DEAD - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1354.840	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1354.820			1267.294	.024	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1354.784	.131		1267.392	.066	1996	GPS - STATIC	2024	HTH108
1354.820			1267.294	.024	2011	GPS - STATIC	2024	HTH108
1354.896	.262		1267.297	.197	2011	GPS - RTRN	2023	RTRN2023
1354.866	.262		1267.268	.197	2011	GPS - RTRN	2022	RTRN2022
1354.768	.262		1267.183	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.598 12B = -87.585 09 = -87.470 03 = -87.372

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 34	22.98438	96 09	38.94616	388286.680	270510.657	.013		ADJUSTMENT	2024	GPS3689
46 34	22.98438	96 09	38.94616	388286.680	270510.657	.013	C	GPS - STATIC	2024	HTH108
46 34	22.98427	96 09	38.94601	388286.690	270510.646	.131	3	GPS - RTRN	2023	RTRN2023
46 34	22.98424	96 09	38.94553	388286.724	270510.643	.131	3	GPS - RTRN	2022	RTRN2022
46 34	22.98413	96 09	38.94594	388286.695	270510.632	.131	3	GPS - RTRN	2014	RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 34	22.98417	96 09	38.94672	388286.641	270510.636	.033	C	GPS - STATIC	2024	HTH108

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2144160.928	907500.281	845785.955	16937548.021	.013		ADJUSTMENT	2024	GPS3689		
2144160.928	907500.281	845785.955	16937548.021	.013	C	GPS - STATIC	2024	HTH108		
2144160.938	907500.270	845785.965	16937548.009	.131	3	GPS - RTRN	2023	RTRN2023		
2144160.971	907500.266	845785.998	16937548.004	.131	3	GPS - RTRN	2022	RTRN2022		
2144160.942	907500.255	845785.969	16937547.994	.131	3	GPS - RTRN	2014	RTRN2014		

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2144160.888	907500.261	845785.915	16937548.000	.033	C	GPS - STATIC	2024	HTH108		



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MAN-DR9950-3S-27JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MAN-DR9950-2-27JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MAN-DR9950-1-27JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Jul 27, 2023
	Jul 27, 2023
	Jul 27, 2023



Mn/DOT Name: MANN

NGS Name: MANN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ1979](#) [Get Map](#)
NGS Quad / Sta Num : 46096121/
USGS Quad: CORMORANT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	27	137 N	43 W	463920.54	960548.65	2	C	2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 64 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: MANN 2014

5.8 MILES NORTH OF PELICAN RAPIDS, 3.4 MILES WEST ALONG TRUNK HIGHWAY 34 FROM THE JUNCTION OF TRUNK HIGHWAYS 34 AND 59 (THE JUNCTION IS 6.0 MILES NORTH OF PELICAN RAPIDS), AT TRUNK HIGHWAY 34 MILEPOINT 15.45, 56.6 FEET SOUTH OF TRUNK HIGHWAY 34, 25.8 FEET NORTHEAST OF A RIGHT-OF-WAY POST, 1.5 FEET NORTH OF A WITNESS POST.

Station Pair: ROLLINS - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1346.959	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1346.959			1259.686	.021	2011	HORIZONTAL ADJUSTMENT	2024	GPS3671
1346.959	.131		1259.794	.066	1996	GPS - STATIC	2023	HTH9
1346.959			1259.686	.021	2011	GPS - STATIC	2023	HTH9
1347.104	.262		1259.774	.197	2011	GPS - RTRN	2022	RTRN2022

Geoid Separations(ft): GEOID18 = -87.329 12B = -87.303 09 = -87.198 03 = -87.086

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 39 20.54309	96 05 48.65039	404521.485	300573.272	.013		ADJUSTMENT			2024	GPS3671
46 39 20.54309	96 05 48.65039	404521.485	300573.272	.013	C	GPS - STATIC			2023	HTH9
46 39 20.54270	96 05 48.65130	404521.421	300573.233	.131	3	GPS - RTRN			2022	RTRN2022

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 39 20.54286	96 05 48.65077	404521.458	300573.249	.033	C	GPS - STATIC			2023	HTH9

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2160947.294	937253.541	863052.147	16967040.133	.013		ADJUSTMENT			2024	GPS3671
2160947.294	937253.541	863052.147	16967040.133	.013	C	GPS - STATIC			2023	HTH9
2160947.230	937253.503	863052.082	16967040.096	.131	3	GPS - RTRN			2022	RTRN2022

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2160947.267	937253.519	863052.120	16967040.111	.033	C	GPS - STATIC			2023	HTH9

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MANN-DQ1979-3S-13SEP2022.jpg	S	Sep 13, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MANN-DQ1979-2-13SEP2022.jpg		Sep 13, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MANN-DQ1979-1-13SEP2022.jpg		Sep 13, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MARIE MNDT

NGS Name: MARIE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R01116](#)
NGS Quad / Sta Num : 46095333/
USGS Quad: FOURMILE LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NW	32	131 N	42 W	460717.22	955954.24	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1978	2012	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	MNDT

Description: (1978) **Stamping:** MARIE 1978

9.0 MILES NORTH-NORTHWEST OF ELBOW LAKE, 6.6 MILES SOUTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94, AT TRUNK HIGHWAY 59 MILEPOINT 205.8, 44.9 FEET EAST OF TRUNK HIGHWAY 59, 16.8 FEET NORTHWEST A POWER POLE WITH A GUYWIRE, 77.76 FEET NORTH-NORTHWEST OF MARIE MNDT RM 1, 94.19 FEET EAST OF MARIE MNDT RM 2, 8.1 FEET NORTH OF A WITNESS POST. THE STATION IS A NAIL IN A CAP ON A ROD.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1236.684	.016	2/1				VERTICAL CONTROL SURVEY	2012	VTENN	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1236.448	.262		1149.476	.197	1996	GPS - RTRN	2009	RTRN2009	
1240.811	.197		1153.908	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648	

NGVD29			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1240.188						RECIPROCAL VERTICAL ANGLE	1979	HORZ	

Geoid Separations(ft): GEOID18 = -87.139 12B = -87.106 09 = -86.988 03 = -86.972

Lat/Lon and County Coordinates (Feet)

NAD83(1996)		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 07 17.22279	95 59 54.24056	428551.338	105620.324	.131	3	GPS - RTRN	2009	RTRN2009
46 07 17.22008	95 59 54.23577	428551.674	105620.048	.066	2	ADJUSTMENT	1999	17648
46 07 17.22015	95 59 54.23504	428551.726	105620.055	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 07 17.21941	95 59 54.22341	428552.544	105619.977	.066	2	ADJUSTMENT	1986	17289

NAD27		Determination Method			Project Info			
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 07 17.36585	95 59 53.02277			.100	2	CLASSICAL SURVEY	1981	16333



State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2181361.663	741914.646	880377.035	16771334.241	.131	3	GPS - RTRN	2009	RTRN2009
2181361.994	741914.364	880377.362	16771333.954	.066	2	ADJUSTMENT	1999	17648
2181362.046	741914.370	880377.413	16771333.960	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2181362.863	741914.277	880378.229	16771333.854	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1556767.665	413841.218			.100	2	CLASSICAL SURVEY	1981	16333



Mn/DOT Name: MARIE MNDT RM 1

NGS Name: MARIE RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4255](#) [Get Map](#)
NGS Quad / Sta Num : 46095333/
USGS Quad: FOURMILE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	32	131 N	42 W	460716.46	955954.07			1978	2009	NOT FOUND	Horz=? Vert=YES	NO		FLUSH	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	REFERENCE MARK DISK	MNDT

Description: (1978)

Stamping: MARIE NO 1 1978

9.0 MILES NORTH-NORTHWEST OF ELBOW LAKE, 6.6 MILES SOUTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94, AT TRUNK HIGHWAY 59 MILEPOINT 205.8, 56.3 FEET EAST OF THE CENTERLINE OF TRUNK HIGHWAY 59, 126.8 FEET EAST-SOUTHEAST OF A POWER POLE, 2.1 FEET NORTH OF A POWER POLE, 77.76 FEET SOUTH-SOUTHEAST OF STATION MARIE MNDT, 77.4 FEET SOUTH-SOUTHEAST OF A STEEL WITNESS POST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.139 12B = -87.106 09 = -86.985 03 = -86.972



Mn/DOT Name: MARIE MNDT RM 2

NGS Name: MARIE RM 2

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	32	131 N	42 W	460717.18	955955.57		

NGS ACRN: [CP4256](#)
NGS Quad / Sta Num : 46095333/
USGS Quad: FOURMILE LAKE

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1978	2009	NOT FOUND	Horz=? Vert=YES	NO		FLUSH	STEEL ROD IMBED IN MON

Monument Type
UNKNOWN

Disk Type
REFERENCE MARK DISK

Mon. Agency
MNDT

Description: (1978)

Stamping: MARIE NO 2 1978

9.0 MILES NORTH-NORTHWEST OF ELBOW LAKE, 6.6 MILES SOUTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94, AT TRUNK HIGHWAY 59 MILEPOINT 205.8, 49.3 FEET WEST OF THE CENTERLINE OF TRUNK HIGHWAY 59, 129.0 FEET WEST-NORTHWEST OF A POWER POLE, 2.8 FEET NORTH-NORTHEAST OF A POWER POLE, 94.19 FEET WEST OF STATION MARIE MNDT, 99.2 FEET WEST OF A STEEL WITNESS POST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.139 12B = -87.106 09 = -86.985 03 = -86.972



Mn/DOT Name: MARIE RESET

NGS Name: MARIE RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DO8457](#) [Get Map](#)
NGS Quad / Sta Num : 46095333/
USGS Quad: FOURMILE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	32	131 N	42 W	460717.22	955954.24	2	3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2000	2023	GOOD	Horz=NO Vert=NO	YES		RECESSED 18 IN.	STEEL SPIKE ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009)

Stamping: MARIE

9.0 MILES NORTH-NORTHWEST OF ELBOW LAKE, 6.6 MILES SOUTH ON TRUNK HIGHWAY 59 FROM THE SOUTHEAST JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94, AT TRUNK HIGHWAY 59 MILEPOINT 205.8, 44.9 FEET EAST OF TRUNK HIGHWAY 59, 16.8 FEET NORTHWEST A POWER POLE WITH A GUY WIRE, 8.1 FEET NORTH OF A WITNESS POST.

Station Notes

MONUMENT IS BURIED AND HAS BEEN ABANDONED FOR GEODETIC USE.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order</u>	<u>(/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>				<u>Year</u>	<u>Reference</u>		
1236.556	.016	2/1							VERTICAL ADJUSTMENT	2020	00000941-2		
1236.622	.016	2/1							VERTICAL ADJUSTMENT	2017	00000911		
1236.664	.016	2/1							VERTICAL ADJUSTMENT	2016	00000869		
1236.664	.016	2/1							VERTICAL ADJUSTMENT	2014	00000821		

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order</u>	<u>(/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>				<u>Year</u>	<u>Reference</u>		
1236.458	.262			1149.469	.197	2007			GPS - RTRN	2012	RTRN2012		

Geoid Separations(ft): GEOID18 = -87.139 12B = -87.106 09 = -86.988 03 = -86.972

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2007)</u>		<u>Geodetic Position</u>		<u>Latitude</u>		<u>Longitude</u>		<u>Otter Tail County</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
															<u>Year</u>	<u>Reference</u>
46 07	17.22144	95 59	54.23727	428551.569	105620.186	.131	3	GPS - RTRN							2012	RTRN2012

State Plane and UTM Coordinates (Feet)

<u>NAD83(2007)</u>		<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>UTM - Zone 15</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
													<u>Year</u>	<u>Reference</u>
2181361.892	741914.504	880377.261	16771334.096	.131	3	GPS - RTRN							2012	RTRN2012

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MARIE_RESET-DO8457-3E-01MAY2012.jpg	E	May 1, 2012
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MARIE_RESET-DO8457-2-01MAY2012.jpg		May 1, 2012
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MARIE_RESET-DO8457-1-06SEP2012.jpg		Sep 6, 2012

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MARK

NGS Name: MARK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR9951](#) [Get Map](#)
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SE	34	136 N	41 W	463240.04	954927.58	2	C	2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 54 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: MARK 2014

5.0 MILES WEST OF DENT, 5.6 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 26.0, 51.5 FEET SOUTH OF TRUNK HIGHWAY 108, 11.6 FEET WEST OF DRIVEWAY NUMBER 31904, 5.0FEET EAST OF A WITNESS POST.

Station Pair: FLAD - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u> <u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1362.684	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPPEL12

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u> <u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1362.711			1275.434	.023	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1362.678	.131		1275.529	.066	1996	GPS - STATIC	2024	HTH108
1362.711			1275.434	.023	2011	GPS - STATIC	2024	HTH108
1362.779	.262		1275.450	.197	2011	GPS - RTRN	2023	RTRN2023
1362.720	.262		1275.394	.197	2011	GPS - RTRN	2022	RTRN2022
1362.658	.262		1275.335	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.326 12B = -87.323 09 = -87.211 03 = -87.073

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u> <u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 32 40.03914	95 49 27.57633	472906.935	259785.802	.013		ADJUSTMENT	2024	GPS3689
46 32 40.03914	95 49 27.57633	472906.935	259785.802	.013	C	GPS - STATIC	2024	HTH108
46 32 40.03876	95 49 27.57615	472906.948	259785.763	.131	3	GPS - RTRN	2023	RTRN2023
46 32 40.03953	95 49 27.57658	472906.918	259785.841	.131	3	GPS - RTRN	2022	RTRN2022
46 32 40.03961	95 49 27.57672	472906.909	259785.849	.131	3	GPS - RTRN	2014	RTRN2014

<u>NAD83(1996)</u> <u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 32 40.03891	95 49 27.57686	472906.898	259785.778	.033	C	GPS - STATIC	2024	HTH108

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u> <u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2228557.507	895212.357	930002.715	16923912.168	.013		ADJUSTMENT	2024	GPS3689
2228557.507	895212.357	930002.715	16923912.168	.013	C	GPS - STATIC	2024	HTH108
2228557.519	895212.318	930002.726	16923912.129	.131	3	GPS - RTRN	2023	RTRN2023
2228557.490	895212.396	930002.699	16923912.208	.131	3	GPS - RTRN	2022	RTRN2022
2228557.481	895212.405	930002.689	16923912.216	.131	3	GPS - RTRN	2014	RTRN2014

<u>NAD83(1996)</u> <u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2228557.470	895212.334	930002.677	16923912.146	.033	C	GPS - STATIC	2024	HTH108



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MARK-DR9951-3S-31JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MARK-DR9951-2-31JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MARK-DR9951-1-31JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Jul 31, 2023
	Jul 31, 2023
	Jul 31, 2023



Mn/DOT Name: MARSHA

NGS Name: MARSHA

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DQ2699 NGS Quad / Sta Num : 46095334/ USGS Quad: DALTON	Get Map
NW	5	131 N	42 W	461144.14	955950.86	2	C		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2009	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 30 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015)

Stamping: MARSHA 2009

7.7 MILES SOUTH-SOUTHEAST OF FERGUS FALLS, 0.85 MILE SOUTH ALONG TRUNK HIGHWAY 59 FROM THE SOUTHEAST JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94 (THE JUNCTION IS 6.0 MILES SOUTH OF FERGUS FALLS) TO TRUNK HIGHWAY 59 MILEPOINT 211.35, THEN 1.05 MILES EAST ON COUNTY ROAD 82, 52.8 FEET SOUTH OF COUNTY ROAD 82, 220.0 FEET EAST OF A DRIVEWAY NUMBER 16095 (TOWNSHIP ROAD NUMBER 1157), 201.5 FEET WEST OF THE SOUTHWEST CORNER OF A COUNTY ROAD 82 BRIDGE OVER INTERSTATE HIGHWAY 94, 8.8 FEET SOUTH-SOUTHEAST OF THE SOUTHWEST CORNER OF A GUARD RAIL, 3.0 FEET WEST OF A WITNESS POST.

Station Pair: JEREMY - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1217.209	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1217.252	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1217.215	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1217.209			1129.647	.016	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1217.209			1129.647	.016	2011	GPS - STATIC	2025	HTH94B
1217.238	.262		1129.643	.197	2011	GPS - RTRN	2023	RTRN2023
1217.153	.262		1129.558	.197	2011	GPS - OPUS	2022	GPSBM
1217.252	.262		1129.657	.197	2011	GPS - RTRN	2021	RTRN2021
1217.140	.262		1129.545	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -87.595 12B = -87.595 09 = -87.457 03 = -87.408

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 11 44.13563	95 59 50.86424	428885.175	132659.212	.010				ADJUSTMENT	2025	GPS3847
46 11 44.13563	95 59 50.86424	428885.175	132659.212	.010	C			GPS - STATIC	2025	HTH94B
46 11 44.13574	95 59 50.86419	428885.179	132659.223	.131	3			GPS - RTRN	2023	RTRN2023
46 11 44.13581	95 59 50.86471	428885.142	132659.230	.131	3			GPS - OPUS	2022	GPSBM
46 11 44.13584	95 59 50.86380	428885.206	132659.233	.131	3			GPS - RTRN	2021	RTRN2021
46 11 44.13639	95 59 50.86410	428885.185	132659.288	.131	3			GPS - RTRN	2015	RTRN2015

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 11 44.13508	95 59 50.86482	428885.134	132659.156	.066				NCAT	2025	HTH94B

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2182195.860	768939.044	881635.466	16798351.193	.010		ADJUSTMENT	2025	GPS3847
2182195.860	768939.044	881635.466	16798351.193	.010	C	GPS - STATIC	2025	HTH94B
2182195.864	768939.055	881635.470	16798351.204	.131	3	GPS - RTRN	2023	RTRN2023
2182195.828	768939.063	881635.433	16798351.212	.131	3	GPS - OPUS	2022	GPSBM
2182195.892	768939.065	881635.498	16798351.213	.131	3	GPS - RTRN	2021	RTRN2021
2182195.872	768939.121	881635.479	16798351.269	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2182195.818	768938.989	881635.423	16798351.138	.066		NCAT	2025	HTH94B

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MARSHA-DQ2699-3S-15AUG2023.jpg	S	Aug 15, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MARSHA-DQ2699-2-15AUG2023.jpg		Aug 15, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MARSHA-DQ2699-1-15AUG2023.jpg		Aug 15, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MARY RM 1

NGS Name: MARY RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4260](#) [Get Map](#)
NGS Quad / Sta Num : 46095324/1035
USGS Quad: EAGLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	16	131 N	40 W	460951.84	954232.30	2		1967	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	REFERENCE MARK DISK	USGS

Description: (1967)

Stamping: MARY NO 1 1967

2.0 MILES NORTH AND 10.0 MILES WEST OF URBANK, 1.95 MILES NORTH ON TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND COUNTY ROAD 38, AT TRUNK HIGHWAY 78 MILEPOINT 13.9, 110.0 FEET WEST OF SOUTHBOUND TRUNK HIGHWAY 78, 92.0 FEET SOUTH OF A DRIVEWAY NUMBER 13947, 1.0 FOOT EAST OF A NORTH-SOUTH FENCE, 86.80 FEET NORTH OF STATION MARY USGS.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1433.383	.016	2/1				VERTICAL ADJUSTMENT	2013 00000792
1433.383	.016	2/1				VERTICAL CONTROL SURVEY	2012 VASHB

Geoid Separations(ft): GEOID18 = -87.041 12B = -87.037 09 = -86.942 03 = -86.916

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MARY_RM_1-CP4260-3SW-29JUL2009.jpg	SW	Jul 29, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MARY_RM_1-CP4260-2-29JUL2009.jpg		Jul 29, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MARY_RM_1-CP4260-1-29JUL2009.jpg		Jul 29, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MARY RM 2

NGS Name: MARY RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4261](#) [Get Map](#)
NGS Quad / Sta Num : 46095324/1035
USGS Quad: EAGLE LAKE

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
NE	16	131 N	40 W	460950.08	954232.33	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1967	2009	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	REFERENCE MARK DISK	USGS

Description: (1967)

Stamping: MARY NO 2 1967

2.0 MILES NORTH AND 10.0 MILES WEST OF URBANK, 1.95 MILES NORTH ON TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND COUNTY ROAD 38, AT TRUNK HIGHWAY 78 MILEPOINT 13.9, 270.0 FEET SOUTH OF A DRIVEWAY NUMBER 13947, 110.0 FEET WEST OF SOUTHBOUND TRUNK HIGHWAY 78, 1.0 FOOT EAST OF A NORTH-SOUTH FENCE, 91.35 FEET SOUTH OF STATION MARY USGS.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1432.307	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1432.307	.016	2/1				VERTICAL CONTROL SURVEY	2012	VASHB

Geoid Separations(ft): GEOID18 = -87.041 12B = -87.037 09 = -86.942 03 = -86.916

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MARY_RM_2-CP4261-3E-29JUL2009.jpg	E	Jul 29, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MARY_RM_2-CP4261-2-29JUL2009.jpg		Jul 29, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MARY_RM_2-CP4261-1-29JUL2009.jpg		Jul 29, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MARY USGS

NGS Name: MARY

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO1103](#) [Get Map](#)
NGS Quad / Sta Num : 46095324/1035
USGS Quad: EAGLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	16	131 N	40 W	460950.98	954232.31	2	2

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1967	2009	GOOD	Horz=NO Vert=YES	YES		PROJECTS 3 IN.	STEEL SPIKE ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (2005)

Stamping: MARY 1967

2.0 MILES NORTH AND 10.0 MILES WEST OF URBANK, 1.95 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND COUNTY ROAD 38, AT TRUNK HIGHWAY 78 MILEPOINT 13.9, 180.0 FEET SOUTH OF A DRIVEWAY NUMBER 13947, 109.6 FEET WEST OF SOUTHBOUND TRUNK HIGHWAY 78, 91.35 FEET NORTH OF MARY RM 2, 86.80 FEET SOUTH OF MARY RM 1, 2.1 FEET EAST OF A NORTH/SOUTH FENCE, 1.8 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1435.919	.016	2/1					VERTICAL ADJUSTMENT	2013	00000792	
1435.919	.016	2/1					VERTICAL CONTROL SURVEY	2012	VASHB	
1435.919	.016	2/1					VERTICAL ADJUSTMENT	2009	00000591	
1435.909	.016	2/1					VERTICAL CONTROL SURVEY	2006	VPEAK	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1436.677	.197			1349.768	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648	

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1435.988							RECIPROCAL VERTICAL ANGLE	1967	HORZ	

Geoid Separations(ft): GEOID18 = -87.041 12B = -87.037 09 = -86.942 03 = -86.916

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>					
<u>Latitude</u>	<u>Longitude</u>					<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 09 50.98079	95 42 32.30818			501949.253	121069.775	.066	2	ADJUSTMENT	1999	17648
46 09 50.98109	95 42 32.30430			501949.526	121069.805	.066	2	ADJUSTMENT	1998	17655

<u>NAD83(1986)</u>				<u>Otter Tail County</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>					
<u>Latitude</u>	<u>Longitude</u>					<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 09 50.97904	95 42 32.29790			501949.976	121069.598	.066	2	ADJUSTMENT	1986	17289

<u>NAD27</u>							<u>Determination Method</u>		<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>					
<u>Latitude</u>	<u>Longitude</u>					<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 09 51.12040	95 42 31.11829					.100	2	CLASSICAL SURVEY	1977	15945
46 09 51.14700	95 42 31.09700					.100	3	CLASSICAL SURVEY	1969	USGS-HORZ



State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255022.979	756000.639	954270.114	16784266.987	.066	2	ADJUSTMENT	1999	17648
2255023.252	756000.665	954270.389	16784267.008	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255023.699	756000.449	954270.832	16784266.785	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		<u>X</u>	<u>Y</u>	Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1630429.116	427927.080			.100	2	CLASSICAL SURVEY	1977	15945
1630430.664	427929.746			.100	3	CLASSICAL SURVEY	1969	USGS-HORZ

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MARY-RO1103-3SW-29JUL2009.jpg	SW	Jul 29, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MARY-RO1103-2-29JUL2009.jpg		Jul 29, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MARY-RO1103-1-29JUL2009.jpg		Jul 29, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MAUCK

NGS Name: MAUCK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5778](#)
NGS Quad / Sta Num : 46096224/
USGS Quad: ORWELL LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	21	132 N	44 W	461419.90	961256.73		C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2001	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MN-111

Description: Stamping: MAUCK 2001

3.5 MILES SOUTH OF FRENCH, 2.25 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS TO TRUNK HIGHWAY 210 MILEPOINT 22.01, THEN 1.2 MILES SOUTH ALONG COUNTY ROAD 86, THEN 3.4 MILES SOUTH AND WEST ALONG COUNTY ROAD 15, THEN 1.5 MILES WEST ALONG 190TH STREET, 40.0 FEET SOUTH OF 190TH STREET, 22.0 FEET NORTHEAST OF A POWER POLE WITH A GUYWIRE, BETWEEN 2 WITNESS POSTS, 1.5 FEET SOUTHWEST OF A WITNESS POST. THE ROD DEPTH IS UNKNOWN.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1086.973				998.873	.017	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1086.888	.131			999.027	.066	1996	GPS - STATIC	2024	HTH210A
1086.973				998.873	.017	2011	GPS - STATIC	2024	HTH210A
1086.979	.131			999.027	.066	1996	GPS - STATIC	2021	HOTTE
1086.970				998.873	.025	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1086.970				998.873	.025	2011	GPS - STATIC	2020	HOTTE
1086.881	.262			998.948	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.110 12B = -88.103 09 = -87.985 03 = -87.933

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>				<u>Lat/Lon and County Coordinates (Feet)</u>				<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>						<u>Year</u>	<u>Reference</u>
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>			
46 14 19.90232	96 12 56.73331	373699.022	148711.672	.010		ADJUSTMENT		2025	GPS3793
46 14 19.90232	96 12 56.73331	373699.022	148711.672	.010	C	GPS - STATIC		2024	HTH210A
46 14 19.90232	96 12 56.73331	373699.022	148711.672	.016		ADJUSTMENT		2020	GPS3384
46 14 19.90232	96 12 56.73331	373699.022	148711.672	.016	C	GPS - STATIC		2020	HOTTE

<u>NAD83(1996)</u>				<u>Lat/Lon and County Coordinates (Feet)</u>				<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>						<u>Year</u>	<u>Reference</u>
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>			
46 14 19.90199	96 12 56.73382	373698.986	148711.639	.033	C	GPS - STATIC		2024	HTH210A
46 14 19.90199	96 12 56.73382	373698.986	148711.639	.033	C	GPS - STATIC		2021	HOTTE
46 14 19.90277	96 12 56.73438	373698.946	148711.719	.131	3	GPS - RTRN		2009	RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>				<u>State Plane and UTM Coordinates (Feet)</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>						<u>Year</u>	<u>Reference</u>
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>			
2127323.672	786007.933	827017.582	16816287.576	.010		ADJUSTMENT		2025	GPS3793
2127323.672	786007.933	827017.582	16816287.576	.010	C	GPS - STATIC		2024	HTH210A
2127323.672	786007.933	827017.582	16816287.576	.016		ADJUSTMENT		2020	GPS3384
2127323.672	786007.933	827017.582	16816287.576	.016	C	GPS - STATIC		2020	HOTTE

<u>NAD83(1996)</u>				<u>State Plane and UTM Coordinates (Feet)</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>						<u>Year</u>	<u>Reference</u>
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>			
2127323.635	786007.901	827017.545	16816287.544	.033	C	GPS - STATIC		2024	HTH210A
2127323.635	786007.901	827017.545	16816287.544	.033	C	GPS - STATIC		2021	HOTTE
2127323.598	786007.981	827017.509	16816287.624	.131	3	GPS - RTRN		2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MAUCK-DR5778-3S-21FEB2024.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MAUCK-DR5778-2-21FEB2024.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MAUCK-DR5778-1-21FEB2024.jpg

<u>Dir</u>	<u>Date</u>
S	Feb 21, 2024
	Feb 21, 2024
	Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MAYNARD

NGS Name: MAYNARD

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096223/
USGS Quad: STONY LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	34	131 N	44 W	460631.16	961100.63		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
	2010	DESTROYED	Horz=NO Vert=NO	YES		RECESSED 4 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE)	METAL ROD	MNDT

Description: (2010)

Stamping: MAYNARD 1999

5.0 MILES NORTH ALONG COUNTY ROAD 11 FROM THE JUNCTION OF COUNTY ROAD 11 AND TRUNK HIGHWAY 55 IN WENDELL, THEN 4.0 MILES WEST ON COUNTY ROAD 26, 51.1 FEET WEST OF COUNTY ROAD 15, 49.9 FEET NORTH OF COUNTY ROAD 26, 1.8 FEET WEST OF A RIGHT-OF-WAY POST, 1.0 FOOT NORTHEAST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj			Year	Reference
1085.444	.262		998.449	.197	1996	GPS - RTRN		2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.175 12B = -87.119 09 = -87.004 03 = -86.995

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Determination Method		Project Info	
Latitude	Longitude	X	Y	Acc	Order	Year	Reference
46 06 31.15780	96 11 00.62949	381580.144	101175.898	.131	3	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method		Project Info	
X	Y	X	Y	Acc	Order	Year	Reference
2134322.701	738340.904	833270.360	16768496.339	.131	3	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MAYNARD-3N-01NOV2010.jpg	N	Nov 1, 2010
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MAYNARD-2-01NOV2010.jpg		Nov 1, 2010
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MAYNARD-1-01NOV2010.jpg		Nov 1, 2010

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MAYNARD RESET

NGS Name: MAYNARD RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DP4330](#)
NGS Quad / Sta Num : 46096223/
USGS Quad: STONY LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	34	131 N	44 W	460631.16	961100.63		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2010) **Stamping:** MAYNARD 1999 2009

5.0 MILES NORTH ALONG COUNTY ROAD 11 FROM THE JUNCTION OF COUNTY ROAD 11 AND TRUNK HIGHWAY 55 IN WENDELL, THEN 4.0 MILES WEST ON COUNTY ROAD 26, 51.1 FEET WEST OF COUNTY ROAD 15, 49.9 FEET NORTH OF COUNTY ROAD 26, 1.8 FEET WEST OF A RIGHT-OF-WAY POST, 1.0 FOOT NORTHEAST OF A WITNESS POST.

Station Notes

THIS IS A RESET OF DISTRICT 4 STATION MAYNARD.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj			Year	Reference
1085.565	.131		998.525	.066	1996	GPS - STATIC		2021	HOTTE
1085.497			998.358	.018	2011	HORIZONTAL ADJUSTMENT		2020	GPS3384
1085.497			998.358	.018	2011	GPS - STATIC		2020	HOTTE
1085.493			998.358	.026	2011	HORIZONTAL ADJUSTMENT		2014	GPS3028
1085.569	.131		998.525	.066	1996	GPS - STATIC		2014	HGRAN
1085.493			998.358	.026	2011	GPS - STATIC		2014	HGRAN

Geoid Separations(ft): GEOID18 = -87.175 12B = -87.119 09 = -87.004 03 = -86.995

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 06 31.15867	96 11 00.62945	381580.147	101175.986	.013		ADJUSTMENT	2020	GPS3384
46 06 31.15867	96 11 00.62945	381580.147	101175.986	.013	C	GPS - STATIC	2020	HOTTE
46 06 31.15867	96 11 00.62945	381580.147	101175.986	.020		ADJUSTMENT	2014	GPS3028
46 06 31.15867	96 11 00.62945	381580.147	101175.986	.020	C	GPS - STATIC	2014	HGRAN

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 06 31.15810	96 11 00.63035	381580.084	101175.929	.033	C	GPS - STATIC	2021	HOTTE
46 06 31.15810	96 11 00.63035	381580.084	101175.929	.033	C	GPS - STATIC	2014	HGRAN

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2134322.706	738340.992	833270.367	16768496.427	.013		ADJUSTMENT	2020	GPS3384
2134322.706	738340.992	833270.367	16768496.427	.013	C	GPS - STATIC	2020	HOTTE
2134322.706	738340.992	833270.367	16768496.427	.020		ADJUSTMENT	2014	GPS3028
2134322.706	738340.992	833270.367	16768496.427	.020	C	GPS - STATIC	2014	HGRAN

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2134322.641	738340.936	833270.301	16768496.371	.033	C	GPS - STATIC	2021	HOTTE
2134322.641	738340.936	833270.301	16768496.371	.033	C	GPS - STATIC	2014	HGRAN



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MAYNARD_RESET-DP4330-3N-08OCT2014.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MAYNARD_RESET-DP4330-2-08OCT2014.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MAYNARD_RESET-DP4330-1-08OCT2014.jpg

<u>Dir</u>	<u>Date</u>
N	Oct 8, 2014
	Oct 8, 2014
	Oct 8, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MC ARTER

NGS Name: MC ARTER

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	15	137 N	40 W	464112.75	954351.96		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1999	2009	GOOD	Horz=YES Vert=YES	NO		RECESSED 3 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (1999)

Stamping: MC ARTER 1999

4.2 MILES NORTHWEST OF VERGAS, 4.5 MILES NORTH AND EAST ALONG TRUNK HIGHWAY 228 FROM THE JUNCTION OF TRUNK HIGHWAY 228, COUNTY ROAD 4 AND COUNTY ROAD 17 NORTH IN VERGAS, TO TRUNK HIGHWAY 228 MILEPOINT 4.5, THEN 1.25 MILES NORTH ALONG 370TH AVENUE, THEN 0.25 MILE WEST ALONG 493RD STREET, THEN 0.75 MILE NORTH ALONG 368TH AVENUE, THEN 0.25 MILE WEST ALONG 500TH STREET, 55.0 FEET SOUTH OF 500TH STREET, 55.0 FEET EAST OF EXTENDED 365TH AVENUE, 42.0 FEET WEST OF A POWER POLE WITH TWO GUY WIRES, 1.0 FOOT WEST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1415.128	.262		1328.140	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.211 12B = -87.208 09 = -87.116 03 = -86.988

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 41 12.74686	95 43 51.95715	496377.474	311712.091	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2252982.408	946688.763	955251.551	16975003.586	.131	3	GPS - RTRN	2009	RTRN2009



Mn/DOT Name: MCCOY

NGS Name: MCCOY

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2057](#)
NGS Quad / Sta Num : 46095434/
USGS Quad: LAKE FRANKLIN

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	14	137 N	42 W	464054.34	955701.47	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 14 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) **Stamping:** MCCOY 2014

9.8 MILES NORTHEAST OF PELICAN RAPIDS, 11.0 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAYS 59 AND 108 WEST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 251.65, 52.0 FEET NORTHWEST OF TRUNK HIGHWAY 59, 1.5 FEET SOUTHEAST OF A WITNESS POST.

Station Pair: MUNDT - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1463.314	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1463.314			1376.221	.022	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672	
1463.314	.131		1376.326	.066	1996	GPS - STATIC	2023	HTH59	
1463.314			1376.221	.022	2011	GPS - STATIC	2023	HTH59	
1463.373	.262		1376.175	.197	2011	GPS - RTRN	2022	RTRN2022	
1463.311	.262		1376.126	.197	2011	GPS - RTRN	2014	RTRN2014	

Geoid Separations(ft): GEOID18 = -87.198 12B = -87.185 09 = -87.100 03 = -86.945

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position		Otter Tail County		Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year
46 40 54.33860	95 57 01.47413	441325.806	309933.413	.013		ADJUSTMENT	2024
46 40 54.33860	95 57 01.47413	441325.806	309933.413	.013	C	GPS - STATIC	2023
46 40 54.33833	95 57 01.47477	441325.762	309933.386	.131	3	GPS - RTRN	2022
46 40 54.33902	95 57 01.47433	441325.793	309933.456	.131	3	GPS - RTRN	2014

NAD83(1996)		Geodetic Position		Otter Tail County		Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year
46 40 54.33838	95 57 01.47462	441325.772	309933.391	.033	C	GPS - STATIC	2023

State Plane and UTM Coordinates (Feet)

NAD83(2011)		MN State Plane - Central Zone		UTM - Zone 15		Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year
2197914.016	945929.721	900164.859	16975125.950	.013		ADJUSTMENT	2024
2197914.016	945929.721	900164.859	16975125.950	.013	C	GPS - STATIC	2023
2197913.971	945929.695	900164.814	16975125.925	.131	3	GPS - RTRN	2022
2197914.003	945929.764	900164.847	16975125.993	.131	3	GPS - RTRN	2014

NAD83(1996)		MN State Plane - Central Zone		UTM - Zone 15		Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year
2197913.981	945929.700	900164.824	16975125.929	.033	C	GPS - STATIC	2023



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MCCOY-DQ2057-3NW-12OCT2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MCCOY-DQ2057-2-12OCT2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MCCOY-DQ2057-1-12OCT2022.jpg

<u>Dir</u>	<u>Date</u>
NW	Oct 12, 2022
	Oct 12, 2022
	Oct 12, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MINERAL MNDT

NGS Name: MINERAL

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0968](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	18	131 N	42 W	460938.13	960107.44		2	1978	2009	DESTROYED	Horz=NO Vert=NO	NO			STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MNDT

Description: (1978) Stamping: MINERAL 1978

9.0 MILES SOUTH-SOUTHEAST OF FERGUS FALLS, AT TRUNK HIGHWAY 59 MILEPOINT 209, 3.3 MILES SOUTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94, 13.0 FEET EAST OF A GRAVEL ROAD, 91.5 FEET SOUTH-SOUTHWEST OF TRUNK HIGHWAY 59, 82.5 FEET SOUTH-SOUTHEAST OF A POWER POLE, 47.2 FEET SOUTHWEST OF A WITNESS POST, 44.51 FEET SOUTHWEST OF MINERAL MNDT RM 1, 57.81 FEET NORTHWEST OF MINERAL MNDT RM 2, IN 1996, A DISTRICT 4 SURVEY CREW SEARCHED FOR AND COULD NOT FIND THE STATION.

Station Notes

5/21/84 THE MARK NEEDS SOME MARK MAINTENANCE.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order/(Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1237.202	.197		1150.109	.131	1996	HORIZONTAL ADJUSTMENT		1999	17648

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order/(Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1236.513						RECIPROCAL VERTICAL ANGLE		1979	HORZ

Geoid Separations(ft): GEOID18 = -87.329 12B = -87.326 09 = -87.178 03 = -87.159

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 09 38.13383	96 01 07.43584	423449.601	119914.375	.066	2	ADJUSTMENT	1999	17648
46 09 38.13387	96 01 07.43533	423449.637	119914.379	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 09 38.13287	96 01 07.42353	423450.467	119914.274	.066	2	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>							<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 09 38.28068	96 01 06.21907			.100	2	CLASSICAL SURVEY	1981	16333

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2176526.062	756298.724	875765.953	16785797.210	.066	2	ADJUSTMENT	1999	17648
2176526.098	756298.728	875765.989	16785797.213	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2176526.926	756298.608	875766.815	16785797.080	.066	2	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - Central Zone</u>							<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1551931.786	428225.583			.100	2	CLASSICAL SURVEY	1981	16333



Mn/DOT Name: MINERAL MNDT AZ MK

NGS Name: MINERAL AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0969](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	18	131 N	42 W	460921.65	960108.18		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1978	2009	NOT FOUND	Horz=? Vert=YES	NO		FLUSH	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	AZIMUTH MARK DISK	MNDT

Description: (1978)

Stamping: MINERAL 1978

9.5 MILES SOUTH-SOUTHEAST OF FERGUS FALLS, 3.3 MILES SOUTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94, THEN 0.5 MILE SOUTH ON A GRAVEL ROAD, 14.5 FEET EAST OF A GRAVEL ROAD, 13.0 FEET NORTH OF AN ENTRANCE, 128.0 FEET NORTH-NORTHWEST OF A POWER POLE, 80.0 FEET SOUTH-SOUTHWEST OF A POWER POLE, 79.7 FEET SOUTH-SOUTHWEST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1234.249	.262			1147.186	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648	

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1233.593							RECIPROCAL VERTICAL ANGLE	1979	HORZ	

Geoid Separations(ft): GEOID18 = -87.296 12B = -87.293 09 = -87.149 03 = -87.129

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 09	21.65471	96 01	08.17799	423390.977	118245.151	.131	3	ADJUSTMENT	1999	17648
46 09	21.65475	96 01	08.17746	423391.015	118245.155	.131	3	ADJUSTMENT	1998	17655

<u>NAD83(1986)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 09	21.65377	96 01	08.16564	423391.846	118245.052	.131	3	ADJUSTMENT	1986	17289

<u>NAD27</u>		<u>Geodetic Position</u>		<u>Determination Method</u>			<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Reference</u>
46 09	21.80154	96 01	06.96129			.100	3	CLASSICAL SURVEY

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2176436.562	754631.099	875650.265	16784130.626	.131	3	ADJUSTMENT	1999	17648		
2176436.599	754631.102	875650.303	16784130.628	.131	3	ADJUSTMENT	1998	17655		

<u>NAD83(1986)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2176437.429	754630.984	875651.131	16784130.497	.131	3	ADJUSTMENT	1986	17289		

<u>NAD27</u>		<u>MN State Plane - Central Zone</u>		<u>Determination Method</u>			<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Reference</u>
1551842.286	426557.964					.100	3	CLASSICAL SURVEY



Mn/DOT Name: MINERAL MNDT RM 1

NGS Name: MINERAL RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4289](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	18	131 N	42 W	460938.00	960107.00			1978	2009	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (1978) **Stamping:** MINERAL NO 1 1978

9.0 MILES SOUTH-SOUTHEAST OF FERGUS FALLS, AT TRUNK HIGHWAY 59 MILEPOINT 209, 3.3 MILES SOUTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94, 47.5 FEET EAST OF THE CENTER OF A GRAVEL ROAD, 49.0 FEET SOUTH-SOUTHWEST OF THE CENTERLINE OF TRUNK HIGHWAY 59, 89.6 FEET EAST-SOUTHEAST OF A POWER POLE, 4.3 FEET SOUTH-SOUTHWEST OF A STEEL WITNESS POST.

Station Notes

THE TIES FALL IN A FIELD.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.326 12B = -87.326 09 = -87.178 03 = -87.159



Mn/DOT Name: MINERAL MNDT RM 2

NGS Name: MINERAL RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4290](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	18	131 N	42 W	460938.00	960107.00			1978	2009	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (1978) **Stamping:** MINERAL NO 2 1978

9.0 MILES SOUTH-SOUTHEAST OF FERGUS FALLS, AT TRUNK HIGHWAY 59 MILEPOINT 209, 3.3 MILES SOUTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94, 49.0 FEET EAST OF THE CENTER OF A GRAVEL ROAD, 73.5 FEET SOUTH-SOUTHWEST OF THE CENTERLINE OF TRUNK HIGHWAY 59, 72.4 FEET NORTH-NORTHEAST OF RIGHT-OF-WAY MONUMENT STATION 690+00, 79.4 FEET SOUTH OF A STEEL WITNESS POST.

Station Notes

THE TIES FALL IN A FIELD.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.326 12B = -87.326 09 = -87.178 03 = -87.159



Mn/DOT Name: MINK

NGS Name: MINK

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DR5780 Get Map
NW	29	137 N	40 W	463928.11	954555.82		C	NGS Quad / Sta Num : 46095431/ USGS Quad: VERGAS

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 109 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014)

Stamping: MINK 2014

1.75 MILES EAST OF VERGAS, 1.6 MILES SOUTHEAST ALONG TRUNK HIGHWAY 228 FROM THE JUNCTION OF TRUNK HIGHWAY 228 AND THE NORTH JUNCTION OF COUNTY ROAD 4 IN VERGAS, AT TRUNK HIGHWAY 228 MILEPOINT 2.5, 56.1 FEET SOUTH OF TRUNK HIGHWAY 228, 0.15 MILE EAST OF JOLLY FISHERMAN ROAD, 17.0 FEET WEST OF A FIELD ENTRANCE, 5.0 FEET EAST OF A WITNESS POST.

Station Pair: 5626 A - OTTER TAIL, MN

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1378.947	.131		1292.025	.066	1996	GPS - STATIC		2021	HOTTE
1378.987			1291.874	.022	2011	HORIZONTAL ADJUSTMENT		2020	GPS3384
1378.987			1291.874	.022	2011	GPS - STATIC		2020	HOTTE

Geoid Separations(ft): GEOID18 = -87.126 12B = -87.123 09 = -87.021 03 = -86.890

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 39 28.11005	95 45 55.81713	487735.236	301114.244	.016		ADJUSTMENT	2020	GPS3384
46 39 28.11005	95 45 55.81713	487735.236	301114.244	.016	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 39 28.10972	95 45 55.81764	487735.200	301114.210	.033	C	GPS - STATIC	2021	HOTTE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2244146.513	936254.036	946248.117	16964709.367	.016		ADJUSTMENT	2020	GPS3384
2244146.513	936254.036	946248.117	16964709.367	.016	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2244146.476	936254.004	946248.080	16964709.335	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MINK-DR5780-3S-04NOV2014.jpg	S	Nov 4, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MINK-DR5780-2-04NOV2014.jpg		Nov 4, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MINK-DR5780-1-04NOV2014.jpg		Nov 4, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MINN 1338

NGS Name: MINN 1338

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>						
SW	20	133 N	40 W	461840.00	954456.00			1910	2009	DESTROYED	Horz=NO Vert=NO	NO			MARK IS STEEL PIPE						
<table><thead><tr><th><u>Monument Type</u></th><th><u>Disk Type</u></th><th><u>Mon. Agency</u></th></tr></thead><tbody><tr><td>IRON POST</td><td>SURVEY DISK</td><td>CGS</td></tr></tbody></table>																<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>	IRON POST	SURVEY DISK	CGS
<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>																			
IRON POST	SURVEY DISK	CGS																			

Description: (2008)

Stamping: 1338

2.7 MILES NORTHWEST OF BATTLE LAKE, 4.3 MILES WEST, THEN NORTH ON COUNTY HIGHWAY 83 FROM THE JUNCTION OF COUNTY HIGHWAY 83 AND TRUNK HIGHWAY 78 IN BATTLE LAKE, THEN 0.5 MILE EAST ON NORTH SILVER LAKE ROAD, 20.0 FEET EAST AND 25.0 FEET NORTH OF THE SOUTHWEST CORNER OF THE SOUTHEAST QUARTER OF SECTION 20.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1386.775	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.818 12B = -87.825 09 = -87.716 03 = -87.595

* No Horizontal Positions in the Database *



Mn/DOT Name: MINN 1339

NGS Name: 1339

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	14	135 N	44 W	463051.00	961037.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1930	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON POST

Disk Type
BENCH MARK DISK

Mon. Agency
USGS

Description:

Stamping: 1339

4.2 MILES NORTHWEST ERHARD, 2.6 MILES NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 24 IN ERHARD, THEN 4.5 MILES WEST ON TRUNK HIGHWAY 28, 30.0 FEET SOUTH AND 50.0 FEET WEST OF THE CROSSROADS.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.920 12B = -87.897 09 = -87.798 03 = -87.710



Mn/DOT Name: MINN 1343

NGS Name: MINN 1343

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095314/
USGS Quad: WALKER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	11	134 N	40 W	462624.00	954154.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1910	2009	NOT FOUND	Horz=? Vert=YES	NO			MARK IS STEEL PIPE

Monument Type

IRON POST

Disk Type

SURVEY DISK

Mon. Agency

CGS

Description: (2008)

Stamping: 1343

3.0 MILES NORTHEAST OF AMOR, 2.5 MILES EAST ON COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND LARSON ROAD IN AMOR, THEN 1.5 MILES NORTH ON COUNTY ROAD 14 TO A TEE-ROAD EAST NEAR THE DEAD RIVER.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1341.126	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.936 12B = -87.933 09 = -87.798 03 = -87.674

* No Horizontal Positions in the Database *



Mn/DOT Name: MINN 1345

NGS Name: 1345

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	4	133 N	41 W	462118.00	955142.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
	2009	DESTROYED	Horz=NO Vert=NO	NO			MARKER IS STEEL ROD

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON POST	SEE DESCRIPTION	USGS

Description: Stamping: 1345

NEAR THE SOUTHWEST CORNER OF SECTION 4, ON THE EAST SIDE OF A ROAD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1343.445	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.081 12B = -88.094 09 = -87.976 03 = -87.821

* No Horizontal Positions in the Database *



Mn/DOT Name: MINN USGS

NGS Name: MINN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9852](#)
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	31	136 N	40 W	463320.64	954649.44	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1900	2023	GOOD	Horz=NO Vert=YES	YES		PROJECTS 4 IN.	MARK IS STEEL PIPE

Monument Type	Disk Type	Mon. Agency
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	PIPE CAP	USGS

Description: (2005)

Stamping: MINN 1384

3.0 MILES WEST OF DENT, 2.9 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND A RAILROAD CROSSING IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 28.6, 74.3 FEET NORTH OF TRUNK HIGHWAY 108, 112.6 FEET EAST OF ENGSTROM BEACH ROAD, 15.6 FEET EAST OF A TELEPHONE PEDESTAL NUMBER 19W6, 9.1 FEET EAST OF THE CENTER OF A MANHOLE COVER, 1.0 FOOT SOUTH OF A WITNESS POST.

Station Notes

DUE TO TREE COVER, THIS SURVEY MARK HAS BEEN ABANDONED FOR MNDOT GEODETIC HORIZONTAL SURVEYS.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1383.272	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPOLI2
1383.272	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1383.281	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1383.298	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPOLI

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1382.300	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1383.462	.262		1296.221	.197	2011	GPS - RTRN	2023	RTRN2023

Geoid Separations(ft): GEOID18 = -87.241 12B = -87.237 09 = -87.129 03 = -87.014

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 33 20.63524	95 46 49.43965	483964.604	263886.709	.131	3	GPS - RTRN	2023	RTRN2023

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2239687.802	899107.338	941196.278	16927630.332	.131	3	GPS - RTRN	2023	RTRN2023

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MINN-DG9852-3N-31JUL2023.jpg	N	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MINN-DG9852-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MINN-DG9852-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MNCORS FRGF FERGUS FALLS ARP

NGS Name: FERGUS FALLS CORS ARP

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DK6505](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	2	132 N	43 W	461624.94	960320.67	3	A

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2004	2013	GOOD	Horz=YES Vert=?	YES		FLUSH	NO MAG MATERIAL

Monument Type

SEE DESCRIPTIVE TEXT

Disk Type

SEE DESCRIPTION

Mon. Agency

MNDT

Description: (2012)

Stamping:

0.5 MILE SOUTHEAST OF FERGUS FALLS, 0.2 MILE NORTH-NORTHWEST ALONG COUNTY ROAD 82 FROM THE JUNCTION OF COUNTY ROAD 82 AND TRUNK HIGHWAY 210 IN FERGUS FALLS, THEN 0.1 MILE SOUTHEAST ALONG DOUGLAS AVENUE, AT THE MINNESOTA DEPARTMENT OF TRANSPORTATION BUILDING, ON THE ROOF ON THE WEST SIDE OF THE BUILDING, STATION MNCORS FRGF FERGUS FALLS ARP IS A BRASS PLUG ON THE TOP OF THE ANTENNA MOUNT.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1241.894	.033	3				NON-RECIPROCAL VERTICAL ANGLE	2004 VTRIG1

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1241.861			1153.731	.005	2011	HORIZONTAL ADJUSTMENT	2026	GPS3900
1241.861			1153.731	.005	2011	GPS - STATIC	2026	HTH55N
1241.861			1153.731	.005	2011	HORIZONTAL ADJUSTMENT	2026	GPS3884
1241.861			1153.731	.005	2011	GPS - STATIC	2026	HTH55S
1241.861			1153.731	.007	2011	HORIZONTAL ADJUSTMENT	2025	GPS3860
1241.861			1153.718	.006	2011	HORIZONTAL ADJUSTMENT	2025	GPS3854
1241.861			1153.718	.004	2011	HORIZONTAL ADJUSTMENT	2025	GPS3851
1241.674			1153.718	.007	2011	HORIZONTAL ADJUSTMENT	2025	GPS3838
1241.861			1153.718	.006	2011	HORIZONTAL ADJUSTMENT	2025	GPS3848
1241.861			1153.718	.004	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1241.861			1153.718	.005	2011	HORIZONTAL ADJUSTMENT	2025	GPS3842
1241.861			1153.731	.007	2011	GPS - STATIC	2025	HTH29A1
1241.861			1153.718	.006	2011	GPS - STATIC	2025	HWAHP
1241.861			1153.718	.004	2011	GPS - STATIC	2025	HTH28B
1241.861			1153.718	.006	2011	GPS - STATIC	2025	HTH28A
1241.861			1153.718	.004	2011	GPS - STATIC	2025	HTH94B
1241.861			1153.718	.005	2011	GPS - STATIC	2025	HTH27
1241.871			1153.718	.006	2011	GPS - STATIC	2025	HWHEAT
1241.861			1153.718	.007	2011	HORIZONTAL ADJUSTMENT	2025	GPS3805
1241.861			1153.718	.007	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1241.707	.131		1153.846	.066	1996	GPS - STATIC	2025	HTH94A
1241.861			1153.718	.007	2011	GPS - STATIC	2025	HTH94A
1241.861			1153.718	.007	2011	HORIZONTAL ADJUSTMENT	2024	GPS3782
1241.861			1153.718	.008	2011	HORIZONTAL ADJUSTMENT	2024	GPS3764
1241.799	.131		1153.846	.066	1996	GPS - STATIC	2024	HTH210A
1241.861			1153.718	.007	2011	GPS - STATIC	2024	HTH210A
1241.861			1153.718	.006	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1241.802	.131		1153.846	.066	1996	GPS - STATIC	2024	HTH210B
1241.861			1153.718	.007	2011	GPS - STATIC	2024	HTH210B
1241.802	.131		1153.846	.066	1996	GPS - STATIC	2024	HTH78B
1241.861			1153.718	.006	2011	GPS - STATIC	2024	HTH78B
1241.799	.131		1153.846	.066	1996	GPS - STATIC	2024	HTH78A
1241.861			1153.718	.008	2011	GPS - STATIC	2024	HTH78A
1241.861			1153.718	.006	2011	HORIZONTAL ADJUSTMENT	2024	GPS3840
1241.674			1153.718	.007	2011	GPS - STATIC	2024	HENLOE
1241.861			1153.718	.009	2011	HORIZONTAL ADJUSTMENT	2024	GPS3738
1241.861			1153.718	.009	2011	GPS - STATIC	2024	HMNARP1
1241.861			1153.718	.007	2011	HORIZONTAL ADJUSTMENT	2024	GPS3731
1241.772	.131		1153.846	.066	1996	GPS - STATIC	2024	H23WADE
1241.861			1153.718	.007	2011	GPS - STATIC	2024	H23WADE
			1153.718	.009	2011	HORIZONTAL ADJUSTMENT	2024	GPS3719
			1153.718	.009	2011	HORIZONTAL ADJUSTMENT	2024	GPS3715
1241.733	.131		1153.846	.066	1996	GPS - STATIC	2024	HMOFA1
1241.727			1153.718	.009	2011	GPS - STATIC	2024	HMOFA1
1241.618			1153.718	.009	2011	GPS - STATIC	2024	HMOFA2
1241.605	.131		1153.846	.066	1996	GPS - STATIC	2024	HMOFA2
1241.861			1153.718	.009	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
			1153.718	.009	2011	HORIZONTAL ADJUSTMENT	2024	GPS3674
1241.861			1153.718	.007	2011	HORIZONTAL ADJUSTMENT	2024	GPS3671
1241.861			1153.718	.007	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1241.795	.131		1153.735	.066	1996	GPS - STATIC	2024	HTH108
1241.861			1153.718	.009	2011	GPS - STATIC	2024	HTH108
1241.799	.131		1153.846	.066	1996	GPS - STATIC	2023	HTH59
1241.720	.131		1153.846	.066	1996	GPS - STATIC	2023	HTH9
1241.861			1153.718	.007	2011	GPS - STATIC	2023	HTH9
1241.861			1153.718	.007	2011	GPS - STATIC	2023	HTH59
1241.671			1153.718	.009	2011	GPS - STATIC	2023	HMOFA3
1241.661	.131		1153.846	.066	1996	GPS - STATIC	2023	HMOFA3



1241.861		1153.718	.007	2011	HORIZONTAL ADJUSTMENT	2023	GPS3614
1241.812	.131	1153.846	.066	1996	GPS - STATIC	2023	HPONS
1241.861		1153.718	.007	2011	GPS - STATIC	2023	HPONS
1241.861		1153.718	.013	2011	HORIZONTAL ADJUSTMENT	2022	GPS3507
1241.782	.131	1153.846	.066	1996	GPS - STATIC	2022	H21MORRSE
1241.861		1153.718	.013	2011	GPS - STATIC	2022	H21MORRSE
		1153.715	.006	2011	HORIZONTAL ADJUSTMENT	2019	CORS-MYCS2
1241.864		1153.695	.006	2011	HORIZONTAL ADJUSTMENT	2018	GPS3119
1241.815	.131	1153.846	.066	1996	GPS - STATIC	2017	HMNCORS07
1241.864		1153.695	.006	2011	GPS - STATIC	2017	HMNPH
		1153.695	.009	2011	HORIZONTAL ADJUSTMENT	2017	GPS3174
1241.809	.131	1153.925	.066	1996	GPS - STATIC	2017	HFRAZ
1241.854		1153.695	.009	2011	GPS - STATIC	2017	HFRAZ
		1153.590	.002	2011	GPS - STATIC	2015	HMNCORS15
		1153.695	.035	2011	HORIZONTAL ADJUSTMENT	2015	GPS3080
1241.894	.131	1153.925	.066	1996	GPS - STATIC	2015	HWILK
1241.992		1153.813	.035	2011	GPS - STATIC	2015	HWILK
		1153.695	.040	2011	HORIZONTAL ADJUSTMENT	2015	GPS3061
		1153.695	.038	2011	HORIZONTAL ADJUSTMENT	2014	GPS3028
1241.799	.131	1153.754	.066	1996	GPS - STATIC	2014	HGRAN
1241.897		1153.685	.038	2011	GPS - STATIC	2014	HGRAN
1241.900		1153.705	.040	2011	GPS - STATIC	2014	HDOUG
1241.877		1153.695	.013	2011	HORIZONTAL ADJUSTMENT	2013	GPS2968
		1153.695	.032	2011	HORIZONTAL ADJUSTMENT	2013	GPS2963
1241.802	.131	1153.856	.066	1996	GPS - STATIC	2013	HGEOR
1241.900		1153.725	.032	2011	GPS - STATIC	2013	HGEOR
1241.700	.131	1153.754	.066	1996	GPS - STATIC	2013	HWDNA
1241.877		1153.728	.013	2011	GPS - STATIC	2013	HWDNA
		1153.695	.035	2011	HORIZONTAL ADJUSTMENT	2013	GPS2956
1241.871	.131	1153.925	.066	1996	GPS - STATIC	2013	HHOFF
1241.746		1153.626	.035	2011	GPS - STATIC	2013	HHOFF
1241.861	.098	1153.695	.049	2011	GPS - STATIC	2012	HMNCORS05
		1153.695	.000	2011	HORIZONTAL ADJUSTMENT	2012	CORS-MYCS
		1153.695	.000	2011	HORIZONTAL ADJUSTMENT	2011	CORS4512
1241.828	.098	1153.731	.049	2007	HORIZONTAL ADJUSTMENT	2011	GPS2806
1241.828	.098	1153.731	.049	2007	GPS - STATIC	2011	HBMN3
		1153.731	.049	2007	HORIZONTAL ADJUSTMENT	2010	GPS2697
1241.795	.098	1153.731	.049	2007	GPS - STATIC	2010	HBMN2
		1153.731	.000	2007	HORIZONTAL ADJUSTMENT	2008	CORS2679
1241.894	.098	1153.735	.049	1996	GPS - STATIC	2006	HMNCORS02
1241.894	.098	1153.787	.049	1996	GPS - STATIC	2005	HMNCORS01

Geoid Separations(ft): GEOID18 = -88.153 12B = -88.153 09 = -88.035 03 = -87.946



Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 16 24.93627	96 03 20.66713	414247.463	161163.844	.003		ADJUSTMENT	2026	GPS3900
46 16 24.93627	96 03 20.66713	414247.463	161163.844	.003	C	GPS - STATIC	2026	HTH55N
46 16 24.93627	96 03 20.66713	414247.463	161163.844	.003		ADJUSTMENT	2026	GPS3884
46 16 24.93627	96 03 20.66713	414247.463	161163.844	.003	C	GPS - STATIC	2026	HTH55S
46 16 24.93627	96 03 20.66713	414247.463	161163.844	.003		ADJUSTMENT	2025	GPS3860
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003		ADJUSTMENT	2025	GPS3854
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003		ADJUSTMENT	2025	GPS3851
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003		ADJUSTMENT	2025	GPS3838
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003		ADJUSTMENT	2025	GPS3848
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003		ADJUSTMENT	2025	GPS3847
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003		ADJUSTMENT	2025	GPS3842
46 16 24.93627	96 03 20.66713	414247.463	161163.844	.003	C	GPS - STATIC	2025	HTH29A1
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003	C	GPS - STATIC	2025	HWAHP
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003	C	GPS - STATIC	2025	HTH28B
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003	C	GPS - STATIC	2025	HTH28A
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003	C	GPS - STATIC	2025	HTH94B
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003	C	GPS - STATIC	2025	HTH27
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003		ADJUSTMENT	2025	HWHEAT
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003		ADJUSTMENT	2025	GPS3805
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003	C	GPS - STATIC	2025	HTH94A
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003		ADJUSTMENT	2024	GPS3782
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003		ADJUSTMENT	2024	GPS3764
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003	C	GPS - STATIC	2024	HTH210A
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003		ADJUSTMENT	2024	GPS3771
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003	C	GPS - STATIC	2024	HTH210B
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003	C	GPS - STATIC	2024	HTH78B
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003	C	GPS - STATIC	2024	HTH78A
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003		ADJUSTMENT	2024	GPS3840
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003	C	GPS - STATIC	2024	HENLOE
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003		ADJUSTMENT	2024	GPS3738
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003	C	GPS - STATIC	2024	HMNARP1
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.007		ADJUSTMENT	2024	GPS3731
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.007	C	GPS - STATIC	2024	H23WADE
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003		ADJUSTMENT	2024	GPS3719
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.007		ADJUSTMENT	2024	GPS3715
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003	C	GPS - STATIC	2024	HMOFA1
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.007	C	GPS - STATIC	2024	HMOFA2
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003		ADJUSTMENT	2024	GPS3689
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003		ADJUSTMENT	2024	GPS3674
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003		ADJUSTMENT	2024	GPS3671
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003		ADJUSTMENT	2024	GPS3672
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003	C	GPS - STATIC	2024	HTH108
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003	C	GPS - STATIC	2023	HTH9
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003	C	GPS - STATIC	2023	HMOFA3
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003	C	GPS - STATIC	2023	HTH59
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003		ADJUSTMENT	2023	GPS3614
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.003	C	GPS - STATIC	2023	HPONS
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.007		ADJUSTMENT	2022	GPS3507
46 16 24.93634	96 03 20.66715	414247.461	161163.852	.007	C	GPS - STATIC	2022	H21MORRSE
46 16 24.93634	96 03 20.66717	414247.460	161163.852	.003		ADJUSTMENT	2019	CORS-MYCS2
46 16 24.93634	96 03 20.66712	414247.463	161163.851	.003		ADJUSTMENT	2018	GPS3119
46 16 24.93634	96 03 20.66712	414247.463	161163.851	.003	C	GPS - STATIC	2017	HMNPH
46 16 24.93634	96 03 20.66712	414247.463	161163.851	.003		ADJUSTMENT	2017	GPS3174
46 16 24.93634	96 03 20.66712	414247.463	161163.851	.003	C	GPS - STATIC	2017	HFRAZ
46 16 24.93624	96 03 20.66702	414247.470	161163.841	.000	A	GPS - STATIC	2015	HMNCORS15
46 16 24.93634	96 03 20.66712	414247.463	161163.851	.020		ADJUSTMENT	2015	GPS3080
46 16 24.93644	96 03 20.66704	414247.469	161163.861	.020	C	GPS - STATIC	2015	HWILK



46 16 24.93634	96 03 20.66712	414247.463	161163.851	.026		ADJUSTMENT	2015	GPS3061
46 16 24.93634	96 03 20.66712	414247.463	161163.851	.023		ADJUSTMENT	2014	GPS3028
46 16 24.93613	96 03 20.66711	414247.464	161163.830	.023	C	GPS - STATIC	2014	HGRAN
46 16 24.93667	96 03 20.66725	414247.454	161163.885	.026	C	GPS - STATIC	2014	HDOUG
46 16 24.93634	96 03 20.66712	414247.463	161163.851	.013		ADJUSTMENT	2013	GPS2968
46 16 24.93634	96 03 20.66712	414247.463	161163.851	.016		ADJUSTMENT	2013	GPS2963
46 16 24.93658	96 03 20.66710	414247.465	161163.876	.016	C	GPS - STATIC	2013	HGEOR
46 16 24.93659	96 03 20.66709	414247.465	161163.877	.013	C	GPS - STATIC	2013	HWDNA
46 16 24.93634	96 03 20.66712	414247.463	161163.851	.020		ADJUSTMENT	2013	GPS2956
46 16 24.93660	96 03 20.66712	414247.463	161163.878	.020	C	GPS - STATIC	2013	HHOFF
46 16 24.93634	96 03 20.66712	414247.463	161163.851	.016	B	GPS - STATIC	2012	HMNCORS05
46 16 24.93634	96 03 20.66712	414247.463	161163.851	.003		ADJUSTMENT	2012	CORS-MYCS
46 16 24.93634	96 03 20.66712	414247.463	161163.851	.003	A	ADJUSTMENT	2011	CORS4512

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 24.93631	96 03 20.66811	414247.394	161163.849	.016	B	ADJUSTMENT	2011	GPS2806
46 16 24.93631	96 03 20.66811	414247.394	161163.849	.016	B	GPS - STATIC	2011	HBMN3
46 16 24.93631	96 03 20.66811	414247.394	161163.849	.016	B	ADJUSTMENT	2010	GPS2697
46 16 24.93631	96 03 20.66811	414247.394	161163.849	.016	B	GPS - STATIC	2010	HBMN2
46 16 24.93631	96 03 20.66811	414247.394	161163.849	.003	A	ADJUSTMENT	2008	CORS2679

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 24.93567	96 03 20.66766	414247.425	161163.784	.066		NCAT	2026	HTH55N
46 16 24.93567	96 03 20.66766	414247.425	161163.784	.066		NCAT	2026	HTH55S
46 16 24.93567	96 03 20.66766	414247.425	161163.784	.066		NCAT	2025	HTH29A1
46 16 24.93574	96 03 20.66768	414247.423	161163.791	.066		NCAT	2025	HWAHP
46 16 24.93574	96 03 20.66768	414247.423	161163.791	.066		NCAT	2025	HTH28B
46 16 24.93574	96 03 20.66768	414247.423	161163.791	.066		NCAT	2025	HTH28A
46 16 24.93574	96 03 20.66768	414247.423	161163.791	.066		NCAT	2025	HTH94B
46 16 24.93574	96 03 20.66768	414247.423	161163.791	.066		NCAT	2025	HTH27
46 16 24.93574	96 03 20.66768	414247.423	161163.791	.066		NCAT	2025	HWHEAT
46 16 24.93622	96 03 20.66744	414247.441	161163.839	.033	C	GPS - STATIC	2025	HTH94A
46 16 24.93622	96 03 20.66744	414247.441	161163.839	.033	C	GPS - STATIC	2024	HTH210A
46 16 24.93622	96 03 20.66744	414247.441	161163.839	.033	C	GPS - STATIC	2024	HTH210B
46 16 24.93622	96 03 20.66744	414247.441	161163.839	.033	C	GPS - STATIC	2024	HTH78B
46 16 24.93622	96 03 20.66744	414247.441	161163.839	.033	C	GPS - STATIC	2024	HTH78A
46 16 24.93574	96 03 20.66768	414247.423	161163.791	.066		NCAT	2024	HENLOE
46 16 24.93622	96 03 20.66744	414247.441	161163.839	.033	C	GPS - STATIC	2024	H23WADE
46 16 24.93622	96 03 20.66744	414247.441	161163.839	.033	C	GPS - STATIC	2024	HMOFA1
46 16 24.93622	96 03 20.66744	414247.441	161163.839	.033	C	GPS - STATIC	2024	HMOFA2
46 16 24.93631	96 03 20.66832	414247.379	161163.849	.033	C	GPS - STATIC	2024	HTH108
46 16 24.93622	96 03 20.66744	414247.441	161163.839	.033	C	GPS - STATIC	2023	HTH59
46 16 24.93622	96 03 20.66744	414247.441	161163.839	.033	C	GPS - STATIC	2023	HTH9
46 16 24.93622	96 03 20.66744	414247.441	161163.839	.033	C	GPS - STATIC	2023	HMOFA3
46 16 24.93622	96 03 20.66744	414247.441	161163.839	.033	C	GPS - STATIC	2023	HPONS
46 16 24.93622	96 03 20.66744	414247.441	161163.839	.033	C	GPS - STATIC	2022	H21MORRSE
46 16 24.93622	96 03 20.66744	414247.441	161163.839	.033	C	GPS - STATIC	2017	HMNCORS07
46 16 24.93631	96 03 20.66832	414247.379	161163.849	.033	C	GPS - STATIC	2017	HFRAZ
46 16 24.93631	96 03 20.66832	414247.379	161163.849	.033	C	GPS - STATIC	2015	HWILK
46 16 24.93631	96 03 20.66832	414247.379	161163.849	.033	C	GPS - STATIC	2014	HGRAN
46 16 24.93592	96 03 20.66772	414247.421	161163.809	.033	C	GPS - STATIC	2013	HGEOR
46 16 24.93631	96 03 20.66832	414247.379	161163.849	.033	C	GPS - STATIC	2013	HWDNA
46 16 24.93631	96 03 20.66832	414247.379	161163.849	.033	C	GPS - STATIC	2013	HHOFF
46 16 24.93631	96 03 20.66832	414247.379	161163.849	.016	B	GPS - STATIC	2006	HMNCORS02
46 16 24.93651	96 03 20.66820	414247.387	161163.869	.016	B	GPS - STATIC	2005	HMNCORS01



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2168090.198	797705.892	867979.461	16827346.451	.003		ADJUSTMENT	2026	GPS3900
2168090.198	797705.892	867979.461	16827346.451	.003	C	GPS - STATIC	2026	HTH55N
2168090.198	797705.892	867979.461	16827346.451	.003		ADJUSTMENT	2026	GPS3884
2168090.198	797705.892	867979.461	16827346.451	.003	C	GPS - STATIC	2026	HTH55S
2168090.198	797705.892	867979.461	16827346.451	.003		ADJUSTMENT	2025	GPS3860
2168090.197	797705.899	867979.460	16827346.458	.003		ADJUSTMENT	2025	GPS3854
2168090.197	797705.899	867979.460	16827346.458	.003		ADJUSTMENT	2025	GPS3851
2168090.197	797705.899	867979.460	16827346.458	.003		ADJUSTMENT	2025	GPS3838
2168090.197	797705.899	867979.460	16827346.458	.003		ADJUSTMENT	2025	GPS3848
2168090.197	797705.899	867979.460	16827346.458	.003		ADJUSTMENT	2025	GPS3847
2168090.197	797705.899	867979.460	16827346.458	.003		ADJUSTMENT	2025	GPS3842
2168090.198	797705.892	867979.461	16827346.451	.003	C	GPS - STATIC	2025	HTH29A1
2168090.197	797705.899	867979.460	16827346.458	.003	C	GPS - STATIC	2025	HWAHP
2168090.197	797705.899	867979.460	16827346.458	.003	C	GPS - STATIC	2025	HTH28B
2168090.197	797705.899	867979.460	16827346.458	.003	C	GPS - STATIC	2025	HTH28A
2168090.197	797705.899	867979.460	16827346.458	.003	C	GPS - STATIC	2025	HTH94B
2168090.197	797705.899	867979.460	16827346.458	.003	C	GPS - STATIC	2025	HTH27
2168090.197	797705.899	867979.460	16827346.458	.003	C	GPS - STATIC	2025	HWHEAT
2168090.197	797705.899	867979.460	16827346.458	.003		ADJUSTMENT	2025	GPS3805
2168090.197	797705.899	867979.460	16827346.458	.003		ADJUSTMENT	2025	GPS3793
2168090.197	797705.899	867979.460	16827346.458	.003	C	GPS - STATIC	2025	HTH94A
2168090.197	797705.899	867979.460	16827346.458	.003		ADJUSTMENT	2024	GPS3782
2168090.197	797705.899	867979.460	16827346.458	.003		ADJUSTMENT	2024	GPS3764
2168090.197	797705.899	867979.460	16827346.458	.003	C	GPS - STATIC	2024	HTH210A
2168090.197	797705.899	867979.460	16827346.458	.003		ADJUSTMENT	2024	GPS3771
2168090.197	797705.899	867979.460	16827346.458	.003	C	GPS - STATIC	2024	HTH210B
2168090.197	797705.899	867979.460	16827346.458	.003	C	GPS - STATIC	2024	HTH78B
2168090.197	797705.899	867979.460	16827346.458	.003	C	GPS - STATIC	2024	HTH78A
2168090.197	797705.899	867979.460	16827346.458	.003		ADJUSTMENT	2024	GPS3840
2168090.197	797705.899	867979.460	16827346.458	.003	C	GPS - STATIC	2024	HENLOE
2168090.197	797705.899	867979.460	16827346.458	.003		ADJUSTMENT	2024	GPS3738
2168090.197	797705.899	867979.460	16827346.458	.003	C	GPS - STATIC	2024	HMNARP1
2168090.197	797705.899	867979.460	16827346.458	.007		ADJUSTMENT	2024	GPS3731
2168090.197	797705.899	867979.460	16827346.458	.007	C	GPS - STATIC	2024	H23WADE
2168090.197	797705.899	867979.460	16827346.458	.003		ADJUSTMENT	2024	GPS3719
2168090.197	797705.899	867979.460	16827346.458	.007		ADJUSTMENT	2024	GPS3715
2168090.197	797705.899	867979.460	16827346.458	.003	C	GPS - STATIC	2024	HMOFA1
2168090.197	797705.899	867979.460	16827346.458	.007	C	GPS - STATIC	2024	HMOFA2
2168090.197	797705.899	867979.460	16827346.458	.003		ADJUSTMENT	2024	GPS3689
2168090.197	797705.899	867979.460	16827346.458	.003		ADJUSTMENT	2024	GPS3674
2168090.197	797705.899	867979.460	16827346.458	.003		ADJUSTMENT	2024	GPS3671
2168090.197	797705.899	867979.460	16827346.458	.003		ADJUSTMENT	2024	GPS3672
2168090.197	797705.899	867979.460	16827346.458	.003	C	GPS - STATIC	2024	HTH108
2168090.197	797705.899	867979.460	16827346.458	.003	C	GPS - STATIC	2023	HTH9
2168090.197	797705.899	867979.460	16827346.458	.003	C	GPS - STATIC	2023	HMOFA3
2168090.197	797705.899	867979.460	16827346.458	.003	C	GPS - STATIC	2023	HTH59
2168090.197	797705.899	867979.460	16827346.458	.003		ADJUSTMENT	2023	GPS3614
2168090.197	797705.899	867979.460	16827346.458	.003	C	GPS - STATIC	2023	HPONS
2168090.197	797705.899	867979.460	16827346.458	.007		ADJUSTMENT	2022	GPS3507
2168090.197	797705.899	867979.460	16827346.458	.007	C	GPS - STATIC	2022	H21MORRSE
2168090.195	797705.899	867979.458	16827346.458	.003		ADJUSTMENT	2019	CORS-MYCS2
2168090.199	797705.899	867979.462	16827346.458	.003		ADJUSTMENT	2018	GPS3119
2168090.199	797705.899	867979.462	16827346.458	.003	C	GPS - STATIC	2017	HMNPH
2168090.199	797705.899	867979.462	16827346.458	.003		ADJUSTMENT	2017	GPS3174
2168090.199	797705.899	867979.462	16827346.458	.003	C	GPS - STATIC	2017	HFRAZ
2168090.205	797705.889	867979.468	16827346.448	.000	A	GPS - STATIC	2015	HMNCORS15
2168090.199	797705.899	867979.462	16827346.458	.020		ADJUSTMENT	2015	GPS3080



2168090.204	797705.909	867979.467	16827346.468	.020	C	GPS - STATIC	2015	HWILK
2168090.199	797705.899	867979.462	16827346.458	.026		ADJUSTMENT	2015	GPS3061
2168090.199	797705.899	867979.462	16827346.458	.023		ADJUSTMENT	2014	GPS3028
2168090.199	797705.878	867979.462	16827346.437	.023	C	GPS - STATIC	2014	HGRAN
2168090.190	797705.933	867979.454	16827346.492	.026	C	GPS - STATIC	2014	HDOUG
2168090.199	797705.899	867979.462	16827346.458	.013		ADJUSTMENT	2013	GPS2968
2168090.199	797705.899	867979.462	16827346.458	.016		ADJUSTMENT	2013	GPS2963
2168090.201	797705.924	867979.464	16827346.482	.016	C	GPS - STATIC	2013	HGEOR
2168090.202	797705.925	867979.465	16827346.483	.013	C	GPS - STATIC	2013	HWDNA
2168090.199	797705.899	867979.462	16827346.458	.020		ADJUSTMENT	2013	GPS2956
2168090.199	797705.926	867979.463	16827346.484	.020	C	GPS - STATIC	2013	HHOFF
2168090.199	797705.899	867979.462	16827346.458	.016	B	GPS - STATIC	2012	HMNCORS05
2168090.199	797705.899	867979.462	16827346.458	.003		ADJUSTMENT	2012	CORS-MYCS
2168090.199	797705.899	867979.462	16827346.458	.003	A	ADJUSTMENT	2011	CORS4512

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2168090.129	797705.898	867979.392	16827346.458	.016	B	ADJUSTMENT	2011	GPS2806
2168090.129	797705.898	867979.392	16827346.458	.016	B	GPS - STATIC	2011	HBMN3
2168090.129	797705.898	867979.392	16827346.458	.016	B	ADJUSTMENT	2010	GPS2697
2168090.129	797705.898	867979.392	16827346.458	.016	B	GPS - STATIC	2010	HBMN2
2168090.129	797705.898	867979.392	16827346.458	.003	A	ADJUSTMENT	2008	CORS2679

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2168090.159	797705.832	867979.421	16827346.391	.066		NCAT	2026	HTH55N
2168090.159	797705.832	867979.421	16827346.391	.066		NCAT	2026	HTH55S
2168090.159	797705.832	867979.421	16827346.391	.066		NCAT	2025	HTH29A1
2168090.158	797705.840	867979.420	16827346.399	.066		NCAT	2025	HWAHP
2168090.158	797705.840	867979.420	16827346.399	.066		NCAT	2025	HTH28B
2168090.158	797705.840	867979.420	16827346.399	.066		NCAT	2025	HTH28A
2168090.158	797705.840	867979.420	16827346.399	.066		NCAT	2025	HTH94B
2168090.158	797705.840	867979.420	16827346.399	.066		NCAT	2025	HTH27
2168090.158	797705.840	867979.420	16827346.399	.066		NCAT	2025	HWHEAT
2168090.176	797705.888	867979.439	16827346.447	.033	C	GPS - STATIC	2025	HTH94A
2168090.176	797705.888	867979.439	16827346.447	.033	C	GPS - STATIC	2024	HTH210A
2168090.176	797705.888	867979.439	16827346.447	.033	C	GPS - STATIC	2024	HTH210B
2168090.176	797705.888	867979.439	16827346.447	.033	C	GPS - STATIC	2024	HTH78B
2168090.176	797705.888	867979.439	16827346.447	.033	C	GPS - STATIC	2024	HTH78A
2168090.158	797705.840	867979.420	16827346.399	.066		NCAT	2024	HENLOE
2168090.176	797705.888	867979.439	16827346.447	.033	C	GPS - STATIC	2024	H23WADE
2168090.176	797705.888	867979.439	16827346.447	.033	C	GPS - STATIC	2024	HMOFA1
2168090.176	797705.888	867979.439	16827346.447	.033	C	GPS - STATIC	2024	HMOFA2
2168090.114	797705.898	867979.377	16827346.458	.033	C	GPS - STATIC	2024	HTH108
2168090.176	797705.888	867979.439	16827346.447	.033	C	GPS - STATIC	2023	HTH59
2168090.176	797705.888	867979.439	16827346.447	.033	C	GPS - STATIC	2023	HTH9
2168090.176	797705.888	867979.439	16827346.447	.033	C	GPS - STATIC	2023	HMOFA3
2168090.176	797705.888	867979.439	16827346.447	.033	C	GPS - STATIC	2023	HPONS
2168090.176	797705.888	867979.439	16827346.447	.033	C	GPS - STATIC	2022	H21MORRSE
2168090.176	797705.888	867979.439	16827346.447	.033	C	GPS - STATIC	2017	HMNCORS07
2168090.114	797705.898	867979.377	16827346.458	.033	C	GPS - STATIC	2017	HFRAZ
2168090.114	797705.898	867979.377	16827346.458	.033	C	GPS - STATIC	2015	HWILK
2168090.114	797705.898	867979.377	16827346.458	.033	C	GPS - STATIC	2014	HGRAN
2168090.156	797705.858	867979.418	16827346.417	.033	C	GPS - STATIC	2013	HGEOR
2168090.114	797705.898	867979.377	16827346.458	.033	C	GPS - STATIC	2013	HWDNA
2168090.114	797705.898	867979.377	16827346.458	.033	C	GPS - STATIC	2013	HHOFF
2168090.114	797705.898	867979.377	16827346.458	.016	B	GPS - STATIC	2006	HMNCORS02
2168090.123	797705.918	867979.386	16827346.478	.016	B	GPS - STATIC	2005	HMNCORS01



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_FALLS_CORP-DK6505-3E-20JUN2007.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_FALLS_CORP-DK6505-2-20JUN2007.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_FALLS_CORP-DK6505-1-20JUN2007.jpg

<u>Dir</u>	<u>Date</u>
E	Jun 20, 2007
	Jun 20, 2007
	Jun 20, 2007

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MNCORS FRGF FERGUS FALLS L1PC0

NGS Name: FERGUS FALLS CORS L1 PHASE CEN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DK6506](#)

[Get Map](#)

NGS Quad / Sta Num : 46096212/

USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	2	132 N	43 W	461624.94	960320.67		A

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2004	2008	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

SEE DESCRIPTIVE TEXT

Disk Type

SEE DESCRIPTION

Mon. Agency

MNDT

Description: (2012)

Stamping:

0.5 MILE SOUTHEAST OF FERGUS FALLS, 0.2 MILE NORTH-NORTHWEST ALONG COUNTY ROAD 82 FROM THE JUNCTION OF COUNTY ROAD 82 AND TRUNK HIGHWAY 210 IN FERGUS FALLS, THEN 0.1 MILE SOUTHEAST ALONG DOUGLAS AVENUE, AT THE MINNESOTA DEPARTMENT OF TRANSPORTATION BUILDING, ON THE ROOF ON THE WEST SIDE OF THE BUILDING.

Station Notes

PROPOSED THE NATIONAL GEODETIC SURVEY (NGS) SITE ID IS MNFF.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1153.912	.000		1153.912	.000	2011	HORIZONTAL ADJUSTMENT	2011	CORS4512	
1153.951	.000		1153.951	.000	2007	HORIZONTAL ADJUSTMENT	2008	CORS2679	

Geoid Separations(ft): GEOID18 = -88.149 12B = -88.153 09 = -88.035 03 = -87.946

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 16 24.93638	96 03 20.66714	414247.462	161163.855	.003	A	ADJUSTMENT	2011	CORS4512

NAD83(2007)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 16 24.93634	96 03 20.66813	414247.392	161163.852	.003	A	ADJUSTMENT	2008	CORS2679

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2168090.197	797705.903	867979.460	16827346.462	.003	A	ADJUSTMENT	2011	CORS4512

NAD83(2007)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2168090.128	797705.901	867979.391	16827346.461	.003	A	ADJUSTMENT	2008	CORS2679



Mn/DOT Name: MNCORS FRGF FERGUS FALLS L1PC1

NGS Name: FERGUS FALLS CORS L1 PHASE CEN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DK7464](#)

[Get Map](#)

NGS Quad / Sta Num : 46096212/

USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	2	132 N	43 W	461624.94	960320.67		A

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2004	2008	DESTROYED	Horz=NO Vert=NO	YES			SEE DESCRIPTION

Monument Type

SEE DESCRIPTIVE TEXT

Disk Type

SEE DESCRIPTION

Mon. Agency

MNDT

Description: (2012)

Stamping:

0.5 MILE SOUTHEAST OF FERGUS FALLS, 0.2 MILE NORTH-NORTHWEST ALONG COUNTY ROAD 82 FROM THE JUNCTION OF COUNTY ROAD 82 AND TRUNK HIGHWAY 210 IN FERGUS FALLS, THEN 0.1 MILE SOUTHEAST ALONG DOUGLAS AVENUE, AT THE MINNESOTA DEPARTMENT OF TRANSPORTATION BUILDING, ON THE ROOF ON THE WEST SIDE OF THE BUILDING, THE STATION IS IN A ZEPHYR GEODETIC ANTENNA SERIAL NUMBER 12471519.

Station Notes

PROPOSED THE NATIONAL GEODETIC SURVEY (NGS) SITE ID IS MNFF.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Year</u>	<u>Reference</u>
			1153.912	.000	2011	2011	CORS4512
			1153.951	.000	2007	2008	CORS2679

Geoid Separations(ft): GEOID18 = -88.149 12B = -88.153 09 = -88.035 03 = -87.946

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 16 24.93638	96 03 20.66714	414247.462	161163.855	.003	A	ADJUSTMENT	2011	CORS4512

NAD83(2007)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 16 24.93634	96 03 20.66813	414247.392	161163.852	.003	A	ADJUSTMENT	2008	CORS2679

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2168090.197	797705.903	867979.460	16827346.462	.003	A	ADJUSTMENT	2011	CORS4512

NAD83(2007)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2168090.128	797705.901	867979.391	16827346.461	.003	A	ADJUSTMENT	2008	CORS2679

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_FALLS_CORS_L1_PHASE_CEN-DK7464-3NE-07OCT2003.jp	NE	Oct 7, 2003
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_FALLS_CORS_L1_PHASE_CEN-DK7464-2-27JUL2006.jpg		Jul 27, 2006
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_FALLS_CORS_L1_PHASE_CEN-DK7464-1-31AUG2006.jpg		Aug 31, 2006

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MNCORS FRGF FERGUS FALLS L1PC2

NGS Name: FERGUS FALLS CORS L1 PHASE CEN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DL6665](#)

[Get Map](#)

NGS Quad / Sta Num : 46096212/

USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	2	132 N	43 W	461624.94	960320.67		A

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2008	2008	GOOD	Horz=YES Vert=?	YES			SEE DESCRIPTION

Monument Type

SEE DESCRIPTIVE TEXT

Disk Type

SEE DESCRIPTION

Mon. Agency

MNDT

Description: (2012)

Stamping:

0.5 MILE SOUTHEAST OF FERGUS FALLS, 0.2 MILE NORTH-NORTHWEST ALONG COUNTY ROAD 82 FROM THE JUNCTION OF COUNTY ROAD 82 AND TRUNK HIGHWAY 210 IN FERGUS FALLS, THEN 0.1 MILE SOUTHEAST ALONG DOUGLAS AVENUE, AT THE MINNESOTA DEPARTMENT OF TRANSPORTATION BUILDING, ON THE ROOF ON THE WEST SIDE OF THE BUILDING, STATION MNCORS FRGF FERGUS FALLS L1PC2 IS IN A ZEPHYR GEODETIC ANTENNA MODEL 2 SERIAL NUMBER 30975345.

Station Notes

PROPOSED THE NATIONAL GEODETIC SURVEY (NGS) SITE ID IS MNFF.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1153.912	.000	2011	1153.912	.000	2011	HORIZONTAL ADJUSTMENT	2011	CORS4512	
1153.951	.000	2007	1153.951	.000	2007	HORIZONTAL ADJUSTMENT	2008	CORS2679	

Geoid Separations(ft): GEOID18 = -88.149 12B = -88.153 09 = -88.035 03 = -87.946

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 16 24.93638	96 03 20.66714	414247.462	161163.855	.003	A	ADJUSTMENT	2011	CORS4512

NAD83(2007)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 16 24.93634	96 03 20.66813	414247.392	161163.852	.003	A	ADJUSTMENT	2008	CORS2679

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2168090.197	797705.903	867979.460	16827346.462	.003	A	ADJUSTMENT	2011	CORS4512

NAD83(2007)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2168090.128	797705.901	867979.391	16827346.461	.003	A	ADJUSTMENT	2008	CORS2679

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_FALLS_CORS_L1_PHASE_CEN-DL6665-3W-09SEP2008.jpg	W	Sep 9, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_FALLS_CORS_L1_PHASE_CEN-DL6665-2-09SEP2008.jpg		Sep 9, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/FERGUS_FALLS_CORS_L1_PHASE_CEN-DL6665-1-08SEP2008.jpg		Sep 8, 2008

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MNDT UNSTAMPED

NGS Name: UNSTAMPED

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>	<u>Mon. Agency</u>
SW	5	133 N	40 W	462116.00	954532.00				2009	DESTROYED	Horz=NO Vert=NO	NO	56509		SEE DESCRIPTION	MNDT
Monument Type BRIDGE CURB																
Disk Type SURVEY DISK																
Description: (1973) Stamping: 1328.23																

5.0 MILES NORTH AND 2.0 MILES WEST OF BATTLE LAKE, 47.0 FEET SOUTH AND 16.0 FEET EAST OF THE CENTER OF COUNTY ROAD 83 BRIDGE NUMBER 56509 OVER THE OTTER TAIL RIVER, IN THE SOUTHEAST BRIDGE CURB, THE DISK IS STAMPED 1328.23, YEAR SET IS UNKNOWN.

Station Notes

NEW BRIDGE IN 2007, NUMBER 56536.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1326.789	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT
Geoid Separations(ft): GEOID18 = -87.966 12B = -87.969 09 = -87.857 03 = -87.716							
* No Horizontal Positions in the Database *							



Mn/DOT Name: MOEN

NGS Name: MOEN

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DR5781	Get Map
NW	35	135 N	44 W	462803.56	961150.74		C	NGS Quad / Sta Num : 46096214/ USGS Quad: ELIZABETH	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1998	2018	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (<10 FT)	SURVEY DISK	MNDT

Description: Stamping: MOEN 1998

4.2 MILES EAST OF ROTHSA, 3.0 MILES EAST ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND COUNTY ROAD 11 IN ROTHSA, THEN 1.25 MILES EAST AND SOUTH ALONG COUNTY ROAD 21, 72.0 FEET EAST OF COUNTY ROAD 21, 58.0 FEET SOUTH OF A DRIVEWAY NUMBER 34388, 8.4 FEET SOUTH OF A WITNESS POST. THE ROD DEPTH IS UNKNOWN.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1350.361	.131		1262.422	.066	1996	GPS - STATIC	2021	HOTTE
1350.378			1262.271	.022	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1350.378			1262.271	.022	2011	GPS - STATIC	2020	HOTTE

Geoid Separations(ft): GEOID18 = -88.123 12B = -88.117 09 = -88.002 03 = -87.916

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>
46 28 03.55803	96 11 50.73574	378845.424	232124.871	.016		ADJUSTMENT	2020
46 28 03.55803	96 11 50.73574	378845.424	232124.871	.016	C	GPS - STATIC	2020

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>
46 28 03.55770	96 11 50.73622	378845.390	232124.838	.033	C	GPS - STATIC	2021

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>
2134012.119	869300.666	835025.776	16899499.516	.016		ADJUSTMENT	2020
2134012.119	869300.666	835025.776	16899499.516	.016	C	GPS - STATIC	2020

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>
2134012.085	869300.633	835025.741	16899499.484	.033	C	GPS - STATIC	2021

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MOEN-DR5781-3S-18AUG2009.jpg	S	Aug 18, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MOEN-DR5781-2-18AUG2009.jpg		Aug 18, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MOEN-DR5781-1-09OCT2008.jpg		Oct 9, 2008

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MOLLY MNDT

NGS Name: MOLLY

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0518](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/1036
USGS Quad: BATTLE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	28	133 N	40 W	461819.64	954306.27	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1975) **Stamping:** MOLLY 1975

1.6 MILES NORTH OF BATTLE LAKE, 1.6 MILES NORTH ON TRUNK HIGHWAY 78 FROM THE POST OFFICE AT BATTLE LAKE, 50.2 FEET WEST OF TRUNK HIGHWAY 78, 24.1 FEET SOUTH OF A RIGHT-OF-WAY POST, 8.6 FEET SOUTH-SOUTHEAST OF A POWER POLE, 3.6 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1407.648	.016	2/1					VERTICAL ADJUSTMENT	1991	00000025

NGVD29				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1406.861	.016	2					VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1407.642	.197			1320.119	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.720 12B = -87.723 09 = -87.615 03 = -87.510

Lat/Lon and County Coordinates (Feet)

NAD83(1996)				Otter Tail County				Project Info	
Geodetic Position				X	Y	Acc	Order	Determination Method	
Latitude	Longitude								
46 18 19.64273	95 43 06.27369			499559.525	172600.690	.066	2	ADJUSTMENT	1999 17648
46 18 19.64264	95 43 06.27395			499559.506	172600.681	.066	2	ADJUSTMENT	1998 17655

NAD83(1986)				Otter Tail County				Project Info	
Geodetic Position				X	Y	Acc	Order	Determination Method	
Latitude	Longitude								
46 18 19.63994	95 43 06.26273			499560.294	172600.407	.066	2	ADJUSTMENT	1986 17289

NAD27								Project Info	
Geodetic Position				X	Y	Acc	Order	Determination Method	
Latitude	Longitude								
46 18 19.78284	95 43 05.09272					.100	2	CLASSICAL SURVEY	1977 15945

State Plane and UTM Coordinates (Feet)

NAD83(1996)				UTM - Zone 15				Project Info	
MN State Plane - Central Zone				X	Y	Acc	Order	Determination Method	
X	Y								
2253588.020	807560.052			953646.560	16835853.654	.066	2	ADJUSTMENT	1999 17648
2253588.001	807560.043			953646.541	16835853.646	.066	2	ADJUSTMENT	1998 17655

NAD83(1986)				UTM - Zone 15				Project Info	
MN State Plane - Central Zone				X	Y	Acc	Order	Determination Method	
X	Y								
2253588.784	807559.755			953647.319	16835853.346	.066	2	ADJUSTMENT	1986 17289

NAD27								Project Info	
MN State Plane - Central Zone				X	Y	Acc	Order	Determination Method	
X	Y								
1628993.240	479486.262					.100	2	CLASSICAL SURVEY	1977 15945



Mn/DOT Name: MOLLY MNDT RM 1

NGS Name: MOLLY RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0520](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/1037
USGS Quad: BATTLE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	27	133 N	40 W	461840.08	954303.01	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (1975)

Stamping: MOLLY NO 1 1975

2.0 MILES NORTH OF BATTLE LAKE, 2.60 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 24.10, 206.0 FEET EAST OF TRUNK HIGHWAY 78, 47.0 FEET SOUTH OF COUNTY ROAD 16, 1.0 FOOT WEST OF A WITNESS POST.

Station Pair: STARK - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1363.377	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1363.373	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1363.373	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1363.373	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1362.586	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1362.586	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1363.377			1275.588	.012	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1363.377	.131		1275.700	.066	1996	GPS - STATIC	2024	HTH78B
1363.377			1275.588	.012	2011	GPS - STATIC	2024	HTH78B
1363.367	.262		1275.627	.197	2011	GPS - RTRN	2023	RTRN2023
1363.239	.262		1275.496	.197	2011	GPS - RTRN	2015	RTRN2015
1363.239	.262		1275.496	.197	2011	GPS - RTRN	2015	RTRN2015
1363.199	.262		1275.673	.197	1996	GPS - RTRN	2009	RTRN2009
1363.383	.197		1275.824	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.743 12B = -87.746 09 = -87.634 03 = -87.526

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 18 40.08496	95 43 03.01059	499788.648	174671.647	.007		ADJUSTMENT	2024	GPS3771
46 18 40.08496	95 43 03.01059	499788.648	174671.647	.007	C	GPS - STATIC	2024	HTH78B
46 18 40.08483	95 43 03.01118	499788.607	174671.633	.131	3	GPS - RTRN	2023	RTRN2023
46 18 40.08546	95 43 03.01092	499788.625	174671.697	.131	3	GPS - RTRN	2015	RTRN2015
46 18 40.08546	95 43 03.01092	499788.625	174671.697	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 18 40.08484	95 43 03.01088	499788.628	174671.635	.033	C	GPS - STATIC	2024	HTH78B
46 18 40.08489	95 43 03.01135	499788.595	174671.640	.131	3	GPS - RTRN	2009	RTRN2009
46 18 40.08476	95 43 03.01139	499788.592	174671.626	.066	2	ADJUSTMENT	1999	17648
46 18 40.08468	95 43 03.01167	499788.573	174671.618	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 18 40.08195	95 43 03.00049	499789.358	174671.342	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 18 40.22490	95 43 01.83059			.100	2	CLASSICAL SURVEY	1977	15945

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2253855.416	809626.137	953946.587	16837915.710	.007		ADJUSTMENT	2024	GPS3771
2253855.416	809626.137	953946.587	16837915.710	.007	C	GPS - STATIC	2024	HTH78B
2253855.374	809626.125	953946.545	16837915.698	.131	3	GPS - RTRN	2023	RTRN2023
2253855.394	809626.188	953946.565	16837915.761	.131	3	GPS - RTRN	2015	RTRN2015
2253855.394	809626.188	953946.565	16837915.761	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2253855.395	809626.125	953946.566	16837915.698	.033	C	GPS - STATIC	2024	HTH78B
2253855.362	809626.131	953946.533	16837915.704	.131	3	GPS - RTRN	2009	RTRN2009
2253855.359	809626.118	953946.530	16837915.691	.066	2	ADJUSTMENT	1999	17648
2253855.339	809626.110	953946.510	16837915.684	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2253856.119	809625.819	953947.285	16837915.381	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1629260.566	481552.321			.100	2	CLASSICAL SURVEY	1977	15945

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MOLLY_RM_1-RO0520-3E-17OCT2023.jpg	E	Oct 17, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MOLLY_RM_1-RO0520-2-17OCT2023.jpg		Oct 17, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MOLLY_RM_1-RO0520-1-17OCT2023.jpg		Oct 17, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MOLLY MNDT RM 2

NGS Name: MOLLY RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R00519](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/1038
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	27	133 N	40 W	461840.16	954230.20	2	2	1975	2015	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	REFERENCE MARK DISK	MNDT

Description: (1975)

Stamping: MOLLY NO 2 1975

2.1 MILES NORTH-NORTHEAST OF BATTLE LAKE, 2.0 MILES NORTH ON TRUNK HIGHWAY 78 FROM THE POST OFFICE AT BATTLE LAKE THEN 0.5 MILE EAST ON COUNTY ROAD 16, 51.0 FEET SOUTH OF COUNTY ROAD 16, 68.5 FEET WEST OF A TEE-ROAD SOUTH, 22.8 FEET WEST OF A POWER POLE, 24.9 FEET WEST OF CABLE POST NUMBER 125-1, 4.7 FEET WEST-NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1371.710	.016	2/1					VERTICAL ADJUSTMENT	1991	00000025

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1370.926	.016	2					VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1371.716	.197			1284.181	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.716 12B = -87.720 09 = -87.608 03 = -87.506

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 18 40.16203	95 42 30.19591			502092.326	174679.563	.066	2	ADJUSTMENT	1999 17648
46 18 40.16197	95 42 30.19618			502092.307	174679.557	.066	2	ADJUSTMENT	1998 17655

<u>NAD83(1986)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 18 40.15926	95 42 30.18504			502093.089	174679.282	.066	2	ADJUSTMENT	1986 17289

<u>NAD27</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>
<u>Geodetic Position</u>									<u>Year</u> <u>Reference</u>
<u>Latitude</u>	<u>Longitude</u>								
46 18 40.30221	95 42 29.01621					.100	2	CLASSICAL SURVEY	1977 15945

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2256158.540	809591.401			956249.370	16837844.619	.066	2	ADJUSTMENT	1999 17648
2256158.521	809591.395			956249.351	16837844.614	.066	2	ADJUSTMENT	1998 17655

<u>NAD83(1986)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2256159.298	809591.107			956250.123	16837844.312	.066	2	ADJUSTMENT	1986 17289

<u>NAD27</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>
<u>MN State Plane - Central Zone</u>									<u>Year</u> <u>Reference</u>
<u>X</u>	<u>Y</u>								
1631563.738	481517.618					.100	2	CLASSICAL SURVEY	1977 15945



Mn/DOT Name: MOLLY RESET

NGS Name: MOLLY RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4330](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	27	133 N	40 W	461819.83	954303.58	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1992	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	HORIZONTAL CONTROL DISK	MNDT

Description: (1992)

Stamping: MOLLY RESET 1992

1.7 MILES NORTH OF BATTLE LAKE, 2.2 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 23.7, 140.5 FEET EAST OF TRUNK HIGHWAY 78, 4.3 FEET NORTH OF A RIGHT-OF-WAY POST, 0.8 FOOT WEST OF A WITNESS POST, THE ROD DEPTH IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1401.198	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1401.191	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1401.195	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1401.198			1313.406	.011	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1401.198	.131		1313.557	.066	1996	GPS - STATIC	2024	HTH78B
1401.198			1313.406	.011	2011	GPS - STATIC	2024	HTH78B
1401.211	.262		1313.495	.197	2011	GPS - RTRN	2023	RTRN2023
1401.198	.131		1313.557	.066	1996	GPS - STATIC	2021	HOTTE
1401.198			1313.406	.026	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1401.198			1313.406	.026	2011	GPS - STATIC	2020	HOTTE
1401.041	.262		1313.321	.197	2011	GPS - RTRN	2015	RTRN2015
1401.041	.262		1313.321	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -87.720 12B = -87.720 09 = -87.611 03 = -87.506

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 18 19.82773	95 43 03.57726	499748.841	172619.429	.007		ADJUSTMENT	2024	GPS3771
46 18 19.82773	95 43 03.57726	499748.841	172619.429	.007	C	GPS - STATIC	2024	HTH78B
46 18 19.82788	95 43 03.57842	499748.760	172619.444	.131	3	GPS - RTRN	2023	RTRN2023
46 18 19.82773	95 43 03.57726	499748.841	172619.429	.020		ADJUSTMENT	2020	GPS3384
46 18 19.82773	95 43 03.57726	499748.841	172619.429	.020	C	GPS - STATIC	2020	HOTTE
46 18 19.82709	95 43 03.57680	499748.873	172619.364	.131	3	GPS - RTRN	2015	RTRN2015
46 18 19.82709	95 43 03.57680	499748.873	172619.364	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 18 19.82743	95 43 03.57779	499748.804	172619.399	.033	C	GPS - STATIC	2024	HTH78B
46 18 19.82743	95 43 03.57779	499748.804	172619.399	.033	C	GPS - STATIC	2021	HOTTE



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2253777.626	807575.280	953836.423	16835865.892	.007		ADJUSTMENT	2024	GPS3771
2253777.626	807575.280	953836.423	16835865.892	.007	C	GPS - STATIC	2024	HTH78B
2253777.545	807575.297	953836.342	16835865.910	.131	3	GPS - RTRN	2023	RTRN2023
2253777.626	807575.280	953836.423	16835865.892	.020		ADJUSTMENT	2020	GPS3384
2253777.626	807575.280	953836.423	16835865.892	.020	C	GPS - STATIC	2020	HOTTE
2253777.657	807575.215	953836.453	16835865.826	.131	3	GPS - RTRN	2015	RTRN2015
2253777.657	807575.215	953836.453	16835865.826	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2253777.588	807575.250	953836.385	16835865.863	.033	C	GPS - STATIC	2024	HTH78B
2253777.588	807575.250	953836.385	16835865.863	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MOLLY_RESET-DQ4330-3E-17OCT2023.jpg	E	Oct 17, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MOLLY_RESET-DQ4330-2-17OCT2023.jpg		Oct 17, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MOLLY_RESET-DQ4330-1-17OCT2023.jpg		Oct 17, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MOORE

NGS Name: MOORE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5782](#) [Get Map](#)
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	33	136 N	42 W	463300.46	955849.86	2	C	2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 19 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: MOORE 2014

5.0 MILES EAST-SOUTHEAST OF PELICAN RAPIDS, 6.0 MILES EAST-SOUTHEAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 108 MILEPOINT 18.4, 35.1 FEET NORTH OF TRUNK HIGHWAY 108, 15.7 FEET WEST OF A FIELD ENTRANCE, 5.0 FEET EAST OF A WITNESS POST.

Station Pair: CROW - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1372.950	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPOLI2

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1372.996			1285.375	.017	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1372.822	.131		1285.526	.066	1996	GPS - STATIC	2024	HTH108
1372.996			1285.375	.017	2011	GPS - STATIC	2024	HTH108
1372.920	.262		1285.286	.197	2011	GPS - RTRN	2023	RTRN2023
1372.986	.262		1285.348	.197	2011	GPS - RTRN	2022	RTRN2022
1372.911	.131		1285.526	.066	1996	GPS - STATIC	2021	HOTTE
1372.996			1285.375	.023	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1372.996			1285.375	.023	2011	GPS - STATIC	2020	HOTTE
1372.789	.262		1285.175	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.638 12B = -87.615 09 = -87.523 03 = -87.362

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>								
<u>Geodetic Position</u>		<u>Otter Tail County</u>				<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 33 00.45880	95 58 49.86004	433608.162	261946.860	.010		ADJUSTMENT	2024	GPS3689
46 33 00.45880	95 58 49.86004	433608.162	261946.860	.010	C	GPS - STATIC	2024	HTH108
46 33 00.45862	95 58 49.85931	433608.213	261946.841	.131	3	GPS - RTRN	2023	RTRN2023
46 33 00.45827	95 58 49.86031	433608.143	261946.806	.131	3	GPS - RTRN	2022	RTRN2022
46 33 00.45880	95 58 49.86004	433608.162	261946.860	.013		ADJUSTMENT	2020	GPS3384
46 33 00.45880	95 58 49.86004	433608.162	261946.860	.013	C	GPS - STATIC	2020	HOTTE
46 33 00.45846	95 58 49.86006	433608.161	261946.825	.131	3	GPS - RTRN	2014	RTRN2014

<u>NAD83(1996)</u>								
<u>Geodetic Position</u>		<u>Otter Tail County</u>				<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 33 00.45848	95 58 49.86053	433608.128	261946.827	.033	C	GPS - STATIC	2024	HTH108
46 33 00.45848	95 58 49.86053	433608.128	261946.827	.033	C	GPS - STATIC	2021	HOTTE



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2189310.437	898100.223	890795.642	16927425.687	.010		ADJUSTMENT	2024	GPS3689
2189310.437	898100.223	890795.642	16927425.687	.010	C	GPS - STATIC	2024	HTH108
2189310.488	898100.204	890795.692	16927425.667	.131	3	GPS - RTRN	2023	RTRN2023
2189310.417	898100.170	890795.621	16927425.634	.131	3	GPS - RTRN	2022	RTRN2022
2189310.437	898100.223	890795.642	16927425.687	.013		ADJUSTMENT	2020	GPS3384
2189310.437	898100.223	890795.642	16927425.687	.013	C	GPS - STATIC	2020	HOTTE
2189310.435	898100.189	890795.639	16927425.653	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2189310.402	898100.192	890795.607	16927425.656	.033	C	GPS - STATIC	2024	HTH108
2189310.402	898100.192	890795.607	16927425.656	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MOORE-DR5782-3N-31JUL2023.jpg	N	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MOORE-DR5782-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MOORE-DR5782-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MOSES

NGS Name: MOSES

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	4	136 N	43 W	463654.93	960615.33			1999	2009	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (1999)

Stamping: MOSES 1999

3.15 MILES NORTH OF PELICAN RAPIDS, 0.55 MILE NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 WEST IN PELICAN RAPIDS, TO TRUNK HIGHWAY MILEPOINT 241.15, THENCE 2.5 MILES NORTHWEST ALONG COUNTY ROAD 9, 0.45 MILE WEST ALONG COUNTY ROAD 23, 44.3 FEET NORTH OF COUNTY ROAD 23, 10.0 FEET WEST OF AN ENTRANCE, 18.0 FEET SOUTH OF A WITNESS POST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.434 12B = -87.415 09 = -87.316 03 = -87.195

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MOSES-3N-18AUG2009.jpg	N	Aug 18, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MOSES-2-18AUG2009.jpg		Aug 18, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MOSES-1-18AUG2009.jpg		Aug 18, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MUD AZ MK

NGS Name: MUD AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4329](#) [Get Map](#)
NGS Quad / Sta Num : 46095334/1010
USGS Quad: DALTON

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	5	131 N	42 W	461122.00	955907.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2015	DESTROYED	Horz=NO Vert=NO	NO	56801		SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	AZIMUTH MARK DISK	MNDT

Description: (1962)

Stamping: MUD 1962

3.25 MILES WEST OF DALTON, 0.7 MILE NORTHWEST ON INTERSTATE HIGHWAY 94 TO THE TRUNK HIGHWAY 52 OVERPASS
AND THE STATION IS ON THE RIGHT, SET IN THE SOUTHEAST CORNER OF A BRIDGE (NUMBER 56801).

Station Notes

NO BRIDGE IN THIS AREA.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.529 12B = -87.533 09 = -87.395 03 = -87.352



Mn/DOT Name: MUD MNDT

NGS Name: MUD

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0602](#) [Get Map](#)
NGS Quad / Sta Num : 46095334/1010
USGS Quad: DALTON

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	5	131 N	42 W	461113.01	955854.71	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1962	2015	GOOD	Horz=NO Vert=NO	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRAVERSE STATION DISK	MNDT

Description: (2015) **Stamping:** MUD 1962

7.9 MILES SOUTH-SOUTHEAST OF FERGUS FALLS, 2.3 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE SOUTHEAST JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 (THE JUNCTION IS 6.0 MILES SOUTH OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 64.05, 130.0 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 61.13 FEET WEST OF STATION MUD RM 1, 50.0 FEET WEST-NORTHWEST OF A POWER POLE, 49.0 FEET NORTHWEST OF STATION MUD RM 2, 4.3 FEET NORTHWEST OF A WITNESS POST.

Station Notes

THE SURVEY MARK IS BEYOND THE RIGHT-OF-WAY FENCE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1252.714	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1252.750	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1252.721	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1252.757	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1252.025	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1252.025	.016	2				VERTICAL CONTROL SURVEY	1972	Q460953
1252.025	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1252.025	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1252.645	.262		1165.135	.197	2011	GPS - RTRN	2015	RTRN2015
1252.622	.262		1165.290	.197	1996	GPS - RTRN	2009	RTRN2009
1252.753	.197		1165.477	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.503 12B = -87.513 09 = -87.372 03 = -87.329

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 11 13.01465	95 58 54.70422	432825.476	129492.837	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 11 13.01477	95 58 54.70695	432825.284	129492.850	.131	3	GPS - RTRN	2009	RTRN2009
46 11 13.01375	95 58 54.70587	432825.360	129492.746	.066	2	ADJUSTMENT	1999	17648
46 11 13.01384	95 58 54.70570	432825.372	129492.755	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 11 13.01264	95 58 54.69400	432826.194	129492.631	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 11 13.16220	95 58 53.49470			.100	2	CLASSICAL SURVEY	1963	13276

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2186076.346	765700.709	885465.868	16795051.219	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2186076.155	765700.725	885465.676	16795051.238	.131	3	GPS - RTRN	2009	RTRN2009
2186076.229	765700.620	885465.748	16795051.132	.066	2	ADJUSTMENT	1999	17648
2186076.241	765700.629	885465.761	16795051.141	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2186077.061	765700.490	885466.579	16795050.988	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1561481.796	437627.629			.100	2	CLASSICAL SURVEY	1963	13276

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MUD-RO0602-3NE-14SEP2015.jpg	NE	Sep 14, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MUD-RO0602-2-14SEP2015.jpg		Sep 14, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MUD-RO0602-1-14SEP2015.jpg		Sep 14, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MUD RM 1

NGS Name: MUD RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0603](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	5	131 N	42 W	461113.02	955853.84	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1962	2015	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2015)

Stamping: MUD NO. 1 1962

7.9 MILES SOUTH-SOUTHEAST OF FERGUS FALLS, 2.3 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE SOUTHEAST JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 (THE JUNCTION IS 6.0 MILES SOUTH OF FERGUS FALLS), 191.0 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 62.0 FEET NORTHEAST OF AN EAST-WEST FENCE LINE, 27.0 FEET NORTH OF A POWER POLE, 61.13 FEET EAST OF STATION MUD MNDT, 48.0 FEET NORTH-NORTHEAST OF STATION MUD RM 2, 5.0 FEET NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1257.324	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1257.356	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1257.330	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1257.356	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1256.625	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1256.625	.016	2				VERTICAL CONTROL SURVEY	1972	Q460953
1256.625	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1256.625	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1257.330	.262		1169.820	.197	2011	GPS - RTRN	2015	RTRN2015
1257.183	.262		1169.853	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.503 12B = -87.510 09 = -87.372 03 = -87.329

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 11 13.01604	95 58 53.83750	432886.460	129492.773	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 11 13.01602	95 58 53.83921	432886.340	129492.772	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2186137.311	765699.516	885526.825	16795049.069	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2186137.190	765699.517	885526.705	16795049.071	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MUD_RM_1-RO0603-3NE-14SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MUD_RM_1-RO0603-2-14SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MUD_RM_1-RO0603-1-14SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
NE	Sep 14, 2015
	Sep 14, 2015
	Sep 14, 2015



Mn/DOT Name: MUD RM 2

NGS Name: MUD RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0604](#) [Get Map](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	5	131 N	42 W	461112.64	955854.25	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1962	2015	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	MNDT

Description: (2015)

Stamping: MUD NO. 2 1962

7.9 MILES SOUTH-SOUTHEAST OF FERGUS FALLS, 2.3 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 SOUTH (THE JUNCTION IS 6.0 MILES SOUTH OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 64.05, 143.0 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 49.0 FEET SOUTHEAST OF STATION MUD MNDT, 48.0 FEET SOUTH-SOUTHWEST OF STATION MUD RM 1, 21.0 FEET SOUTH OF A POWER POLE, 1.0 FOOT SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1252.468	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1252.501	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1252.475	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1252.497	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1251.766	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1251.766	.016	2				VERTICAL CONTROL SURVEY	1972	Q460953
1251.766	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1251.766	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1252.415	.262		1164.906	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -87.503 12B = -87.510 09 = -87.369 03 = -87.329

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 11 12.64027	95 58 54.25371	432857.047	129454.804	.131	3	GPS - RTRN	2015	RTRN2015

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2186107.204	765662.103	885496.125	16795012.121	.131	3	GPS - RTRN	2015	RTRN2015

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MUD_RM_2-RO0604-3NE-14SEP2015.jpg	NE	Sep 14, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MUD_RM_2-RO0604-2-14SEP2015.jpg		Sep 14, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MUD_RM_2-RO0604-1-14SEP2015.jpg		Sep 14, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MUFF

NGS Name: MUFF

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5783](#) [Get Map](#)
NGS Quad / Sta Num : 46096222/
USGS Quad: WENDELL

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	35	131 N	43 W	460631.20	960221.15		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015)

Stamping: MUFF 2001 2009

12.2 MILES SOUTH-SOUTHEAST OF FERGUS FALLS, 7.3 MILES SOUTH AND SOUTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94, TO TRUNK HIGHWAY 59 MILEPOINT 204.95, THENCE 2.0 MILES WEST ALONG COUNTY ROAD 26, 68.6 FEET NORTH OF COUNTY ROAD 26, 59.0 FEET EAST OF 215TH AVENUE, 9.3 FEET NORTHWEST OF A CABLE BOX, 1.9 FEET NORTHWEST OF A WITNESS POST, UNKNOWN ROD DEPTH.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1158.603	.131			1071.642	.066	1996	GPS - STATIC	2021	HOTTE
1158.593				1071.487	.025	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1158.593				1071.487	.025	2011	GPS - STATIC	2020	HOTTE
1158.475	.262			1071.537	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.119 12B = -87.070 09 = -86.952 03 = -86.942

Lat/Lon and County Coordinates (Feet)

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 31.20010	96 02 21.15198	418183.134	100997.534	.016		ADJUSTMENT	2020	GPS3384
46 06 31.20010	96 02 21.15198	418183.134	100997.534	.016	C	GPS - STATIC	2020	HOTTE

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 06 31.19977	96 02 21.15250	418183.097	100997.500	.033	C	GPS - STATIC	2021	HOTTE
46 06 31.20042	96 02 21.15228	418183.113	100997.566	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2170911.096	737485.183	869854.818	16767067.512	.016		ADJUSTMENT	2020	GPS3384
2170911.096	737485.183	869854.818	16767067.512	.016	C	GPS - STATIC	2020	HOTTE

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2170911.058	737485.150	869854.780	16767067.480	.033	C	GPS - STATIC	2021	HOTTE
2170911.075	737485.216	869854.798	16767067.545	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MUFF-DR5783-3N-07OCT2014.jpg	N	Oct 7, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MUFF-DR5783-2-07OCT2014.jpg		Oct 7, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MUFF-DR5783-1-07OCT2014.jpg		Oct 7, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: MUNDT

NGS Name: MUNDT

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2056](#) [Get Map](#)
NGS Quad / Sta Num : 46095434/
USGS Quad: LAKE FRANKLIN

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	14	137 N	42 W	464043.74	955721.82	2	C	2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 27 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: MUNDT 2014

9.45 MILES NORTHEAST OF PELICAN RAPIDS, 10.65 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAYS 59 AND 108 WEST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 251.3, 82.0 FEET SOUTHEAST OF TRUNK HIGHWAY 59, 54.7 FEET NORTHEAST OF AN ENTRANCE, 31.2 FEET NORTH OF A RIGHT-OF-WAY POST, 1.5 FEET NORTHWEST OF A WITNESS POST.

Station Pair: MCCOY - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1451.040	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1451.040			1363.869	.021	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1451.040	.131		1363.977	.066	1996	GPS - STATIC	2023	HTH59
1451.040			1363.869	.021	2011	GPS - STATIC	2023	HTH59
1451.070	.262		1363.862	.197	2011	GPS - RTRN	2022	RTRN2022
1450.985	.262		1363.790	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.208 12B = -87.198 09 = -87.109 03 = -86.958

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 40	43.74462	95 57	21.81790	439904.034	308864.327	.013		ADJUSTMENT	2024	GPS3672
46 40	43.74462	95 57	21.81790	439904.034	308864.327	.013	C	GPS - STATIC	2023	HTH59
46 40	43.74497	95 57	21.81742	439904.068	308864.362	.131	3	GPS - RTRN	2022	RTRN2022
46 40	43.74436	95 57	21.81787	439904.037	308864.301	.131	3	GPS - RTRN	2014	RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 40	43.74440	95 57	21.81839	439904.000	308864.305	.033	C	GPS - STATIC	2023	HTH59

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2196472.874	944887.267	898706.793	16974106.411	.013		ADJUSTMENT			2024	GPS3672
2196472.874	944887.267	898706.793	16974106.411	.013	C	GPS - STATIC			2023	HTH59
2196472.908	944887.301	898706.828	16974106.445	.131	3	GPS - RTRN			2022	RTRN2022
2196472.875	944887.240	898706.794	16974106.384	.131	3	GPS - RTRN			2014	RTRN2014

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2196472.839	944887.245	898706.758	16974106.390	.033	C	GPS - STATIC			2023	HTH59



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MUNDT-DQ2056-3SE-12OCT2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MUNDT-DQ2056-2-12OCT2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MUNDT-DQ2056-1-12OCT2022.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
SE	Oct 12, 2022
	Oct 12, 2022
	Oct 12, 2022



Mn/DOT Name: MURDOFF

NGS Name: MURDOFF

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096224/
USGS Quad: ORWELL LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	34	132 N	44 W	461143.75	961215.03		3	2001	2014	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MN-111

Description: **Stamping:** MURDOFF 2001

4.05 MILES SOUTH ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND INTERSTATE HIGHWAY 94 AT FERGUS FALLS, THEN 4.3 MILES WEST ALONG COUNTY ROAD 2, THEN 1.0 MILE WEST ALONG 165TH STREET, THEN 0.5 MILE SOUTH ALONG 135TH AVENUE, 55.0 FEET NORTH OF 160TH STREET, 14.0 FEET EAST OF 135TH AVENUE, 1.0 FOOT NORTH OF A WITNESS POST. THE ROD DEPTH IS UNKNOWN.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1103.334	.262			1015.651	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.844 12B = -87.779 09 = -87.687 03 = -87.680

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 11 43.74869	96 12 15.02903			376533.076	132874.273	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2129863.783	770122.933			829308.616	16800357.765	.131	3	GPS - RTRN	2009 RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MURDOFF-3E-06AUG2009.jpg	E	Aug 6, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MURDOFF-2-06AUG2009.jpg		Aug 6, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/MURDOFF-1-06AUG2009.jpg		Aug 6, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: N 61

NGS Name: N 61

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0140](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	32	133 N	42 W	461717.00	960011.00	2		1934	2009	NOT FOUND	Horz=NO Vert=YES	NO		FLUSH	STEEL SPIKE ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	BENCH MARK DISK	NGS

Description: (1967)

Stamping: N 61 1934

3.5 MILES EAST ON A RAILROAD FROM FERGUS FALLS, 15 RAILS EAST OF RAILROAD MILEPOST 46, 25.0 FEET SOUTH OF A RAILROAD, 40.0 FEET NORTH OF AN EAST-WEST FENCE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1258.465	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1257.652	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1257.652	.007	1				VERTICAL CONTROL SURVEY	1941	Q460962
1257.652	.007	1				VERTICAL CONTROL SURVEY	1934	L40 MINN

Geoid Separations(ft): GEOID18 = -88.156 12B = -88.159 09 = -88.048 03 = -87.939

* No Horizontal Positions in the Database *



Mn/DOT Name: NEIDT

NGS Name: NEIDT

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ1974](#) [Get Map](#)
NGS Quad / Sta Num : 46096124/
USGS Quad: ROLLAG

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	30	137 N	43 W	463935.19	960934.58	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 19 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: NEIDT 2014

7.2 MILES NORTHWEST OF PELICAN RAPIDS, 6.45 MILES WEST ALONG TRUNK HIGHWAY 34 FROM THE JUNCTION OF TRUNK HIGHWAYS 34 AND 59 (THE JUNCTION IS 6.0 MILES NORTH OF PELICAN RAPIDS), AT TRUNK HIGHWAY 34 MILEPOINT 12.4, 34.1 FEET SOUTH OF TRUNK HIGHWAY 34, 15.3 FEET EAST OF A FIELD ENTRANCE, 1.5 FEET NORTH OF A WITNESS POST.

Station Pair: FRODL - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1381.273	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1381.273			1294.105	.023	2011	HORIZONTAL ADJUSTMENT	2024	GPS3671
1381.273	.131		1294.217	.066	1996	GPS - STATIC	2023	HTH9
1381.273			1294.105	.023	2011	GPS - STATIC	2023	HTH9
1381.352	.262		1294.062	.197	2011	GPS - RTRN	2022	RTRN2022
1381.119	.262		1293.862	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.290 12B = -87.257 09 = -87.162 03 = -87.077

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 39 35.18519	96 09 34.58261	388768.672	302138.721	.013		ADJUSTMENT		2024	GPS3671	
46 39 35.18519	96 09 34.58261	388768.672	302138.721	.013	C	GPS - STATIC		2023	HTH9	
46 39 35.18493	96 09 34.58251	388768.678	302138.694	.131	3	GPS - RTRN		2022	RTRN2022	
46 39 35.18510	96 09 34.58216	388768.703	302138.711	.131	3	GPS - RTRN		2014	RTRN2014	

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 39 35.18495	96 09 34.58304	388768.641	302138.697	.033	C	GPS - STATIC		2023	HTH9	

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2145228.098	939110.065	847358.947	16969148.883	.013		ADJUSTMENT		2024	GPS3671	
2145228.098	939110.065	847358.947	16969148.883	.013	C	GPS - STATIC		2023	HTH9	
2145228.105	939110.039	847358.953	16969148.856	.131	3	GPS - RTRN		2022	RTRN2022	
2145228.129	939110.056	847358.978	16969148.872	.131	3	GPS - RTRN		2014	RTRN2014	

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2145228.068	939110.042	847358.916	16969148.860	.033	C	GPS - STATIC		2023	HTH9	



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NEIDT-DQ1974-3S-13SEP2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NEIDT-DQ1974-2-13SEP2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NEIDT-DQ1974-1-13SEP2022.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Sep 13, 2022
	Sep 13, 2022
	Sep 13, 2022



Mn/DOT Name: NESS AZ MK

NGS Name: NESS AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4353](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/1048
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	36	132 N	43 W	461229.00	960110.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2009	DESTROYED	Horz=NO Vert=NO	NO	9701		SEE DESCRIPTION

Monument Type

BRIDGE ABUTMENT

Disk Type

AZIMUTH MARK DISK

Mon. Agency

MNDT

Description:

Stamping: NESS 1962

0.7 MILE SOUTHEAST ON INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF TRUNK HIGHWAY 52 TO THE STATION ON THE RIGHT, SET IN THE SOUTHEAST CORNER OF THE BRIDGE ON TRUNK HIGHWAY 52 OVER INTERSTATE HIGHWAY 94 (BRIDGE NUMBER.9701).

Station Notes

NEW BRIDGE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.726 12B = -87.716 09 = -87.588 03 = -87.533



Mn/DOT Name: NESS MNDT

NGS Name: NESS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0146](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/1048
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	25	132 N	43 W	461255.73	960147.57	2	C	1962	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	TRAVERSE STATION DISK	MNDT

Description: (2015) Stamping: NESS 1962

5.0 MILES SOUTHEAST OF FERGUS FALLS, 6.9 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOST 61.00, 164.5 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 139.0 FEET NORTH OF A POWER POLE, 4.0 FEET NORTHEAST OF A RIGHT-OF-WAY FENCE, 42.84 FEET NORTHWEST OF STATION NESS RM 1, 59.14 FEET SOUTHEAST OF STATION NESS RM 2, 3.4 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1261.556	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1261.592	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1261.572	.016	2/1				VERTICAL CONTROL SURVEY	2016 VI94D4
1261.572	.016	2/1				VERTICAL ADJUSTMENT	2007 00000425-15
1261.589	.016	2/1				VERTICAL CONTROL SURVEY	2005 VFAUN
1261.589	.016	2				VERTICAL ADJUSTMENT	1991 00000025

<u>NGVD29</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1260.828	.016	2/0				UNKNOWN/APPROXIMATE	1992 UNCHECKD
1260.828	.016	2				VERTICAL CONTROL SURVEY	1972 Q460962
1260.828	.016	2				VERTICAL CONTROL SURVEY	1972 L22167-A
1260.828	.016	2				VERTICAL CONTROL SURVEY	1971 L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1261.556			1173.790	.016	2011	HORIZONTAL ADJUSTMENT	2025 GPS3847
1261.556			1173.790	.016	2011	GPS - STATIC	2025 HTH94B
1262.849	.262		1175.050	.197	2011	GPS - RTRN	2023 RTRN2023
1261.431	.262		1173.643	.197	2011	GPS - RTRN	2015 RTRN2015
1261.421	.262		1173.813	.197	1996	GPS - RTRN	2009 RTRN2009
1261.579	.197		1174.053	.131	1996	HORIZONTAL ADJUSTMENT	1999 17648

Geoid Separations(ft): GEOID18 = -87.798 12B = -87.789 09 = -87.664 03 = -87.605

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 12 55.73058	96 01 47.57028	420703.606	139943.026	.013		ADJUSTMENT	2025	GPS3847
46 12 55.73058	96 01 47.57028	420703.606	139943.026	.013	C	GPS - STATIC	2025	HTH94B
46 12 55.73045	96 01 47.57042	420703.596	139943.013	.131	3	GPS - RTRN	2023	RTRN2023
46 12 55.73141	96 01 47.57068	420703.579	139943.110	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 12 55.73002	96 01 47.57084	420703.567	139942.969	.066		NCAT	2025	HTH94B
46 12 55.73083	96 01 47.57093	420703.561	139943.051	.131	3	GPS - RTRN	2009	RTRN2009
46 12 55.72989	96 01 47.57137	420703.529	139942.956	.066	2	ADJUSTMENT	1999	17648
46 12 55.72990	96 01 47.57112	420703.547	139942.957	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 12 55.72860	96 01 47.55935	420704.374	139942.822	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 12 55.87620	96 01 46.35200			.100	2	CLASSICAL SURVEY	1963	13276

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2174151.611	776372.059	873706.333	16805912.282	.013		ADJUSTMENT	2025	GPS3847
2174151.611	776372.059	873706.333	16805912.282	.013	C	GPS - STATIC	2025	HTH94B
2174151.601	776372.046	873706.323	16805912.270	.131	3	GPS - RTRN	2023	RTRN2023
2174151.585	776372.143	873706.308	16805912.368	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2174151.570	776372.003	873706.292	16805912.227	.066		NCAT	2025	HTH94B
2174151.566	776372.085	873706.288	16805912.310	.131	3	GPS - RTRN	2009	RTRN2009
2174151.533	776371.991	873706.254	16805912.216	.066	2	ADJUSTMENT	1999	17648
2174151.550	776371.991	873706.271	16805912.216	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2174152.375	776371.841	873707.094	16805912.053	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1549557.266	448298.668			.100	2	CLASSICAL SURVEY	1963	13276

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NESS-RP0146-3W-14AUG2023.jpg	W	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NESS-RP0146-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NESS-RP0146-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: NESS RM 1

NGS Name: NESS RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0147](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	25	132 N	43 W	461255.39	960147.21	2	3	1962	2015	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2015)

Stamping: NESS NO 1 1962

5.0 MILES SOUTHEAST OF FERGUS FALLS, 6.9 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 61.00, 167.3 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 102.0 FEET SOUTHEAST OF STATION NESS RM 2, 42.84 FEET SOUTHEAST OF STATION NESS MNDT, 2.0 FEET NORTHEAST OF AN INTERSTATE HIGHWAY 94 RIGHT-OF-WAY FENCE, 1.0 FOOT SOUTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1257.596	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1257.632	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1257.612	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1257.612	.016	2/1				VERTICAL ADJUSTMENT	2007	00000425-15
1257.629	.016	2/1				VERTICAL CONTROL SURVEY	2005	VFAUN
1257.612	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1256.851	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1256.851	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1256.851	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1256.851	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1257.422	.262		1169.633	.197	2011	GPS - RTRN	2015	RTRN2015
1257.452	.262		1169.847	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.798 12B = -87.789 09 = -87.664 03 = -87.605

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 12 55.39166	96 01 47.20900	420728.877	139908.591	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 12 55.39060	96 01 47.20851	420728.911	139908.483	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2174176.237	776337.166	873730.416	16805876.995	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2174176.269	776337.058	873730.446	16805876.887	.131	3	GPS - RTRN	2009	RTRN2009



<u>Station Photos</u>		<u>Dir</u>	<u>Date</u>
<u>Type</u>	<u>File Name</u>	SW	Sep 15, 2015
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NESS_RM_1-RP0147-3SW-15SEP2015.jpg		Sep 15, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NESS_RM_1-RP0147-2-15SEP2015.jpg		Sep 15, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NESS_RM_1-RP0147-1-15SEP2015.jpg		Sep 15, 2015
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: NESS RM 2

NGS Name: NESS RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0148](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	25	132 N	43 W	461256.18	960148.12	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1962	2015	GOOD	Horz=NO Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2015)

Stamping: NESS NO 2 1962

5.0 MILES SOUTHEAST OF FERGUS FALLS, 6.9 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210 WEST IN FERGUS FALLS, AT INTERSTATE HIGHWAY 94 MILEPOINT 61.00, 165.7 FEET SOUTHWEST OF EASTBOUND INTERSTATE HIGHWAY 94, 102.0 FEET NORTHWEST OF STATION NESS RM 1, 59.14 FEET NORTHWEST OF STATION NESS MNDT, 2.0 FEET NORTHEAST OF AN INTERSTATE HIGHWAY 94 RIGHT-OF-WAY FENCE, 1.0 FOOT SOUTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1262.324	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1262.356	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1262.340	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1262.340	.016	2/1				VERTICAL ADJUSTMENT	2007	00000425-15
1262.353	.016	2/1				VERTICAL CONTROL SURVEY	2005	VFAUN
1262.353	.016	2				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1261.589	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1261.589	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1261.589	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1261.589	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1262.242	.262		1174.450	.197	2011	GPS - RTRN	2015	RTRN2015
1262.199	.262		1174.591	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.798 12B = -87.789 09 = -87.664 03 = -87.608

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 12 56.17568	96 01 48.11587	420665.417	139988.269	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 12 56.17612	96 01 48.11504	420665.475	139988.314	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2174114.270	776417.995	873669.706	16805958.816	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2174114.330	776418.038	873669.766	16805958.859	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NESS_RM_2-RP0148-3SW-15SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NESS_RM_2-RP0148-2-15SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NESS_RM_2-RP0148-1-15SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
SW	Sep 15, 2015
	Sep 15, 2015
	Sep 15, 2015



Mn/DOT Name: NESTE

NGS Name: NESTE

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DQ2061 NGS Quad / Sta Num : 46095434/ USGS Quad: LAKE FRANKLIN Get Map
NW	6	137 N	41 W	464251.40	955432.60	2	C	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 104 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: NESTE 2014

12.6 MILES NORTHEAST OF PELICAN RAPIDS, 14.2 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAYS 59 AND 108 WEST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 254.85, 81.6 FEET SOUTH OF TRUNK HIGHWAY 59, 134.2 FEET WEST OF BUCKS MILL ROAD, 18.7 FEET NORTH OF A RIGHT-OF-WAY POST, 1.5 FEET NORTH OF A WITNESS POST.

Station Pair: PALM - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1357.829	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1357.904			1270.713	.017	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1357.829	.131		1270.857	.066	1996	GPS - STATIC	2023	HTH59
1357.904			1270.713	.017	2011	GPS - STATIC	2023	HTH59
1357.891	.262		1270.745	.197	2011	GPS - RTRN	2022	RTRN2022
1357.898			1270.713	.026	2011	HORIZONTAL ADJUSTMENT	2019	GPS3292
1357.786	.131		1270.857	.066	1996	GPS - STATIC	2019	HBCKR
1357.898			1270.713	.026	2011	GPS - STATIC	2019	HBCKR
1357.806	.262		1270.657	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.142 12B = -87.149 09 = -87.031 03 = -86.886

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>		<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>					<u>Year</u>	<u>Reference</u>
46 42 51.39610	95 54 32.59697	451735.516	321765.202	.010					ADJUSTMENT	2024	GPS3672
46 42 51.39610	95 54 32.59697	451735.516	321765.202	.010	C				GPS - STATIC	2023	HTH59
46 42 51.39670	95 54 32.59702	451735.513	321765.262	.131	3				GPS - RTRN	2022	RTRN2022
46 42 51.39610	95 54 32.59697	451735.516	321765.202	.016					ADJUSTMENT	2019	GPS3292
46 42 51.39610	95 54 32.59697	451735.516	321765.202	.016	C				GPS - STATIC	2019	HBCKR
46 42 51.39596	95 54 32.59733	451735.492	321765.188	.131	3				GPS - RTRN	2014	RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>		<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>					<u>Year</u>	<u>Reference</u>
46 42 51.39574	95 54 32.59767	451735.468	321765.165	.033	C				GPS - STATIC	2023	HTH59
46 42 51.39574	95 54 32.59767	451735.468	321765.165	.033	C				GPS - STATIC	2019	HBCKR

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2208539.678	957565.344	910978.524	16986593.009	.010		ADJUSTMENT	2024	GPS3672
2208539.678	957565.344	910978.524	16986593.009	.010	C	GPS - STATIC	2023	HTH59
2208539.675	957565.405	910978.523	16986593.070	.131	3	GPS - RTRN	2022	RTRN2022
2208539.678	957565.344	910978.524	16986593.009	.016		ADJUSTMENT	2019	GPS3292
2208539.678	957565.344	910978.524	16986593.009	.016	C	GPS - STATIC	2019	HBCKR
2208539.652	957565.330	910978.498	16986592.996	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2208539.628	957565.308	910978.474	16986592.975	.033	C	GPS - STATIC	2023	HTH59
2208539.628	957565.308	910978.474	16986592.975	.033	C	GPS - STATIC	2019	HBCKR

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NESTE-DQ2061-3S-12OCT2022.jpg	S	Oct 12, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NESTE-DQ2061-2-12OCT2022.jpg		Oct 12, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NESTE-DQ2061-1-12OCT2022.jpg		Oct 12, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: NOBLE

NGS Name: NOBLE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR9952](#) [Get Map](#)
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	34	136 N	44 W	463330.20	961303.24	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 22 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) **Stamping:** NOBLE 2014

6.5 MILES WEST OF PELICAN RAPIDS, 7.2 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 108 MILEPOINT 4.9, 49.2 FEET SOUTH OF TRUNK HIGHWAY 108, 16.2 FEET EAST OF A FIELD ENTRANCE, 10.0 FEET WEST OF A WITNESS POST.

Station Pair: 5625 C - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1317.333	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPOLI2

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1317.353			1229.729	.021	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1317.323	.131		1229.827	.066	1996	GPS - STATIC	2024	HTH108
1317.353			1229.729	.021	2011	GPS - STATIC	2024	HTH108
1317.412	.262		1229.715	.197	2011	GPS - RTRN	2023	RTRN2023
1317.402	.262		1229.706	.197	2011	GPS - RTRN	2022	RTRN2022
1317.255	.262		1229.578	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.697 12B = -87.677 09 = -87.575 03 = -87.487

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 33 30.19536	96 13 03.23555	373979.937	265247.835	.013		ADJUSTMENT	2024	GPS3689
46 33 30.19536	96 13 03.23555	373979.937	265247.835	.013	C	GPS - STATIC	2024	HTH108
46 33 30.19512	96 13 03.23536	373979.950	265247.810	.131	3	GPS - RTRN	2023	RTRN2023
46 33 30.19560	96 13 03.23520	373979.961	265247.859	.131	3	GPS - RTRN	2022	RTRN2022
46 33 30.19496	96 13 03.23477	373979.991	265247.794	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 33 30.19516	96 13 03.23611	373979.897	265247.815	.033	C	GPS - STATIC	2024	HTH108

State Plane and UTM Coordinates (Feet)

NAD83(2011)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Year	Reference
2129761.043	902503.781	831302.328	16932779.989	.013		ADJUSTMENT	2024	GPS3689
2129761.043	902503.781	831302.328	16932779.989	.013	C	GPS - STATIC	2024	HTH108
2129761.055	902503.757	831302.341	16932779.964	.131	3	GPS - RTRN	2023	RTRN2023
2129761.068	902503.805	831302.354	16932780.012	.131	3	GPS - RTRN	2022	RTRN2022
2129761.096	902503.740	831302.381	16932779.946	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Year	Reference
2129761.003	902503.762	831302.289	16932779.970	.033	C	GPS - STATIC	2024	HTH108



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NOBLE-DR9952-3S-27JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NOBLE-DR9952-2-27JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NOBLE-DR9952-1-27JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Jul 27, 2023
	Jul 27, 2023
	Jul 27, 2023



Mn/DOT Name: NORTH EMANUEL LUTH CH SPIRE

NGS Name: NORTH EMANUEL LUTH CH SPIRE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0902](#) [Get Map](#)
NGS Quad / Sta Num : 46096123/1027
USGS Quad: LAKE OLAF

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	10	136 N	44 W	463633.66	961249.14		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	1935	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	CHURCH SPIRE	NGS

Description: (1935) Stamping:
10.0 MILES WEST-NORTHWEST OF PELICAN RAPIDS.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.411 12B = -87.395 09 = -87.287 03 = -87.205

Lat/Lon and County Coordinates (Feet)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 36 33.66431	96 12 49.13662	375082.025	283829.059	.328	4	ADJUSTMENT	1999	17648
46 36 33.66335	96 12 49.13685	375082.008	283828.962	.328	4	ADJUSTMENT	1998	17655

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 36 33.66399	96 12 49.13000	375082.487	283829.024	.328	4	ADJUSTMENT	1986	17289

<u>Geodetic Position</u>								<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 36 33.81300	96 12 47.90600			.100	4	CLASSICAL SURVEY	1944	05937	

State Plane and UTM Coordinates (Feet)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2131206.658	921059.098	833044.802	16951317.535	.328	4	ADJUSTMENT	1999	17648
2131206.639	921059.001	833044.782	16951317.439	.328	4	ADJUSTMENT	1998	17655

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2131207.119	921059.054	833045.263	16951317.484	.328	4	ADJUSTMENT	1986	17289

<u>MN State Plane - Central Zone</u>								<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
1506611.170	592985.095			.100	4	CLASSICAL SURVEY	1944	05937	



Mn/DOT Name: NORWAY RESET

NGS Name: NORWAY RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5785](#) [Get Map](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	18	133 N	41 W	461933.92	955345.27		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015)

Stamping: NORWAY 2000 2009

2.5 MILES NORTH OF UNDERWOOD, 3.55 MILES NORTH ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 210 IN UNDERWOOD, TO TRUNK HIGHWAY 210 MILEPOINT 37.55, THENCE 1.1 MILES WEST ALONG COUNTY ROAD 18, 24.6 FEET NORTH OF COUNTY ROAD 18, 11.0 FEET WEST OF A FIELD ENTRANCE, 4.8 FEET SOUTHWEST OF A WITNESS POST, UNKNOWN ROD DEPTH.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Year	Reference
1381.802	.131		1293.918	.066	1996	2021	HOTTE
1381.857			1293.767	.024	2011	2020	GPS3384
1381.857			1293.767	.024	2011	2020	HOTTE

Geoid Separations(ft): GEOID18 = -88.103 12B = -88.117 09 = -88.005 03 = -87.851

Lat/Lon and County Coordinates (Feet)

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 33.92055	95 53 45.26941	454712.755	180176.939	.016		ADJUSTMENT	2020	GPS3384
46 19 33.92055	95 53 45.26941	454712.755	180176.939	.016	C	GPS - STATIC	2020	HOTTE

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 19 33.92025	95 53 45.26992	454712.719	180176.908	.033	C	GPS - STATIC	2021	HOTTE

State Plane and UTM Coordinates (Feet)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2208895.116	815964.220	909080.630	16844964.491	.016		ADJUSTMENT	2020	GPS3384
2208895.116	815964.220	909080.630	16844964.491	.016	C	GPS - STATIC	2020	HOTTE

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2208895.079	815964.190	909080.593	16844964.462	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NORWAY_RESET-DR5785-3N-10JUN2015.jpg	N	Jun 10, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NORWAY_RESET-DR5785-2-10JUN2015.jpg		Jun 10, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/NORWAY_RESET-DR5785-1-10JUN2015.jpg		Jun 10, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: OLAF MNDT

NGS Name: OLAF

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9321](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	20	136 N	43 W	463444.30	960656.12	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1982	2022	GOOD	Horz=NO Vert=NO	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MNDT

Description: (1982) **Stamping:** OLAF 1982

1.75 MILES WEST-NORTHWEST OF PELICAN RAPIDS, 1.5 MILES WEST ON TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS TO TRUNK HIGHWAY 109 MILEPOINT 10.60, THEN 0.5 MILE NORTH ON 180TH AVENUE, 83.0 FEET WEST 180TH AVENUE, 44.4 FEET NORTH-NORTHWEST OF THE EAST POWER POLE, 42.2 FEET NORTH OF THE WEST 1 OF 2 POWER POLES, 40.02 FEET NORTHWEST OF OLAF MNDT RM 2, 30.56 FEET SOUTHWEST OF OLAF MNDT RM 1.

Station Notes

THE SURVEY MARK IS ON PRIVATE PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1395.233	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1395.302	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1395.306	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1395.256	.262		1307.691	.197	2011	GPS - RTRN	2022	RTRN2022
1395.240	.197		1307.983	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1394.387						RECIPROCAL VERTICAL ANGLE	1982	HORZ

Geoid Separations(ft): GEOID18 = -87.565 12B = -87.552 09 = -87.437 03 = -87.319

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 34 44.30257	96 06 56.11932	399673.668	272609.809	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 34 44.30294	96 06 56.11995	399673.624	272609.847	.066	2	ADJUSTMENT	1999	17648
46 34 44.30299	96 06 56.11916	399673.679	272609.852	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 34 44.29991	96 06 56.11995	399673.623	272609.540	.066	2	ADJUSTMENT	1997	16997

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 34 44.44550	96 06 54.90970			.100	2	CLASSICAL SURVEY	1950	UNK



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2155583.383	909388.074	857241.434	16939253.930	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2155583.340	909388.112	857241.391	16939253.969	.066	2	ADJUSTMENT	1999	17648
2155583.395	909388.116	857241.447	16939253.972	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2155583.333	909387.805	857241.379	16939253.662	.066	2	ADJUSTMENT	1997	16997

NAD27

MN State Plane - Central Zone		<u>X</u>	<u>Y</u>	Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1530987.200	581313.663			.100	2	CLASSICAL SURVEY	1950	UNK

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OLAF-AD9321-3W-12OCT2022.jpg	W	Oct 12, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OLAF-AD9321-2-12OCT2022.jpg		Oct 12, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OLAF-AD9321-1-12OCT2022.jpg		Oct 12, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: OLAF MNDT AZ MK

NGS Name: OLAF AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AB9911](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	28	136 N	43 W	463417.32	960651.27	2	B	1982	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	MNDT

Description: (2001) Stamping: OLAF 1982

1.45 MILES WEST OF PELICAN RAPIDS, 1.45 MILES WEST ON TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 AT PELICAN RAPIDS, AT TRUNK HIGHWAY 108 MILEPOINT 10.60, 73.3 FEET SOUTH OF TRUNK HIGHWAY 108, 7.6 FEET WEST-NORTHWEST OF A POWER POLE, 4.0 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1328.849	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPOLI2
1328.849	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1328.918	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1328.918	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPOLR
1328.918	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1328.902	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPOLI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1328.849			1241.320	.008	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1328.849			1241.320	.008	2011	GPS - STATIC	2025	HTH94B
1328.849			1241.320	.009	2011	HORIZONTAL ADJUSTMENT	2025	GPS3805
1328.849	.131		1241.369	.066	1996	GPS - STATIC	2025	HTH94A
1328.849			1241.320	.009	2011	GPS - STATIC	2025	HTH94A
1328.849			1241.320	.011	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1328.849			1241.320	.011	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1328.849	.131		1241.369	.066	1996	GPS - STATIC	2024	HTH108
1328.849			1241.320	.011	2011	GPS - STATIC	2024	HTH108
1328.849	.131		1241.369	.066	1996	GPS - STATIC	2023	HTH59
1328.849			1241.320	.011	2011	GPS - STATIC	2023	HTH59
1328.852	.262		1241.254	.197	2011	GPS - RTRN	2023	RTRN2023
1328.911	.262		1241.313	.197	2011	GPS - RTRN	2022	RTRN2022
1328.918			1241.320	.012	2011	HORIZONTAL ADJUSTMENT	2019	GPS3292
1328.918	.131		1241.520	.066	1996	GPS - STATIC	2019	HBCKR
1328.918			1241.320	.012	2011	GPS - STATIC	2019	HBCKR
1328.918			1241.320	.013	2011	HORIZONTAL ADJUSTMENT	2018	GPS3119
1328.918	.131		1241.520	.066	1996	GPS - STATIC	2017	HMNCORS07
1328.918			1241.320	.013	2011	GPS - STATIC	2017	HMNPH
1328.790	.262		1241.202	.197	2011	GPS - RTRN	2015	RTRN2015
1328.918			1241.320	.012	2011	HORIZONTAL ADJUSTMENT	2015	GPS3084
1328.918	.131		1241.520	.066	1996	GPS - STATIC	2015	HCLAY
1328.918			1241.320	.013	2011	HORIZONTAL ADJUSTMENT	2015	GPS3080
1328.918			1241.310	.012	2011	GPS - STATIC	2015	HCLAY
1328.816	.131		1241.520	.066	1996	GPS - STATIC	2015	HWILK
1328.918			1241.313	.013	2011	GPS - STATIC	2015	HWILK
1328.918			1241.320	.013	2011	HORIZONTAL ADJUSTMENT	2014	GPS2750
1328.918			1241.323	.013	2011	GPS - STATIC	2014	HBARN
1328.774	.262		1241.185	.197	2011	GPS - RTRN	2013	RTRN2013
			1241.320	.015	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1328.902	.131		1241.415	.066	2007	GPS - STATIC	2010	HBARN
1328.918	.131		1241.520	.066	1996	GPS - STATIC	2010	HBARN
			1241.415	.016	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1328.934	.098		1241.520	.049	1996	GPS - STATIC	2005	GPS2036
1328.902	.098		1241.612	.049	1996	HORIZONTAL ADJUSTMENT	1999	17648
1328.905	.098		1241.520	.049	1996	GPS - STATIC	1997	GPS805-B

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1328.016						RECIPROCAL VERTICAL ANGLE	1982	HORZ

Geoid Separations(ft): GEOID18 = -87.598 12B = -87.588 09 = -87.474 03 = -87.352

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County					Project Info	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 34 17.32225	96 06 51.26820	399998.822	269874.683	.007		ADJUSTMENT	2025	GPS3847
46 34 17.32225	96 06 51.26820	399998.822	269874.683	.007	C	GPS - STATIC	2025	HTH94B
46 34 17.32225	96 06 51.26820	399998.822	269874.683	.007		ADJUSTMENT	2025	GPS3805
46 34 17.32225	96 06 51.26820	399998.822	269874.683	.007	C	GPS - STATIC	2025	HTH94A
46 34 17.32225	96 06 51.26820	399998.822	269874.683	.007		ADJUSTMENT	2024	GPS3689
46 34 17.32225	96 06 51.26820	399998.822	269874.683	.007		ADJUSTMENT	2024	GPS3672
46 34 17.32225	96 06 51.26820	399998.822	269874.683	.007	C	GPS - STATIC	2024	HTH108
46 34 17.32225	96 06 51.26820	399998.822	269874.683	.007	C	GPS - STATIC	2023	HTH59
46 34 17.32212	96 06 51.26794	399998.840	269874.670	.131	3	GPS - RTRN	2023	RTRN2023
46 34 17.32251	96 06 51.26813	399998.827	269874.710	.131	3	GPS - RTRN	2022	RTRN2022
46 34 17.32225	96 06 51.26820	399998.822	269874.683	.007		ADJUSTMENT	2019	GPS3292
46 34 17.32225	96 06 51.26820	399998.822	269874.683	.007	C	GPS - STATIC	2019	HBCKR
46 34 17.32225	96 06 51.26820	399998.822	269874.683	.007		ADJUSTMENT	2018	GPS3119
46 34 17.32225	96 06 51.26820	399998.822	269874.683	.007	C	GPS - STATIC	2017	HMNPH
46 34 17.32222	96 06 51.26831	399998.814	269874.680	.131	3	GPS - RTRN	2015	RTRN2015
46 34 17.32225	96 06 51.26820	399998.822	269874.683	.007		ADJUSTMENT	2015	GPS3084
46 34 17.32225	96 06 51.26820	399998.822	269874.683	.010		ADJUSTMENT	2015	GPS3080
46 34 17.32222	96 06 51.26813	399998.827	269874.680	.007	C	GPS - STATIC	2015	HCLAY
46 34 17.32228	96 06 51.26822	399998.820	269874.686	.010	C	GPS - STATIC	2015	HWILK
46 34 17.32225	96 06 51.26820	399998.822	269874.683	.010		ADJUSTMENT	2014	GPS2750
46 34 17.32223	96 06 51.26816	399998.825	269874.681	.010	C	GPS - STATIC	2014	HBARN
46 34 17.32239	96 06 51.26776	399998.853	269874.697	.131	3	GPS - RTRN	2013	RTRN2013
46 34 17.32225	96 06 51.26820	399998.822	269874.683	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Otter Tail County					Project Info	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 34 17.32216	96 06 51.26911	399998.758	269874.674	.033	C	GPS - STATIC	2010	HBARN
46 34 17.32216	96 06 51.26911	399998.758	269874.674	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Otter Tail County					Project Info	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 34 17.32191	96 06 51.26883	399998.777	269874.649	.066		NCAT	2025	HTH94B
46 34 17.32239	96 06 51.26895	399998.770	269874.698	.033	C	GPS - STATIC	2025	HTH94A
46 34 17.32239	96 06 51.26895	399998.770	269874.698	.033	C	GPS - STATIC	2024	HTH108
46 34 17.32239	96 06 51.26895	399998.770	269874.698	.033	C	GPS - STATIC	2023	HTH59
46 34 17.32191	96 06 51.26883	399998.777	269874.649	.033	C	GPS - STATIC	2019	HBCKR
46 34 17.32191	96 06 51.26883	399998.777	269874.649	.033	C	GPS - STATIC	2017	HMNCORS07
46 34 17.32191	96 06 51.26883	399998.777	269874.649	.033	C	GPS - STATIC	2015	HCLAY
46 34 17.32191	96 06 51.26883	399998.777	269874.649	.033	C	GPS - STATIC	2015	HWILK
46 34 17.32191	96 06 51.26883	399998.777	269874.649	.033	C	GPS - STATIC	2010	HBARN
46 34 17.32191	96 06 51.26883	399998.777	269874.649	.016	B	GPS - STATIC	2005	GPS2036
46 34 17.32191	96 06 51.26883	399998.777	269874.649	.016	B	ADJUSTMENT	1999	17648
46 34 17.32191	96 06 51.26883	399998.777	269874.649	.016	B	GPS - STATIC	1997	GPS805-B

NAD27

Geodetic Position							Project Info	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 34 17.46440	96 06 50.05890			.100	B	CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2155857.821	906647.742	857472.195	16936508.554	.007		ADJUSTMENT	2025	GPS3847
2155857.821	906647.742	857472.195	16936508.554	.007	C	GPS - STATIC	2025	HTH94B
2155857.821	906647.742	857472.195	16936508.554	.007		ADJUSTMENT	2025	GPS3805
2155857.821	906647.742	857472.195	16936508.554	.007	C	GPS - STATIC	2025	HTH94A
2155857.821	906647.742	857472.195	16936508.554	.007		ADJUSTMENT	2024	GPS3689
2155857.821	906647.742	857472.195	16936508.554	.007		ADJUSTMENT	2024	GPS3672
2155857.821	906647.742	857472.195	16936508.554	.007	C	GPS - STATIC	2024	HTH108
2155857.821	906647.742	857472.195	16936508.554	.007	C	GPS - STATIC	2023	HTH59
2155857.839	906647.729	857472.212	16936508.540	.131	3	GPS - RTRN	2023	RTRN2023
2155857.826	906647.768	857472.200	16936508.580	.131	3	GPS - RTRN	2022	RTRN2022
2155857.821	906647.742	857472.195	16936508.554	.007		ADJUSTMENT	2019	GPS3292
2155857.821	906647.742	857472.195	16936508.554	.007	C	GPS - STATIC	2019	HBCKR
2155857.821	906647.742	857472.195	16936508.554	.007		ADJUSTMENT	2018	GPS3119
2155857.821	906647.742	857472.195	16936508.554	.007	C	GPS - STATIC	2017	HMNPH
2155857.813	906647.740	857472.187	16936508.551	.131	3	GPS - RTRN	2015	RTRN2015
2155857.821	906647.742	857472.195	16936508.554	.007		ADJUSTMENT	2015	GPS3084
2155857.821	906647.742	857472.195	16936508.554	.010		ADJUSTMENT	2015	GPS3080
2155857.826	906647.739	857472.199	16936508.551	.007	C	GPS - STATIC	2015	HCLAY
2155857.820	906647.745	857472.194	16936508.557	.010	C	GPS - STATIC	2015	HWILK
2155857.821	906647.742	857472.195	16936508.554	.010		ADJUSTMENT	2014	GPS2750
2155857.823	906647.740	857472.197	16936508.552	.010	C	GPS - STATIC	2014	HBARN
2155857.852	906647.756	857472.226	16936508.567	.131	3	GPS - RTRN	2013	RTRN2013
2155857.821	906647.742	857472.195	16936508.554	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2155857.757	906647.735	857472.131	16936508.548	.033	C	GPS - STATIC	2010	HBARN
2155857.757	906647.735	857472.131	16936508.548	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2155857.776	906647.709	857472.149	16936508.522	.066		NCAT	2025	HTH94B
2155857.769	906647.758	857472.143	16936508.570	.033	C	GPS - STATIC	2025	HTH94A
2155857.769	906647.758	857472.143	16936508.570	.033	C	GPS - STATIC	2024	HTH108
2155857.769	906647.758	857472.143	16936508.570	.033	C	GPS - STATIC	2023	HTH59
2155857.776	906647.709	857472.149	16936508.522	.033	C	GPS - STATIC	2019	HBCKR
2155857.776	906647.709	857472.149	16936508.522	.033	C	GPS - STATIC	2017	HMNCORS07
2155857.776	906647.709	857472.149	16936508.522	.033	C	GPS - STATIC	2015	HCLAY
2155857.776	906647.709	857472.149	16936508.522	.033	C	GPS - STATIC	2015	HWILK
2155857.776	906647.709	857472.149	16936508.522	.033	C	GPS - STATIC	2010	HBARN
2155857.776	906647.709	857472.149	16936508.522	.016	B	GPS - STATIC	2005	GPS2036
2155857.776	906647.709	857472.149	16936508.522	.016	B	ADJUSTMENT	1999	17648
2155857.776	906647.709	857472.149	16936508.522	.016	B	GPS - STATIC	1997	GPS805-B

NAD27

MN State Plane - Central Zone							Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1531261.639	578573.264			.100	B	CLASSICAL SURVEY	1950	UNK

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OLAF_AZ_MK-AB9911-3S-31JUL2023.jpg	S	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OLAF_AZ_MK-AB9911-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OLAF_AZ_MK-AB9911-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: OLAF MNDT RM 1

NGS Name: OLAF RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9302](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	21	136 N	43 W	463444.06	960655.87	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1982	2023	NOT FOUND	Horz=NO Vert=NO	YES		FLUSH	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (1982)

Stamping: OLAF NO 1 1982

1.75 MILES WEST-NORTHWEST OF PELICAN RAPIDS, 1.5 MILES WEST ON TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS TO TRUNK HIGHWAY 108 MILEPOINT 10.60, THEN 0.5 MILE NORTH ON 180TH AVENUE, 57.0 FEET WEST OF 180TH AVENUE, 64.5 FEET NORTHEAST OF THE WEST 1 OF 2 POWER POLES, 60.5 FEET NORTH-NORTHEAST OF THE EAST POWER POLE, 17.4 FEET NORTH-NORTHEAST OF A WITNESS POST, 30.56 FEET NORTHEAST OF STATION OLAF MNDT.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info		
Height	Acc	Order /(Class)	Height	Acc	Adj	Determination Method	Year	Reference
1389.768	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1389.836	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1389.840	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info		
Height	Acc	Order /(Class)	Height	Acc	Adj	Determination Method	Year	Reference
1395.076	.262		1307.819	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.565 12B = -87.552 09 = -87.437 03 = -87.319

Lat/Lon and County Coordinates (Feet)

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 34 44.05797	96 06 55.86503	399691.308	272584.939	.131	3	ADJUSTMENT	1999	17648
46 34 44.05803	96 06 55.86424	399691.363	272584.945	.131	3	ADJUSTMENT	1998	17655

NAD83(1986)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 34 44.05494	96 06 55.86503	399691.306	272584.632	.131	3	ADJUSTMENT	1997	16997

State Plane and UTM Coordinates (Feet)

NAD83(1996)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Year	Reference
2155600.557	909362.884	857258.210	16939228.460	.131	3	ADJUSTMENT	1999	17648
2155600.612	909362.889	857258.265	16939228.464	.131	3	ADJUSTMENT	1998	17655

NAD83(1986)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Year	Reference
2155600.550	909362.577	857258.198	16939228.153	.131	3	ADJUSTMENT	1997	16997

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OLAF_RM_1-AD9302-3W-04AUG2009.jpg	W	Aug 4, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OLAF_RM_1-AD9302-2-04AUG2009.jpg		Aug 4, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OLAF_RM_1-AD9302-1-04AUG2009.jpg		Aug 4, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: OLAF MNDT RM 2

NGS Name: OLAF RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9303](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	20	136 N	43 W	463444.53	960655.65	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1982	2023	NOT FOUND	Horz=NO Vert=NO	YES		FLUSH	STEEL ROD IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (1982)

Stamping: OLAF NO 2 1982

1.75 MILES WEST-NORTHWEST OF PELICAN RAPIDS, 1.5 MILES WEST ON TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS TO TRUNK HIGHWAY 108 MILEPOINT 10.60, THEN 0.5 MILE NORTH ON 180TH AVENUE, 59.5 FEET WEST OF 180TH AVENUE, 40.2 FEET SOUTHEAST OF STATION OLAF MNDT, 24.7 FEET EAST-NORTHEAST OF THE WEST 1 OF 2 POWER POLES, 13.5 FEET NORTHEAST OF THE EAST POWER POLE, 32.9 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info		
Height	Acc	Order /(Class)	Height	Acc	Adj	Determination Method	Year	Reference
1389.013	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1389.082	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1389.085	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info		
Height	Acc	Order /(Class)	Height	Acc	Adj	Determination Method	Year	Reference
1395.076	.262		1307.819	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.565 12B = -87.552 09 = -87.437 03 = -87.319

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>									
Geodetic Position		Otter Tail County		Project Info					
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 34 44.52863	96 06 55.64992	399706.575	272632.547	.131	3	ADJUSTMENT	1999	17648	
46 34 44.52868	96 06 55.64913	399706.630	272632.551	.131	3	ADJUSTMENT	1998	17655	
<u>NAD83(1986)</u>									
Geodetic Position		Otter Tail County		Project Info					
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 34 44.52560	96 06 55.64993	399706.573	272632.240	.131	3	ADJUSTMENT	1997	16997	

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		UTM - Zone 15		Project Info					
MN State Plane - Central Zone									
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
2155616.701	909410.195	857275.113	16939275.525	.131	3	ADJUSTMENT	1999	17648	
2155616.757	909410.199	857275.168	16939275.528	.131	3	ADJUSTMENT	1998	17655	

<u>NAD83(1986)</u>		UTM - Zone 15		Project Info					
MN State Plane - Central Zone									
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
2155616.693	909409.888	857275.100	16939275.218	.131	3	ADJUSTMENT	1997	16997	

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OLAF_RM_2-AD9303-3W-04AUG2009.jpg	W	Aug 4, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OLAF_RM_2-AD9303-2-04AUG2009.jpg		Aug 4, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OLAF_RM_2-AD9303-1-04AUG2009.jpg		Aug 4, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: ONSTAD

NGS Name: ONSTAD

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	27	133 N	41 W	461755.40	955030.10			1999	2009	GOOD	Horz=YES Vert=YES	NO		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (1999)

Stamping: ONSTAD

1.5 MILES NORTHEAST OF UNDERWOOD, 1.25 MILES NORTH ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 210 IN UNDERWOOD, TO TRUNK HIGHWAY 210 MILEPOINT 37.55, THENCE 1.0 MILE EAST ALONG 230TH AVENUE, THENCE 0.10 MILE NORTH-NORTHEAST ALONG 310TH AVENUE, 23.5 FEET EAST OF 310TH AVENUE, 13.7 FEET SOUTH OF A FIELD ENTRANCE.

Station Notes

NO WITNESS POST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.969 12B = -87.989 09 = -87.880 03 = -87.729



Mn/DOT Name: ORWELL

NGS Name: ORWELL

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096224/
USGS Quad: ORWELL LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	14	132 N	44 W	461439.56	960947.90		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2001	2014	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: **Stamping:** ORWELL 2001

2.25 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, TO TRUNK HIGHWAY 210 MILEPOST 22.0, THEN 1.2 MILES SOUTH ALONG COUNTY ROAD 86, THEN 3.4 MILES SOUTH AND WEST ALONG COUNTY ROAD 15, THEN 1.0 MILE EAST ALONG 190TH STREET, THEN 0.3 MILE NORTH ALONG 155TH AVENUE, 37.0 FEET WEST OF 155TH AVENUE, 51.0 FEET NORTH OF A FIELD ENTRANCE, 4.8 FEET SOUTHEAST OF A POWER POLE, 1.5 FEET NORTHWEST OF A WITNESS POST. THE ROD DEPTH IS UNKNOWN.

Station Notes

NEXT TO A POWER POLE.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference	
1145.631	.262		1057.724	.197	1996	GPS - RTRN	2009	RTRN2009	

Geoid Separations(ft): GEOID18 = -88.094 12B = -88.090 09 = -87.959 03 = -87.907

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Acc		Order	Determination Method	Project Info	
Latitude	Longitude	X	Y					Year	Reference
46 14 39.56140	96 09 47.89914	386984.175	150623.887	.131	3	GPS - RTRN		2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc		Order	Determination Method	Project Info	
X	Y	X	Y					Year	Reference
2140640.157	787673.713	840364.239	16817744.177	.131	3	GPS - RTRN		2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ORWELL-3W-06AUG2009.jpg	W	Aug 6, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ORWELL-2-06AUG2009.jpg		Aug 6, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ORWELL-1-06AUG2009.jpg		Aug 6, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: OSCAR

NGS Name: OSCAR

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2722](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	15	134 N	44 W	462505.76	961256.22	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1998	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (<10 FT)	SURVEY DISK	MNDT

Description: (2015) **Stamping:** OSCAR 1998

5.5 MILES SOUTHEAST OF ROTHSA, 5.5 MILES SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 11 IN ROTHSA, AT INTERSTATE HIGHWAY 94 MILEPOINT 43.75, 106.0 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 9.0 FEET SOUTHWEST OF A FENCE LINE, 8.2 FEET SOUTHWEST OF A WITNESS POST. THE ROD DEPTH IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj		Year	Reference	
1319.066	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941	
1319.131	.016	2/1					VERTICAL ADJUSTMENT	2017	00000911	
1319.125	.016	2/1					VERTICAL CONTROL SURVEY	2016	VI94D4	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj		Year	Reference	
1319.066				1230.857	.011	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847	
1319.066				1230.857	.011	2011	GPS - STATIC	2025	HTH94B	
1320.453	.262			1232.202	.197	2011	GPS - RTRN	2023	RTRN2023	
1318.997	.262			1230.749	.197	2011	GPS - RTRN	2015	RTRN2015	

Geoid Separations(ft): GEOID18 = -88.251 12B = -88.251 09 = -88.143 03 = -88.071

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position		Otter Tail County		Determination Method			Project Info	
		Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 25 05.76181	96 12 56.22206	374147.701	214141.055	.007		ADJUSTMENT		2025	GPS3847	
46 25 05.76181	96 12 56.22206	374147.701	214141.055	.007	C	GPS - STATIC		2025	HTH94B	
46 25 05.76170	96 12 56.22247	374147.672	214141.044	.131	3	GPS - RTRN		2023	RTRN2023	
46 25 05.76163	96 12 56.22173	374147.724	214141.037	.131	3	GPS - RTRN		2015	RTRN2015	

NAD83(1996)		Geodetic Position		Otter Tail County		Determination Method			Project Info	
		Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 25 05.76134	96 12 56.22275	374147.652	214141.008	.066		NCAT		2025	HTH94B	

State Plane and UTM Coordinates (Feet)

NAD83(2011)		MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
		X	Y	X	Y	Acc	Order		Year	Reference
2128983.006	851409.183	829711.041	16881682.607	.007		ADJUSTMENT		2025	GPS3847	
2128983.006	851409.183	829711.041	16881682.607	.007	C	GPS - STATIC		2025	HTH94B	
2128982.977	851409.173	829711.012	16881682.597	.131	3	GPS - RTRN		2023	RTRN2023	
2128983.029	851409.164	829711.064	16881682.588	.131	3	GPS - RTRN		2015	RTRN2015	

NAD83(1996)		MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
		X	Y	X	Y	Acc	Order		Year	Reference
2128982.957	851409.137	829710.991	16881682.561	.066		NCAT		2025	HTH94B	



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OSCAR-DQ2722-3NE-14AUG2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OSCAR-DQ2722-2-14AUG2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OSCAR-DQ2722-1-14AUG2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
NE	Aug 14, 2023
	Aug 14, 2023
	Aug 14, 2023



Mn/DOT Name: OT 31

NGS Name: OT 31

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	9	136 N	42 W	463624.10	955831.45		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1999	2018	DESTROYED	Horz=NO Vert=NO	YES		RECESSED 4 IN.	MARKER W/BAR MAGNET

Monument Type

ALUMINUM ALLOY ROD (NO SLEEVE)

Disk Type

SURVEY DISK

Mon. Agency

MNDT

Description: (2015)

Stamping: OT 31 1999

5.7 MILES NORTHEAST OF PELICAN RAPIDS, 2.45 MILES NORTH AND NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 WEST IN PELICAN RAPIDS, TO TRUNK HIGHWAY 59 MILEPOINT 243.05, THENCE 4.10 MILES EAST ALONG COUNTY ROAD 4, 169.0 FEET EAST OF COUNTY ROAD 31, 102.0 FEET NORTH OF COUNTY ROAD 4, 1.0 FOOT SOUTH OF A WITNESS POST.

Station Notes

THE DISK WAS TURNED IN TO THE OFFICE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.437 12B = -87.418 09 = -87.313 03 = -87.165

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OT_31-3NE-07OCT2014.jpg	NE	Oct 7, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OT_31-2-07OCT2014.jpg		Oct 7, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OT_31-1-07OCT2014.jpg		Oct 7, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: OT 31 RESET

NGS Name: OT 31 RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5788](#)
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	9	136 N	42 W	463624.10	955831.45		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2018	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: **Stamping:** OT 31 1999 2018

5.7 MILES NORTHEAST OF PELICAN RAPIDS, 2.45 MILES NORTH AND NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 WEST IN PELICAN RAPIDS TO TRUNK HIGHWAY 59 MILEPOINT 243.05, THEN 4.10 MILES EAST ALONG COUNTY ROAD 4, 169.0 FEET EAST OF COUNTY ROAD 31, 102.0 FEET NORTH OF COUNTY ROAD 4, 1.0 FOOT SOUTH OF A WITNESS POST.

Station Notes

THE ROD DEPTH IS UNKNOWN.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj			Year	Reference
1341.739	.131		1254.548	.066	1996	GPS - STATIC		2021	HOTTE
1341.818			1254.397	.029	2011	HORIZONTAL ADJUSTMENT		2020	GPS3384
1341.818			1254.397	.029	2011	GPS - STATIC		2020	HOTTE

Geoid Separations(ft): GEOID18 = -87.434 12B = -87.418 09 = -87.313 03 = -87.165

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 36 24.10361	95 58 31.44836	434962.558	282574.358	.020		ADJUSTMENT	2020	GPS3384
46 36 24.10361	95 58 31.44836	434962.558	282574.358	.020	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 36 24.10327	95 58 31.44886	434962.523	282574.324	.033	C	GPS - STATIC	2021	HOTTE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2191046.235	918696.527	892860.360	16947998.039	.020		ADJUSTMENT	2020	GPS3384
2191046.235	918696.527	892860.360	16947998.039	.020	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2191046.200	918696.494	892860.324	16947998.006	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OT_31_RESET-DR5788-3N-30NOV1999.jpg	N	Nov 30, 1999
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OT_31_RESET-DR5788-2-30NOV1999.jpg		Nov 30, 1999
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OT_31_RESET-DR5788-1-30NOV1999.jpg		Nov 30, 1999

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: OTC 101

NGS Name: OTC 101

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SE	23	135 N	43 W	462905.88	960301.49			2001	2009	GOOD	Horz=YES Vert=YES	NO		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2001)

Stamping: OTC 101 2001

2.35 MILES EAST OF ERHARD, 2.35 MILES EAST ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND TRUNK HIGHWAY 59 IN ERHARD, TO TRUNK HIGHWAY 59 MILEPOINT 234.45, 22.0 FEET NORTH OF COUNTY ROAD 24, 60.0 FEET WEST OF EXTENDED DRIVEWAY NUMBER 21136, 1.6 FEET WEST OF A WITNESS POST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.920 12B = -87.907 09 = -87.808 03 = -87.680



Mn/DOT Name: OTC 102

NGS Name: OTC 102

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5789](#) [Get Map](#)
NGS Quad / Sta Num : 46095344/
USGS Quad: HEILBERGER LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	16	135 N	42 W	462958.15	955920.22		C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2001	2018	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2001) Stamping: OTC 102 2001

5.3 MILES EAST-NORTHEAST OF ERHARD, 5.3 MILES EAST ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND TRUNK HIGHWAY 59 IN ERHARD, TO TRUNK HIGHWAY 59 MILEPOINT 234.5, THENCE 1.0 MILE NORTH ALONG COUNTY ROAD 3, 40.5 FEET EAST OF COUNTY ROAD 3, 21.8 FEET NORTH OF A FIELD ENTRANCE, 42.0 FEET NORTHWEST OF A POWER POLE WITH TWO GUY WIRES, 2.0 FEET EAST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1434.656	.131		1347.058	.066	1996	GPS - STATIC	2021	HOTTE	
1434.728			1346.907	.023	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384	
1434.728			1346.907	.023	2011	GPS - STATIC	2020	HOTTE	

Geoid Separations(ft): GEOID18 = -87.831 12B = -87.812 09 = -87.713 03 = -87.569

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>		<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>					<u>Year</u>	<u>Reference</u>
46 29 58.14804	95 59 20.22040	431422.507	243483.932	.016		ADJUSTMENT	2020	GPS3384			
46 29 58.14804	95 59 20.22040	431422.507	243483.932	.016	C	GPS - STATIC	2020	HOTTE			

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>		<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>					<u>Year</u>	<u>Reference</u>
46 29 58.14775	95 59 20.22089	431422.473	243483.902	.033	C	GPS - STATIC	2021	HOTTE			

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>		<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>					<u>Year</u>	<u>Reference</u>
2186783.697	879683.257	887975.195	16909045.453	.016		ADJUSTMENT	2020	GPS3384			
2186783.697	879683.257	887975.195	16909045.453	.016	C	GPS - STATIC	2020	HOTTE			

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>		<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>					<u>Year</u>	<u>Reference</u>
2186783.662	879683.229	887975.159	16909045.424	.033	C	GPS - STATIC	2021	HOTTE			

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_102-DR5789-3E-19AUG2009.jpg	E	Aug 19, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_102-DR5789-2-19AUG2009.jpg		Aug 19, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_102-DR5789-1-19AUG2009.jpg		Aug 19, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: OTC 103

NGS Name: OTC 103

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5790](#)

[Get Map](#)

NGS Quad / Sta Num : 46095341/

USGS Quad: PHELPS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	29	135 N	41 W	462839.71	955227.34		C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2001	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2001)

Stamping: OTC 103 2001

11.15 MILES EAST OF ERHARD, 11.15 MILES EAST ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND TRUNK HIGHWAY 59 IN ERHARD, TO TRUNK HIGHWAY 59 MILEPOINT 234.45, 43.0 FEET SOUTH OF COUNTY ROAD 24, 29.0 FEET EAST OF EXTENDED DRIVEWAY NUMBER 29517 29523, 16.0 FEET EAST OF A FIELD ENTRANCE, 2.0 FEET WEST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1383.399	.131		1295.827	.066	1996	GPS - STATIC	2021	HOTTE
1383.478			1295.680	.022	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1383.478			1295.680	.022	2011	GPS - STATIC	2020	HOTTE
1383.314	.262		1295.772	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.812 12B = -87.798 09 = -87.687 03 = -87.542

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 28 39.70880	95 52 27.34156	460292.162	235458.692	.016		ADJUSTMENT	2020	GPS3384
46 28 39.70880	95 52 27.34156	460292.162	235458.692	.016	C	GPS - STATIC	2020	HOTTE

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 28 39.70851	95 52 27.34207	460292.126	235458.663	.033	C	GPS - STATIC	2021	HOTTE
46 28 39.70874	95 52 27.34253	460292.094	235458.686	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2215496.164	871126.033	916556.529	16900030.354	.016		ADJUSTMENT	2020	GPS3384
2215496.164	871126.033	916556.529	16900030.354	.016	C	GPS - STATIC	2020	HOTTE

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2215496.128	871126.005	916556.493	16900030.326	.033	C	GPS - STATIC	2021	HOTTE
2215496.097	871126.029	916556.462	16900030.350	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_103-DR5790-3S-23JUL2020.jpg	S	Jul 23, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_103-DR5790-2-23JUL2020.jpg		Jul 23, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_103-DR5790-1-23JUL2020.jpg		Jul 23, 2020

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: OTC 104

NGS Name: OTC 104

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5791](#) [Get Map](#)
NGS Quad / Sta Num : 46095341/
USGS Quad: PHELPS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	23	135 N	41 W	462954.66	954815.93		C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2001	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2001)

Stamping: OTC 104 2001

5.60 MILES SOUTHWEST OF DENT, 6.95 MILES SOUTHWEST ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 108 IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 31.50, 50.0 FEET NORTH OF COUNTY ROAD 35, 114.0 FEET EAST OF STAR RIDGE LANE, 24.0 FEET SOUTH OF STAR RIDGE DRIVE, 2.7 FEET NORTHEAST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1360.785	.131			1273.347	.066	1996	GPS - STATIC	2021	HOTTE
1360.850				1273.196	.026	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1360.850				1273.196	.026	2011	GPS - STATIC	2020	HOTTE
1360.591	.262			1273.193	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.661 12B = -87.641 09 = -87.529 03 = -87.401

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>				<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 29 54.65816	95 48 15.92691			477896.912	243024.593	.016		ADJUSTMENT	2020 GPS3384
46 29 54.65816	95 48 15.92691			477896.912	243024.593	.016	C	GPS - STATIC	2020 HOTTE

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>				<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 29 54.65785	95 48 15.92743			477896.875	243024.562	.033	C	GPS - STATIC	2021 HOTTE
46 29 54.65806	95 48 15.92818			477896.823	243024.584	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2233235.705	878363.774			934413.424	16906987.155	.016		ADJUSTMENT	2020 GPS3384
2233235.705	878363.774			934413.424	16906987.155	.016	C	GPS - STATIC	2020 HOTTE

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2233235.668	878363.743			934413.386	16906987.125	.033	C	GPS - STATIC	2021 HOTTE
2233235.617	878363.766			934413.335	16906987.148	.131	3	GPS - RTRN	2009 RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<u>Location:</u>	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_104-DR5791-3NW-23JUL2020.jpg	NW	Jul 23, 2020
<u>Monument:</u>	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_104-DR5791-2-23JUL2020.jpg		Jul 23, 2020
<u>Disk:</u>	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_104-DR5791-1-23JUL2020.jpg		Jul 23, 2020

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: OTC 105

NGS Name: OTC 105

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5792](#)

[Get Map](#)

NGS Quad / Sta Num : 46095341/

USGS Quad: PHELPS

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	32	135 N	40 W	462719.96	954526.40		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2010)

Stamping: OTC 105 2001 2009

3.1 MILES NORTH-NORTHWEST OF AMOR, 2.35 MILES WEST ALONG COUNTY ROAD 74 FROM THE JUNCTION OF COUNTY ROAD 74 WEST AND COUNTY ROAD 1 IN AMOR, THENCE 3.5 MILES NORTH AND NORTHEAST ALONG COUNTY ROAD 32, 53.0 FEET NORTH OF COUNTY ROAD 32, 13.0 FEET EAST OF AN ENTRANCE, 2.0 FEET SOUTHWEST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1347.409	.131		1259.758	.066	1996	GPS - STATIC	2021	HOTTE
1347.481			1259.604	.023	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1347.481			1259.604	.023	2011	GPS - STATIC	2020	HOTTE
1347.323	.262		1259.709	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.887 12B = -87.880 09 = -87.749 03 = -87.615

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 27 19.96305	95 45 26.40403	489749.125	227342.680	.016		ADJUSTMENT	2020	GPS3384
46 27 19.96305	95 45 26.40403	489749.125	227342.680	.016	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 27 19.96274	95 45 26.40454	489749.089	227342.648	.033	C	GPS - STATIC	2021	HOTTE
46 27 19.96296	95 45 26.40489	489749.064	227342.670	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2244794.051	862467.138	945720.571	16890905.226	.016		ADJUSTMENT	2020	GPS3384
2244794.051	862467.138	945720.571	16890905.226	.016	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2244794.015	862467.108	945720.534	16890905.196	.033	C	GPS - STATIC	2021	HOTTE
2244793.991	862467.130	945720.511	16890905.219	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_105-DR5792-3N-20JUL2020.jpg	N	Jul 20, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_105-DR5792-2-20JUL2020.jpg		Jul 20, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_105-DR5792-1-20JUL2020.jpg		Jul 20, 2020

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: OTC 106

NGS Name: OTC 106

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5793](#)

[Get Map](#)

NGS Quad / Sta Num : 46095341/

USGS Quad: PHELPS

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	24	134 N	41 W	462437.52	954804.14		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2009)

Stamping: OTC 106 2001 2009

3.2 MILES WEST OF AMOR, 3.2 MILES WEST ALONG COUNTY ROAD 74 FROM THE JUNCTION OF COUNTY ROAD 74 WEST AND COUNTY ROAD 1 IN AMOR, THENCE 0.15 MILE SOUTH ALONG 330TH AVENUE, 30.0 FEET EAST OF 330TH AVENUE, 6.5 FEET NORTHWEST OF A CABLE BOX, 32.9 FEET NORTH OF A FIELD ENTRANCE, 2.2 FEET NORTH OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1358.787	.131		1271.018	.066	1996	GPS - STATIC	2021	HOTTE
1358.862			1270.867	.022	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1358.862			1270.867	.022	2011	GPS - STATIC	2020	HOTTE
1358.596	.262		1270.864	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.005 12B = -88.005 09 = -87.877 03 = -87.733

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 24 37.51590	95 48 04.14307	478687.022	210893.909	.016		ADJUSTMENT	2020	GPS3384
46 24 37.51590	95 48 04.14307	478687.022	210893.909	.016	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 24 37.51559	95 48 04.14359	478686.986	210893.878	.033	C	GPS - STATIC	2021	HOTTE
46 24 37.51613	95 48 04.14409	478686.950	210893.933	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2233430.760	846228.104	934098.539	16874844.555	.016		ADJUSTMENT	2020	GPS3384
2233430.760	846228.104	934098.539	16874844.555	.016	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2233430.723	846228.073	934098.502	16874844.525	.033	C	GPS - STATIC	2021	HOTTE
2233430.689	846228.129	934098.468	16874844.581	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_106-DR5793-3E-20JUL2020.jpg	E	Jul 20, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_106-DR5793-2-20JUL2020.jpg		Jul 20, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_106-DR5793-1-20JUL2020.jpg		Jul 20, 2020

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: OTC 107

NGS Name: OTC 107

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5794](#) [Get Map](#)
NGS Quad / Sta Num : 46095344/
USGS Quad: HEILBERGER LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	11	134 N	42 W	462538.92	955559.91		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2001	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2001)

Stamping: OTC 107 2001

9.85 MILES NORTHEAST OF ELIZABETH, 6.95 MILES EAST ALONG COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND TRUNK HIGHWAY 59 IN ELIZABETH, TO TRUNK HIGHWAY 59 MILEPOINT 236.75, THENCE 4.20 MILES NORTH ALONG COUNTY ROAD 3, THENCE 2.75 MILES EAST ALONG COUNTY ROAD 22, 51.4 FEET NORTH OF COUNTY ROAD 22, 25.0 FEET EAST OF A FIELD ENTRANCE, 9.3 FEET WEST OF CABLE BOX NUMBER 51 B 3, 12.4 FEET WEST OF A POWER POLE WITH A GUY WIRE, 2.1 FEET WEST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1444.548	.131		1356.776	.066	1996	GPS - STATIC	2021 HOTTE
1444.617			1356.628	.023	2011	HORIZONTAL ADJUSTMENT	2020 GPS3384
1444.617			1356.628	.023	2011	GPS - STATIC	2020 HOTTE
1444.452	.262		1356.710	.197	1996	GPS - RTRN	2009 RTRN2009

Geoid Separations(ft): GEOID18 = -88.002 12B = -88.002 09 = -87.887 03 = -87.743

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year Reference	
46 25 38.92425	95 55 59.91162	445364.400	217178.612	.016		ADJUSTMENT	2020 GPS3384	
46 25 38.92425	95 55 59.91162	445364.400	217178.612	.016	C	GPS - STATIC	2020 HOTTE	

NAD83(1996)

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year Reference	
46 25 38.92396	95 55 59.91213	445364.364	217178.582	.033	C	GPS - STATIC	2021 HOTTE	
46 25 38.92386	95 55 59.91291	445364.309	217178.573	.131	3	GPS - RTRN	2009 RTRN2009	

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year Reference	
2200234.504	853127.762	901006.729	16882271.422	.016		ADJUSTMENT	2020 GPS3384	
2200234.504	853127.762	901006.729	16882271.422	.016	C	GPS - STATIC	2020 HOTTE	

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year Reference	
2200234.468	853127.734	901006.692	16882271.394	.033	C	GPS - STATIC	2021 HOTTE	
2200234.413	853127.725	901006.637	16882271.386	.131	3	GPS - RTRN	2009 RTRN2009	

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_107-DR5794-3NW-20JUL2020.jpg	NW	Jul 20, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_107-DR5794-2-20JUL2020.jpg		Jul 20, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_107-DR5794-1-20JUL2020.jpg		Jul 20, 2020

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: OTC 108

NGS Name: OTC 108

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5795](#) [Get Map](#)
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	30	134 N	42 W	462318.20	960148.67		C	2001	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2001)

Stamping: OTC 108 2001

4.75 MILES EAST-NORTHEAST OF ELIZABETH, 4.5 MILES EAST ALONG COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND TRUNK HIGHWAY 59 IN ELIZABETH, TO TRUNK HIGHWAY 59 MILEPOINT 226.75, THENCE 1.0 MILE NORTH ALONG 215TH AVENUE, THENCE 0.5 MILE EAST ALONG 90TH STREET, THENCE 0.30 MILE NORTH ALONG 220TH AVENUE, 30.0 FEET EAST OF 220TH AVENUE, 2.0 FEET NORTH OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1375.890	.131		1287.924	.066	1996	GPS - STATIC	2021	HOTTE
1375.932			1287.773	.025	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1375.932			1287.773	.025	2011	GPS - STATIC	2020	HOTTE

Geoid Separations(ft): GEOID18 = -88.169 12B = -88.176 09 = -88.054 03 = -87.936

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
46 23 18.20140	96 01 48.67095	420876.160	203004.037	.016		2020	GPS3384
46 23 18.20140	96 01 48.67095	420876.160	203004.037	.016	C	2020	HOTTE

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
46 23 18.20110	96 01 48.67146	420876.124	203004.007	.033	C	2021	HOTTE

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
2175491.277	839410.719	876041.226	16868943.812	.016		2020	GPS3384
2175491.277	839410.719	876041.226	16868943.812	.016	C	2020	HOTTE

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
2175491.240	839410.690	876041.189	16868943.783	.033	C	2021	HOTTE

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_108-DR5795-3E-20JUL2020.jpg	E	Jul 20, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_108-DR5795-2-20JUL2020.jpg		Jul 20, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_108-DR5795-1-20JUL2020.jpg		Jul 20, 2020

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: OTC 109

NGS Name: OTC 109

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095341/
USGS Quad: PHELPS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	20	134 N	41 W	462419.30	955149.20		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2001	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	ALUMINUM MARKER (OTHER THAN A DISK)	MNDT

Description: Stamping: OTC 109

9.0 MILES NORTH OF UNDERWOOD, 9.35 MILES NORTH ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 210 IN UNDERWOOD, TO TRUNK HIGHWAY 210 MILEPOINT 37.55, 36.0 FEET WEST OF COUNTY ROAD 35, 150.0 FEET SOUTH OF A DRIVEWAY NUMBER 30553, 2.8 FEET SOUTHWEST OF A WITNESS POST.

Station Notes

THE DISK WAS TURNED IN TO THE OFFICE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.028 12B = -88.028 09 = -87.913 03 = -87.759



Mn/DOT Name: OTC 109 RESET

NGS Name: OTC 109 RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095341/
USGS Quad: PHELPS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	20	134 N	41 W	462419.30	955149.20			2009	2009	GOOD	Horz=YES Vert=YES	NO		RECESSED 3 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009)

Stamping: OTC 109 RESET

9.0 MILES NORTH OF UNDERWOOD, 9.35 MILES NORTH ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 210 IN UNDERWOOD, TO TRUNK HIGHWAY 210 MILEPOINT 37.55, 36.0 FEET WEST OF COUNTY ROAD 35, 150.0 FEET SOUTH OF A DRIVEWAY NUMBER 30553, 2.8 FEET SOUTHWEST OF A WITNESS POST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.028 12B = -88.028 09 = -87.913 03 = -87.759



Mn/DOT Name: OTC 1971

NGS Name: OTC 1971

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095434/
USGS Quad: LAKE FRANKLIN

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	2	137 N	42 W	464206.59	955733.03		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1971	2009	GOOD	Horz=NO Vert=YES	YES	56517	FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (2013)

Stamping: OTC 1971 1327.76

2.50 MILES SOUTHWEST OF BUCKS MILL, 3.4 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 34 IN DUNVILLA, THEN 1.85 MILES NORTH ON COUNTY ROAD 31 (EAST PELICAN LAKE ROAD), IN THE SOUTHEAST CORNER OF COUNTY ROAD 31 BRIDGE NUMBER 56517 OVER THE CHANNEL BETWEEN PELICAN LAKE AND LITTLE PELICAN LAKE.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1327.117	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1328.012	.262		1241.093	.197	1996	GPS - RTRN	2009	RTRN2009	

Geoid Separations(ft): GEOID18 = -87.178 12B = -87.175 09 = -87.060 03 = -86.919

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 42 06.59153	95 57 33.03265	439147.749	317260.363	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2195872.221	953294.832	898240.751	16982524.937	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_1971-3N-12AUG2009.jpg	N	Aug 12, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_1971-2-12AUG2009.jpg		Aug 12, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/OTC_1971-1-12AUG2009.jpg		Aug 12, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: OTTER

NGS Name: OTTER

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0956](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/1053
USGS Quad: FERGUS FALLS

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	33	133 N	43 W	461710.98	960625.98		1

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	2009	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (1974) **Stamping:** OTTER 1974

2.0 MILES WEST-NORTHWEST OF FERGUS FALLS, 0.75 MILE EAST-SOUTHEAST ON TRUNK HIGHWAY 210 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210, 100.0 FEET SOUTH OF TRUNK HIGHWAY 210, 3.5 FEET NORTHEAST OF A RIGHT-OF-WAY POST, 2.0 FEET NORTH OF THE NORTH EDGE OF A FIELD, 32.28 FEET NORTHWEST OF OTTER RM 1, 37.60 FEET SOUTHEAST OF OTTER RM 2.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1273.291	.131		1185.368	.066	1996	HORIZONTAL ADJUSTMENT	1999 17648

Geoid Separations(ft): GEOID18 = -88.225 12B = -88.218 09 = -88.103 03 = -88.025

Lat/Lon and County Coordinates (Feet)

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year Reference	
46 17 10.97590	96 06 25.97681	401252.484	165887.991	.033	1	ADJUSTMENT	1999 17648	
46 17 10.97589	96 06 25.97683	401252.483	165887.990	.033	1	ADJUSTMENT	1998 17655	

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year Reference	
46 17 10.97494	96 06 25.96523	401253.297	165887.890	.033	1	ADJUSTMENT	1986 17289	

Geodetic Position					Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year Reference
46 17 11.12126	96 06 24.75168			.100	1	CLASSICAL SURVEY	1977 15955

State Plane and UTM Coordinates (Feet)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year Reference	
2155186.607	802669.108	855150.962	16832514.371	.033	1	ADJUSTMENT	1999 17648	
2155186.605	802669.107	855150.960	16832514.370	.033	1	ADJUSTMENT	1998 17655	

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year Reference	
2155187.417	802668.991	855151.771	16832514.242	.033	1	ADJUSTMENT	1986 17289	

MN State Plane - Central Zone					Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year Reference
1530592.047	474595.468			.100	1	CLASSICAL SURVEY	1977 15955



Mn/DOT Name: OTTER MNDT

NGS Name: OTTER

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0156](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/1047
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	15	132 N	43 W	461457.72	960418.25	2	2

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2015	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 3 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	SURVEY DISK	MNDT

Description: (1979)

Stamping: OTTER 1962

2.0 MILES SOUTH OF FERGUS FALLS, AT THE NORTHEAST CORNER OF THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 25, 17.0 FEET EAST OF COUNTY ROAD 25, 9.5 FEET NORTH OF THE NORTHEAST CORNER OF A BRIDGE, 1.0 FOOT EAST OF A GUARDRAIL, 6.1 FEET SOUTH OF A WITNESS POST, 278.02 FEET NORTH OF OTTER MNDT RM 1, 43.36 FEET EAST OF OTTER RM 2, 6.1 FEET SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1261.251	.016	2/0						VERTICAL ADJUSTMENT	1991	00000025

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1260.454	.016	2						VERTICAL CONTROL SURVEY	1972	Q460962
1260.454	.016	2						VERTICAL CONTROL SURVEY	1972	L22167-A
1260.454	.016	2						VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1261.251	.197			1173.482	.131	1996		HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -88.051 12B = -88.054 09 = -87.926 03 = -87.851

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Latitude</u>		<u>Longitude</u>		<u>Otter Tail County</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
46 14	57.72245	96 04	18.25395	410162.321	152346.289	.066	2	ADJUSTMENT	1999	17648						
46 14	57.72237	96 04	18.25378	410162.333	152346.281	.066	2	ADJUSTMENT	1998	17655						

<u>NAD83(1986)</u>		<u>Geodetic Position</u>		<u>Latitude</u>		<u>Longitude</u>		<u>Otter Tail County</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
46 14	57.72111	96 04	18.24147	410163.197	152346.149	.066	2	ADJUSTMENT	1986	17289						

<u>NAD27</u>		<u>Geodetic Position</u>		<u>Latitude</u>		<u>Longitude</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
46 14	57.87080	96 04	17.03210			.100	2	CLASSICAL SURVEY	1963	13276				



State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2163843.107	788966.632	863593.649	16818672.030	.066	2	ADJUSTMENT	1999	17648
2163843.118	788966.623	863593.661	16818672.021	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2163843.980	788966.476	863594.521	16818671.860	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1539248.650	460893.406			.100	2	CLASSICAL SURVEY	1963	13276



Mn/DOT Name: OTTER MNDT RM 1

NGS Name: OTTER RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4453](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

	<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	
NE	15	132 N	43 W	
	461454.98	960418.22		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2009	DESTROYED	Horz=NO Vert=NO	NO	9875		SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: Stamping: OTTER NO 1 1962

2.0 MILES SOUTH OF FERGUS FALLS, NEAR A COUNTY ROAD 25 BRIDGE OVER INTERSTATE HIGHWAY 94, SET IN THE SOUTHEAST CORNER OF BRIDGE NUMBER 9875.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.048 12B = -88.051 09 = -87.920 03 = -87.848



Mn/DOT Name: OTTER RM 1

NGS Name: OTTER RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4451](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/1053
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	33	133 N	43 W	461711.00	960625.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1974	2009	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1974)

Stamping: OTTERNO NO 1 1974

2.0 MILES WEST-NORTHWEST OF FERGUS FALLS, 0.75 MILE EAST-SOUTHEAST ON TRUNK HIGHWAY 210 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210, 100.0 FEET SOUTH OF THE CENTERLINE OF TRUNK HIGHWAY 210, 36.0 FEET EAST OF A ROAD RIGHT-OF-WAY SIGNPOST, 2.0 FEET NORTH OF THE NORTH EDGE OF A PLOWED FIELD.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.225 12B = -88.218 09 = -88.103 03 = -88.025



Mn/DOT Name: OTTER RM 2

NGS Name: OTTER RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0155](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	15	132 N	43 W	461457.96	960418.76	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2009	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 4 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STRUCTURE (MASSIVE)	REFERENCE MARK DISK	MNDT

Description: (1962)

Stamping: OTTER NO 2 1962

2.0 MILES SOUTH OF FERGUS FALLS, NEAR COUNTY ROAD 25 BRIDGE OVER INTERSTATE HIGHWAY 94, 17.0 FEET WEST OF COUNTY ROAD 25, 5.0 FEET NORTH OF THE NORTHWEST CORNER OF A BRIDGE ABUTMENT, 43.4 FEET WEST OF STATION OTTER MNDT.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1261.789	.016	2/0				VERTICAL ADJUSTMENT	1991 00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1260.992	.016	2				VERTICAL CONTROL SURVEY	1972 Q460962
1260.992	.016	2				VERTICAL CONTROL SURVEY	1972 L22167-A
1260.992	.016	2				VERTICAL CONTROL SURVEY	1971 L22167-A

Geoid Separations(ft): GEOID18 = -88.051 12B = -88.054 09 = -87.926 03 = -87.851

* No Horizontal Positions in the Database *



Mn/DOT Name: OTTER RM 2 1974

NGS Name: OTTER RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4452](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/1053
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	33	133 N	43 W	461711.00	960625.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1974	2009	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1974)

Stamping: OTTERNO NO 2 1974

2.0 MILES WEST-NORTHWEST OF FERGUS FALLS, 0.75 MILE EAST-SOUTHEAST ON TRUNK HIGHWAY 210 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210, 100.0 FEET SOUTH OF THE CENTERLINE OF TRUNK HIGHWAY 210, 34.0 FEET WEST OF A ROAD RIGHT-OF-WAY SIGNPOST, 2.0 FEET NORTH OF THE NORTH EDGE OF A FIELD.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.225 12B = -88.218 09 = -88.103 03 = -88.025



Mn/DOT Name: P 61

NGS Name: P 61

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: RO0484 NGS Quad / Sta Num : 46095343/ USGS Quad: WALL LAKE	Get Map
NW	34	133 N	42 W	461727.80	955756.40	2	3		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	2009	GOOD	Horz=NO Vert=NO	YES		PROJECTS 3 IN.	STEEL SPIKE ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (2008)

Stamping: P 61 1934

4.2 MILES EAST OF FERGUS FALLS, GO 4.7 MILES EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 59 AT THE SOUTHEAST EDGE OF FERGUS FALLS TO TRUNK HIGHWAY 210 MILEPOINT 32.9. GO NORTH ON 249TH AVENUE FOR 0.15 MILE, THEN 0.15 MILE EAST ON 225TH STREET, 134.0 FEET NORTH OF 225TH STREET, 103.5 FEET NORTH-NORTHEAST OF A TELEPHONE PEDESTAL NUMBER 6252, 57.0 FEET SOUTH-SOUTHEAST OF THE SOUTHEAST CORNER OF A SHED, 0.8 FOOT EAST OF A WITNESS POST.

Station Notes

THE MARK IS ON PRIVATE PROPERTY.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1282.878	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1282.885	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1282.888	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFGUS
1282.868	.016	2				VERTICAL ADJUSTMENT	1991	00000025

<u>NGVD29</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1282.074	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1282.074	.016	2				VERTICAL CONTROL SURVEY	1976	L23961
1282.061	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT
1282.061	.007	1				VERTICAL CONTROL SURVEY	1972	L22167-A
1282.061	.007	1				VERTICAL CONTROL SURVEY	1971	L22167-A
1282.061	.007	1				VERTICAL CONTROL SURVEY	1941	Q460953
1282.061	.007	1				VERTICAL CONTROL SURVEY	1934	L40 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1282.707	.262		1194.807	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.126 12B = -88.143 09 = -88.018 03 = -87.897

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>			<u>Otter Tail County</u>			<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>		<u>X</u>	<u>Y</u>					<u>Year</u>	<u>Reference</u>
46 17 27.77010	95 57 56.18311		437062.588	167444.624		.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>			<u>UTM - Zone 15</u>			<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>	<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>					<u>Year</u>	<u>Reference</u>
2191014.631	803562.480		891001.173	16832842.776		.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/P_61-RO0484-3N-26SEP2005.jpg	N	Sep 26, 2005
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/P_61-RO0484-2-26SEP2005.jpg		Sep 26, 2005
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/P_61-RO0484-1-26SEP2005.jpg		Sep 26, 2005

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: PALM

NGS Name: PALM

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	6	137 N	41 W	464251.65	955454.37	2	C

NGS ACRN: [DQ2060](#)
NGS Quad / Sta Num : 46095434/
USGS Quad: LAKE FRANKLIN

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 34 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: PALM 2014

12.3 MILES NORTHEAST OF PELICAN RAPIDS, 13.9 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAYS 59 AND 108 WEST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 254.55, 58.7 FEET NORTH OF TRUNK HIGHWAY 59, 20.0 FEET WEST OF AN ENTRANCE, 1.5 FEET SOUTH OF A WITNESS POST.

Station Pair: NESTE - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1344.919	.016	2/1				VERTICAL ADJUSTMENT		2019	00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1344.978			1257.780	.018	2011	HORIZONTAL ADJUSTMENT		2024	GPS3672
1344.919	.131		1257.924	.066	1996	GPS - STATIC		2023	HTH59
1344.978			1257.780	.018	2011	GPS - STATIC		2023	HTH59
1344.942	.262		1257.796	.197	2011	GPS - RTRN		2022	RTRN2022
1344.968			1257.780	.027	2011	HORIZONTAL ADJUSTMENT		2019	GPS3292
1344.856	.131		1257.924	.066	1996	GPS - STATIC		2019	HBCKR
1344.968			1257.780	.027	2011	GPS - STATIC		2019	HBCKR
1344.902	.262		1257.750	.197	2011	GPS - RTRN		2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.145 12B = -87.152 09 = -87.034 03 = -86.890

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 42 51.65189	95 54 54.36817	450218.432	321794.865	.010		ADJUSTMENT	2024	GPS3672
46 42 51.65189	95 54 54.36817	450218.432	321794.865	.010	C	GPS - STATIC	2023	HTH59
46 42 51.65196	95 54 54.36871	450218.394	321794.872	.131	3	GPS - RTRN	2022	RTRN2022
46 42 51.65189	95 54 54.36817	450218.432	321794.865	.016		ADJUSTMENT	2019	GPS3292
46 42 51.65189	95 54 54.36817	450218.432	321794.865	.016	C	GPS - STATIC	2019	HBCKR
46 42 51.65165	95 54 54.36861	450218.401	321794.841	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 42 51.65153	95 54 54.36887	450218.383	321794.829	.033	C	GPS - STATIC	2023	HTH59
46 42 51.65153	95 54 54.36887	450218.383	321794.829	.033	C	GPS - STATIC	2019	HBCKR

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2207023.587	957623.081	909463.152	16986675.061	.010		ADJUSTMENT	2024	GPS3672
2207023.587	957623.081	909463.152	16986675.061	.010	C	GPS - STATIC	2023	HTH59
2207023.550	957623.089	909463.114	16986675.069	.131	3	GPS - RTRN	2022	RTRN2022
2207023.587	957623.081	909463.152	16986675.061	.016		ADJUSTMENT	2019	GPS3292
2207023.587	957623.081	909463.152	16986675.061	.016	C	GPS - STATIC	2019	HBCKR
2207023.556	957623.058	909463.120	16986675.037	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2207023.538	957623.046	909463.102	16986675.026	.033	C	GPS - STATIC	2023	HTH59
2207023.538	957623.046	909463.102	16986675.026	.033	C	GPS - STATIC	2019	HBCKR

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PALM-DQ2060-3N-12OCT2022.jpg	N	Oct 12, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PALM-DQ2060-2-12OCT2022.jpg		Oct 12, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PALM-DQ2060-1-12OCT2022.jpg		Oct 12, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: PARK MNDT

NGS Name: PARK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9847](#)
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	34	136 N	42 W	463259.43	955724.65	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1999	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2005)

Stamping: PARK 1999

6.75 MILES EAST OF PELICAN RAPIDS, 7.3 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE SOUTH JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 108 MILEPOINT 19.5, 35.0 FEET SOUTH OF TRUNK HIGHWAY 108, 26.0 FEET EAST OF ENTRANCE NUMBER L2088, 2.0 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1413.281	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPELI2
1413.281	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1413.321	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1413.304	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1413.281			1325.739	.024	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1413.281	.131		1325.837	.066	1996	GPS - STATIC	2024	HTH108
1413.281			1325.739	.024	2011	GPS - STATIC	2024	HTH108
1413.268	.262		1325.683	.197	2011	GPS - RTRN	2023	RTRN2023
1413.363	.262		1325.778	.197	2011	GPS - RTRN	2022	RTRN2022
1413.363	.262		1325.775	.197	2011	GPS - RTRN	2021	RTRN2021

Geoid Separations(ft): GEOID18 = -87.585 12B = -87.565 09 = -87.474 03 = -87.313

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 32 59.42982	95 57 24.64508	439564.049	261823.634	.013		ADJUSTMENT	2024	GPS3689
46 32 59.42982	95 57 24.64508	439564.049	261823.634	.013	C	GPS - STATIC	2024	HTH108
46 32 59.42970	95 57 24.64450	439564.089	261823.622	.131	3	GPS - RTRN	2023	RTRN2023
46 32 59.42949	95 57 24.64473	439564.073	261823.601	.131	3	GPS - RTRN	2022	RTRN2022
46 32 59.42987	95 57 24.64513	439564.045	261823.639	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 32 59.42959	95 57 24.64561	439564.012	261823.611	.033	C	GPS - STATIC	2024	HTH108

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2195262.270	897866.793	896744.831	16927097.365	.013		ADJUSTMENT	2024	GPS3689
2195262.270	897866.793	896744.831	16927097.365	.013	C	GPS - STATIC	2024	HTH108
2195262.311	897866.780	896744.871	16927097.351	.131	3	GPS - RTRN	2023	RTRN2023
2195262.294	897866.759	896744.854	16927097.330	.131	3	GPS - RTRN	2022	RTRN2022
2195262.267	897866.798	896744.827	16927097.370	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2195262.233	897866.771	896744.793	16927097.343	.033	C	GPS - STATIC	2024	HTH108



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PARK-DG9847-3S-31JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PARK-DG9847-2-18OCT2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PARK-DG9847-1-31JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Jul 31, 2023
	Oct 18, 2022
	Jul 31, 2023



Mn/DOT Name: PBM T 3 A

NGS Name: PBM T 3 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0477](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	11	131 N	42 W	461023.00	955503.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1967	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

CONCRETE FOOTING - SMALL

Disk Type

CHISELED CROSS

Mon. Agency

MNDT

Description: (1967)

Stamping:

IN DALTON. THE STATION IS LOCATED ON THE TOP OF THE NORTHEAST BOLT IN THE RAILROAD YARD SIGNAL BASE AT THE DALTON RAILROAD STATION.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1355.539	.016	2/0				VERTICAL ADJUSTMENT	1991 00000025

Geoid Separations(ft): GEOID18 = -87.342 12B = -87.355 09 = -87.221 03 = -87.182

* No Horizontal Positions in the Database *



Mn/DOT Name: PEBBLE

NGS Name: PEBBLE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2707](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	10	132 N	43 W	461517.38	960452.33	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 29 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) **Stamping:** PEBBLE 2014

3.0 MILES SOUTH OF FERGUS FALLS, 0.65 MILE NORTHWEST ALONG WESTBOUND INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF EAST TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 (THE JUNCTION IS 2.5 MILES SOUTH OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 57.25, 14.3 FEET NORTHEAST OF EASTBOUND INTERSTATE HIGHWAY 94, 66.7 FEET SOUTHWEST OF WESTBOUND INTERSTATE HIGHWAY 94, 3.3 FEET NORTHEAST OF A GUARD RAIL CABLE, 45.2 FEET SOUTHEAST OF A CROSSOVER, 1.5 FEET SOUTHEAST OF A WITNESS POST.

Station Pair: IVERSON - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1238.528	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1238.544	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1238.544	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1238.544	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1239.820	.262		1151.733	.197	2011	GPS - RTRN	2023	RTRN2023
1238.442	.262		1150.355	.197	2011	GPS - RTRN	2015	RTRN2015
1238.511	.262		1150.424	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -88.087 12B = -88.087 09 = -87.959 03 = -87.884

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 15 17.38357	96 04 52.33467	407776.271	154348.976	.131	3	GPS - RTRN	2023	RTRN2023
46 15 17.38365	96 04 52.33442	407776.289	154348.984	.131	3	GPS - RTRN	2015	RTRN2015
46 15 17.38271	96 04 52.33430	407776.297	154348.888	.131	3	GPS - RTRN	2014	RTRN2014

State Plane and UTM Coordinates (Feet)

NAD83(2011)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Year	Reference
X	Y							
2161494.850	791012.868	861277.050	16820755.754	.131	3	GPS - RTRN	2023	RTRN2023
2161494.868	791012.876	861277.068	16820755.762	.131	3	GPS - RTRN	2015	RTRN2015
2161494.874	791012.781	861277.073	16820755.666	.131	3	GPS - RTRN	2014	RTRN2014

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PEBBLE-DQ2707-3SE-14AUG2023.jpg	SE	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PEBBLE-DQ2707-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PEBBLE-DQ2707-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: PEL MNDT TEMP

NGS Name: PEL TEMP

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9304](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	26	136 N	43 W	463408.79	960404.08		2

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1982	2022	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	SEE DESCRIPTION	MNDT

Description: (1982) Stamping: PEL 1982

0.5 MILE EAST OF PELICAN RAPIDS, 0.5 MILE EAST ON TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108, THEN 0.2 MILE EAST ON A GRAVEL ROAD, THEN 0.1 MILE SOUTHEAST ON A GRAVEL ROAD, 11.0 FEET SOUTH OF A GRAVEL ROAD, 33.6 FEET SOUTH OF A WITNESS POST, 94.10 FEET SOUTHEAST OF A 30.0 INCH DIAMETER BOXELDER TREE, 111.80 FEET SOUTHWEST OF A CABLE MARKER POST.

Station Notes

THE PIPE HAS BROKEN OFF.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order/(Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1383.757	.197		1296.461	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order/(Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1383.002						RECIPROCAL VERTICAL ANGLE	1982	HORZ

Geoid Separations(ft): GEOID18 = -87.595 12B = -87.592 09 = -87.477 03 = -87.339

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 34 08.78590	96 04 04.08211	411676.014	268954.565	.066	2	ADJUSTMENT	1999	17648
46 34 08.78580	96 04 04.08123	411676.075	268954.555	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 34 08.78434	96 04 04.08163	411676.047	268954.407	.066	2	ADJUSTMENT	1997	16997

NAD27

<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>						<u>Year</u>	<u>Reference</u>
46 34 08.92950	96 04 02.87690			.100		CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2167514.515	905511.781	869113.466	16935186.315	.066	2	ADJUSTMENT	1999	17648
2167514.576	905511.770	869113.527	16935186.302	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2167514.545	905511.622	869113.493	16935186.156	.066	2	ADJUSTMENT	1997	16997

NAD27

<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1542918.400	577437.510			.100		CLASSICAL SURVEY	1950	UNK



Mn/DOT Name: PELICAN

NGS Name: PELICAN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R01150](#) [Get Map](#)
NGS Quad / Sta Num : 46095434/1003
USGS Quad: LAKE FRANKLIN

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	10	137 N	42 W	464120.83	955855.87		1

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2009	GOOD	Horz=NO Vert=NO	YES		PROJECTS 8 IN.	STEEL SPIKE IMBED IN MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (1964) **Stamping:** PELICAN 1935

2.8 MILES NORTHEAST OF DUNVILLA, 2.2 MILES NORTHEAST ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 34 IN DUNVILLA, THEN NORTH 0.45 MILE 245TH AVENUE TO A HOUSE, THEN NORTH THROUGH A GATE BETWEEN A GARAGE AND A BARN, THEN 0.55 MILE ON A TRACK ROAD TO A TRIPLE FORK, THEN 0.15 MILE NORTH ON THE MIDDLE FORK TO A WIRE GATE THEN THROUGH A GATE AND NORTH 0.15 MILE ON A TRACK ROAD TO A 10.0 INCH DIAMETER OAK TREE WITH AN ORANGE TRIANGLE PAINTED ON IT, THEN BEAR RIGHT AND GO NORTHEAST TO THE HIGHEST POINT OF A RIDGE, 78.5 FEET NORTH OF A 36.0 INCH DIAMETER OAK TREE, 83.84 FEET WEST OF PELICAN RM 2, 57.90 FEET NORTH OF PELICAN RM 3, 51.88 FEET NORTHWEST OF PELICAN RM 1, 32.0 FEET SOUTH OF THE NORTH RIM OF A RIDGE, 30.0 FEET EAST OF THE WEST RIM OF A RIDGE.

Station Notes

THE SURVEY MARK IS ON PRIVATE PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference
1515.745	.131		1428.813	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference
1515.712						RECIPROCAL VERTICAL ANGLE	1935	HORZ

Geoid Separations(ft): GEOID18 = -87.211 12B = -87.201 09 = -87.100 03 = -86.958

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 41 20.82696	95 58 55.86859	433358.362	312642.255	.033	1	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 41 20.82583	95 58 55.86620	433358.528	312642.140	.033	1	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 41 20.97511	95 58 54.67433			.100	1	CLASSICAL SURVEY	1964	13522

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2189999.056	948785.242	892294.351	16978108.734	.033	1	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2189999.220	948785.124	892294.513	16978108.614	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1565402.644	620711.315			.100	1	CLASSICAL SURVEY	1964	13522



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PELICAN-RO1150-3W-12AUG2009.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PELICAN-RO1150-2-12AUG2009.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PELICAN-RO1150-1-04SEP2009.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
W	Aug 12, 2009
	Aug 12, 2009
	Sep 4, 2009



Mn/DOT Name: PELICAN RAPIDS MUNICIPAL TANK

NGS Name: PELICAN RAPIDS MUNICIPAL TANK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0900](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/1028
USGS Quad: PELICAN RAPIDS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	22	136 N	43 W	463429.04	960501.91		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	1982	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	ELEVATED TANK	NGS

Description: (1982)

Stamping:

AT THE NORTH EDGE OF PELICAN RAPIDS, 50.0 FEET WEST OF TRUNK HIGHWAY 59, 0.25 MILE NORTH OF TRUNK HIGHWAY 108.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.579 12B = -87.572 09 = -87.457 03 = -87.323

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 34 29.03947	96 05 01.91466	407644.691	271024.839	.328	4	ADJUSTMENT	1999	17648
46 34 29.03932	96 05 01.91399	407644.737	271024.823	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 34 29.03747	96 05 01.90772	407645.175	271024.634	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>								<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 34 29.18700	96 05 00.70400			.100	4	CLASSICAL SURVEY	1944	05937	

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2163522.705	907656.050	865154.975	16937394.767	.328	4	ADJUSTMENT	1999	17648
2163522.751	907656.034	865155.021	16937394.750	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2163523.185	907655.837	865155.451	16937394.545	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - Central Zone</u>								<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
1538926.851	579582.140			.100	4	CLASSICAL SURVEY	1944	05937	



Mn/DOT Name: PELICAN RAPIDS RADIO MAST

NGS Name: PELICAN RAPIDS RADIO MAST

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9322](#) [Get Map](#)
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	26	136 N	42 W	463328.32	955620.88		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1982	1982	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	RADIO/TV MAST	MNDT

Description: (1982)

Stamping:

7.0 MILES EAST OF PELICAN RAPIDS, 1.0 MILE SOUTH OF THE SOUTHEAST SIDE OF LAKE IDA, 125.0 FEET NORTH OF A GRAVEL ROAD.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.497 12B = -87.490 09 = -87.388 03 = -87.221

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 33 28.32116	95 56 20.88106	444029.172	264737.640	.328	4	ADJUSTMENT	1999	17648

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 33 28.31993	95 56 20.88344	444029.006	264737.516	.328	4	ADJUSTMENT	1997	16997

NAD27

<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>						<u>Year</u>	<u>Reference</u>
46 33 28.46610	95 56 19.69490			.100		CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2199780.003	900697.282	901308.448	16929856.339	.328	4	ADJUSTMENT	1999	17648

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2199779.834	900697.161	901308.277	16929856.221	.328	4	ADJUSTMENT	1997	16997

NAD27

<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1575183.550	572623.308			.100		CLASSICAL SURVEY	1950	UNK



Mn/DOT Name: PELICAN RM 1

NGS Name: PELICAN RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4472](#) [Get Map](#)
NGS Quad / Sta Num : 46095434/1003
USGS Quad: LAKE FRANKLIN

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	10	137 N	42 W	464120.51	955855.28			1935	2009	GOOD	Horz=NO Vert=NO	YES		PROJECTS 8 IN.	STEEL SPIKE IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: Stamping: PELICAN NO 1 1935

2.8 MILES NORTHEAST OF DUNVILLA, 2.2 MILES NORTHEAST ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 34 IN DUNVILLA, THEN NORTH 0.45 MILE 245TH AVENUE TO A HOUSE, THEN NORTH THROUGH A GATE BETWEEN A GARAGE AND A BARN, THEN 0.55 MILE ON A TRACK ROAD TO A TRIPLE FORK, THEN 0.15 MILE NORTH ON THE MIDDLE FORK TO A WIRE GATE, THEN THROUGH THE GATE AND NORTH 0.15 MILE ON A TRACK ROAD TO A 10.0 INCH DIAMETER OAK TREE WITH AN ORANGE TRIANGLE PAINTED ON IT THEN BEAR RIGHT AND GO NORTHEAST TO THE HIGHEST POINT OF A RIDGE, ON THE EAST SLOPE OF THE RIDGE, 51.88 FEET SOUTHEAST OF STATION PELICAN.

Station Notes

THE SURVEY MARK IS ON PRIVATE PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.211 12B = -87.201 09 = -87.100 03 = -86.958

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PELICAN_RM_1-CP4472-3E-12AUG2009.jpg	E	Aug 12, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PELICAN_RM_1-CP4472-2-12AUG2009.jpg		Aug 12, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PELICAN_RM_1-CP4472-1-12AUG2009.jpg		Aug 12, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: PELICAN RM 2

NGS Name: PELICAN RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4473](#) [Get Map](#)
NGS Quad / Sta Num : 46095434/1003
USGS Quad: LAKE FRANKLIN

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	10	137 N	42 W	464120.04	955855.50		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	2009	GOOD	Horz=NO Vert=NO	YES		PROJECTS 8 IN.	STEEL SPIKE IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2012) **Stamping:** PELICAN NO 2 1935

2.8 MILES NORTHEAST OF DUNVILLA, 2.2 MILES NORTHEAST ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 34 AT DUNVILLA, THEN NORTH 0.45 MILE ON 245TH AVENUE TO A HOUSE, THEN NORTH THROUGH A GATE BETWEEN A GARAGE AND A BARN, THEN 0.55 MILE ON A TRACK ROAD TO A TRIPLE FORK, THEN 0.15 MILE NORTH ON THE MIDDLE FORK TO A WIRE GATE, THEN THROUGH A GATE AND NORTH 0.15 MILE ON A TRACK ROAD TO A 10.0 INCH DIAMETER OAK TREE WITH AN ORANGE TRIANGLE PAINTED ON IT THEN BEAR RIGHT AND GO NORTHEAST TO THE HIGHEST POINT OF A RIDGE, 32.0 FEET EAST OF A 36.0 INCH DIAMETER OAK TREE, 83.84 FEET SOUTH OF STATION PELICAN.

Station Notes

THE SURVEY MARK IS ON PRIVATE PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order / (Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1543.885	.262		1456.930	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.211 12B = -87.201 09 = -87.100 03 = -86.958

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 41 20.03898	95 58 55.50443	433383.483	312562.336	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2190022.690	948704.881	892316.701	16978027.981	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PELICAN_RM_2-CP4473-3W-12AUG2009.jpg	W	Aug 12, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PELICAN_RM_2-CP4473-2-12AUG2009.jpg		Aug 12, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PELICAN_RM_2-CP4473-1-12AUG2009.jpg		Aug 12, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: PELICAN RM 3

NGS Name: PELICAN RM 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4474](#) [Get Map](#)
NGS Quad / Sta Num : 46095434/1003
USGS Quad: LAKE FRANKLIN

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	10	137 N	42 W	464120.29	955856.15		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	2009	GOOD	Horz=NO Vert=NO	YES		PROJECTS 6 IN.	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: Stamping: PELICAN NO 3 1935

2.8 MILES NORTHEAST OF DUNVILLA, 2.2 MILES NORTHEAST ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 34 AT DUNVILLA, THEN NORTH 0.45 MILE 245TH AVENUE TO A HOUSE, THEN NORTH THROUGH A GATE BETWEEN A GARAGE AND A BARN, THEN 0.55 MILE ON A TRACK ROAD TO A TRIPLE FORK, THEN 0.15 MILE NORTH ON THE MIDDLE FORK TO A WIRE GATE, THEN THROUGH A GATE AND NORTH 0.15 MILE ON TRACK ROAD TO A 10.0 INCH DIAMETER OAK TREE WITH AN ORANGE TRIANGLE PAINTED ON IT THEN BEAR RIGHT AND GO NORTHEAST TO THE HIGHEST POINT OF A RIDGE, 26.0 FEET NORTHWEST OF A 36.0 INCH DIAMETER OAK TREE, 57.90 FEET SOUTH OF STATION PELICAN.

Station Notes

THE SURVEY MARK IS ON PRIVATE PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.211 12B = -87.201 09 = -87.100 03 = -86.958

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PELICAN_RM_3-CP4474-3W-12AUG2009.jpg	W	Aug 12, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PELICAN_RM_3-CP4474-2-12AUG2009.jpg		Aug 12, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PELICAN_RM_3-CP4474-1-12AUG2009.jpg		Aug 12, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: PET 32

NGS Name: PET 32

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	19	131 N	41 W	460837.12	955319.71			2009	2014	GOOD	Horz=YES Vert=YES	YES		RECESSED 5 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009)

Stamping: PET 32 1998 2009

2.1 MILES SOUTHEAST OF DALTON, 2.25 MILES SOUTHEAST ALONG COUNTY ROAD 82 FROM THE JUNCTION OF COUNTY ROAD 82 AND COUNTY ROAD 35 IN THE SOUTH PART OF DALTON, 32.0 FEET SOUTHWEST OF COUNTY ROAD 82, 16.0 FEET SOUTHEAST OF A FIELD ENTRANCE, 37.0 FEET NORTHEAST OF A WITNESS POST, 7.0 FEET NORTHEAST OF A WITNESS POST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.178 12B = -87.182 09 = -87.057 03 = -87.027

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PET_32-3SW-02OCT2014.jpg	SW	Oct 2, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PET_32-2-02OCT2014.jpg		Oct 2, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PET_32-1-02OCT2014.jpg		Oct 2, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: PICK MNDT TEMP

NGS Name: PICK TEMP

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9305](#)
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	30	136 N	40 W	463324.42	954558.35		2

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1982	2023	GOOD	Horz=NO Vert=NO	NO		FLUSH	MARKER IS STEEL ROD

Monument Type

CONCRETE POST (PREFABRICATED)

Disk Type

SURVEY DISK

Mon. Agency

MNDT

Description: (1982)

Stamping: PICK 1982

2.2 MILES WEST OF DENT, AT TRUNK HIGHWAY 108 MILEPOINT 29.25, 69.0 FEET NORTH-NORTHWEST OF TRUNK HIGHWAY 108, 4.0 FEET NORTH-NORTHWEST OF A WITNESS POST, 12.52 FEET SOUTHWEST OF A NAIL AND A DISK IN A POWER POLE, ALONG A BIKE PATH.

Station Notes

THE SURVEY MARK IS UNSUITABLE FOR MNDOT GEODETIC SURVEYS.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1412.343	.262		1325.096	.197	2011	GPS - RTRN	2023	RTRN2023
1411.349	.197		1324.282	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1411.414						RECIPROCAL VERTICAL ANGLE	1982	HORZ

Geoid Separations(ft): GEOID18 = -87.247 12B = -87.244 09 = -87.126 03 = -87.014

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 33 24.41636	95 45 58.35188	487535.336	264267.227	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 33 24.41320	95 45 58.35435	487535.163	264266.907	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 33 24.40959	95 45 58.35454	487535.150	264266.541	.066	2	ADJUSTMENT	1997	16997

NAD27

<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>						<u>Year</u>	<u>Reference</u>
46 33 24.55890	95 45 57.18580			.100		CLASSICAL SURVEY	1950	UNK



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone

UTM - Zone 15

Project Info

<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2243264.516	899421.637	944778.353	16927887.698	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

MN State Plane - Central Zone

UTM - Zone 15

Project Info

<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2243264.338	899421.321	944778.169	16927887.384	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone

UTM - Zone 15

Project Info

<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2243264.317	899420.955	944778.144	16927887.019	.066	2	ADJUSTMENT	1997	16997

NAD27

MN State Plane - Central Zone

Project Info

<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1618667.956	571347.605			.100		CLASSICAL SURVEY	1950	UNK

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PICK_TEMP-AD9305-3N-31JUL2023.jpg	N	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PICK_TEMP-AD9305-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PICK_TEMP-AD9305-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: PRAIRIE

NGS Name: PRAIRIE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0899](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/1006
USGS Quad: PELICAN RAPIDS

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	4	136 N	43 W	463654.86	960616.09		1

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (1971) **Stamping:** PRAIRIE 1935

3.3 MILES NORTH AND 1.0 MILE WEST OF PELICAN RAPIDS, 0.7 MILE NORTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 AT PELICAN RAPIDS, THEN 2.5 MILES NORTH ON COUNTY ROAD 9 THEN 0.5 MILE WEST ON COUNTY ROAD 23, IN A PASTURE SOUTH OF COUNTY ROAD 23, 116.47 FEET SOUTHWEST OF PRAIRIE 1, 195.92 FEET SOUTHEAST OF PRAIRIE RM 2.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88							Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1443.567	.131		1356.441	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29							Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1443.599						RECIPROCAL VERTICAL ANGLE	1935	HORZ

Geoid Separations(ft): GEOID18 = -87.434 12B = -87.415 09 = -87.316 03 = -87.195

Lat/Lon and County Coordinates (Feet)

NAD83(1996)							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 36 54.85946	96 06 16.09449	402534.604	285822.907	.033	1	ADJUSTMENT	1999	17648
46 36 54.85810	96 06 16.09376	402534.655	285822.769	.033	1	ADJUSTMENT	1998	17655

NAD83(1986)							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 36 54.85946	96 06 16.08839	402535.030	285822.904	.033	1	ADJUSTMENT	1986	17289

NAD27							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 36 55.00700	96 06 14.88100			.100	1	CLASSICAL SURVEY	1944	05937

State Plane and UTM Coordinates (Feet)

NAD83(1996)							Project Info	
MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Year	Reference
X	Y	X	Y					
2158688.009	922544.306	860556.989	16952363.685	.033	1	ADJUSTMENT	1999	17648
2158688.057	922544.167	860557.034	16952363.546	.033	1	ADJUSTMENT	1998	17655

NAD83(1986)							Project Info	
MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Year	Reference
X	Y	X	Y					
2158688.435	922544.296	860557.414	16952363.669	.033	1	ADJUSTMENT	1986	17289

NAD27							Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Year	Reference
X	Y							
1534092.134	594470.303			.100	1	CLASSICAL SURVEY	1944	05937



Mn/DOT Name: PRAIRIE AZ MK

NGS Name: PRAIRIE AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP3866](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/1006
USGS Quad: PELICAN RAPIDS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	4	136 N	43 W	463655.00	960645.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	AZIMUTH MARK DISK	NGS

Description: (1935) **Stamping:** PRAIRIE 1935

3.3 MILES NORTH AND 1.0 MILE WEST OF PELICAN RAPIDS, 0.7 MILE NORTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 AT PELICAN RAPIDS, THEN 2.5 MILES NORTH ON COUNTY ROAD 9, THEN 0.5 MILE WEST ON COUNTY ROAD 23, 22.0 FEET NORTH OF THE CENTERLINE OF A ROAD, 1.0 FOOT EAST OF A TELEPHONE POLE.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.431 12B = -87.415 09 = -87.310 03 = -87.195



Mn/DOT Name: PRAIRIE RM 1

NGS Name: PRAIRIE RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP3867](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/1006
USGS Quad: PELICAN RAPIDS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	4	136 N	43 W	463655.00	960615.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	2009	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 6 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	REFERENCE MARK DISK	NGS

Description: **Stamping:** PRAIRIE NO 1 1935

3.3 MILES NORTH AND 1.0 MILE WEST OF PELICAN RAPIDS, 0.7 MILE NORTH ON TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 IN PELICAN RAPIDS, THEN 2.5 MILES NORTH ON COUNTY ROAD 9, THEN 0.5 MILE WEST ON COUNTY ROAD 23, 116.47 FEET NORTHEAST OF STATION PRAIRIE, 100.0 FEET NORTH OF THE CENTERLINE OF A ROAD, 77.5 FEET NORTH OF A FENCE LINE, 51.5 FEET WEST OF THE NORTHWEST CORNER OF BARN.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.434 12B = -87.415 09 = -87.316 03 = -87.195



Mn/DOT Name: PRAIRIE RM 2

NGS Name: PRAIRIE RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP3868](#) [Get Map](#)
NGS Quad / Sta Num : 46096122/1006
USGS Quad: PELICAN RAPIDS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	4	136 N	43 W	463655.57	960618.61		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	2009	GOOD	Horz=NO Vert=YES	YES		PROJECTS 8 IN.	STEEL SPIKE IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (2011)

Stamping: PRAIRIE NO 2 1935

3.15 MILES NORTH OF PELICAN RAPIDS, 0.55 MILE NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 WEST IN PELICAN RAPIDS TO TRUNK HIGHWAY 59 MILEPOINT 241.15, THEN 2.5 MILES NORTHWEST ON COUNTY ROAD 9, THEN 0.5 MILE WEST ON COUNTY ROAD 3, 195.92 FEET NORTHWEST OF STATION PRAIRIE, 106.0 FEET NORTH OF COUNTY ROAD 23, 110.0 FEET NORTH OF THE CENTERLINE OF COUNTY ROAD 23, 84.5 FEET NORTH OF AN EAST-WEST FENCE LINE, 27.0 FEET EAST OF DRIVEWAY NUMBER 45248, 1.0 FOOT EAST OF A NORTH-SOUTH FENCE LINE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.434 12B = -87.415 09 = -87.316 03 = -87.195

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PRAIRIE_RM_2-CP3868-3NW-18AUG2009.jpg	NW	Aug 18, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PRAIRIE_RM_2-CP3868-2-18AUG2009.jpg		Aug 18, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PRAIRIE_RM_2-CP3868-1-04SEP2009.jpg		Sep 4, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: PRAXL

NGS Name: PRAXL

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ1984](#) [Get Map](#)
NGS Quad / Sta Num : 46096121/
USGS Quad: CORMORANT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	30	137 N	42 W	463930.79	960139.70	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 1 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 44 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: PRAXL 2014

6.55 MILES NORTH OF PELICAN RAPIDS, 6.95 MILES NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAYS 59 AND 108 WEST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 247.6, 66.8 FEET NORTHWEST OF TRUNK HIGHWAY 59, 78.5 FEET SOUTHWEST OF TRUNK HIGHWAY 34, 3.0 FEET SOUTHEAST OF A WITNESS POST.

Station Pair: DAHL - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1324.062	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1324.062			1236.818	.023	2011	HORIZONTAL ADJUSTMENT	2024	GPS3671
1324.062			1236.756	.021	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1324.062	.131		1236.861	.066	1996	GPS - STATIC	2023	HTH59
1324.062	.131		1236.923	.066	1996	GPS - STATIC	2023	HTH9
1324.062			1236.818	.023	2011	GPS - STATIC	2023	HTH9
1324.062			1236.756	.021	2011	GPS - STATIC	2023	HTH59
1324.223	.262		1236.900	.197	2011	GPS - RTRN	2022	RTRN2022
1324.020	.262		1236.697	.197	2011	GPS - RTRN	2022	RTRN2022
1323.931	.262		1236.622	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.323 12B = -87.310 09 = -87.201 03 = -87.063

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
46 39 30.79134	96 01 39.70261	421892.331	301535.681	.013		ADJUSTMENT			2024	GPS3671
46 39 30.79102	96 01 39.70192	421892.379	301535.649	.013		ADJUSTMENT			2024	GPS3672
46 39 30.79134	96 01 39.70261	421892.331	301535.681	.013	C	GPS - STATIC			2023	HTH9
46 39 30.79102	96 01 39.70192	421892.379	301535.649	.013	C	GPS - STATIC			2023	HTH59
46 39 30.79098	96 01 39.70250	421892.339	301535.645	.131	3	GPS - RTRN			2022	RTRN2022
46 39 30.79121	96 01 39.70232	421892.351	301535.668	.131	3	GPS - RTRN			2022	RTRN2022
46 39 30.79099	96 01 39.70322	421892.289	301535.646	.131	3	GPS - RTRN			2014	RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
46 39 30.79080	96 01 39.70241	421892.345	301535.627	.033	C	GPS - STATIC			2023	HTH59
46 39 30.79111	96 01 39.70300	421892.304	301535.658	.033	C	GPS - STATIC			2023	HTH9



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2178330.830	937894.165	880449.571	16967402.561	.013		ADJUSTMENT	2024	GPS3671
2178330.878	937894.132	880449.618	16967402.527	.013		ADJUSTMENT	2024	GPS3672
2178330.830	937894.165	880449.571	16967402.561	.013	C	GPS - STATIC	2023	HTH9
2178330.878	937894.132	880449.618	16967402.527	.013	C	GPS - STATIC	2023	HTH59
2178330.837	937894.128	880449.577	16967402.524	.131	3	GPS - RTRN	2022	RTRN2022
2178330.850	937894.152	880449.590	16967402.547	.131	3	GPS - RTRN	2022	RTRN2022
2178330.787	937894.131	880449.527	16967402.527	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2178330.843	937894.110	880449.583	16967402.506	.033	C	GPS - STATIC	2023	HTH59
2178330.802	937894.143	880449.543	16967402.539	.033	C	GPS - STATIC	2023	HTH9

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PRAXL-DQ1984-3NW-12OCT2022.jpg	NW	Oct 12, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PRAXL-DQ1984-2-12OCT2022.jpg		Oct 12, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PRAXL-DQ1984-1-12OCT2022.jpg		Oct 12, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: PRIM TRAV STA 10

NGS Name: PRIM TRAV STA 10

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>	<u>Mon. Agency</u>
NW	4	136 N	40 W	463744.00	954353.00			1911	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION	USGS
Monument Type IRON POST																
Disk Type SURVEY DISK																

Description: (1911) **Stamping:** PRIM TRAV STA NO 10 1911

20.0 FEET SOUTH AND 30.0 FEET WEST OF A TEE-ROAD NORTH.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.162 12B = -87.155 09 = -87.057 03 = -86.942



Mn/DOT Name: PRIM TRAV STA 11

NGS Name: PRIM TRAV STA 11

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	21	132 N	43 W	461355.00	960611.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1910	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SURVEY DISK

Mon. Agency

USGS

Description: (1974)

Stamping: PRIM TRAV STA NO 11 1910

3.75 MILES SOUTHWEST OF FERGUS FALLS, 2.6 MILES SOUTH ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND INTERSTATE HIGHWAY 94/TRUNK HIGHWAY 52 IN FERGUS FALLS, AT THE JUNCTION OF 185TH STREET AND COUNTY ROAD 1, 25.0 FEET EAST OF A TEE-ROAD WEST, ON THE EAST EDGE OF A NORTH-SOUTH ROAD.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -87.979 12B = -87.979 09 = -87.838 03 = -87.779



Mn/DOT Name: PRIM TRAV STA 12

NGS Name: PRIM TRAV STA 12

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>	<u>Mon. Agency</u>
SW	12	137 N	40 W	464127.00	954109.00			1911	2009	NOT FOUND	Horz=? Vert=YES	NO			MARKER IS STEEL ROD	USGS
<u>Monument Type</u>				<u>Disk Type</u>				<u>Mon. Agency</u>								
IRON POST				SURVEY DISK				USGS								

Description: (1911)

Stamping: PRIM TRAV STA NO 12 1911

3.0 MILES SOUTHEAST OF FRAZEE, 0.25 MILE SOUTHEAST FROM SCHOOL NUMBER 75, 25.0 FEET NORTH AND 30.0 FEET WEST OF THE CROSSROADS.

Station Notes

THE TIES FALL IN A DITCH BOTTOM.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.310 12B = -87.306 09 = -87.211 03 = -87.077



Mn/DOT Name: PRIM TRAV STA 13

NGS Name: PRIM TRAV STA 13

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	16	132 N	40 W	461510.75	954327.52		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1910	2009	DESTROYED	Horz=NO Vert=NO	NO			MARKER IS STEEL ROD

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON POST	SURVEY DISK	USGS

Description: (1974)

Stamping: PRIM TRAV STA NO 13 1910

IN THE SOUTHEAST ANGLE OF OFFSET CROSSROADS, ON LINE WITH THE EAST EDGE OF THE NORTH ROAD, 35.0 FEET
SOUTHEAST OF THE INTERSECTION.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.464 12B = -87.474 09 = -87.369 03 = -87.283



Mn/DOT Name: PRIM TRAV STA 19

NGS Name: PRIM TRAV STA 19

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095423/
USGS Quad: DENT

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>	<u>Mon. Agency</u>
SW	3	135 N	40 W	463139.00	954304.00			1910	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION	USGS
Monument Type																
IRON POST																
Disk Type																
SURVEY DISK																

Description: (1910)

Stamping: PRIM TRAV STA NO 19 1910

2.0 MILES SOUTH FROM THE RAILROAD STATION IN DENT, 500.0 FEET WEST OF THE JUNCTION OF A ROAD SOUTH TO RICHVILLE, IN A FENCE CORNER.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.477 12B = -87.477 09 = -87.342 03 = -87.224



Mn/DOT Name: PRIM TRAV STA 7

NGS Name: PRIM TRAV STA 7

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>	<u>Mon. Agency</u>
NE	7	136 N	41 W	463629.00	955328.00			1911	2009	NOT FOUND	Horz=? Vert=YES	NO			MARKER IS STEEL ROD	USGS
Monument Type IRON POST																
Disk Type SURVEY DISK																
Mon. Agency USGS																

Description: (1911)

Stamping: PRIM TRAV STA NO 7 1911

2.25 MILES EAST OF LIDA, 0.8 MILE EAST OF JACOBS SCHOOL, 35.0 FEET NORTH AND 30.0 FEET EAST OF A TEE-ROAD NORTH.

Station Notes

THE TIES FALL IN A DITCH BOTTOM.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.198 12B = -87.188 09 = -87.086 03 = -86.936



Mn/DOT Name: PRIM TRAV STA 8

NGS Name: PRIM TRAV STA 8

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095431/
USGS Quad: VERGAS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>	<u>Mon. Agency</u>
SW	35	137 N	41 W	463807.00	955006.00			1911	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION	USGS
Monument Type																
IRON POST																
Disk Type																
SURVEY DISK																

Description: (1911)

Stamping: PRIM TRAV STA NO 8 1911

2.5 MILES SOUTHWEST OF VERGAS, 0.2 MILE EAST OF THE SAINT PAUL LUTHERAN CHURCH, 20.0 FEET WEST OF A ROAD FORK, 9.0 FEET SOUTH AND 5.0 FEET WEST OF A FENCE CORNER.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.070 12B = -87.070 09 = -86.965 03 = -86.814



Mn/DOT Name: PRIM TRAV STA 9

NGS Name: PRIM TRAV STA 9

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095423/
USGS Quad: DENT

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	27	136 N	40 W	463325.00	954301.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1911	2009	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SURVEY DISK

Mon. Agency

USGS

Description: (1911)

Stamping: PRIM TRAV STA NO 9 1911

IN DENT, NEAR A RAILROAD STATION, AT THE JUNCTION OF TRUNK HIGHWAY 108 AND EAST, 20.0 FEET SOUTH AND 80.0 FEET EAST OF AN EAST-WEST ROAD CROSSING OF THE MAIN TRACK.

Station Notes

THE SURVEY MARK IS ON RAILROAD PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.346 12B = -87.329 09 = -87.218 03 = -87.113



Mn/DOT Name: PRIM TRAV STA NO 11

NGS Name: PRIM TRAV STA 11

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	23	137 N	40 W	463941.00	954158.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1911	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON POST	SURVEY DISK	USGS

Description: (1911)

Stamping: PRIM TRAV STA NO 11 1911

5.0 MILES SOUTH OF FRAZEE, OPPOSITE RICE LAKE, ON THE NORTH SIDE OF FRAZEE SYBIL ROAD.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.264 12B = -87.260 09 = -87.152 03 = -87.024



Mn/DOT Name: PRIM TRAV STA NO 28

NGS Name: PRIM TRAV STA NO 28

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	32	134 N	43 W	462243.66	960147.56		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1910	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2011)

Stamping: PRIM TRAV STA NO 28 1910

AT ELIZABETH, 2.9 MILES EAST ALONG COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND INTERSTATE HIGHWAY 94, THEN 1.0 BLOCK SOUTH ON PELICAN STREET, IN THE NORTHWEST CORNER OF A SCHOOLYARD, 200.0 FEET NORTHWEST OF A SCHOOLHOUSE.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -88.189 12B = -88.192 09 = -88.071 03 = -87.956



Mn/DOT Name: PRIM TRAV STA NO 5

NGS Name: PRIM TRAV STA NO 5

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	18	135 N	43 W	463002.05	960844.68		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1910	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

BENCH MARK DISK

Mon. Agency

USGS

Description: (2011)

Stamping: PRIM TRAV STA NO 5 1910

6.3 MILES EAST ROTHSA, 6.4 MILES EAST AND NORTH ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND INTERSTATE HIGHWAY 94 IN ROTHSA, THEN 1.0 MILE NORTH ON 165TH STREET, ON THE EAST SIDE OF A SMALL LAKE, NEAR THE JUNCTION OF THE ROADS.

Station Notes

THE TIES FALL IN A FIELD.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.949 12B = -87.930 09 = -87.825 03 = -87.726



Mn/DOT Name: PTS 1

NGS Name: PTS 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095433/
USGS Quad: LAKE LIDA

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	33	136 N	42 W	463309.00	955909.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1911	2023	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON POST	SEE DESCRIPTION	USGS

Description: (1973)

Stamping: PRIM TRAV STA NO 1 1911

AT STONY BARN, NEAR THE NICK STERGIN'S MAILBOX, 260.0 FEET EAST OF A BRIDGE OVER LAKE LIDA, 1.5 MILES SOUTHEAST OF KINNEYS CAMP, STATION PTS 1 IS CONSIDERED LOST.

Station Notes

7-27-2009 GRADED OUT WHEN TRUNK HIGHWAY 108 ROAD AND BRIDGE WAS REBUILT.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1324.400	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.634 12B = -87.615 09 = -87.523 03 = -87.362

* No Horizontal Positions in the Database *



Mn/DOT Name: PTS 10

NGS Name: PTS 10

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096231/
USGS Quad: CAMPBELL NE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	18	132 N	44 W	461418.90	961552.46		3	1910	2009	GOOD	Horz=NO Vert=NO	YES		PROJECTS 8 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	PIPE CAP	USGS

Description: (1910)

Stamping: MINNESOTA PRIM TRAV STA NO 10 1910 1045

8.0 MILES SOUTHWEST OF FERGUS FALLS, 2.25 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, AT TRUNK HIGHWAY MILEPOINT 22.01, THEN 1.2 MILES SOUTH ON COUNTY ROAD 86, THEN 3.4 MILES SOUTH ON COUNTY ROAD 15, THEN 2.65 MILES WEST ON 190TH STREET, THEN 1.15 MILES WEST ON A MINIMUM MAINTENANCE ROAD, 60.0 FEET EAST OF A CANAL DITCH, 7.0 FEET EAST OF A POWER POLE WITH A GUYWIRE, 1.0 FOOT SOUTH OF A WITNESS POST.

Station Notes

DON'T USE. NO WINTER ACCESS.

Leveling-Derived Orthometric Heights (Feet)

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1044.916	.033	3					VERTICAL CONTROL SURVEY	1973	USGS-VERT

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1045.595	.262			957.623	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.140 12B = -88.126 09 = -88.028 03 = -87.972

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Ellipsoid (NAD83)</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>
46 14 18.89906	96 15 52.45825	361345.960	148691.792	.131	3	GPS - RTRN	2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>
2114974.013	786216.651	814667.259	16816690.788	.131	3	GPS - RTRN	2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PTS_10-3N-06AUG2009.jpg	N	Aug 6, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PTS_10-2-06AUG2009.jpg		Aug 6, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PTS_10-1-06AUG2009.jpg		Aug 6, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: PTS 14

NGS Name: PTS 14

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0514](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	33	133 N	40 W	461700.18	954309.59	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1910	2015	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 2 IN.	SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SURVEY DISK

Mon. Agency

USGS

Description: (1910)

Stamping: PRIM TRAV STA NO 14 1373

AT BATTLE LAKE, 0.25 MILE WEST ON SUMMIT STREET FROM THE JUNCTION OF SUMMIT STREET AND TRUNK HIGHWAY 78, 43.0 FEET NORTH OF SUMMIT STREET, 34.0 FEET WEST OF MCKINLEY AVENUE, 70.0 FEET SOUTHEAST OF THE SOUTHEAST CORNER OF A SCHOOL, 17.0 FEET NORTH OF A FIRE HYDRANT, 8.7 FEET SOUTH-SOUTHWEST OF A 10.0 INCH DIAMETER ELM TREE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1372.202	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1371.421	.016	2				VERTICAL CONTROL SURVEY	1976	L23961
1371.835	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -87.611 12B = -87.618 09 = -87.513 03 = -87.418

* No Horizontal Positions in the Database *



Mn/DOT Name: PTS 15

NGS Name: PTS 15

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	9	133 N	40 W	462052.00	954343.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1910	2015	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON POST	PIPE CAP	USGS

Description: (1910)

Stamping: PRIM TRAV STA NO 15 1363

5.0 MILES NORTH AND 1.0 MILE WEST OF BATTLE LAKE, 40.0 FEET NORTH AND 30.0 FEET WEST OF THE CENTER OF SECTION 9, 45.0 FEET NORTHWEST OF THE JUNCTION OF COUNTY ROAD 72 AND A TOWNSHIP ROAD WEST, 20.0 FEET NORTH OF A FENCE CORNER.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1361.182	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.903 12B = -87.900 09 = -87.789 03 = -87.661

* No Horizontal Positions in the Database *



Mn/DOT Name: PTS 16

NGS Name: PTS 16

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095314/
USGS Quad: WALKER LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	32	134 N	40 W	462235.00	954440.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1910	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (1973)

Stamping:

2.5 MILES SOUTH OF AMOUR, 0.5 MILE SOUTH ALONG COUNTY ROAD 145 FROM THE JUNCTION OF COUNTY ROAD 145 AND COUNTY ROAD 1 IN AMOUR, 40.0 FEET NORTHEAST OF THE JUNCTION OF COUNTY ROAD 1 AND COUNTY ROAD 72, NEAR A TELEPHONE POLE AT THE EAST EDGE OF COUNTY ROAD 1.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1328.997	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.982 12B = -87.979 09 = -87.861 03 = -87.723

* No Horizontal Positions in the Database *



Mn/DOT Name: PTS 17

NGS Name: PTS 17

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095314/
USGS Quad: WALKER LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	16	134 N	40 W	462445.00	954422.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1911	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON POST	PIPE CAP	USGS

Description: (1973)

Stamping: PRIM TRAV STA NO 17 1368

0.2 MILE EAST OF THE AMOR STORE, 35.0 FEET NORTHEAST OF THE JUNCTION OF COUNTY ROAD 74 AND A TEE-ROAD
NORTH, SOUTHWEST OF A CHURCH.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1366.910	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.982 12B = -87.979 09 = -87.848 03 = -87.713

* No Horizontal Positions in the Database *



Mn/DOT Name: PTS 2

NGS Name: PTS 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	18	136 N	42 W	463601.00	960040.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1911	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON POST	PIPE CAP	USGS

Description: (1911) Stamping: 1322 PRIM TRAV STA NO 2 MINN

NEAR THE NORTHEAST CORNER OF SECTION 18, NEAR COUNTY ROAD 4 AT A TEE-ROAD SOUTH.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1320.099	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.490 12B = -87.477 09 = -87.365 03 = -87.218

* No Horizontal Positions in the Database *



Mn/DOT Name: PTS 20

NGS Name: PTS 20

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095341/
USGS Quad: PHELPS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	29	135 N	41 W	462839.00	955149.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1910	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON POST

Disk Type
SEE DESCRIPTION

Mon. Agency
USGS

Description: (1973)

Stamping:

25.0 FEET SOUTHWEST OF THE EAST 1/4 OF SECTION 29, SOUTHWEST OF THE JUNCTION OF COUNTY ROAD 24 AND NORTH-SOUTH TOWNSHIP ROAD, THE STATION IS CONSIDERED LOST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1374.413	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.808 12B = -87.792 09 = -87.680 03 = -87.536

* No Horizontal Positions in the Database *



Mn/DOT Name: PTS 27

NGS Name: PTS 27

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	4	133 N	41 W	462210.00	955147.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1910	2005	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON POST	PIPE CAP	USGS

Description: (1910)

Stamping: PRIM TRAV STA NO 27 1379

40.0 FEET NORTHWEST OF THE JUNCTION OF COUNTY ROAD 1 AND COUNTY ROAD 35, 250.0 FEET NORTHWEST OF SCHOOLHOUSE NUMBER 182.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1377.405	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.077 12B = -88.087 09 = -87.969 03 = -87.815

* No Horizontal Positions in the Database *



Mn/DOT Name: PTS 3

NGS Name: PTS 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096124/
USGS Quad: ROLLAG

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	5	136 N	43 W	463750.00	960811.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1911	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

SEE DESCRIPTION

Mon. Agency

USACE

Description: (2008)

Stamping: PRIM TRAV STA NO 3 1911

5.6 MILES NORTHWEST OF PELICAN RAPIDS, 2.2 MILES SOUTH ALONG COUNTY ROAD 23 FROM THE JUNCTION OF COUNTY ROAD 23 AND TRUNK HIGHWAY 34, THEN 354.0 FEET WEST ON 460TH STREET, 25.0 FEET SOUTH AND 3.0 FEET EAST FROM A TEE-ROAD.

Station Notes

7-27-2009 GRADED OUT WHEN THE TEE-ROAD WAS RECONFIGURED.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1373.800	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.382 12B = -87.359 09 = -87.250 03 = -87.149

* No Horizontal Positions in the Database *



Mn/DOT Name: PTS 4

NGS Name: PTS 4

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095344/
USGS Quad: HEILBERGER LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	16	135 N	42 W	462959.00	955919.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1910	2009	DESTROYED	Horz=NO Vert=NO	YES			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON POST	PIPE CAP	USGS

Description: (1910)

Stamping: PRIM TRAV STA NO 4 1436 MINN 1910

5.0 MILES EAST-NORTHEAST OF REHEARD, AT THE NORTHEAST CORNER OF COUNTY ROAD 3 AT A TEE-ROAD WEST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1434.420	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.828 12B = -87.812 09 = -87.713 03 = -87.569

* No Horizontal Positions in the Database *



Mn/DOT Name: PTS 6

NGS Name: PTS 6

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096241/
USGS Quad: ROTHSA

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	19	135 N	44 W	462955.00	961539.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1910	2009	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 24 IN.	SEE DESCRIPTION

Monument Type

IRON POST

Disk Type

REFERENCE MARK DISK

Mon. Agency

USGS

Description: (2011)

Stamping: PTS 6 1910

1.6 MILES NORTHEAST ROTHSA, 1.2 MILES NORTH ALONG COUNTY ROAD 11 FROM THE JUNCTION OF COUNTY ROAD 11 AND INTERSTATE HIGHWAY 94, THEN 0.9 MILE EAST ON 370TH STREET, 581.0 FEET NORTH OF THE STATION, 29.0 FEET SOUTH AND 22.0 FEET WEST OF A ROAD AND THE CROSSROADS.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1285.867	.033	3				VERTICAL CONTROL SURVEY	1973 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.051 12B = -88.038 09 = -87.946 03 = -87.864

* No Horizontal Positions in the Database *



Mn/DOT Name: PTS 7

NGS Name: PTS 7

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096241/
USGS Quad: ROTHSA

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	8	134 N	44 W	462631.00	961535.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1910	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON POST	PIPE CAP	USGS

Description: (1910)

Stamping: PTS 7 1910 1188

2.0 MILES SOUTH AND 1.0 MILE EAST OF ROTHSA, 37.0 FEET SOUTH AND 24.0 FEET EAST OF THE CROSSROADS.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1185.910	.033	3				VERTICAL CONTROL SURVEY	1973 USGS-VERT

Geoid Separations(ft): GEOID18 = -88.254 12B = -88.258 09 = -88.146 03 = -88.071

* No Horizontal Positions in the Database *



Mn/DOT Name: PTS 9

NGS Name: PTS 9

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096242/
USGS Quad: FOXHOME
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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	8	133 N	44 W	462118.12	961536.31			1910	2009	GOOD	Horz=NO Vert=YES	YES		PROJECTS 30 IN.	MARKER W/BAR MAGNET
<u>Monument Type</u> IRON POST												<u>Disk Type</u> PIPE CAP	<u>Mon. Agency</u> USGS		

Description: (1910)

Stamping: PTS 9 1910 1124

3.5 MILES SOUTHWEST OF CARLISLE, 3.6 MILES WEST ON COUNTY ROAD 10 FROM THE JUNCTION OF COUNTY ROAD 10 AND INTERSTATE HIGHWAY 94/TRUNK HIGHWAY 52 IN CARLISLE, THEN 2.0 MILES SOUTH ON COUNTY ROAD 11, 49.0 FEET EAST OF COUNTY ROAD 11, 22.0 FEET SOUTH OF 270TH STREET, 0.5 FOOT WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1124.220	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT

Geoid Separations(ft): GEOID18 = -88.376 12B = -88.363 09 = -88.261 03 = -88.225

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PTS_9-3E-12MAR2015.jpg	E	Mar 12, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PTS_9-2-12MAR2015.jpg		Mar 12, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PTS_9-1-12MAR2015.jpg		Mar 12, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: PTS K 61 A

NGS Name: PTS K 61 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0136](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	3	132 N	43 W	461657.00	960404.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1967	1967	GOOD	Horz=? Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	SEE DESCRIPTION	MNDT

Description: (1967)

Stamping:

0.3 MILE EAST OF FERGUS FALLS, ABOUT 0.3 MILE EAST OF THE NORTHERN PACIFIC RAILROAD STATION, 8.0 FEET SOUTH OF THE SOUTH RAIL OF THE MAIN TRACK, 43.0 FEET EAST OF MILEPOST 49+600, 45.0 FEET NORTHEAST OF A TELEGRAPH ANCHOR POLE, 21.0 FEET NORTH -NORTHWEST OF A TELEGRAPH POLE, 2.0 FEET EAST OF THE END OF A CONCRETE SLAB, 1.0 FOOT SOUTH OF THE NORTH END OF A CONCRETE SLAB.

Station Notes

THE SET DATE UNKNOWN. THE MARK IS A CHISELED X ON THE TOP OF A BOLT IN A LARGE RAILROAD SIGNAL BASE (NORTHWEST BOLT OF EAST STEEL SUPPORT) AND ABOUT LEVEL WITH THE TRACK.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1192.550	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1191.733	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD

Geoid Separations(ft): GEOID18 = -88.189 12B = -88.192 09 = -88.074 03 = -87.985

* No Horizontal Positions in the Database *



Mn/DOT Name: PTS NO 1

NGS Name: PTS NO 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	8	132 N	42 W	461520.12	955919.80		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1910	2015	POOR	Horz=NO Vert=NO	YES		PROJECTS 5 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	PIPE CAP	USGS

Description: (2008)

Stamping: MINNESOTA PRIM TRAV STA NO 1 1910 1045

5.5 MILES SOUTHEAST OF FERGUS FALLS, 0.75 MILE EAST-NORTHEAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 82 IN THE SOUTHEAST CORNER OF FERGUS FALLS, TO TRUNK HIGHWAY 210 MILEPOINT 29.05, THEN 1.35 MILES SOUTH AND SOUTHEAST ON COUNTY ROAD 29, THEN 1.65 MILES EAST AND SOUTHEAST ON COUNTY ROAD 120, 48.0 FEET NORTH OF COUNTY ROAD 120, 86.0 FEET WEST OF COUNTY ROAD 33, 72.0 FEET SOUTH OF A CABLE BOX, 1.0 FOOT SOUTH A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj			Year	Reference
1330.781	.262		1242.767	.197	2011	GPS - RTRN		2015	RTRN2015
1330.781	.262		1242.767	.197	2011	GPS - RTRN		2015	RTRN2015
1330.706	.262		1242.901	.197	1996	GPS - RTRN		2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.015 12B = -88.015 09 = -87.903 03 = -87.805

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 15 20.12209	95 59 19.80254	431145.664	154532.351	.131	3	GPS - RTRN	2015	RTRN2015
46 15 20.12209	95 59 19.80254	431145.664	154532.351	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 15 20.12066	95 59 19.80318	431145.618	154532.207	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2184860.510	790763.658	884644.059	16820138.406	.131	3	GPS - RTRN	2015	RTRN2015
2184860.510	790763.658	884644.059	16820138.406	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2184860.462	790763.514	884644.009	16820138.263	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PTS_NO_1-3N-09SEP2015.jpg	N	Sep 9, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PTS_NO_1-2-09SEP2015.jpg		Sep 9, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/PTS_NO_1-1-09SEP2015.jpg		Sep 9, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: PTS NO 12

NGS Name: PTS NO 12

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	8	132 N	42 W	461513.89	955921.36		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2005	2009	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (2008)

Stamping: PTS NO 12 1910

5.5 MILES SOUTHEAST OF FERGUS FALLS, 0.75 MILE WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 82 IN THE SOUTHEAST PART OF FERGUS FALLS TO TRUNK HIGHWAY 210 MILEPOINT 29.05, THEN 1.35 MILES SOUTH-SOUTHEAST ON COUNTY ROAD 29, THEN 1.65 MILES EAST-SOUTHEAST ON COUNTY ROAD 120.

Station Notes

THE SURVEY MARK IS ON PRIVATE PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.005 12B = -88.005 09 = -87.894 03 = -87.798



Mn/DOT Name: PTS NO 2

NGS Name: PTS NO 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SE	33	134 N	42 W	462211.14	955915.80			1973	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION
<u>Monument Type</u>				<u>Disk Type</u>				<u>Mon. Agency</u>							
IRON POST				SURVEY DISK				USGS							

Description: (2008)

Stamping: PTS NO 2 1910

5.7 MILES SOUTH OF EDWARDS, 4.2 MILES SOUTH ALONG COUNTY ROAD 3 FROM THE JUNCTION OF COUNTY ROAD 3 AND COUNTY ROAD 22 IN EDWARDS, THEN 187.0 FEET EAST ON COUNTY ROAD 10, AT THE JUNCTION OF COUNTY ROAD 10 AND COUNTY ROAD 1.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -88.163 12B = -88.166 09 = -88.051 03 = -87.926



Mn/DOT Name: PTS NO 3

NGS Name: PTS NO 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095344/
USGS Quad: HEILBERGER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	20	135 N	42 W	462908.00	955921.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1973	2000	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE)	SURVEY DISK	USGS

Description: (2008) Stamping: PRIM TRAV STA NO 3 1910 1439

TOWNSHIP 135N, RANGE 42W, 20.0 FEET WEST FROM THE CROSSROADS AT THE CORNER OF SECTION 20, 21, 28, 29.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.864 12B = -87.851 09 = -87.759 03 = -87.615



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/Q_61-RO0487-3S-09SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/Q_61-RO0487-2-09SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/Q_61-RO0487-1-09SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Sep 9, 2015
	Sep 9, 2015
	Sep 9, 2015



Mn/DOT Name: R 3

NGS Name: R 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0474](#) [Get Map](#)
NGS Quad / Sta Num : 46095332/
USGS Quad: ASHBY

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
SE	33	131 N	41 W	460632.00	955001.00	1	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1969	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	PIPE CAP	NGS

Description: (1969)

Stamping:

1.4 MILES NORTH-NORTHWEST OF ASHBY, 1.5 MILES NORTHWEST ON A RAILROAD FROM ASHBY, 0.2 MILE NORTH-NORTHWEST ALONG MAIN STREET FROM THE JUNCTION OF MAIN STREET AND LARSON AVENUE IN ASHBY, THEN 1.2 MILES NORTH-NORTHWEST ALONG COUNTY HIGHWAY 82, 363.0 FEET WEST OF RAILROAD MILEPOST 169, 77.0 FEET NORTH OF A RAILROAD, 2.0 FEET NORTH OF A FENCE CORNER, 1.0 FOOT SOUTH OF THE ROW OF POLES, AT THE NORTH END OF A SHORT CUT, OPPOSITE A RAILROAD SIGNAL.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1259.660	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1258.984	.007	1				VERTICAL CONTROL SURVEY	1972	Q460953
1258.984	.007	1				VERTICAL CONTROL SURVEY	1972	L22167-A
1258.984	.007	1				VERTICAL CONTROL SURVEY	1971	L22167-A
1258.984	.007	3				VERTICAL CONTROL SURVEY	1952	CS2606
1258.984	.007	1				VERTICAL CONTROL SURVEY	1929	Q460953
1258.984	.007	1				VERTICAL CONTROL SURVEY	1905	L36 MINN

GA1912

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1259.404	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -87.041 12B = -87.041 09 = -86.913 03 = -86.893

* No Horizontal Positions in the Database *



Mn/DOT Name: R 61

NGS Name: R 61

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0492](#) [Get Map](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	31	133 N	41 W	461700.00	955300.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	2005	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1975)

Stamping: R 61 1934

9.5 MILES EAST ON A RAILROAD FROM FERGUS FALLS, 11 RAILS EAST OF RAILROAD MILEPOST 40, 600.0 FEET SOUTH OF A HOUSE, 25.0 FEET WEST OF A ROAD, 30.0 FEET NORTH OF A RAILROAD.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1337.501	.016	2/0				VERTICAL ADJUSTMENT		1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1336.680	.007	1				VERTICAL CONTROL SURVEY		1941	Q460953
1336.680	.007	1				VERTICAL CONTROL SURVEY		1934	L40 MINN

Geoid Separations(ft): GEOID18 = -87.985 12B = -88.012 09 = -87.890 03 = -87.752

* No Horizontal Positions in the Database *



Mn/DOT Name: RAND

NGS Name: RAND

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	30	137 N	43 W	463934.51	961011.65	2	C

NGS ACRN: DQ1973	Get Map
NGS Quad / Sta Num : 46096124/	
USGS Quad: ROLLAG	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1999	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (1999) Stamping: RAND 1999

7.0 MILES WEST OF DUNVILLA, 6.9 MILES WEST ALONG TRUNK HIGHWAY 34 FROM THE JUNCTION OF TRUNK HIGHWAY 34 AND TRUNK HIGHWAY 59 IN DUNVILLA, AT TRUNK HIGHWAY 34 MILEPOINT 11.90, 87.5 FEET SOUTH OF TRUNK HIGHWAY 34, 1.6 FEET WEST OF A WITNESS POST. THE ROD DEPTH IS UNKNOWN.

Station Notes

THE ROD DEPTH IS UNKNOWN.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1420.319	.016	2/1				VERTICAL ADJUSTMENT		2019	00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1420.319			1333.075	.021	2011	HORIZONTAL ADJUSTMENT		2024	GPS3671
1420.319	.131		1333.186	.066	1996	GPS - STATIC		2023	HTH9
1420.319			1333.075	.021	2011	GPS - STATIC		2023	HTH9
1420.345	.262		1333.062	.197	2011	GPS - RTRN		2022	RTRN2022
1420.142	.262		1332.888	.197	2011	GPS - RTRN		2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.287 12B = -87.250 09 = -87.155 03 = -87.073

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>				<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
		46 39 34.51440	96 10 11.65210	386182.500	302085.409	.013		ADJUSTMENT	2024 GPS3671
		46 39 34.51440	96 10 11.65210	386182.500	302085.409	.013	C	GPS - STATIC	2023 HTH9
		46 39 34.51355	96 10 11.65267	386182.459	302085.324	.131	3	GPS - RTRN	2022 RTRN2022
		46 39 34.51389	96 10 11.65156	386182.537	302085.357	.131	3	GPS - RTRN	2014 RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>				<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
		46 39 34.51416	96 10 11.65254	386182.469	302085.385	.033	C	GPS - STATIC	2023 HTH9

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
		2142641.702	939104.630	844771.806	16969184.886	.013		ADJUSTMENT	2024 GPS3671
		2142641.702	939104.630	844771.806	16969184.886	.013	C	GPS - STATIC	2023 HTH9
		2142641.660	939104.545	844771.763	16969184.802	.131	3	GPS - RTRN	2022 RTRN2022
		2142641.739	939104.578	844771.841	16969184.833	.131	3	GPS - RTRN	2014 RTRN2014

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
		2142641.671	939104.607	844771.774	16969184.863	.033	C	GPS - STATIC	2023 HTH9



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/RAND-DQ1973-3S-13SEP2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/RAND-DQ1973-2-13SEP2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/RAND-DQ1973-1-13SEP2022.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Sep 13, 2022
	Sep 13, 2022
	Sep 13, 2022



Mn/DOT Name: REAM MNDT TEMP

NGS Name: REAM TEMP

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9306](#) [Get Map](#)
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	32	136 N	40 W	463322.13	954511.73		2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1982	2023	GOOD	Horz=NO Vert=NO	NO		RECESSED 4 IN.	MARKER IS STEEL ROD

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	SURVEY DISK	MNDT

Description: (1982) **Stamping:** REAM 1982

1.55 MILES WEST ON TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 AT DENT, AT TRUNK HIGHWAY 108 MILEPOINT 29.9, 22.0 FEET SOUTH OF TRUNK HIGHWAY 108, 10.5 FEET EAST OF A FIELD ENTRANCE SOUTH AND A DRIVEWAY NORTH, 58.64 FEET EAST-NORTHEAST OF A NAIL AND A DISK IN A GATE POST, 55.02 FEET WEST-NORTHWEST OF A NAIL AND A DISK IN THE 1ST FENCE POST EAST OF A GATE POST. THE STATION, A 2.0 INCH DIAMETER BY 2.0 INCH DIAMETER ALUMINUM CAP RIVETED TO A DRIVEN 30.0 INCH TELSPAR.

Station Notes

THE SURVEY MARK IS UNSUITABLE FOR MNDOT GEODETIC SURVEYS.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference
1379.636	.262		1292.369	.197	2011	GPS - RTRN	2023	RTRN2023
1378.672	.197		1291.582	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference
1378.705						RECIPROCAL VERTICAL ANGLE	1982	HORZ

Geoid Separations(ft): GEOID18 = -87.267 12B = -87.264 09 = -87.142 03 = -87.034

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 22.13451	95 45 11.72679	490793.765	264034.273	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 22.13140	95 45 11.72860	490793.638	264033.958	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 33 22.12792	95 45 11.72913	490793.601	264033.605	.066	2	ADJUSTMENT	1997	16997

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 33 22.27730	95 45 10.56140			.100		CLASSICAL SURVEY	1950	UNK



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2246517.663	899128.428	948027.136	16927542.652	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2246517.531	899128.116	948026.998	16927542.341	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2246517.487	899127.764	948026.949	16927541.990	.066	2	ADJUSTMENT	1997	16997

NAD27

MN State Plane - Central Zone		<u>X</u>	<u>Y</u>	Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1621921.152	571054.429			.100		CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/REAM_TEMP-AD9306-3S-31JUL2023.jpg	S	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/REAM_TEMP-AD9306-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/REAM_TEMP-AD9306-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: REBAR 530

NGS Name: REBAR 530

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO1102](#) [Get Map](#)
NGS Quad / Sta Num : 46095324/
USGS Quad: EAGLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	5	131 N	40 W	461050.52	954440.54		2

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1967	1967	GOOD	Horz=? Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
OBJECT DRIVEN INTO THE GROUND	METAL ROD	USGS

Description:

Stamping:

THE REINFORCING BAR IS LOCATED IN OTTER TAIL COUNTY, 7.04 MILES SOUTH-SOUTHWEST OF BATTLE LAKE ALONG COUNTY HIGHWAY 12.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1437.989	.197		1350.982	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.136 12B = -87.145 09 = -87.044 03 = -86.998

Lat/Lon and County Coordinates (Feet)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 10 50.52086	95 44 40.53886	492925.106	127102.711	.066	2	ADJUSTMENT	1999	17648
46 10 50.52110	95 44 40.53570	492925.329	127102.735	.066	2	ADJUSTMENT	1998	17655

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 10 50.51899	95 44 40.52847	492925.838	127102.521	.066	2	ADJUSTMENT	1986	17289

<u>Geodetic Position</u>					<u>Project Info</u>			
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 10 50.65935	95 44 39.34522			.100	2	CLASSICAL SURVEY	1977	15945
46 10 50.68800	95 44 39.32200			.100	3	CLASSICAL SURVEY	1969	USGS-HORZ

State Plane and UTM Coordinates (Feet)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2246113.295	762198.792	945456.917	16790605.647	.066	2	ADJUSTMENT	1999	17648
2246113.518	762198.812	945457.140	16790605.664	.066	2	ADJUSTMENT	1998	17655

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2246114.023	762198.589	945457.641	16790605.433	.066	2	ADJUSTMENT	1986	17289

<u>MN State Plane - Central Zone</u>					<u>Project Info</u>			
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1621519.401	434125.047			.100	2	CLASSICAL SURVEY	1977	15945
1621521.089	434127.918			.100	3	CLASSICAL SURVEY	1969	USGS-HORZ



Mn/DOT Name: REBAR 531

NGS Name: REBAR 531

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO1104](#)
NGS Quad / Sta Num : 46095331/
USGS Quad: STALKER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	30	132 N	40 W	461319.14	954531.52		2

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1967	1967	GOOD	Horz=? Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BLANK	UNMONUMENTED	USGS

Description:

Stamping:

THE REINFORCING BAR IS LOCATED IN OTTER TAIL COUNTY, 4.61 MILES SOUTH-SOUTHWEST OF BATTLE LAKE ALONG TREFOLDIGHED ROAD.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1462.595	.197		1375.401	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648	

Geoid Separations(ft): GEOID18 = -87.359 12B = -87.385 09 = -87.273 03 = -87.191

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 13 19.14011	95 45 31.51611	489345.862	142160.402	.066	2	ADJUSTMENT	1999	17648
46 13 19.14041	95 45 31.51407	489346.006	142160.432	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 13 19.13808	95 45 31.50556	489346.604	142160.196	.066	2	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>						<u>Year</u>	<u>Reference</u>
46 13 19.27738	95 45 30.32528			.100	2	CLASSICAL SURVEY	1977	15945
46 13 19.30700	95 45 30.29300			.100	3	CLASSICAL SURVEY	1969	USGS-HORZ

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2242813.915	777318.134	942394.868	16805778.455	.066	2	ADJUSTMENT	1999	17648
2242814.059	777318.161	942395.013	16805778.481	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2242814.652	777317.914	942395.603	16805778.224	.066	2	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1618219.649	449244.172			.100	2	CLASSICAL SURVEY	1977	15945
1618221.975	449247.129			.100	3	CLASSICAL SURVEY	1969	USGS-HORZ



Mn/DOT Name: REED

NGS Name: REED

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2719](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	26	134 N	44 W	462324.99	961122.26	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 24 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) **Stamping:** REED 2014

8.0 MILES NORTHWEST OF FERGUS FALLS, 4.7 MILES NORTHWEST ALONG WESTBOUND INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 (THE JUNCTION IS 4.5 MILES NORTHWEST OF FERGUS FALLS), AT INTERSTATE HIGHWAY 94 MILEPOINT 46.05, 85.5 FEET EAST-NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 29.4 FEET WEST-SOUTHWEST OF A RIGHT-OF-WAY FENCE, 1.5 FEET WEST-SOUTHWEST OF A WITNESS POST.

Station Pair: EVIL - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1285.854	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1285.906	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1285.906	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1285.854			1197.632	.018	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1285.854			1197.632	.018	2011	GPS - STATIC	2025	HTH94B
1287.219	.262		1198.944	.197	2011	GPS - RTRN	2023	RTRN2023
1285.837	.262		1197.567	.197	2011	GPS - RTRN	2015	RTRN2015
1285.778	.262		1197.507	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -88.274 12B = -88.271 09 = -88.159 03 = -88.097

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 24.98817	96 11 22.25796	380670.183	203891.470	.013		ADJUSTMENT	2025	GPS3847
46 23 24.98817	96 11 22.25796	380670.183	203891.470	.013	C	GPS - STATIC	2025	HTH94B
46 23 24.98854	96 11 22.25777	380670.196	203891.508	.131	3	GPS - RTRN	2023	RTRN2023
46 23 24.98806	96 11 22.25832	380670.158	203891.459	.131	3	GPS - RTRN	2015	RTRN2015
46 23 24.98848	96 11 22.25815	380670.170	203891.502	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 23 24.98770	96 11 22.25864	380670.135	203891.423	.066		NCAT	2025	HTH94B

State Plane and UTM Coordinates (Feet)

NAD83(2011)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Year	Reference
2135313.849	841041.983	835879.391	16871211.958	.013		ADJUSTMENT	2025	GPS3847
2135313.849	841041.983	835879.391	16871211.958	.013	C	GPS - STATIC	2025	HTH94B
2135313.864	841042.020	835879.406	16871211.995	.131	3	GPS - RTRN	2023	RTRN2023
2135313.824	841041.972	835879.366	16871211.948	.131	3	GPS - RTRN	2015	RTRN2015
2135313.837	841042.015	835879.379	16871211.990	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Year	Reference
2135313.801	841041.937	835879.342	16871211.912	.066		NCAT	2025	HTH94B



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/REED-DQ2719-3NE-14AUG2023.jpg	NE	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/REED-DQ2719-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/REED-DQ2719-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: REHBEIN

NGS Name: REHBEIN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R01141](#) [Get Map](#)
NGS Quad / Sta Num : 46095423/1004
USGS Quad: DENT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	26	136 N	40 W	463415.72	954049.15		C	1935	2009	GOOD	Horz=YES Vert=YES	YES		RECESSED 8 IN.	STEEL ROD ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (1994) Stamping: REHBEIN 1935

2.5 MILES NORTHEAST OF DENT, 4.5 MILES WEST ON COUNTY ROAD 34 FROM THE WEST EDGE OF PERHAM, THEN 2.0 MILES SOUTH ON COUNTY ROAD 123, THEN 0.05 MILE WEST ON MINNESOTA ROAD, 100.99 FEET WEST OF REHBEIN RM 1, 72.19 FEET EAST-SOUTHEAST OF REHBEIN RM 3, 28.0 FEET SOUTH OF MINNESOTA ROAD, 10.0 FEET SOUTH OF A FENCE, IN A CULTIVATED FIELD, 10.5 FEET SOUTH OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1414.521	.262		1327.330	.012	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
			1327.337	.197	1996	GPS - RTRN	2009	RTRN2009
			1327.435	.012	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1414.728	.131		1327.527	.066	1996	HORIZONTAL ADJUSTMENT	2005	GPS2123
1414.728	.131		1327.527	.066	1996	GPS - STATIC	2005	HPERH
1414.794	.131		1327.553	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648
1414.797	.131		1327.527	.066	1996	GPS - STATIC	1997	GPS805-C

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1412.989						RECIPROCAL VERTICAL ANGLE	1966	HORZ

Geoid Separations(ft): GEOID18 = -87.408 12B = -87.382 09 = -87.283 03 = -87.188

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 34 15.71713	95 40 49.15368	509142.205	269462.840	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 34 15.71707	95 40 49.15457	509142.143	269462.834	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 34 15.71745	95 40 49.15635	509142.019	269462.872	.131	3	GPS - RTRN	2009	RTRN2009
46 34 15.71645	95 40 49.15451	509142.147	269462.771	.033	C	ADJUSTMENT	2005	GPS2123
46 34 15.71645	95 40 49.15451	509142.147	269462.771	.033	C	GPS - STATIC	2005	HPERH
46 34 15.71645	95 40 49.15451	509142.147	269462.771	.033	C	ADJUSTMENT	1999	17648
46 34 15.71645	95 40 49.15451	509142.147	269462.771	.033	C	GPS - STATIC	1997	GPS805-C

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 34 15.71481	95 40 49.15741	509141.945	269462.605	.033	1	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>						<u>Year</u>	<u>Reference</u>
46 34 15.86200	95 40 47.99500			.100	1	CLASSICAL SURVEY	1944	05937



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2264961.151	904215.678	966553.054	16932336.537	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2264961.089	904215.673	966552.992	16932336.533	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2264960.965	904215.714	966552.869	16932336.576	.131	3	GPS - RTRN	2009	RTRN2009
2264961.092	904215.610	966552.994	16932336.470	.033	C	ADJUSTMENT	2005	GPS2123
2264961.092	904215.610	966552.994	16932336.470	.033	C	GPS - STATIC	2005	HPERH
2264961.092	904215.610	966552.994	16932336.470	.033	C	ADJUSTMENT	1999	17648
2264961.092	904215.610	966552.994	16932336.470	.033	C	GPS - STATIC	1997	GPS805-C

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2264960.887	904215.448	966552.786	16932336.311	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		<u>X</u>	<u>Y</u>	Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1640364.700	576141.939			.100	1	CLASSICAL SURVEY	1944	05937

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/REHBEIN-RO1141-3S-04AUG2009.jpg	S	Aug 4, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/REHBEIN-RO1141-2-04AUG2009.jpg		Aug 4, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/REHBEIN-RO1141-1-04AUG2009.jpg		Aug 4, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: REHBEIN AZ MK

NGS Name: REHBEIN AZ MK 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9326](#) [Get Map](#)
NGS Quad / Sta Num : 46095423/1004
USGS Quad: DENT

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	23	136 N	40 W	463416.32	954108.08		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1968	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL ROD ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	NGS

Description: (1982)

Stamping: REHBEIN 1935 1968

2.0 MILES NORTHEAST OF DENT, 1.0 MILE NORTH ON COUNTY ROAD 123 FROM THE JUNCTION OF COUNTY ROAD 123 AND TRUNK HIGHWAY 108, THEN 0.3 MILE WEST ON MINNESOTA ROAD, 14.5 FEET NORTH OF EAST-WEST MINNESOTA ROAD, 1.0 FOOT SOUTH OF A FENCE, 1.0 FOOT EAST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1412.277	.262		1325.106	.197	1996	GPS - RTRN	2009	RTRN2009
1412.661	.262		1325.437	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1412.103						RECIPROCAL VERTICAL ANGLE	1982	HORZ

Geoid Separations(ft): GEOID18 = -87.392 12B = -87.362 09 = -87.267 03 = -87.168

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 34 16.32188	95 41 08.08440	507819.496	269523.545	.131	3	GPS - RTRN	2009	RTRN2009
46 34 16.32075	95 41 08.08275	507819.611	269523.431	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 34 16.31929	95 41 08.08565	507819.409	269523.283	.131	3	ADJUSTMENT	1997	16997

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 34 16.46630	95 41 06.92330			.100		CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2263639.959	904300.854	965233.136	16932442.764	.131	3	GPS - RTRN	2009	RTRN2009
2263640.072	904300.738	965233.248	16932442.646	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2263639.867	904300.594	965233.040	16932442.505	.131	3	ADJUSTMENT	1997	16997

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1639043.637	576227.062			.100		CLASSICAL SURVEY	1950	UNK



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/REHBEIN_AZ_MK_2-AD9326-3N-04AUG2009.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/REHBEIN_AZ_MK_2-AD9326-2-04AUG2009.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/REHBEIN_AZ_MK_2-AD9326-1-04AUG2009.jpg

<u>Dir</u>	<u>Date</u>
N	Aug 4, 2009
	Aug 4, 2009
	Aug 4, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: REHBEIN AZ MK 1935

NGS Name: REHBEIN AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP3919](#) [Get Map](#)
NGS Quad / Sta Num : 46095423/1004
USGS Quad: DENT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	24	136 N	40 W	463416.00	954029.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	2009	NOT FOUND	Horz=? Vert=YES	NO		PROJECTS 2 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	AZIMUTH MARK DISK	NGS

Description:

Stamping: REHBEIN 1935

2.0 MILES NORTHEAST OF DENT, 1.0 MILE NORTH ON COUNTY ROAD 123 FROM THE JUNCTION OF COUNTY ROAD 123 AND TRUNK HIGHWAY 108, THEN 0.3 MILE WEST ON A TOWNSHIP ROAD, 0.5 MILE EAST TO STATION REHBEIN AZ MK 1935 IN A NORTH RIGHT-OF-WAY FENCE LINE, 0.5 MILE EAST OF STATION REHBEIN.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.428 12B = -87.398 09 = -87.303 03 = -87.205



Mn/DOT Name: REHBEIN RM 1

NGS Name: REHBEIN RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9315](#)
NGS Quad / Sta Num : 46095423/
USGS Quad: DENT

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	26	136 N	40 W	463415.88	954050.58		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	2009	NOT FOUND	Horz=? Vert=?	NO		PROJECTS 2 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	REFERENCE MARK DISK	CGS

Description: (1968)

Stamping: REHBEIN NO 1 1935

2.5 MILES NORTHEAST OF DENT, 4.5 MILES WEST ON COUNTY ROAD 34 FROM THE WEST EDGE OF PERHAM, THEN 2.0 MILES SOUTH ON COUNTY ROAD 123, THEN 0.05 MILE WEST ON A TOWNSHIP ROAD, 100.99 FEET EAST OF STATION REHBEIN, 85.0 FEET EAST-SOUTHEAST OF A TELEPHONE POLE, 19.0 FEET SOUTH OF AN EAST-WEST ROAD, 1.0 FOOT SOUTH OF A FENCE LINE.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1414.794	.262		1327.553	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648	

Geoid Separations(ft): GEOID18 = -87.408 12B = -87.378 09 = -87.283 03 = -87.185

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 34 15.88057	95 40 50.58040	509042.513	269479.353	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 34 15.76856	95 40 48.12692	509213.943	269468.084	.131	3	ADJUSTMENT	1997	16997

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2264861.795	904234.032	966453.984	16932356.474	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2265032.964	904219.592	966624.934	16932339.307	.131	3	ADJUSTMENT	1997	16997



Mn/DOT Name: REHBEIN RM 2

NGS Name: REHBEIN RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP3920](#) [Get Map](#)
NGS Quad / Sta Num : 46095423/
USGS Quad: DENT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	25	136 N	40 W	463412.52	954044.39		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	2009	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 5 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	CGS

Description: Stamping: REHBEIN NO 2 1935

2.5 MILES NORTHEAST OF DENT, 4.5 MILES WEST ON COUNTY ROAD 34 FROM WEST EDGE OF PERHAM, THEN 2.0 MILES SOUTH ON COUNTY ROAD 123, THEN 0.05 MILE WEST ON A TOWNSHIP ROAD, SOUTHEAST OF STATION REHBEIN, IN A NORTH AND A SOUTH FENCE LINE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.431 12B = -87.405 09 = -87.306 03 = -87.208



Mn/DOT Name: REHBEIN RM 3

NGS Name: REHBEIN RM 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9316](#)
NGS Quad / Sta Num : 46095423/
USGS Quad: DENT

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	26	136 N	40 W	463415.77	954048.12		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1968	2009	NOT FOUND	Horz=NO Vert=NO	NO		FLUSH	SEE DESCRIPTION

Monument Type

SEE DESCRIPTIVE TEXT

Disk Type

REFERENCE MARK DISK

Mon. Agency

NGS

Description: (1968)

Stamping: REHBEIN 1967 RM 3

2.5 MILES NORTHEAST OF DENT, 4.5 MILES WEST ALONG COUNTY ROAD 34 FROM THE WEST EDGE OF PERHAM, THEN 2.0 MILES SOUTH ON COUNTY ROAD 123, THEN 0.05 MILE WEST ON A TOWNSHIP ROAD, 89.0 FEET WEST-NORTHWEST OF A TELEPHONE POLE, 72.19 FEET WEST-NORTHWEST OF STATION REHBEIN, 17.0 FEET SOUTH OF THE CENTERLINE OF A ROAD, 1.0 FOOT NORTH OF A FENCE LINE.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1414.794	.262		1327.553	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648	

Geoid Separations(ft): GEOID18 = -87.408 12B = -87.382 09 = -87.287 03 = -87.188

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 34 15.77020	95 40 48.12412	509214.138	269468.250	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 34 15.87894	95 40 50.58330	509042.311	269479.188	.131	3	ADJUSTMENT	1997	16997

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2265033.163	904219.754	966625.135	16932339.467	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2264861.589	904233.870	966453.776	16932356.316	.131	3	ADJUSTMENT	1997	16997



Mn/DOT Name: RESET MNDT 1-19-43

NGS Name: RESET 1-19-43

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095431/
USGS Quad: VERGAS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>	<u>Mon. Agency</u>
NE	25	137 N	41 W	463926.00	954814.00			1943	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION	MNDT
Monument Type CONCRETE MONUMENT (CAST-IN-PLACE)																
Disk Type SURVEY DISK																
Mon. Agency MNDT																

Description: (1943)

Stamping: RESET MHD 1-19-43

AT VERGAS, 135.0 FEET NORTH OF THE STATION, ON THE SOUTH SIDE OF THE HIGHWAY.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1397.747	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.083 12B = -87.077 09 = -86.991 03 = -86.840

* No Horizontal Positions in the Database *



Mn/DOT Name: RGUSIE

NGS Name: RGUSIE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DJ9282](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NE	25	133 N	44 W	461840.56	960918.57	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2005	2021	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	SURVEY DISK	MNDT

Description: (2006)

Stamping: RGUSIE 2005

2.0 MILES NORTHWEST OF FERGUS FALLS, 1.8 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, THEN 1.35 MILES NORTH ON 160TH AVENUE, AT THE JUNCTION OF COUNTY HIGHWAY 116 AND 160TH AVENUE IN THE SOUTHWEST QUADRANT, 55.4 FEET WEST OF 160TH AVENUE, 49.2 FEET SOUTH OF COUNTY HIGHWAY 116, 13.4 FEET WEST OF A POWER POLE GUY WIRE, 1.0 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1192.609	.016	2/1				VERTICAL ADJUSTMENT	2020	00000941-2
1192.609	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1192.635	.016	2/1				VERTICAL ADJUSTMENT	2015	00000821-R
1192.635	.016	2/1				VERTICAL ADJUSTMENT	2014	00000821
1192.635	.016	2/1				VERTICAL CONTROL SURVEY	2013	VBREC
1192.635	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-25
1192.635	.016	2/1				VERTICAL CONTROL SURVEY	2006	VFALL

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1192.593	.262		1104.299	.197	2011	GPS - OPUS	2022	GPSBM
1192.589	.262		1104.296	.197	2011	GPS - OPUS	2022	GPSBM
1192.567	.262		1104.273	.197	2011	GPS - RTRN	2021	RTRN2021
1192.455	.262		1104.342	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.294 12B = -88.284 09 = -88.176 03 = -88.113

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 18 40.55857	96 09 18.57179	389180.860	175026.803	.131	3	GPS - OPUS	2022	GPSBM
46 18 40.55893	96 09 18.57146	389180.883	175026.839	.131	3	GPS - OPUS	2022	GPSBM
46 18 40.55886	96 09 18.57093	389180.920	175026.832	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 18 40.55896	96 09 18.57252	389180.809	175026.843	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2143287.780	812028.549	843396.661	16842064.117	.131	3	GPS - OPUS	2022	GPSBM
2143287.804	812028.585	843396.685	16842064.153	.131	3	GPS - OPUS	2022	GPSBM
2143287.841	812028.577	843396.722	16842064.144	.131	3	GPS - RTRN	2021	RTRN2021

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2143287.730	812028.590	843396.611	16842064.159	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/RGUSIE-DJ9282-3S-22JUN2021.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/RGUSIE-DJ9282-2-22JUN2021.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/RGUSIE-DJ9282-1-22JUN2021.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Jun 22, 2021
	Jun 22, 2021
	Jun 22, 2021



Mn/DOT Name: RICE

NGS Name: RICE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	34	137 N	40 W	463939.14	954110.15		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2014	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 124 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: RICE 2014

5.7 MILES EAST OF VERGAS, 5.4 MILES EAST ALONG TRUNK HIGHWAY 228 FROM THE JUNCTION OF TRUNK HIGHWAY 228 AND THE NORTH JUNCTION OF COUNTY ROAD 4 IN VERGAS, AT TRUNK HIGHWAY 228 MILEPOINT 6.25, 53.2 FEET NORTH OF TRUNK HIGHWAY 228, 1.5 FEET SOUTH OF A WITNESS POST.

Station Pair: ROSE - OTTER TAIL, MN

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1385.673	.262		1298.383	.197	2011	GPS - RTRN	2014	RTRN2014	

Geoid Separations(ft): GEOID18 = -87.293 12B = -87.290 09 = -87.188 03 = -87.060

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 39 39.13566	95 41 10.15088	507662.495	302228.994	.131	3	GPS - RTRN	2014	RTRN2014

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2264088.532	936999.527	966203.425	16965136.191	.131	3	GPS - RTRN	2014	RTRN2014

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/RICE-3N-04NOV2014.jpg	N	Nov 4, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/RICE-2-04NOV2014.jpg		Nov 4, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/RICE-1-04NOV2014.jpg		Nov 4, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: ROLLINS

NGS Name: ROLLINS

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DQ1980 Get Map
NW	26	137 N	43 W	463921.00	960517.51	2	C	NGS Quad / Sta Num : 46096121/ USGS Quad: CORMORANT

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 24 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014)

Stamping: ROLLINS 2014

5.9 MILES NORTH OF PELICAN RAPIDS, 3.0 MILES WEST ALONG TRUNK HIGHWAY 34 FROM THE JUNCTION OF TRUNK HIGHWAY 34 AND TRUNK HIGHWAY 59 (THE JUNCTION IS 6.0 MILES NORTH OF PELICAN RAPIDS), AT TRUNK HIGHWAY 34 MILEPOINT 15.85, 70.6 FEET NORTH OF TRUNK HIGHWAY 34, 227.4 FEET EAST OF COUNTY ROAD 9 NORTH (195TH AVENUE), 4.9 FEET SOUTH OF A RIGHT-OF-WAY POST, 5.0 FEET SOUTH OF A WITNESS POST.

Station Pair: MANN - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1346.014	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1346.014			1258.790	.022	2011	HORIZONTAL ADJUSTMENT	2024	GPS3671
1346.014	.131		1258.898	.066	1996	GPS - STATIC	2023	HTH9
1346.014			1258.790	.022	2011	GPS - STATIC	2023	HTH9
1346.155	.262		1258.826	.197	2011	GPS - RTRN	2022	RTRN2022

Geoid Separations(ft): GEOID18 = -87.329 12B = -87.306 09 = -87.205 03 = -87.086

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 39	20.99621	96 05	17.51173	406693.950	300608.857	.013		ADJUSTMENT	2024	GPS3671
46 39	20.99621	96 05	17.51173	406693.950	300608.857	.013	C	GPS - STATIC	2023	HTH9
46 39	20.99600	96 05	17.51305	406693.858	300608.836	.131	3	GPS - RTRN	2022	RTRN2022

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 39	20.99598	96 05	17.51211	406693.923	300608.833	.033	C	GPS - STATIC	2023	HTH9

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2163119.778	937248.909	865225.040	16967000.711	.013		ADJUSTMENT			2024	GPS3671
2163119.778	937248.909	865225.040	16967000.711	.013	C	GPS - STATIC			2023	HTH9
2163119.685	937248.890	865224.947	16967000.694	.131	3	GPS - RTRN			2022	RTRN2022

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2163119.751	937248.886	865225.012	16967000.689	.033	C	GPS - STATIC			2023	HTH9

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ROLLINS-DQ1980-3N-13SEP2022.jpg	N	Sep 13, 2022
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ROLLINS-DQ1980-2-13SEP2022.jpg		Sep 13, 2022
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ROLLINS-DQ1980-1-13SEP2022.jpg		Sep 13, 2022

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: ROSE

NGS Name: ROSE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095424/
USGS Quad: FRAZEE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	23	137 N	40 W	463938.29	954201.32		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2014	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014)

Stamping: ROSE 2014

5.0 MILES EAST OF VERGAS, 4.7 MILES EAST ALONG TRUNK HIGHWAY 228 FROM THE JUNCTION OF TRUNK HIGHWAY 228 AND THE NORTH JUNCTION OF COUNTY ROAD 4 IN VERGAS, AT TRUNK HIGHWAY 228 MILEPOINT 5.6, 43.4 FEET SOUTH OF TRUNK HIGHWAY 228, 0.05 MILE WEST OF A DRIVEWAY NUMBER 38060 AND 38057, 37.5 FEET NORTH OF AN EAST/WEST FENCE, 1.5 FEET NORTH OF A WITNESS POST.

Station Pair: RICE - OTTER TAIL, MN

Station Notes

THE ROD DEPTH IS UNKNOWN.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.260 12B = -87.257 09 = -87.149 03 = -87.021

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ROSE-3S-04NOV2014.jpg	S	Nov 4, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ROSE-2-04NOV2014.jpg		Nov 4, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ROSE-1-04NOV2014.jpg		Nov 4, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: ROT MNDT

NGS Name: ROT

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0992](#) [Get Map](#)
NGS Quad / Sta Num : 46096241/1038
USGS Quad: ROTHSA

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	20	135 N	44 W	462910.21	961524.17		2	1961	2009	GOOD	Horz=YES Vert=YES	YES		PROJECTS 6 IN.	STEEL SPIKE IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	MNDT

Description: (1961) **Stamping:** ROT 1961

1.3 MILES EAST AND 1.0 MILE NORTH OF ROTHSA, 1.0 MILE EAST ALONG COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND COUNTY ROAD 11 IN ROTHSA, THEN 1.0 MILE NORTH ON 110TH AVENUE, THEN 0.3 MILE EAST ON 360TH STREET, 92.39 FEET WEST OF ROT MNDT RM 1, 61.12 FEET NORTH OF ROT MNDT RM 2, 33.0 FEET NORTH OF A GRAVEL ROAD, 2.5 FEET EAST OF A POWER POLE, 2.0 FEET SOUTH OF A FIELD LINE.

Station Notes

IT WAS REPORTED THAT RECENT MEASUREMENTS SHOW A DIFFERENCE FROM CURRENT PUBLISHED POSITIONS OF 0.4 FOOT HORIZONTAL AND 6.0 FEET VERTICAL. USE WITH CAUTION. (2018)

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1305.772	.197		1218.022	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

<u>NGVD29</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1305.804						RECIPROCAL VERTICAL ANGLE	1961	HORZ

Geoid Separations(ft): GEOID18 = -88.107 12B = -88.097 09 = -87.999 03 = -87.916

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
		46 29 10.20551	96 15 24.16942	363951.007	238973.234	.066	2	ADJUSTMENT
		46 29 10.20570	96 15 24.16939	363951.010	238973.254	.066	2	ADJUSTMENT

<u>NAD83(1986)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
		46 29 10.20456	96 15 24.16044	363951.635	238973.134	.066	2	ADJUSTMENT

<u>NAD27</u>		<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
		46 29 10.35080	96 15 22.93520			.100	2	CLASSICAL SURVEY

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
		2119248.892	876422.603	820371.352	16906858.419	.066	2	ADJUSTMENT
		2119248.895	876422.622	820371.355	16906858.439	.066	2	ADJUSTMENT

<u>NAD83(1986)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
		2119249.518	876422.491	820371.976	16906858.297	.066	2	ADJUSTMENT

<u>NAD27</u>		<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
		1494653.523	548348.429			.100	2	CLASSICAL SURVEY



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ROT-RP0992-3N-18AUG2009.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ROT-RP0992-2-18AUG2009.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ROT-RP0992-1-18AUG2009.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Aug 18, 2009
	Aug 18, 2009
	Aug 18, 2009



Mn/DOT Name: ROT MNDT AZ MK

NGS Name: ROT AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0994](#) [Get Map](#)
NGS Quad / Sta Num : 46096241/1038
USGS Quad: ROTHSA

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SE	19	135 N	44 W	462910.25	961539.89		2	1961	2010	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION
<u>Monument Type</u>				<u>Disk Type</u>				<u>Mon. Agency</u>							
IRON ROD				AZIMUTH MARK DISK				MNDT							

Description: (1961)

Stamping: ROT 1961

1.0 MILE EAST AND 1.0 MILE NORTH OF ROTHSA, 1.0 MILE EAST ON COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND COUNTY ROAD 52, THEN 1.0 MILE NORTH ON A TOWNSHIP ROAD, 50.0 FEET WEST OF A GRAVEL ROAD, 30.0 FEET NORTH OF A TRACK ROAD, ON AN EAST-WEST FENCE LINE.

Station Notes

THE DISK WAS TURNED IN TO THE OFFICE.
FOUND THE MARK LOOSE.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1305.772	.197			1218.022	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648
<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1305.804							RECIPROCAL VERTICAL ANGLE	1961	HORZ

Geoid Separations(ft): GEOID18 = -88.110 12B = -88.100 09 = -88.002 03 = -87.920

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 29 10.24960	96 15 39.88900			362851.032	238985.242	.066	2	ADJUSTMENT	1999 17648
46 29 10.24979	96 15 39.88900			362851.032	238985.261	.066	2	ADJUSTMENT	1998 17655
<u>NAD83(1986)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 29 10.24864	96 15 39.88000			362851.660	238985.140	.066	2	ADJUSTMENT	1986 17289
<u>NAD27</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>
<u>Geodetic Position</u>									
<u>Latitude</u>	<u>Longitude</u>								
46 29 10.39480	96 15 38.65360					.100	2	CLASSICAL SURVEY	1962 12924

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2118149.467	876454.962			819272.094	16906908.284	.066	2	ADJUSTMENT	1999 17648
2118149.468	876454.981			819272.094	16906908.303	.066	2	ADJUSTMENT	1998 17655
<u>NAD83(1986)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2118150.094	876454.849			819272.719	16906908.160	.066	2	ADJUSTMENT	1986 17289
<u>NAD27</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>
<u>MN State Plane - Central Zone</u>									
<u>X</u>	<u>Y</u>								
1493554.147	548380.773					.100	2	CLASSICAL SURVEY	1962 12924



Mn/DOT Name: ROT MNDT RM 1

NGS Name: ROT RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP3961](#) [Get Map](#)
NGS Quad / Sta Num : 46096241/1038
USGS Quad: ROTHSA Y

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	20	135 N	44 W	462910.18	961522.85		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1961	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (1961) **Stamping:** ROT NO 1 1961

1.3 MILES EAST AND 1.0 MILE NORTH OF ROTHSA Y, 1.0 MILE EAST ON COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND COUNTY ROAD 52, THEN 1.0 MILE NORTH ON TOWNSHIP ROAD, THEN 0.3 MILE EAST ON TOWNSHIP ROAD, 30.0 FEET NORTH OF THE TOWNSHIP ROAD, 75.0 FEET EAST OF A POWER POLE.

Station Notes

THE TIES FALL IN TO A FIELD.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.107 12B = -88.097 09 = -87.999 03 = -87.916



Mn/DOT Name: ROT MNDT RM 2

NGS Name: ROT RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP3962](#) [Get Map](#)
NGS Quad / Sta Num : 46096241/1038
USGS Quad: ROTHSA

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	20	135 N	44 W	462909.61	961524.26		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1961	2009	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 2 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (1961) Stamping: ROT NO 2 1961

1.3 MILES EAST AND 1.0 MILE NORTH OF ROTHSA, 1.0 MILE EAST ON COUNTY ROAD 24 FROM THE JUNCTION OF COUNTY ROAD 24 AND COUNTY ROAD 52, THEN 1.0 MILE NORTH ON A TOWNSHIP ROAD, THEN 0.3 MILE EAST ON A TOWNSHIP ROAD, 60.5 FEET SOUTH OF A POWER POLE, 30.0 FEET SOUTH OF A GRAVEL ROAD.

Station Notes

THE TIES FALL IN TO A FIELD.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.107 12B = -88.097 09 = -87.999 03 = -87.916



Mn/DOT Name: RUDDY

NGS Name: RUDDY

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5797](#) [Get Map](#)
NGS Quad / Sta Num : 46095314/
USGS Quad: WALKER LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	22	135 N	40 W	462954.82	954137.02		C	2000	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2000) Stamping: RUDDY 2000

4.1 MILES SOUTH OF DENT, 1.9 MILES SOUTH ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 108 IN DENT, TO TRUNK HIGHWAY 108 MILEPOINT 31.50, THENCE 3.55 MILES SOUTH AND EAST ALONG COUNTY ROAD 44, 51.0 FEET SOUTH OF COUNTY ROAD 44, 185.0 FEET WEST OF RUDDY DUCK DRIVE, 3.5 FEET EAST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order</u>	<u>(/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1440.525	.131			1353.039	.066	1996	GPS - STATIC	2021	HOTTE
1440.561				1352.881	.023	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1440.561				1352.881	.023	2011	GPS - STATIC	2020	HOTTE
1440.220	.262			1352.773	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.677 12B = -87.670 09 = -87.549 03 = -87.447

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>				<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 29	54.81526	95 41	37.02311	505805.281	243029.094	.016		ADJUSTMENT	2020 GPS3384
46 29	54.81526	95 41	37.02311	505805.281	243029.094	.016	C	GPS - STATIC	2020 HOTTE

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>				<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 29	54.81498	95 41	37.02364	505805.244	243029.065	.033	C	GPS - STATIC	2021 HOTTE
46 29	54.81538	95 41	37.02471	505805.169	243029.106	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2261135.814	877851.593	962308.035	16906031.538	.016		ADJUSTMENT	2020	GPS3384	
2261135.814	877851.593	962308.035	16906031.538	.016	C	GPS - STATIC	2020	HOTTE	

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2261135.776	877851.565	962307.997	16906031.511	.033	C	GPS - STATIC	2021	HOTTE	
2261135.702	877851.607	962307.923	16906031.554	.131	3	GPS - RTRN	2009	RTRN2009	

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/RUDDY-DR5797-3S-23JUL2020.jpg	S	Jul 23, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/RUDDY-DR5797-2-23JUL2020.jpg		Jul 23, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/RUDDY-DR5797-1-23JUL2020.jpg		Jul 23, 2020

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: S 3

NGS Name: S 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0475](#) [Get Map](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	12	131 N	42 W	461030.00	955451.00	1	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	2009	NOT FOUND	Horz=NO Vert=NO	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BOLT	NGS

Description: (1966)

Stamping:

AT DALTON, 0.3 MILE NORTH OF A RAILROAD, AT THE NORTHWEST CORNER OF THE SCHOOL GROUNDS, 2.0 FEET FROM A PROPERTY LINE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1381.303	.007	1				VERTICAL CONTROL SURVEY	1993	POSTED

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1380.581	.007	1				VERTICAL CONTROL SURVEY	1929	Q460953
1380.581	.007	1				VERTICAL CONTROL SURVEY	1905	L36 MINN

GA1912

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1381.014	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -87.352 12B = -87.365 09 = -87.234 03 = -87.191

* No Horizontal Positions in the Database *



Mn/DOT Name: S 61

NGS Name: S 61

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0493](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	32	133 N	41 W	461707.44	955222.23	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1934	2015	GOOD	Horz=NO Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE POST (PREFABRICATED)	BENCH MARK DISK	NGS

Description: (1994) **Stamping:** S 61 1934

IN UNDERWOOD, 0.4 MILE NORTH AND EAST ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 210 IN UNDERWOOD, THEN 0.1 MILE WEST ON CENTENNIAL AVENUE, 37.5 FEET WEST OF WOODLAND AVENUE EXTENDED, 17.6 FEET SOUTH OF CENTENNIAL AVENUE WEST, 40.6 FEET NORTHEAST OF THE NORTHEAST CORNER OF A HOUSE, 42.8 FEET NORTHWEST OF A POWER POLE, 0.7 FOOT EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1337.743	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1337.743	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1337.743	.016	2/1				VERTICAL CONTROL SURVEY	2016 VOTTE
1337.727	.016	2/1				VERTICAL ADJUSTMENT	2008 00000425-26
1337.727	.016	2/1				VERTICAL CONTROL SURVEY	2006 VKATC
1337.727	.016	2/1				VERTICAL ADJUSTMENT	1991 00000025

NGVD29			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1336.936	.016	2/0				UNKNOWN/APPROXIMATE	1992 UNCHECKD
1336.936	.016	2				VERTICAL CONTROL SURVEY	1976 L23961
1336.936	.033	3				VERTICAL CONTROL SURVEY	1974 USGS-VERT
1336.913	.007	1				VERTICAL CONTROL SURVEY	1941 Q460953
1336.913	.007	1				VERTICAL CONTROL SURVEY	1934 L40 MINN

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year Reference
1337.763	.262		1249.761	.197	2011	GPS - RTRN	2015 RTRN2015
1337.763	.262		1249.761	.197	2011	GPS - RTRN	2015 RTRN2015

Geoid Separations(ft): GEOID18 = -87.976 12B = -88.002 09 = -87.884 03 = -87.743

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County		Project Info	
Latitude	Longitude	X	Y	Acc	Order
46 17 07.43778	95 52 22.23299	460511.229	165324.749	.131	3
46 17 07.43778	95 52 22.23299	460511.229	165324.749	.131	3

State Plane and UTM Coordinates (Feet)

NAD83(2011)		UTM - Zone 15		Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order
2214416.900	801009.206	914367.264	16829919.939	.131	3
2214416.900	801009.206	914367.264	16829919.939	.131	3

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/S_61-RO0493-3W-09SEP2015.jpg	W	Sep 9, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/S_61-RO0493-2-09SEP2015.jpg		Sep 9, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/S_61-RO0493-1-09SEP2015.jpg		Sep 9, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: S 61 A

NGS Name: S 61 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DJ3047](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	29	133 N	41 W	461824.00	955145.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2005	2010	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	SURVEY DISK	MNDT

Description: (2005) **Stamping:** S 61 A 2005

1.50 MILES NORTH OF UNDERWOOD, 2.0 MILES NORTH ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 210 (AT TRUNK HIGHWAY 210 MILEPOINT 37.55), 47.4 FEET WEST OF COUNTY ROAD 35, 1.3 FEET EAST OF A WITNESS POST.

Station Notes

THE DISK WAS TURNED IN TO THE OFFICE.
FOUND THE CAP LOOSE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1352.481	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1352.468	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-26
1352.468	.016	2/1				VERTICAL CONTROL SURVEY	2006	VKATC

Geoid Separations(ft): GEOID18 = -88.025 12B = -88.048 09 = -87.933 03 = -87.782

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/S_61_A-DJ3047-3W-01JUN2005.jpg	W	Jun 1, 2005
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/S_61_A-DJ3047-2-01JUN2005.jpg		Jun 1, 2005
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/S_61_A-DJ3047-1-01JUN2005.jpg		Jun 1, 2005

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: S 61 A RESET

NGS Name: S 61 A RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	29	133 N	41 W	461824.93	955145.74		3	2009	2010	GOOD	Horz=YES Vert=YES	NO		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	METAL ROD	MNDT

Description: (2010)

Stamping: S 61 A RESET 2009

1.5 MILES NORTH OF UNDERWOOD, 2.0 MILES NORTH ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 210 IN UNDERWOOD, TO TRUNK HIGHWAY MILEPOINT 37.55, 47.4 FEET WEST OF COUNTY ROAD 35, 1.3 FEET EAST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1352.123	.262			1264.341	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.028 12B = -88.048 09 = -87.933 03 = -87.782

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 18 24.92699	95 51 45.74125			463088.740	173170.098	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2217138.855	808804.457			917212.619	16837673.439	.131	3	GPS - RTRN	2009 RTRN2009



Mn/DOT Name: S 61 B

NGS Name: S 61 B

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DJ3048](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	20	133 N	41 W	461932.00	955222.00	2		2005	2010	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	SURVEY DISK	MNDT

Description: (2005)

Stamping: S 61 B 2005

2.50 MILES NORTH OF UNDERWOOD, 3.55 MILES NORTH ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 210 (AT TRUNK HIGHWAY 210 MILEPOINT 37.55), 62.7 FEET EAST OF COUNTY ROAD 35, 46.9 FEET SOUTH OF COUNTY ROAD 18, 1.1 FEET NORTH OF A WITNESS POST.

Station Notes

THE DISK WAS TURNED IN TO THE OFFICE.
FOUND THE CAP LOOSE.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1346.408	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1346.395	.016	2/1				VERTICAL ADJUSTMENT	2008 00000425-26
1346.395	.016	2/1				VERTICAL CONTROL SURVEY	2006 VKATC

Geoid Separations(ft): GEOID18 = -88.074 12B = -88.094 09 = -87.982 03 = -87.821

* No Horizontal Positions in the Database *

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/S_61_B-DJ3048-3S-01JUN2005.jpg	S	Jun 1, 2005
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/S_61_B-DJ3048-2-01JUN2005.jpg		Jun 1, 2005
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/S_61_B-DJ3048-1-01JUN2005.jpg		Jun 1, 2005

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: S 61 B RESET

NGS Name: S 61 B RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	20	133 N	41 W	461932.73	955222.33			2009	2010	GOOD	Horz=YES Vert=YES	NO		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	METAL ROD	MNDT

Description: Stamping: S 61 B RESET 2009

2.5 MILES NORTH OF UNDERWOOD, 3.55 MILES NORTH ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 210 IN UNDERWOOD, TO TRUNK HIGHWAY 210 MILEPOST 37.55, 62.7 FEET EAST OF COUNTY ROAD 35, 46.9 FEET SOUTH OF COUNTY ROAD 18, 11.0 FEET NORTH OF A WITNESS POST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.074 12B = -88.094 09 = -87.982 03 = -87.821



Mn/DOT Name: S 61 C

NGS Name: S 61 C

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DJ3049](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	8	133 N	41 W	462103.26	955202.61	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2005	2021	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 28 FT)	SURVEY DISK	MNDT

Description: (2005)

Stamping: S 61 C 2005

5.0 MILES NORTH OF UNDERWOOD, 5.35 MILES NORTH ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 210 (THE JUNCTION IS AT TRUNK HIGHWAY 210 MILEPOINT 37.55), 47.3 FEET NORTHWEST OF COUNTY ROAD 35, 40.4 FEET NORTHEAST PLEASANT LAKE ROAD 678, 1.7 FEET SOUTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1322.048	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1322.031	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-26
1322.038	.016	2/1				VERTICAL CONTROL SURVEY	2006	VKATC

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj		Year	Reference
1322.005	.262		1233.918	.197	2011	GPS - OPUS	2022	GPSBM
1321.953	.262		1233.866	.197	2011	GPS - OPUS	2022	GPSBM
1322.022	.262		1233.931	.197	2011	GPS - RTRN	2021	RTRN2021

Geoid Separations(ft): GEOID18 = -88.087 12B = -88.100 09 = -87.982 03 = -87.828

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 21 03.25670	95 52 02.61293	461934.780	189212.396	.131	3	GPS - OPUS	2022	GPSBM
46 21 03.25728	95 52 02.61304	461934.772	189212.454	.131	3	GPS - OPUS	2022	GPSBM
46 21 03.25675	95 52 02.61205	461934.841	189212.400	.131	3	GPS - RTRN	2021	RTRN2021

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2216282.209	824863.252	916609.516	16853748.192	.131	3	GPS - OPUS	2022	GPSBM
2216282.202	824863.311	916609.510	16853748.251	.131	3	GPS - OPUS	2022	GPSBM
2216282.271	824863.256	916609.578	16853748.195	.131	3	GPS - RTRN	2021	RTRN2021

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/S_61_C-DJ3049-3W-22JUN2021.jpg	W	Jun 22, 2021
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/S_61_C-DJ3049-2-22JUN2021.jpg		Jun 22, 2021
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/S_61_C-DJ3049-1-22JUN2021.jpg		Jun 22, 2021

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: SAM

NGS Name: SAM

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7111](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	17	134 N	43 W	462447.24	960739.35	2	C	2009	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 25 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009) Stamping: SAM 2009

2.35 MILES NORTH OF ELIZABETH, 2.3 MILES NORTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 10 IN ELIZABETH, AT TRUNK HIGHWAY 59 MILEPOINT 229.10, 62.7 FEET EAST OF TRUNK HIGHWAY 59, 33.7 FEET NORTH OF 310TH STREET, 28.5 FEET SOUTH OF A POWER POLE WITH A GUY WIRE, 13.2 FEET SOUTHEAST OF CABLE BOX NUMBER 100 49, 1.2 FEET SOUTH OF A WITNESS POST.

Station Pair: JAKE - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1283.485	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1283.498	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1283.508	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1283.485			1195.336	.021	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1283.485	.131		1195.450	.066	1996	GPS - STATIC	2023	HTH59
1283.485			1195.336	.021	2011	GPS - STATIC	2023	HTH59
1283.465	.262		1195.263	.197	2011	GPS - RTRN	2022	RTRN2022

Geoid Separations(ft): GEOID18 = -88.202 12B = -88.202 09 = -88.081 03 = -87.992

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
46 24 47.24038	96 07 39.35195	396339.236	212136.984	.013		ADJUSTMENT			2024	GPS3672
46 24 47.24038	96 07 39.35195	396339.236	212136.984	.013	C	GPS - STATIC			2023	HTH59
46 24 47.24117	96 07 39.35252	396339.196	212137.065	.131	3	GPS - RTRN			2022	RTRN2022

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
46 24 47.24013	96 07 39.35248	396339.198	212136.959	.033	C	GPS - STATIC			2023	HTH59

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
2151130.776	848995.036	851826.756	16878916.490	.013		ADJUSTMENT			2024	GPS3672
2151130.776	848995.036	851826.756	16878916.490	.013	C	GPS - STATIC			2023	HTH59
2151130.738	848995.117	851826.720	16878916.572	.131	3	GPS - RTRN			2022	RTRN2022

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
2151130.738	848995.012	851826.718	16878916.467	.033	C	GPS - STATIC			2023	HTH59



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SAM-DO7111-3N-17OCT2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SAM-DO7111-2-17OCT2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SAM-DO7111-1-17OCT2022.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Oct 17, 2022
	Oct 17, 2022
	Oct 17, 2022



Mn/DOT Name: SAND

NGS Name: SAND

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR9953](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	25	136 N	43 W	463417.16	960302.16	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 42 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) **Stamping:** SAND 2014

1.5 MILES EAST OF PELICAN RAPIDS, 1.6 MILES EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 IN PELICAN RAPIDS, AT TRUNK HIGHWAY 108 MILEPOINT 13.85, 28.9 FEET SOUTH OF TRUNK HIGHWAY 108, 1.5 FEET NORTH OF A WITNESS POST.

Station Pair: LIZZIE - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1352.540	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPPEL12

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1352.553			1265.037	.024	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1352.484	.131		1265.135	.066	1996	GPS - STATIC	2024	HTH108
1352.553			1265.037	.024	2011	GPS - STATIC	2024	HTH108
1352.553	.262		1264.965	.197	2011	GPS - RTRN	2023	RTRN2023
1352.566	.262		1264.978	.197	2011	GPS - RTRN	2022	RTRN2022
1352.478	.262		1264.896	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.585 12B = -87.582 09 = -87.467 03 = -87.326

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 34 17.15923	96 03 02.15653	416006.435	269784.145	.013		ADJUSTMENT	2024	GPS3689
46 34 17.15923	96 03 02.15653	416006.435	269784.145	.013	C	GPS - STATIC	2024	HTH108
46 34 17.15908	96 03 02.15674	416006.421	269784.130	.131	3	GPS - RTRN	2023	RTRN2023
46 34 17.16006	96 03 02.15617	416006.461	269784.229	.131	3	GPS - RTRN	2022	RTRN2022
46 34 17.15894	96 03 02.15622	416006.457	269784.116	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 34 17.15903	96 03 02.15708	416006.397	269784.125	.033	C	GPS - STATIC	2024	HTH108

State Plane and UTM Coordinates (Feet)

NAD83(2011)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Year	Reference
2171859.003	906260.967	873470.854	16935866.346	.013		ADJUSTMENT	2024	GPS3689
2171859.003	906260.967	873470.854	16935866.346	.013	C	GPS - STATIC	2024	HTH108
2171858.988	906260.952	873470.839	16935866.331	.131	3	GPS - RTRN	2023	RTRN2023
2171859.030	906261.050	873470.883	16935866.429	.131	3	GPS - RTRN	2022	RTRN2022
2171859.024	906260.937	873470.875	16935866.316	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Year	Reference
2171858.964	906260.947	873470.815	16935866.327	.033	C	GPS - STATIC	2024	HTH108



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SAND-DR9953-3S-31JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SAND-DR9953-2-31JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SAND-DR9953-1-31JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
S	Jul 31, 2023
	Jul 31, 2023
	Jul 31, 2023



Mn/DOT Name: SANDY

NGS Name: SANDY

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7121](#)
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	15	135 N	43 W	462959.57	960518.45	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2009	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 54 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009)

Stamping: SANDY 2009

1.2 MILES NORTHEAST OF ERHARD, 1.15 MILES NORTH AND NORTHEAST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 24 IN ERHARD, AT TRUNK HIGHWAY 59 MILEPOINT 235.60, 119.0 FEET EAST OF TRUNK HIGHWAY 59, 47.3 FEET NORTH OF 370TH STREET, 15.5 FEET WEST OF AN ENTRANCE TO ERHARD SUBSTATION ENTRANCE NUMBER 19277, 6.3 FEET NORTH OF A WITNESS POST.

Station Pair: LREC - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u> Orthometric Height			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1287.035	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1287.084	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792
1287.084	.016	2/1				VERTICAL CONTROL SURVEY	2012	VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u> Orthometric Height			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1287.035			1199.128	.023	2011	HORIZONTAL ADJUSTMENT	2024	GPS3672
1287.035	.131		1199.233	.066	1996	GPS - STATIC	2023	HTH59
1287.035			1199.128	.023	2011	GPS - STATIC	2023	HTH59
1287.018	.262		1199.115	.197	2011	GPS - RTRN	2022	RTRN2022

Geoid Separations(ft): GEOID18 = -87.903 12B = -87.894 09 = -87.782 03 = -87.667

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u> Geodetic Position		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 29 59.57419	96 05 18.44643	406361.388	243730.453	.013		ADJUSTMENT	2024	GPS3672
46 29 59.57419	96 05 18.44643	406361.388	243730.453	.013	C	GPS - STATIC	2023	HTH59
46 29 59.57409	96 05 18.44736	406361.323	243730.443	.131	3	GPS - RTRN	2022	RTRN2022

<u>NAD83(1996)</u> Geodetic Position		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 29 59.57399	96 05 18.44693	406361.353	243730.433	.033	C	GPS - STATIC	2023	HTH59

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u> MN State Plane - Central Zone		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2161734.630	880393.547	862932.024	16910154.403	.013		ADJUSTMENT	2024	GPS3672
2161734.630	880393.547	862932.024	16910154.403	.013	C	GPS - STATIC	2023	HTH59
2161734.565	880393.538	862931.959	16910154.395	.131	3	GPS - RTRN	2022	RTRN2022

<u>NAD83(1996)</u> MN State Plane - Central Zone		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2161734.595	880393.528	862931.989	16910154.384	.033	C	GPS - STATIC	2023	HTH59



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SANDY-DO7121-3N-17OCT2022.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SANDY-DO7121-2-17OCT2022.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SANDY-DO7121-1-17OCT2022.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Oct 17, 2022
	Oct 17, 2022
	Oct 17, 2022



Mn/DOT Name: SARPSBORG LUTHERAN CHURCH

NGS Name: SARPSBORG LUTHERAN CHURCH

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R01121](#) [Get Map](#)
NGS Quad / Sta Num : 46095334/1021
USGS Quad: DALTON

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	4	131 N	42 W	461110.32	955821.67		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1906	1978	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	CHURCH SPIRE	MNDT

Description: (1978) Stamping:

3.0 MILES WEST-NORTHWEST OF DALTON.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.490 12B = -87.497 09 = -87.359 03 = -87.316

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 11 10.32085	95 58 21.67326	435148.696	129212.282	.328	4	ADJUSTMENT	1999	17648
46 11 10.32099	95 58 21.67302	435148.713	129212.296	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 11 10.32001	95 58 21.66167	435149.511	129212.194	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>								<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 11 10.47000	95 58 20.46300			.100	4	CLASSICAL SURVEY	1963	13276	

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2188393.661	765377.238	887778.565	16794691.279	.328	4	ADJUSTMENT	1999	17648
2188393.678	765377.252	887778.582	16794691.293	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2188394.474	765377.136	887779.377	16794691.164	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - Central Zone</u>								<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
1563799.236	437304.329			.100	4	CLASSICAL SURVEY	1963	13276	



Mn/DOT Name: SAY MNDT

NGS Name: SAY

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0196](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/1039
USGS Quad: ELIZABETH

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	33	135 N	44 W	462733.09	961421.23	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1961	1994	GOOD	Horz=? Vert=YES	NO		PROJECTS 3 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE FOOTING - SMALL	SURVEY DISK	MNDT

Description: (1968) **Stamping:** SAY USC AND GS 1961

1.1 MILES SOUTHEAST ON COUNTY ROAD 52 FROM ROTHSA, THEN 1.5 MILES EAST ON OLD HIGHWAY 52 (COUNTY ROAD 88), THEN NORTH ON A FARM DRIVE TO ABOUT 100.0 FEET SOUTH OF THE TREES, 36.0 FEET EAST OF A FARM DRIVE, 66.0 FEET SOUTHWEST OF A 24.0 INCH DIAMETER BOXELDER TREE, 92.0 FEET SOUTH OF AN 18.0 INCH DIAMETER COTTONWOOD TREE, 80.76 FEET SOUTH OF SAY RM 1, 53.06 FEET EAST OF SAY RM 2.

Station Notes

THE TIES FALL INTO A CORN FIELD BY 800.0 FEET.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Year	Reference
1329.443	.016	2/0					1991	00000025
NGVD29				Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Year	Reference
1328.514	.016	2/0					1992	UNCHECKD
1328.514	.016	2					1972	Q460962
1328.514	.016	2					1972	L22167-A
1328.514	.016	2					1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Year	Reference
1329.459	.197			1241.605	.131	1996	1999	17648

Geoid Separations(ft): GEOID18 = -88.186 12B = -88.186 09 = -88.074 03 = -87.995

Lat/Lon and County Coordinates (Feet)

NAD83(1996)				Otter Tail County			Project Info	
Geodetic Position				X	Y	Acc	Order	Reference
Latitude	Longitude							
46 27 33.08738	96 14 21.23276			368290.118	229104.757	.066	2	17648
46 27 33.08751	96 14 21.23276			368290.118	229104.770	.066	2	17655
NAD83(1986)				Otter Tail County			Project Info	
Geodetic Position				X	Y	Acc	Order	Reference
Latitude	Longitude							
46 27 33.08631	96 14 21.22364			368290.756	229104.644	.066	2	17289
NAD27							Project Info	
Geodetic Position				X	Y	Acc	Order	Reference
Latitude	Longitude							
46 27 33.23320	96 14 20.00000					.100	2	12924



State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2123404.088	866476.787	824369.678	16896843.409	.066	2	ADJUSTMENT	1999	17648
2123404.089	866476.800	824369.678	16896843.422	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2123404.724	866476.662	824370.312	16896843.274	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		<u>X</u>	<u>Y</u>	Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1498808.794	538402.734			.100	2	CLASSICAL SURVEY	1962	12924



Mn/DOT Name: SAY MNDT AZ MK

NGS Name: SAY AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0993](#) [Get Map](#)
NGS Quad / Sta Num : 46096241/1039
USGS Quad: ROTHSA

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	32	135 N	36 W	462725.81	961505.37		2	1961	1968	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION
Monument Type															
CONCRETE MONUMENT (CAST-IN-PLACE)															
Disk Type															
SURVEY DISK															
Mon. Agency															
MNDT															

Description: (1968)

Stamping: SAY 1961

1.8 MILES SOUTHEAST OF ROTHSA, 0.1 MILE EAST ALONG 1ST AVENUE SOUTHWEST FROM THE JUNCTION OF 1ST AVENUE SOUTHWEST AND RAILROAD DRIVE, THEN 0.5 MILE NORTH ALONG COUNTY ROAD 11 (CENTER STREET), THEN 2.3 MILES SOUTH ALONG INTERSTATE HIGHWAY 94 EAST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88							Project Info		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
1240.155	.197		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	HORIZONTAL ADJUSTMENT	1999	17648	
			1152.304	.131	1996				
NGVD29							Project Info		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
1240.188			<u>Height</u>	<u>Acc</u>	<u>Adj</u>	RECIPROCAL VERTICAL ANGLE	1961	HORZ	

Geoid Separations(ft): GEOID18 = -88.205 12B = -88.205 09 = -88.097 03 = -88.018

Lat/Lon and County Coordinates (Feet)

NAD83(1996)							Project Info		
<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Year</u>	<u>Reference</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>			
46 27 25.80749	96 15 05.37087	365194.956	228387.901	.066	2	ADJUSTMENT	1999	17648	
46 27 25.80763	96 15 05.37095	365194.951	228387.915	.066	2	ADJUSTMENT	1998	17655	
NAD83(1986)							Project Info		
<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Year</u>	<u>Reference</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>			
46 27 25.80645	96 15 05.36170	365195.598	228387.791	.066	2	ADJUSTMENT	1986	17289	
NAD27							Project Info		
<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 27 25.95320	96 15 04.13660			.100	2	CLASSICAL SURVEY	1962	12924	

State Plane and UTM Coordinates (Feet)

NAD83(1996)							Project Info		
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Year</u>	<u>Reference</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>			
2120296.590	865817.421	821250.727	16896233.225	.066	2	ADJUSTMENT	1999	17648	
2120296.585	865817.435	821250.722	16896233.239	.066	2	ADJUSTMENT	1998	17655	
NAD83(1986)							Project Info		
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Year</u>	<u>Reference</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>			
2120297.229	865817.299	821251.365	16896233.093	.066	2	ADJUSTMENT	1986	17289	
NAD27							Project Info		
<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
<u>X</u>	<u>Y</u>								
1495701.311	537743.347			.100	2	CLASSICAL SURVEY	1962	12924	



Mn/DOT Name: SAY RM 1

NGS Name: SAY RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0197](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	33	135 N	44 W	462733.88	961421.30	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1961	1994	GOOD	Horz=? Vert=YES	NO		PROJECTS 3 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	SURVEY DISK	MNDT

Description: (1961)

Stamping: SAY R.M. NO. 1 1961

1.1 MILES SOUTHEAST ON COUNTY ROAD 52 FROM ROTHSA, THEN 1.5 MILES EAST ON OLD HIGHWAY 52 (COUNTY ROAD 88), THEN NORTH ON A FARM DRIVE, 0.6 MILE EAST OF INTERSTATE HIGHWAY 94, 81.0 FEET NORTH OF STATION SAY MNDT, 36.0 FEET EAST OF A FARM ENTRANCE, 63.0 FEET NORTHWEST OF A BOXELDER TREE, 12.0 FEET SOUTH OF AN 18.0 INCH DIAMETER COTTONWOOD TREE.

Station Notes

THE TIES FALL INTO A CORN FIELD BY 800.0 FEET.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1326.766	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1325.837	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1325.837	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1325.837	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1325.837	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Geoid Separations(ft): GEOID18 = -88.186 12B = -88.186 09 = -88.074 03 = -87.995

* No Horizontal Positions in the Database *



Mn/DOT Name: SAY RM 2

NGS Name: SAY RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP3997](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	33	135 N	44 W	462733.09	961421.99		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1961	2009	NOT FOUND	Horz=NO Vert=NO	NO		PROJECTS 2 IN.	SEE DESCRIPTION

Monument Type

UNKNOWN

Disk Type

REFERENCE MARK DISK

Mon. Agency

MNDT

Description: (2011)

Stamping: SAY NO 2 1961

1.1 MILES SOUTHEAST ON COUNTY ROAD 52 FROM ROTHSA, THEN 1.5 MILES EAST ON OLD HIGHWAY 52 (COUNTY ROAD 88), THEN NORTH ON A FARM DRIVE, 0.6 MILE EAST OF INTERSTATE HIGHWAY 94, 18.0 FEET WEST OF A FARM DRIVE, 101.0 FEET SOUTH OF AN 18.0 INCH DIAMETER COTTONWOOD TREE, 4.0 FEET WEST OF A FENCE LINE.

Station Notes

THE TIES FALL INTO A FIELD CORN.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.186 12B = -88.186 09 = -88.074 03 = -87.995



Mn/DOT Name: SCHMIDT

NGS Name: SCHMIDT

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7772](#) [Get Map](#)
NGS Quad / Sta Num : 46095324/
USGS Quad: EAGLE LAKE

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	4	131 N	40 W	461049.15	954304.40	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2009	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 80 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009)

Stamping: SCHMIDT 2009

6.75 MILES SOUTH OF BATTLE LAKE, 6.55 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE TO TRUNK HIGHWAY 78 MILEPOINT 14.95, THENCE 0.5 MILE WEST ALONG COUNTY ROAD 12, 46.0 FEET NORTH OF COUNTY ROAD 12, 4.6 FEET SOUTHEAST OF A POWER POLE NUMBER LB SL145, 1.0 FOOT SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1407.281	.016	2/1				VERTICAL ADJUSTMENT	2013	00000792	
1407.284	.016	2/1				VERTICAL CONTROL SURVEY	2012	VASHB	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1407.281			1320.132	.013	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771	
1407.281	.131		1320.283	.066	1996	GPS - STATIC	2024	HTH78B	
1407.281			1320.132	.013	2011	GPS - STATIC	2024	HTH78B	
1407.254	.262		1320.161	.197	2011	GPS - RTRN	2023	RTRN2023	
1407.281	.131		1320.283	.066	1996	GPS - STATIC	2021	HOTTE	
1407.281			1320.132	.026	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384	
1407.281			1320.132	.026	2011	GPS - STATIC	2020	HOTTE	

Geoid Separations(ft): GEOID18 = -87.090 12B = -87.103 09 = -87.001 03 = -86.962

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 10 49.14679	95 43 04.40300	499690.160	126962.262	.010		ADJUSTMENT	2024	GPS3771
46 10 49.14679	95 43 04.40300	499690.160	126962.262	.010	C	GPS - STATIC	2024	HTH78B
46 10 49.14664	95 43 04.40365	499690.114	126962.247	.131	3	GPS - RTRN	2023	RTRN2023
46 10 49.14679	95 43 04.40300	499690.160	126962.262	.020		ADJUSTMENT	2020	GPS3384
46 10 49.14679	95 43 04.40300	499690.160	126962.262	.020	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 10 49.14650	95 43 04.40353	499690.123	126962.233	.033	C	GPS - STATIC	2024	HTH78B
46 10 49.14650	95 43 04.40353	499690.123	126962.233	.033	C	GPS - STATIC	2021	HOTTE



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2252873.673	761933.141	952213.779	16790233.775	.010		ADJUSTMENT	2024	GPS3771
2252873.673	761933.141	952213.779	16790233.775	.010	C	GPS - STATIC	2024	HTH78B
2252873.626	761933.127	952213.732	16790233.762	.131	3	GPS - RTRN	2023	RTRN2023
2252873.673	761933.141	952213.779	16790233.775	.020		ADJUSTMENT	2020	GPS3384
2252873.673	761933.141	952213.779	16790233.775	.020	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2252873.635	761933.113	952213.740	16790233.747	.033	C	GPS - STATIC	2024	HTH78B
2252873.635	761933.113	952213.740	16790233.747	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SCHMIDT-DO7772-3N-16OCT2023.jpg	N	Oct 16, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SCHMIDT-DO7772-2-16OCT2023.jpg		Oct 16, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SCHMIDT-DO7772-1-16OCT2023.jpg		Oct 16, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: SEWELL

NGS Name: SEWELL

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	NGS ACRN: DQ4342 Get Map
NW	6	132 N	41 W	461657.11	955305.48	2	C	NGS Quad / Sta Num : 46095343/ USGS Quad: WALL LAKE

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 24 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: SEWELL 2014

0.75 MILE WEST OF UNDERWOOD, 0.5 MILE WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN UNDERWOOD, AT TRUNK HIGHWAY 210 MILEPOINT 37.0, 58.7 FEET NORTH OF TRUNK HIGHWAY 210, 0.05 MILE EAST OF WILSON ROAD, 15.4 FEET SOUTH OF A RIGHT-OF-WAY POST, 32.3 FEET SOUTH-SOUTHWEST OF A POWER POLE, 15.4 FEET SOUTH OF A WITNESS POST.

Station Pair: HOLTZ - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u> <u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1332.291	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1332.281	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1332.281	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u> <u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1332.291			1244.292	.015	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1332.291	.131		1244.443	.066	1996	GPS - STATIC	2024	HTH210A
1332.291			1244.292	.015	2011	GPS - STATIC	2024	HTH210A
1332.195	.262		1244.213	.197	2011	GPS - RTRN	2023	RTRN2023
1332.291	.131		1244.443	.066	1996	GPS - STATIC	2021	HOTTE
1332.291			1244.292	.025	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1332.291			1244.292	.025	2011	GPS - STATIC	2020	HOTTE
1332.163	.262		1244.154	.197	2011	GPS - RTRN	2015	RTRN2015
1332.163	.262		1244.154	.197	2011	GPS - RTRN	2015	RTRN2015
1332.153	.262		1244.144	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.982 12B = -88.012 09 = -87.890 03 = -87.752

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u> <u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 16 57.10656	95 53 05.47885	457471.609	164284.349	.010		ADJUSTMENT	2025	GPS3793
46 16 57.10656	95 53 05.47885	457471.609	164284.349	.010	C	GPS - STATIC	2024	HTH210A
46 16 57.10632	95 53 05.47888	457471.607	164284.324	.131	3	GPS - RTRN	2023	RTRN2023
46 16 57.10656	95 53 05.47885	457471.609	164284.349	.016		ADJUSTMENT	2020	GPS3384
46 16 57.10656	95 53 05.47885	457471.609	164284.349	.016	C	GPS - STATIC	2020	HOTTE
46 16 57.10616	95 53 05.47813	457471.660	164284.308	.131	3	GPS - RTRN	2015	RTRN2015
46 16 57.10616	95 53 05.47813	457471.660	164284.308	.131	3	GPS - RTRN	2015	RTRN2015
46 16 57.10670	95 53 05.47928	457471.579	164284.363	.131	3	GPS - RTRN	2014	RTRN2014

<u>NAD83(1996)</u> <u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 16 57.10625	95 53 05.47936	457471.574	164284.317	.033	C	GPS - STATIC	2024	HTH210A
46 16 57.10625	95 53 05.47936	457471.574	164284.317	.033	C	GPS - STATIC	2021	HOTTE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2211358.946	800025.388	911293.313	16828984.188	.010		ADJUSTMENT	2025	GPS3793
2211358.946	800025.388	911293.313	16828984.188	.010	C	GPS - STATIC	2024	HTH210A
2211358.944	800025.364	911293.310	16828984.164	.131	3	GPS - RTRN	2023	RTRN2023
2211358.946	800025.388	911293.313	16828984.188	.016		ADJUSTMENT	2020	GPS3384
2211358.946	800025.388	911293.313	16828984.188	.016	C	GPS - STATIC	2020	HOTTE
2211358.996	800025.347	911293.362	16828984.146	.131	3	GPS - RTRN	2015	RTRN2015
2211358.996	800025.347	911293.362	16828984.146	.131	3	GPS - RTRN	2015	RTRN2015
2211358.917	800025.403	911293.283	16828984.204	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2211358.910	800025.358	911293.276	16828984.159	.033	C	GPS - STATIC	2024	HTH210A
2211358.910	800025.358	911293.276	16828984.159	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SEWELL-DQ4342-3N-21FEB2024.jpg	N	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SEWELL-DQ4342-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SEWELL-DQ4342-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: SHARPSDALE LUTHERAN CHURCH

NGS Name: SHARPSDALE LUTHERAN CHURCH

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R01118](#) [Get Map](#)
NGS Quad / Sta Num : 46095334/1022
USGS Quad: DALTON

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	21	132 N	42 W	461421.49	955824.45		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1904	1962	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	CHURCH SPIRE	MNDT

Description: (1962)

Stamping:

STATION SHARPSDALE LUTHERAN CHURCH IS PROBABLY THE SAME STATION AS SWAN LAKE LUTHERAN CHURCH SPIRE (46095334).

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.907 12B = -87.907 09 = -87.792 03 = -87.700

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 14 21.49100	95 58 24.44673	435016.423	148579.629	.328	4	ADJUSTMENT	1999	17648
46 14 21.49109	95 58 24.44656	435016.435	148579.638	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 14 21.48979	95 58 24.43508	435017.242	148579.504	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>						<u>Year</u>	<u>Reference</u>
46 14 21.63400	95 58 23.24200			.100	4	CLASSICAL SURVEY	1963	13276

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2188619.907	784741.107	888309.374	16814055.435	.328	4	ADJUSTMENT	1999	17648
2188619.919	784741.116	888309.386	16814055.444	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2188620.723	784740.966	888310.188	16814055.282	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1564024.990	456667.476			.100	4	CLASSICAL SURVEY	1963	13276



Mn/DOT Name: SHOE

NGS Name: SHOE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5799](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	14	133 N	41 W	462008.93	954837.40		C	2000	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2000)

Stamping: SHOE 2000

3.55 MILES NORTH-NORTHEAST OF UNDERWOOD, 3.55 MILES NORTH ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 210 IN UNDERWOOD, TO TRUNK HIGHWAY 210 MILEPOINT 37.55, THENCE 2.9 MILES EAST ALONG COUNTY ROAD 18, THENCE 0.7 MILE NORTH ALONG COUNTY ROAD 45, 29.0 FEET EAST OF COUNTY ROAD 45, 32.5 FEET SOUTHWEST OF A TELEPHONE PEDESTAL BOX, 4.8 FEET SOUTH OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1409.610				1321.598	.014	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1409.518	.131			1321.749	.066	1996	GPS - STATIC	2024	HTH210A
1409.610				1321.598	.014	2011	GPS - STATIC	2024	HTH210A
1409.544	.131			1321.749	.066	1996	GPS - STATIC	2021	HOTTE
1409.597				1321.598	.019	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1409.597				1321.598	.019	2011	GPS - STATIC	2020	HOTTE

Geoid Separations(ft): GEOID18 = -88.005 12B = -88.015 09 = -87.907 03 = -87.756

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>				<u>Lat/Lon and County Coordinates (Feet)</u>				<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>						<u>Year</u>	<u>Reference</u>
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>			
46 20 08.93383	95 48 37.40212	476324.137	183686.788	.010		ADJUSTMENT		2025	GPS3793
46 20 08.93383	95 48 37.40212	476324.137	183686.788	.010	C	GPS - STATIC		2024	HTH210A
46 20 08.93383	95 48 37.40212	476324.137	183686.788	.013		ADJUSTMENT		2020	GPS3384
46 20 08.93383	95 48 37.40212	476324.137	183686.788	.013	C	GPS - STATIC		2020	HOTTE

<u>NAD83(1996)</u>				<u>Lat/Lon and County Coordinates (Feet)</u>				<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>						<u>Year</u>	<u>Reference</u>
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>			
46 20 08.93354	95 48 37.40262	476324.102	183686.759	.033	C	GPS - STATIC		2024	HTH210A
46 20 08.93354	95 48 37.40262	476324.102	183686.759	.033	C	GPS - STATIC		2021	HOTTE

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>				<u>State Plane and UTM Coordinates (Feet)</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>						<u>Year</u>	<u>Reference</u>
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>			
2230564.920	819072.945	930802.711	16847731.343	.010		ADJUSTMENT		2025	GPS3793
2230564.920	819072.945	930802.711	16847731.343	.010	C	GPS - STATIC		2024	HTH210A
2230564.920	819072.945	930802.711	16847731.343	.013		ADJUSTMENT		2020	GPS3384
2230564.920	819072.945	930802.711	16847731.343	.013	C	GPS - STATIC		2020	HOTTE

<u>NAD83(1996)</u>				<u>State Plane and UTM Coordinates (Feet)</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>						<u>Year</u>	<u>Reference</u>
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>			
2230564.885	819072.916	930802.674	16847731.315	.033	C	GPS - STATIC		2024	HTH210A
2230564.885	819072.916	930802.674	16847731.315	.033	C	GPS - STATIC		2021	HOTTE



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SHOE-DR5799-3E-21FEB2024.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SHOE-DR5799-2-21FEB2024.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SHOE-DR5799-1-21FEB2024.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Feb 21, 2024
	Feb 21, 2024
	Feb 21, 2024



Mn/DOT Name: SILENT

NGS Name: SILENT

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R01148](#) [Get Map](#)
NGS Quad / Sta Num : 46095433/1005
USGS Quad: LAKE LIDA

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>				
SW	30	136 N	41 W	463335.14	955413.21		1				
<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>				
1935	1982	GOOD	Horz=? Vert=YES	NO		FLUSH	STEEL ROD ADJ TO MON				

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (1982) **Stamping:** SILENT 1935

8.75 MILES EAST OF PELICAN RAPIDS, 7.6 MILES EAST ON TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 AT PELICAN RAPIDS, THEN NORTH 1.6 MILES TO A ROAD ON THE RIGHT, THEN EAST 1.3 MILES TO A ROAD ON THE RIGHT THEN SOUTH 0.35 MILE, THEN WALK 600.0 FEET EAST TO THE HIGHEST PART OF A HILL, 0.75 MILE NORTH OF THE WEST END OF SILENT LAKE, ON A TIMBERED HILL, 3.3 FEET WEST-NORTHWEST OF A WITNESS POST, 18.80 FEET NORTH OF SILENT RM 1, 32.15 FEET EAST-SOUTHEAST OF SILENT RM 2, 76.98 FEET EAST-SOUTHEAST OF SILENT RM 3.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Year</u>	<u>Reference</u>
1528.376	.131			1441.257	.066	1996	1999	17648

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Year</u>	<u>Reference</u>
1528.901							1935	HORZ

Geoid Separations(ft): GEOID18 = -87.365 12B = -87.382 09 = -87.283 03 = -87.093

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Lat/Lon and County Coordinates (Feet)</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
46 33 35.14448	95 54 13.20995	452953.284	265405.831	.033	1	1999	17648

<u>NAD83(1986)</u>		<u>Geodetic Position</u>		<u>Lat/Lon and County Coordinates (Feet)</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
46 33 35.14230	95 54 13.20825	452953.402	265405.609	.033	1	1986	17289

<u>NAD27</u>		<u>Geodetic Position</u>		<u>Lat/Lon and County Coordinates (Feet)</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
46 33 35.28900	95 54 12.02500			.100	1	1944	05937

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
2208713.829	901200.084	910251.715	16930216.831	.033	1	1999	17648

<u>NAD83(1986)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
2208713.943	901199.861	910251.826	16930216.606	.033	1	1986	17289

<u>NAD27</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
1584117.551	573126.096			.100	1	1944	05937



Mn/DOT Name: SILENT RM 1

NGS Name: SILENT RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9310](#) [Get Map](#)
NGS Quad / Sta Num : 46095433/1005
USGS Quad: LAKE LIDA

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	30	136 N	41 W	463334.98	955413.33		3	1935	1982	GOOD	Horz=? Vert=YES	NO		FLUSH	STEEL ROD ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1982)

Stamping: SILENT NO 1 1935

8.75 MILES EAST OF PELICAN RAPIDS, 7.6 MILES EAST ON TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 AT PELICAN RAPIDS THEN NORTH 1.6 MILES TO A ROAD ON THE RIGHT, THEN EAST 1.3 MILES TO A ROAD ON THE RIGHT, THEN SOUTH 0.35 MILE, THEN WALK 600.0 FEET EAST TO THE HIGHEST PART OF A HILL, 0.75 MILE NORTH OF THE WEST END OF SILENT LAKE, ON A TIMBERED HILL, 18.7 FEET SOUTHWEST OF A WITNESS POST, 18.80 FEET SOUTH OF STATION SILENT.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>				<u>Year</u>	<u>Reference</u>
1528.409	.262		1441.290	.197	1996	HORIZONTAL ADJUSTMENT			1999	17648

Geoid Separations(ft): GEOID18 = -87.369 12B = -87.382 09 = -87.283 03 = -87.096

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 33 34.97780	95 54 13.32842	452944.965	265388.963	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 33 34.85739	95 54 13.41074	452939.183	265376.778	.131	3	ADJUSTMENT	1997	16997

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2208705.200	901183.376	910242.819	16930200.258	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2208699.195	901171.301	910236.620	16930188.277	.131	3	ADJUSTMENT	1997	16997



Mn/DOT Name: SILENT RM 2

NGS Name: SILENT RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9311](#) [Get Map](#)
NGS Quad / Sta Num : 46095433/1005
USGS Quad: LAKE LIDA

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	30	136 N	41 W	463335.32	955413.60		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	1982	GOOD	Horz=? Vert=YES	NO		FLUSH	STEEL ROD ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1982)

Stamping: SILENT NO 2 1935

8.75 MILES EAST OF PELICAN RAPIDS, 7.6 MILES EAST ON TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 AT PELICAN RAPIDS, THEN NORTH 1.6 MILES TO A ROAD ON THE RIGHT, THEN EAST 1.3 MILES TO A ROAD ON THE RIGHT THEN SOUTH 0.35 MILE, THEN WALK 600.0 FEET EAST TO THE HIGHEST PART OF A HILL, 0.75 MILE NORTH OF THE WEST END OF SILENT LAKE, ON A TIMBERED HILL, 35.6 FEET WEST-NORTHWEST OF A WITNESS POST, 32.15 FEET NORTHWEST OF STATION SILENT.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1528.409	.262		1441.290	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648	

Geoid Separations(ft): GEOID18 = -87.369 12B = -87.382 09 = -87.283 03 = -87.093

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 33 35.31537	95 54 13.59767	452926.230	265423.208	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 33 35.55137	95 54 14.13636	452888.640	265447.207	.131	3	ADJUSTMENT	1997	16997

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2208687.104	901217.957	910225.271	16930235.133	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2208649.970	901242.645	910188.525	16930260.416	.131	3	ADJUSTMENT	1997	16997



Mn/DOT Name: SILENT RM 3

NGS Name: SILENT RM 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9312](#) [Get Map](#)
NGS Quad / Sta Num : 46095433/1005
USGS Quad: LAKE LIDA

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	30	136 N	41 W	463335.55	955414.14		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	1982	GOOD	Horz=? Vert=YES	NO		FLUSH	STEEL ROD ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1982)

Stamping: SILENT NO 3 1935

8.75 MILES EAST OF PELICAN RAPIDS, 7.6 MILES EAST ON TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND TRUNK HIGHWAY 59 AT PELICAN RAPIDS, THEN NORTH 1.6 MILES TO A ROAD ON THE RIGHT, THEN EAST 1.3 MILES TO A ROAD ON THE RIGHT, THEN SOUTH 0.35 MILE, THEN WALK 600.0 FEET EAST TO THE HIGHEST PART OF A HILL, 0.75 MILE NORTH OF THE WEST END OF SILENT LAKE, ON A TIMBERED HILL, 2.1 FEET EAST-SOUTHEAST OF A WITNESS POST, 76.98 FEET NORTHWEST OF STATION SILENT.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
1528.409	.262		1441.290	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648	

Geoid Separations(ft): GEOID18 = -87.369 12B = -87.382 09 = -87.283 03 = -87.096

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 33 35.55374	95 54 14.13824	452888.510	265447.447	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
46 33 35.24227	95 54 13.43499	452937.581	265415.775	.131	3	ADJUSTMENT	1997	16997

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2208649.844	901242.887	910188.403	16930260.661	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
2208698.315	901210.317	910236.361	16930227.312	.131	3	ADJUSTMENT	1997	16997



Mn/DOT Name: SKOGEN

NGS Name: SKOGEN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ2710](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	31	133 N	43 W	461732.98	960902.00	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 49 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) Stamping: SKOGEN 2014

IN FERGUS FALLS, 1.5 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 22.80, 59.5 FEET NORTH OF TRUNK HIGHWAY 210, 59.3 FEET SOUTHWEST OF A POWER POLE, 1.5 FEET SOUTH-SOUTHWEST OF A WITNESS POST.

Station Pair: 5601 D - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1160.073	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1160.109	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1160.083	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1160.073			1071.881	.016	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1160.073	.131		1072.032	.066	1996	GPS - STATIC	2024	HTH210A
1160.073			1071.881	.016	2011	GPS - STATIC	2024	HTH210A
1161.385	.262		1073.121	.197	2011	GPS - RTRN	2023	RTRN2023
1160.053	.262		1071.792	.197	2011	GPS - RTRN	2022	RTRN2022P
1160.060	.262		1071.796	.197	2011	GPS - RTRN	2022	RTRN2022T
1160.073	.131		1072.032	.066	1996	GPS - STATIC	2021	HOTTE
1160.073			1071.881	.025	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1160.073			1071.881	.025	2011	GPS - STATIC	2020	HOTTE
1160.047	.262		1071.783	.197	2011	GPS - OPUS	2020	GPSBM
1160.106	.262		1071.842	.197	2011	GPS - OPUS	2020	GPSBM
1159.965	.262		1071.714	.197	2011	GPS - RTRN	2015	RTRN2015
1159.932	.262		1071.681	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -88.264 12B = -88.251 09 = -88.140 03 = -88.077

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 32.98232	96 09 02.00438	390306.362	168174.487	.010		ADJUSTMENT	2025	GPS3793
46 17 32.98232	96 09 02.00438	390306.362	168174.487	.010	C	GPS - STATIC	2024	HTH210A
46 17 32.98175	96 09 02.00462	390306.345	168174.430	.131	3	GPS - RTRN	2023	RTRN2023
46 17 32.98268	96 09 02.00416	390306.378	168174.524	.131	3	GPS - RTRN	2022	RTRN2022P
46 17 32.98271	96 09 02.00411	390306.381	168174.527	.131	3	GPS - RTRN	2022	RTRN2022T
46 17 32.98232	96 09 02.00438	390306.362	168174.487	.016		ADJUSTMENT	2020	GPS3384
46 17 32.98232	96 09 02.00438	390306.362	168174.487	.016	C	GPS - STATIC	2020	HOTTE
46 17 32.98254	96 09 02.00430	390306.368	168174.510	.131	3	GPS - OPUS	2020	GPSBM
46 17 32.98218	96 09 02.00459	390306.347	168174.473	.131	3	GPS - OPUS	2020	GPSBM
46 17 32.98252	96 09 02.00279	390306.474	168174.507	.131	3	GPS - RTRN	2015	RTRN2015
46 17 32.98214	96 09 02.00450	390306.354	168174.469	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 17 32.98200	96 09 02.00488	390306.327	168174.455	.033	C	GPS - STATIC	2024	HTH210A
46 17 32.98200	96 09 02.00488	390306.327	168174.455	.033	C	GPS - STATIC	2021	HOTTE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2144286.129	805157.486	844286.827	16835175.385	.010		ADJUSTMENT	2025	GPS3793
2144286.129	805157.486	844286.827	16835175.385	.010	C	GPS - STATIC	2024	HTH210A
2144286.110	805157.429	844286.808	16835175.328	.131	3	GPS - RTRN	2023	RTRN2023
2144286.145	805157.522	844286.844	16835175.421	.131	3	GPS - RTRN	2022	RTRN2022P
2144286.149	805157.525	844286.848	16835175.424	.131	3	GPS - RTRN	2022	RTRN2022T
2144286.129	805157.486	844286.827	16835175.385	.016		ADJUSTMENT	2020	GPS3384
2144286.129	805157.486	844286.827	16835175.385	.016	C	GPS - STATIC	2020	HOTTE
2144286.135	805157.508	844286.834	16835175.407	.131	3	GPS - OPUS	2020	GPSBM
2144286.114	805157.472	844286.812	16835175.372	.131	3	GPS - OPUS	2020	GPSBM
2144286.241	805157.504	844286.940	16835175.401	.131	3	GPS - RTRN	2015	RTRN2015
2144286.120	805157.468	844286.818	16835175.368	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2144286.093	805157.455	844286.791	16835175.355	.033	C	GPS - STATIC	2024	HTH210A
2144286.093	805157.455	844286.791	16835175.355	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SKOGEN-DQ2710-3N-21FEB2024.jpg	N	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SKOGEN-DQ2710-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/SKOGEN-DQ2710-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: STA 257+55

NGS Name: STA 257+55

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096132/
USGS Quad: LAWNDAL

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	29	136 N	44 W	463334.00	961536.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1953	2023	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1953)

Stamping:

1.0 MILE EAST OF THE WILKIN-OTTERTAIL COUNTY LINE, 220.0 FEET LEFT OF TRUNK HIGHWAY 108, AT TRUNK HIGHWAY 108 STATION 257+55.

Station Notes

PULLED THE TIES, FALLS IN A FIELD.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1266.070	.033	3				VERTICAL CONTROL SURVEY	1953	CS5625

Geoid Separations(ft): GEOID18 = -87.687 12B = -87.670 09 = -87.569 03 = -87.483

* No Horizontal Positions in the Database *



Mn/DOT Name: STALKER

NGS Name: STALKER

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095331/
USGS Quad: STALKER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	22	132 N	41 W	461329.55	954956.66		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2000	2014	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2014)

Stamping: STALKER 2000

4.4 MILES SOUTHEAST OF UNDERWOOD, 2.25 MILES SOUTHEAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN UNDERWOOD, TO TRUNK HIGHWAY 210 MILEPOINT 39.75, THENCE 3.0 MILES SOUTH ALONG COUNTY ROAD 119, 0.05 MILE NORTH OF 180TH STREET, 47.0 FEET EAST OF COUNTY ROAD 119, 28.7 FEET NORTH OF A CABLE BOX, 3.0 FEET SOUTH OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1318.318	.262			1230.936	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.572 12B = -87.592 09 = -87.477 03 = -87.378

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 13 29.55227	95 49 56.65883	470703.410	143233.824	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2224197.036	778736.346	923797.997	16807489.743	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/STALKER-3N-01OCT2014.jpg	N	Oct 1, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/STALKER-2-01OCT2014.jpg		Oct 1, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/STALKER-1-01OCT2014.jpg		Oct 1, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: STAR MNDT

NGS Name: STAR

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9319](#)
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	35	136 N	41 W	463324.61	954841.16		2	1982	2009	DESTROYED	Horz=NO Vert=NO	NO			STEEL ROD IMBED IN MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MNDT

Description: (2001)

Stamping: STAR 1982

4.5 MILES WEST OF DENT, 4.15 MILES WEST ON TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 TO A CURVE IN THE HIGHWAY, THEN 0.2 MILE WEST ON A GRAVEL ROAD, 15.0 FEET SOUTH OF A GRAVEL ROAD, 26.5 FEET NORTH-NORTHWEST OF A POWER POLE WITH A TRANSFORMER, 35.1 FEET NORTHWEST OF A WITNESS POST, 27.0 FEET NORTHEAST OF A WITNESS POST, 33.11 FEET NORTHWEST OF STAR MNDT RM 1, 25.66 FEET NORTHEAST OF STAR MNDT RM 2.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1399.735	.197			1312.694	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1399.899							RECIPROCAL VERTICAL ANGLE	1982	HORZ

Geoid Separations(ft): GEOID18 = -87.237 12B = -87.234 09 = -87.123 03 = -86.995

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 33 24.60838	95 48 41.15738			476157.205	264297.060	.066	2	ADJUSTMENT	1999 17648

<u>NAD83(1986)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 33 24.60499	95 48 41.15650			476157.267	264296.717	.066	2	ADJUSTMENT	1997 16997

<u>NAD27</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>
<u>Geodetic Position</u>									
<u>Latitude</u>	<u>Longitude</u>								
46 33 24.75350	95 48 39.98390					.100		CLASSICAL SURVEY	1950 UNK

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2231890.323	899662.103			933406.792	16928309.358	.066	2	ADJUSTMENT	1999 17648

<u>NAD83(1986)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2231890.378	899661.758			933406.841	16928309.012	.066	2	ADJUSTMENT	1997 16997

<u>NAD27</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>
<u>MN State Plane - Central Zone</u>									
<u>X</u>	<u>Y</u>								
1607293.942	571588.283					.100		CLASSICAL SURVEY	1950 UNK



Mn/DOT Name: STAR MNDT AZ MK

NGS Name: STAR AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9323](#) [Get Map](#)
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	35	136 N	41 W	463255.91	954846.05	2	C	1982	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	MNDT

Description: (1982) Stamping: STAR 1982

4.5 MILES WEST OF DENT, AT TRUNK HIGHWAY 108 MILEPOINT 26.65, 4.75 MILES WEST ON TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35, 68.5 FEET EAST-SOUTHEAST OF TRUNK HIGHWAY 108, 43.0 FEET WEST OF EAST ROSEWOOD DRIVE, 29.8 FEET WEST-NORTHWEST OF A POWER POLE, 4.2 FEET WEST-NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1369.600	.016	2/1					VERTICAL CONTROL SURVEY	2024	VPELI2
1369.600	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941
1369.617	.016	2/1					VERTICAL ADJUSTMENT	2006	00000497
1369.630	.016	2/1					VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1369.600				1282.389	.025	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1369.600	.131			1282.484	.066	1996	GPS - STATIC	2024	HTH108
1369.600				1282.389	.025	2011	GPS - STATIC	2024	HTH108
1369.666	.262			1282.376	.197	2011	GPS - RTRN	2023	RTRN2023
1369.535	.262			1282.248	.197	2011	GPS - RTRN	2022	RTRN2022
1369.430	.262			1282.389	.197	1996	GPS - RTRN	2009	RTRN2009
1368.107	.262			1281.011	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1368.206							RECIPROCAL VERTICAL ANGLE	1982	HORZ

Geoid Separations(ft): GEOID18 = -87.290 12B = -87.287 09 = -87.172 03 = -87.041

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 32 55.90989	95 48 46.04843	475811.847	261389.962	.013		ADJUSTMENT	2024	GPS3689
46 32 55.90989	95 48 46.04843	475811.847	261389.962	.013	C	GPS - STATIC	2024	HTH108
46 32 55.90956	95 48 46.04843	475811.847	261389.929	.131	3	GPS - RTRN	2023	RTRN2023
46 32 55.91018	95 48 46.04876	475811.824	261389.992	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 32 55.90966	95 48 46.04896	475811.810	261389.939	.033	C	GPS - STATIC	2024	HTH108
46 32 55.91053	95 48 46.04991	475811.743	261390.027	.131	3	GPS - RTRN	2009	RTRN2009
46 32 55.90727	95 48 46.05102	475811.666	261389.697	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 32 55.90388	95 48 46.05036	475811.711	261389.354	.131	3	ADJUSTMENT	1997	16997

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 32 56.05240	95 48 44.87740			.100		CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2231491.250	896762.263	932961.486	16925415.541	.013		ADJUSTMENT	2024	GPS3689
2231491.250	896762.263	932961.486	16925415.541	.013	C	GPS - STATIC	2024	HTH108
2231491.249	896762.230	932961.484	16925415.507	.131	3	GPS - RTRN	2023	RTRN2023
2231491.228	896762.293	932961.464	16925415.571	.131	3	GPS - RTRN	2022	RTRN2022

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2231491.213	896762.241	932961.448	16925415.519	.033	C	GPS - STATIC	2024	HTH108
2231491.148	896762.330	932961.385	16925415.609	.131	3	GPS - RTRN	2009	RTRN2009
2231491.064	896762.001	932961.295	16925415.282	.131	3	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2231491.103	896761.657	932961.329	16925414.937	.131	3	ADJUSTMENT	1997	16997

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1606894.698	568688.195			.100		CLASSICAL SURVEY	1950	UNK

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/STAR_AZ_MK-AD9323-3E-31JUL2023.jpg	E	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/STAR_AZ_MK-AD9323-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/STAR_AZ_MK-AD9323-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: STAR MNDT RM 1

NGS Name: STAR RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9307](#) [Get Map](#)
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	35	136 N	41 W	463324.40	954840.79	2	3	1982	2009	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (2004)

Stamping: STAR NO 1 1982

4.5 MILES WEST OF DENT, 4.15 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 IN DENT, TO TRUNK HIGHWAY 108 MILEPOINT 27.3, THEN 0.2 MILE WEST ON A GRAVEL ROAD, 35.5 FEET SOUTH OF A GRAVEL ROAD, 15.6 FEET EAST OF A POWER POLE, 2.2 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1400.407	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1400.420	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1400.437	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1399.735	.262		1312.694	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.237 12B = -87.234 09 = -87.126 03 = -86.995

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>			<u>Geodetic Position</u>			<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>		<u>X</u>	<u>Y</u>		<u>Year</u>	<u>Reference</u>	
46 33 24.39886	95 48 40.79372		476182.596	264275.803	.131 3	ADJUSTMENT	1999	17648
<u>NAD83(1986)</u>			<u>Geodetic Position</u>			<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>		<u>X</u>	<u>Y</u>		<u>Year</u>	<u>Reference</u>	
46 33 24.39547	95 48 40.79285		476182.656	264275.459	.131 3	ADJUSTMENT	1997	16997

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>			<u>MN State Plane - Central Zone</u>			<u>UTM - Zone 15</u>			<u>Project Info</u>		
<u>X</u>	<u>Y</u>		<u>X</u>	<u>Y</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
2231915.312	899640.381		933431.438	16928287.236		.131	3	ADJUSTMENT	1999	17648	
<u>NAD83(1986)</u>			<u>MN State Plane - Central Zone</u>			<u>UTM - Zone 15</u>			<u>Project Info</u>		
<u>X</u>	<u>Y</u>		<u>X</u>	<u>Y</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
2231915.366	899640.037		933431.486	16928286.890		.131	3	ADJUSTMENT	1997	16997	



Mn/DOT Name: STAR MNDT RM 2

NGS Name: STAR RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9308](#) [Get Map](#)
NGS Quad / Sta Num : 46095432/
USGS Quad: STAR LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	35	136 N	41 W	463324.41	954841.38	2	3	1982	2009	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (2004)

Stamping: STAR NO 2 1982

4.5 MILES WEST OF DENT, 4.15 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 IN DENT, TO TRUNK HIGHWAY 108 MILEPOINT 27.3, THEN 0.2 MILE WEST ON A GRAVEL ROAD, 35.5 FEET SOUTH OF A GRAVEL ROAD, 26.1 FEET WEST OF A POWER POLE, 2.1 FEET EAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1400.335	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1400.348	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1400.368	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1400.063	.262		1313.022	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.237 12B = -87.234 09 = -87.126 03 = -86.995

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>			<u>Geodetic Position</u>			<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>		<u>X</u>	<u>Y</u>		<u>Year</u>	<u>Reference</u>	
46 33 24.40833	95 48 41.38261		476141.440	264276.812	.131 3 ADJUSTMENT	1999	17648	
<u>NAD83(1986)</u>			<u>Geodetic Position</u>			<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>		<u>X</u>	<u>Y</u>		<u>Year</u>	<u>Reference</u>	
46 33 24.40494	95 48 41.38174		476141.501	264276.468	.131 3 ADJUSTMENT	1997	16997	

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>			<u>MN State Plane - Central Zone</u>			<u>UTM - Zone 15</u>			<u>Project Info</u>		
<u>X</u>	<u>Y</u>		<u>X</u>	<u>Y</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
2231874.188	899642.152		933390.337	16928289.662		.131	3	ADJUSTMENT	1999	17648	
<u>NAD83(1986)</u>			<u>MN State Plane - Central Zone</u>			<u>UTM - Zone 15</u>			<u>Project Info</u>		
<u>X</u>	<u>Y</u>		<u>X</u>	<u>Y</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
2231874.242	899641.807		933390.386	16928289.316		.131	3	ADJUSTMENT	1997	16997	



Mn/DOT Name: STARK

NGS Name: STARK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4329](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	22	133 N	40 W	461840.16	954237.46	2	C	2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 84 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: STARK 2014

1.5 MILES NORTH OF BATTLE LAKE, 2.6 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE TO TRUNK HIGHWAY 78 MILEPOINT 24.1, THEN 0.40 MILE EAST ON COUNTY ROAD 16, 60.0 FEET SOUTH OF COUNTY ROAD 16, 49.5 FEET WEST OF A FIELD ENTRANCE, 2.0 FEET NORTH OF A RIGHT-OF-WAY POST, 1.5 FEET NORTH OF A WITNESS POST.

Station Pair: MOLLY MNDT RM 1 - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1364.367	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1364.364	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1364.364	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1364.367			1276.605	.012	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1364.367	.131		1276.717	.066	1996	GPS - STATIC	2024	HTH78B
1364.367			1276.605	.012	2011	GPS - STATIC	2024	HTH78B
1364.318	.262		1276.595	.197	2011	GPS - RTRN	2023	RTRN2023
1364.292	.262		1276.569	.197	2011	GPS - OPUS	2022	GPSBM
1364.180	.262		1276.457	.197	2011	GPS - OPUS	2022	GPSBM
1364.420	.262		1276.700	.197	2011	GPS - RTRN	2021	RTRN2021
1364.226	.262		1276.503	.197	2011	GPS - RTRN	2015	RTRN2015
1364.226	.262		1276.503	.197	2011	GPS - RTRN	2015	RTRN2015
1364.216	.262		1276.490	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.723 12B = -87.726 09 = -87.615 03 = -87.510

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
		46 18 40.16198	95 42 37.45877	501582.454	174679.511	.007		ADJUSTMENT
		46 18 40.16198	95 42 37.45877	501582.454	174679.511	.007	C	GPS - STATIC
		46 18 40.16152	95 42 37.45829	501582.488	174679.464	.131	3	GPS - RTRN
		46 18 40.16156	95 42 37.45886	501582.448	174679.468	.131	3	GPS - OPUS
		46 18 40.16214	95 42 37.45883	501582.450	174679.527	.131	3	GPS - OPUS
		46 18 40.16222	95 42 37.45797	501582.510	174679.535	.131	3	GPS - RTRN
		46 18 40.16210	95 42 37.45987	501582.377	174679.523	.131	3	GPS - RTRN
		46 18 40.16210	95 42 37.45987	501582.377	174679.523	.131	3	GPS - RTRN
		46 18 40.16192	95 42 37.45888	501582.446	174679.505	.131	3	GPS - RTRN

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>
		46 18 40.16185	95 42 37.45906	501582.434	174679.498	.033	C	GPS - STATIC

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255648.822	809600.789	955739.755	16837862.053	.007		ADJUSTMENT	2024	GPS3771
2255648.822	809600.789	955739.755	16837862.053	.007	C	GPS - STATIC	2024	HTH78B
2255648.855	809600.742	955739.787	16837862.005	.131	3	GPS - RTRN	2023	RTRN2023
2255648.815	809600.746	955739.747	16837862.010	.131	3	GPS - OPUS	2022	GPSBM
2255648.818	809600.805	955739.751	16837862.069	.131	3	GPS - OPUS	2022	GPSBM
2255648.879	809600.812	955739.812	16837862.075	.131	3	GPS - RTRN	2021	RTRN2021
2255648.745	809600.802	955739.678	16837862.067	.131	3	GPS - RTRN	2015	RTRN2015
2255648.745	809600.802	955739.678	16837862.067	.131	3	GPS - RTRN	2015	RTRN2015
2255648.814	809600.783	955739.747	16837862.047	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2255648.802	809600.776	955739.734	16837862.040	.033	C	GPS - STATIC	2024	HTH78B

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/STARK-DQ4329-3S-17OCT2023.jpg	S	Oct 17, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/STARK-DQ4329-2-17OCT2023.jpg		Oct 17, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/STARK-DQ4329-1-17OCT2023.jpg		Oct 17, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: STREED MNDT

NGS Name: STREED

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0531](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/1044
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	1	133 N	40 W	462131.18	954019.56	2	C	1975	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	MNDT

Description: (1975) **Stamping:** STREED 1975

5.5 MILES NORTH-NORTHEAST OF BATTLE LAKE, 7.85 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 29.30, 41.0 FEET NORTH OF TRUNK HIGHWAY 78, 39.0 FEET SOUTHWEST OF A RIGHT-OF-WAY POST, 36.0 FEET SOUTHWEST OF A POWER POLE WITH A GUY WIRE, 10.0 FEET WEST OF VIRGIL ROAD, 6.6 FEET SOUTHEAST OF A WITNESS POST.

Station Notes

THE SURVEY MARK IS TIPPED TO THE WEST BUT STILL GOOD.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Determination Method	Project Info	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1327.337	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941
1327.333	.016	2/1					VERTICAL ADJUSTMENT	2017	00000911
1327.323	.016	2/1					VERTICAL CONTROL SURVEY	2016	VOTTE
1326.949	.016	2/1					VERTICAL ADJUSTMENT	1991	00000025
NGVD29				Ellipsoid (NAD83)			Determination Method	Project Info	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1326.159	.016	2/1					UNKNOWN/APPROXIMATE	1992	UNCHECKD
1326.159	.016	2					VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Determination Method	Project Info	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1327.337				1239.486	.011	2011	HORIZONTAL ADJUSTMENT	2024	GPS3764
1327.337	.131			1239.601	.066	1996	GPS - STATIC	2024	HTH78A
1327.337				1239.486	.011	2011	GPS - STATIC	2024	HTH78A
1327.300	.262			1239.469	.197	2011	GPS - RTRN	2023	RTRN2023
1327.232	.262			1239.404	.197	2011	GPS - RTRN	2015	RTRN2015
1327.232	.262			1239.404	.197	2011	GPS - RTRN	2015	RTRN2015
1326.966	.197			1239.322	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.831 12B = -87.828 09 = -87.707 03 = -87.595

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 21 31.18247	95 40 19.56402	511253.269	192008.419	.007		ADJUSTMENT	2024	GPS3764
46 21 31.18247	95 40 19.56402	511253.269	192008.419	.007	C	GPS - STATIC	2024	HTH78A
46 21 31.18283	95 40 19.56371	511253.291	192008.456	.131	3	GPS - RTRN	2023	RTRN2023
46 21 31.18195	95 40 19.56265	511253.365	192008.367	.131	3	GPS - RTRN	2015	RTRN2015
46 21 31.18195	95 40 19.56265	511253.365	192008.367	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 21 31.18231	95 40 19.56430	511253.250	192008.403	.033	C	GPS - STATIC	2024	HTH78A
46 21 31.18068	95 40 19.55714	511253.752	192008.238	.066	2	ADJUSTMENT	1999	17648
46 21 31.18048	95 40 19.55692	511253.768	192008.218	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 21 31.17836	95 40 19.54751	511254.428	192008.003	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 21 31.32389	95 40 18.38129			.100	2	CLASSICAL SURVEY	1977	15945

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2265637.540	826745.396	966000.101	16854850.256	.007		ADJUSTMENT	2024	GPS3764
2265637.540	826745.396	966000.101	16854850.256	.007	C	GPS - STATIC	2024	HTH78A
2265637.562	826745.432	966000.124	16854850.292	.131	3	GPS - RTRN	2023	RTRN2023
2265637.635	826745.342	966000.196	16854850.200	.131	3	GPS - RTRN	2015	RTRN2015
2265637.635	826745.342	966000.196	16854850.200	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2265637.520	826745.381	966000.081	16854850.240	.033	C	GPS - STATIC	2024	HTH78A
2265638.019	826745.206	966000.578	16854850.058	.066	2	ADJUSTMENT	1999	17648
2265638.034	826745.186	966000.593	16854850.038	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2265638.690	826744.959	966001.245	16854849.801	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1641043.152	498671.676			.100	2	CLASSICAL SURVEY	1977	15945

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/STREED-RO0531-3N-17OCT2023.jpg	N	Oct 17, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/STREED-RO0531-2-17OCT2023.jpg		Oct 17, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/STREED-RO0531-1-17OCT2023.jpg		Oct 17, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: SWAN LAKE LUTH CH SPIRE

NGS Name: SWAN LAKE LUTH CH SPIRE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	21	132 N	42 W	461421.49	955824.44		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1979	1979	GOOD	Horz=? Vert=?	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	SURVEY DISK	MNDT

Description: (2022)

Stamping:

4.0 MILES SOUTHEAST OF FERGUS FALLS, STATION SWAN LAKE LUTH CH SPIRE IS PROBABLY THE SAME STATION AS SHARPSDALE LUTHERAN CHURCH (46095334-1022).

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.907 12B = -87.907 09 = -87.792 03 = -87.700

Lat/Lon and County Coordinates (Feet)

NAD27

<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>						<u>Year</u>	<u>Reference</u>
46 14 21.63823	95 58 23.23884			.100		CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD27

<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1564025.221	456667.899			.100		CLASSICAL SURVEY	1950	UNK



Mn/DOT Name: T 3

NGS Name: T 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0476](#) [Get Map](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	11	131 N	42 W	461023.00	955503.00	1	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1905	2013	GOOD	Horz=? Vert=YES	YES		RECESSED 21 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
PIPE (CAPPED) DRIVEN IN GROUND (<10 FT)	PIPE CAP	NGS

Description: (1971) **Stamping:** EL 1364.781 FT

AT DALTON, 213.0 FEET SOUTH ALONG COUNTY ROAD 35 (SOUTH CENTRAL AVENUE) FROM THE JUNCTION OF COUNTY ROAD 35 AND COUNTY HIGHWAY 12 (MAIN STREET) IN DALTON, THEN 436.0 FEET WEST ALONG SUMMIT STREET, THEN 43.0 FEET SOUTH-SOUTHEAST ALONG CEDAR AVENUE, 200.0 FEET NORTHEAST OF THE RAILROAD STATION, 10.0 FEET NORTH OF AN ELEVATOR.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1365.503	.007	1/2					VERTICAL ADJUSTMENT	1991	00000025

NGVD29				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1364.781	.007	1					VERTICAL CONTROL SURVEY	1972	Q460953
1364.781	.007	1					VERTICAL CONTROL SURVEY	1972	L22167-A
1364.781	.007	1					VERTICAL CONTROL SURVEY	1971	L22167-A
1364.781	.007	1					VERTICAL CONTROL SURVEY	1929	Q460953
1364.781	.007	1					VERTICAL CONTROL SURVEY	1905	L36 MINN

GA1912				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1365.211	.007	1					VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -87.342 12B = -87.355 09 = -87.221 03 = -87.182

* No Horizontal Positions in the Database *

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/T_3-RO0476-3SW-28SEP2001.jpg	SW	Sep 28, 2001
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/T_3-RO0476-2-28SEP2001.jpg		Sep 28, 2001
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/T_3-RO0476-1-28SEP2001.jpg		Sep 28, 2001

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: T 61

NGS Name: T 61

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0503](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	34	133 N	41 W	461708.00	954954.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1975) Stamping: T 61 1934

2.0 MILES EAST ON A RAILROAD FROM UNDERWOOD, 0.6 MILE EAST OF RAILROAD MILEPOST 38, 50.0 FEET WEST OF A ROAD, 60.0 FEET SOUTH OF A RAILROAD.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1344.331	.016	2/0				VERTICAL ADJUSTMENT	1991 00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1343.518	.007	1				VERTICAL CONTROL SURVEY	1941 Q460953
1343.518	.007	1				VERTICAL CONTROL SURVEY	1934 L40 MINN

Geoid Separations(ft): GEOID18 = -87.903 12B = -87.923 09 = -87.818 03 = -87.677

* No Horizontal Positions in the Database *



Mn/DOT Name: T131N R44W SEC 26 N 1/4 CORNER

NGS Name: T131N R44W SEC 26 N 1/4 CORNER

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0980](#) [Get Map](#)
NGS Quad / Sta Num : 46096224/1008
USGS Quad: ORWELL LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	26	131 N	44 W	460814.76	961023.10		2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1904	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	SEE DESCRIPTION	NGS

Description: (1935)

Stamping:

9.0 MILES NORTHEAST OF NASHUA, 4.9 MILES NORTH ALONG TRUNK HIGHWAY 19 FROM THE JUNCTION OF TRUNK HIGHWAY 19 AND 2ND STREET, THEN 2.0 MILES EAST ALONG TRUNK HIGHWAY 4, THEN 3.9 MILES EAST ALONG TRUNK HIGHWAY 26, THEN 2.0 MILES NORTH ALONG TRUNK HIGHWAY 15, THEN 0.5 MILE EAST ALONG TRUNK HIGHWAY 2.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1099.079	.197		1012.104	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648	

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1099.112						RECIPROCAL VERTICAL ANGLE	1904	HORZ	

Geoid Separations(ft): GEOID18 = -87.293 12B = -87.247 09 = -87.123 03 = -87.126

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 08 14.76369	96 10 23.09541	384285.390	111656.164	.066	2	ADJUSTMENT	1999	17648
46 08 14.76369	96 10 23.09541	384285.390	111656.164	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 08 14.76319	96 10 23.08385	384286.204	111656.108	.066	2	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 08 14.91200	96 10 21.87100			.100	2	CLASSICAL SURVEY	1932	00967

USSD

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 08 15.08300	96 10 22.25600				3	CLASSICAL SURVEY		17389-73

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2137221.060	748767.877	836332.905	16778880.929	.066	2	ADJUSTMENT	1999	17648
2137221.060	748767.877	836332.905	16778880.929	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2137221.873	748767.807	836333.717	16778880.846	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1512626.203	420694.778			.100	2	CLASSICAL SURVEY	1932	00967



Mn/DOT Name: TAIL AZ MK

NGS Name: TAIL AZ MK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4966](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/1049
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	31	132 N	42 W	461230.00	960113.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	MNDT

Description: (2011) Stamping: TAIL 1962

5.0 MILES WEST-NORTHWEST OF DALTON, 0.4 MILE EAST ON INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59, SET IN THE SOUTHEAST CORNER OF BRIDGE NUMBER 9701.

Station Notes
NEW BRIDGE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.729 12B = -87.720 09 = -87.592 03 = -87.536



Mn/DOT Name: TAIL MNDT

NGS Name: TAIL

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0142](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/1049
USGS Quad: DAYTON HOLLOW DAM

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NW	31	132 N	42 W	461217.56	960040.99	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1962	2019	GOOD	Horz=NO Vert=NO	NO		RECESSED 4 IN.	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1980) **Stamping:** TAIL 1962

5.0 MILES WEST-NORTHWEST OF DALTON, 0.4 MILE EAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 IN DALTON, AT INTERSTATE HIGHWAY 94 MILEPOINT 62.15, 238.5 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 183.96 FEET EAST-NORTHEAST OF TAIL RM 2, 156.84 FEET NORTH OF TAIL RM 1, 31.0 FEET EAST-SOUTHEAST OF A FENCE LINE, ON THE SOUTHWEST SIDE OF A ROCK PILE, 156.0 FEET NORTHEAST OF A WITNESS POST.

Station Notes

THE SURVEY MARK IS ON PRIVATE PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1281.215	.016	2/0					VERTICAL ADJUSTMENT	1991	00000025

NGVD29				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1280.463	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD
1280.463	.016	2					VERTICAL CONTROL SURVEY	1972	Q460962
1280.463	.016	2					VERTICAL CONTROL SURVEY	1972	L22167-A
1280.463	.016	2					VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1281.034	.262			1193.538	.197	1996	GPS - RTRN	2009	RTRN2009
1281.231	.197			1193.774	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.687 12B = -87.684 09 = -87.552 03 = -87.497

Lat/Lon and County Coordinates (Feet)

NAD83(1996)				Otter Tail County				Project Info	
Geodetic Position									
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
46 12 17.56285	96 00 40.98625	425371.699	136058.413	.131	3	GPS - RTRN	2009	RTRN2009	
46 12 17.56113	96 00 40.98567	425371.739	136058.238	.066	2	ADJUSTMENT	1999	17648	
46 12 17.56117	96 00 40.98539	425371.759	136058.242	.066	2	ADJUSTMENT	1998	17655	

NAD83(1986)				Otter Tail County				Project Info	
Geodetic Position									
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
46 12 17.55989	96 00 40.97373	425372.579	136058.109	.066	2	ADJUSTMENT	1986	17289	

NAD27								Project Info	
Geodetic Position									
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
46 12 17.70910	96 00 39.77060			.100	2	CLASSICAL SURVEY	1963	13276	



State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2178746.376	772402.234	878239.684	16801869.337	.131	3	GPS - RTRN	2009	RTRN2009
2178746.413	772402.060	878239.718	16801869.162	.066	2	ADJUSTMENT	1999	17648
2178746.433	772402.063	878239.738	16801869.165	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2178747.250	772401.915	878240.553	16801869.004	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1554152.004	444328.950			.100	2	CLASSICAL SURVEY	1963	13276



Mn/DOT Name: TAIL RM 1

NGS Name: TAIL RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP4967](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	31	132 N	42 W	461216.03	960041.32		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2009	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 1 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2011)

Stamping: TAIL NO 1 1962

5.0 MILES NORTHWEST OF DALTON, 0.4 MILE SOUTHEAST ON INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND INTERSTATE HIGHWAY 94, 3.0 FEET SOUTHWEST OF THE NORTHEAST RIGHT-OF-WAY LINE OF INTERSTATE HIGHWAY 94, 4.5 FEET SOUTH OF A STEEL WITNESS POST -- IN 1979 TAIL RM 1 WAS RECOVERED WITH THE TOP OF THE DISK BROKEN OFF, THE STEM IS SOLID IN THE TOP OF THE MONUMENT AND WAS USED FOR OBSERVATIONS.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.687 12B = -87.684 09 = -87.549 03 = -87.493



Mn/DOT Name: TAIL RM 2

NGS Name: TAIL RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0141](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	31	132 N	42 W	461217.21	960043.55	2	3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2015	GOOD	Horz=NO Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2015)

Stamping: TAIL NO. 2 1962

6.1 MILES SOUTHEAST OF FERGUS FALLS, 0.4 MILE SOUTHEAST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 59 (THE JUNCTION IS 6.0 MILES SOUTH OF FERGUS FALLS), 99.0 FEET NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 184.0 FEET WEST-SOUTHWEST OF STATION TAIL MNDT, 45.0 FEET NORTHEAST OF THE EAST EXIT 61 GAS SIGNPOST, 1.0 FOOT NORTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1274.781	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1274.820	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1274.791	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4
1274.801	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1274.049	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1274.049	.016	2				VERTICAL CONTROL SURVEY	1972	Q460962
1274.049	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A
1274.049	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1274.765	.262		1187.084	.197	2011	GPS - RTRN	2015	RTRN2015
1274.660	.262		1187.166	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.687 12B = -87.684 09 = -87.549 03 = -87.497

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 12 17.21089	96 00 43.55104	425191.163	136023.430	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 12 17.21034	96 00 43.55234	425191.072	136023.375	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2178565.248	772370.604	878058.019	16801840.547	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2178565.155	772370.550	878057.926	16801840.495	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TAIL_RM_2-RP0141-3NE-14SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TAIL_RM_2-RP0141-2-14SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TAIL_RM_2-RP0141-1-14SEP2015.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
NE	Sep 14, 2015
	Sep 14, 2015
	Sep 14, 2015



Mn/DOT Name: TAYLOR

NGS Name: TAYLOR

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7128](#)
NGS Quad / Sta Num : 46096122/
USGS Quad: PELICAN RAPIDS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	34	136 N	43 W	463322.05	960459.63	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2009	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 70 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009)

Stamping: TAYLOR 2009

IN PELICAN RAPIDS, 0.95 MILE SOUTH ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND TRUNK HIGHWAY 108 EAST IN PELICAN RAPIDS, AT TRUNK HIGHWAY 59 MILEPOINT 239.5, 67.0 FEET EAST OF TRUNK HIGHWAY 59, 18.8 FEET WEST OF A BIKE PATH, 82.0 FEET SOUTH OF A FIRE HYDRANT, 41.0 FEET SOUTHEAST OF A MANHOLE, 1.4 FEET WEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1339.837	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1339.909	.016	2/1				VERTICAL ADJUSTMENT	2013 00000792
1339.909	.016	2/1				VERTICAL CONTROL SURVEY	2012 VPELR

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1339.837			1252.235	.021	2011	HORIZONTAL ADJUSTMENT	2024 GPS3672
1339.837	.131		1252.340	.066	1996	GPS - STATIC	2023 HTH59
1339.837			1252.235	.021	2011	GPS - STATIC	2023 HTH59
1339.935	.262		1252.281	.197	2011	GPS - RTRN	2023 RTRN2023
1339.892	.262		1252.242	.197	2011	GPS - RTRN	2022 RTRN2022
1339.804	.262		1252.160	.197	2011	GPS - RTRN	2014 RTRN2014

Geoid Separations(ft): GEOID18 = -87.654 12B = -87.647 09 = -87.529 03 = -87.398

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 33 22.05485	96 04 59.62596	407773.139	264237.779	.013		ADJUSTMENT	2024 GPS3672
46 33 22.05485	96 04 59.62596	407773.139	264237.779	.013	C	GPS - STATIC	2023 HTH59
46 33 22.05451	96 04 59.62602	407773.134	264237.744	.131	3	GPS - RTRN	2023 RTRN2023
46 33 22.05502	96 04 59.62670	407773.087	264237.797	.131	3	GPS - RTRN	2022 RTRN2022
46 33 22.05482	96 04 59.62597	407773.138	264237.776	.131	3	GPS - RTRN	2014 RTRN2014

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
46 33 22.05465	96 04 59.62646	407773.103	264237.759	.033	C	GPS - STATIC	2023 HTH59

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2163525.502	900868.631	865049.485	16930605.747	.013		ADJUSTMENT	2024 GPS3672
2163525.502	900868.631	865049.485	16930605.747	.013	C	GPS - STATIC	2023 HTH59
2163525.497	900868.597	865049.480	16930605.713	.131	3	GPS - RTRN	2023 RTRN2023
2163525.450	900868.649	865049.435	16930605.766	.131	3	GPS - RTRN	2022 RTRN2022
2163525.501	900868.628	865049.485	16930605.744	.131	3	GPS - RTRN	2014 RTRN2014

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
2163525.467	900868.611	865049.450	16930605.728	.033	C	GPS - STATIC	2023 HTH59



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TAYLOR-DO7128-3E-31JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TAYLOR-DO7128-2-31JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TAYLOR-DO7128-1-31JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
E	Jul 31, 2023
	Jul 31, 2023
	Jul 31, 2023



Mn/DOT Name: TBM 02 1 L23961

NGS Name: TBM 02 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9015](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	32	133 N	41 W	461711.00	955241.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON ROD

Disk Type
UNMONUMENTED

Mon. Agency
MN DT

Description:

Stamping:

IN UNDERWOOD, 0.4 MILE NORTH ALONG TRUNK HIGHWAY 35 FROM THE JUNCTION OF TRUNK HIGHWAY 35 AND TRUNK HIGHWAY 210, THEN 0.4 MILE WEST ON WOODLAND AVENUE WEST, 40.0 FEET NORTHEAST OF WOODLAND AVENUE WEST.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.989 12B = -88.015 09 = -87.894 03 = -87.756



Mn/DOT Name: TBM 02 10 L23961

NGS Name: TBM 02 10

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9005](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>	<u>Mon. Agency</u>
SW	4	132 N	40 W	461624.00	954325.00			1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION	MNDT
<u>Monument Type</u> IRON ROD																
<u>Disk Type</u> UNMONUMENTED																

Description:

Stamping:

0.70 MILE SOUTHWEST OF BATTLE LAKE, 0.5 MILE EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 NEAR BATTLE LAKE, THEN 470.0 FEET SOUTH ALONG 368TH AVENUE, 400.0 FEET EAST OF 368TH AVENUE

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.572 12B = -87.579 09 = -87.477 03 = -87.385



Mn/DOT Name: TBM 02 11 L23961

NGS Name: TBM 02 11

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9006](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	5	132 N	40 W	461617.00	954431.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	MNDT

Description:

Stamping:

1.4 MILES SOUTHWEST OF BATTLE LAKE, 1.4 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 NEAR BATTLE LAKE, 1030.0 FEET SOUTHEAST OF TRUNK HIGHWAY 210.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.611 12B = -87.618 09 = -87.520 03 = -87.418



Mn/DOT Name: TBM 02 12 L23961

NGS Name: TBM 02 12

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9007](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	7	132 N	40 W	461604.00	954540.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	MNDT

Description:

Stamping:

2.4 MILES SOUTHWEST OF BATTLE LAKE, 2.3 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 NEAR BATTLE LAKE, 170.0 FEET SOUTH OF TRUNK HIGHWAY 210.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.641 12B = -87.651 09 = -87.556 03 = -87.447



Mn/DOT Name: TBM 02 13 L23961

NGS Name: TBM 02 13

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9011](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	12	132 N	41 W	461602.00	954649.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	MNDT

Description:

Stamping:

3.3 MILES SOUTHWEST OF BATTLE LAKE, 3.3 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 NEAR BATTLE LAKE, 30.0 FEET NORTH OF TRUNK HIGHWAY 210.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.690 12B = -87.703 09 = -87.608 03 = -87.493



Mn/DOT Name: TBM 02 14 L23961

NGS Name: TBM 02 14

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9012](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>	<u>Mon. Agency</u>
SW	2	132 N	41 W	461602.00	954805.00			1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION	MNDT
<u>Monument Type</u> IRON ROD																
<u>Disk Type</u> UNMONUMENTED																

Description: Stamping:

3.56 MILES SOUTHEAST OF UNDERWOOD.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.746 12B = -87.759 09 = -87.664 03 = -87.546



Mn/DOT Name: TBM 02 15 L23961

NGS Name: TBM 02 15

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9013](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	10	132 N	41 W	461602.00	954921.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	MNDT

Description:

Stamping:

2.6 MILES SOUTHEAST OF UNDERWOOD, 2.7 MILES SOUTHEAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 35, 40.0 FEET SOUTH OF TRUNK HIGHWAY 210.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.798 12B = -87.815 09 = -87.713 03 = -87.588



Mn/DOT Name: TBM 02 16 L23961

NGS Name: TBM 02 16

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9014](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	4	132 N	41 W	461633.00	955059.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	MNDT

Description: Stamping:

1.19 MILES SOUTHEAST OF UNDERWOOD.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.900 12B = -87.920 09 = -87.808 03 = -87.674



Mn/DOT Name: TBM 02 2 L23961

NGS Name: TBM 02 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9016](#) [Get Map](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	31	133 N	41 W	461710.00	955345.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	MNDT

Description: Stamping:

1.21 MILES WEST OF UNDERWOOD.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.008 12B = -88.035 09 = -87.920 03 = -87.779



Mn/DOT Name: TBM 02 3 L23961

NGS Name: TBM 02 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9017](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	36	133 N	42 W	461700.00	955452.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON ROD

Disk Type
UNMONUMENTED

Mon. Agency
MNMT

Description:

Stamping:

2.0 MILES WEST OF UNDERWOOD, 1.9 MILES ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210
AND TRUNK HIGHWAY 35, 50.0 FEET NORTH OF TRUNK HIGHWAY 210.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.028 12B = -88.054 09 = -87.933 03 = -87.798



Mn/DOT Name: TBM 02 4 L23961

NGS Name: TBM 02 4

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9018](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	35	133 N	42 W	461658.00	955610.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	MNDT

Description: Stamping:

3.14 MILES WEST OF UNDERWOOD.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.061 12B = -88.081 09 = -87.959 03 = -87.831



Mn/DOT Name: TBM 02 5 L23961

NGS Name: TBM 02 5

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9019](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	33	133 N	42 W	461706.00	955812.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON ROD

Disk Type
UNMONUMENTED

Mon. Agency
MN DT

Description:

Stamping:

4.8 MILES WEST OF UNDERWOOD, 4.6 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 35, THEN 440.0 FEET SOUTH ON 249TH AVENUE, THEN 0.1 MILE WEST ON NORTH WALL LAKE DRIVE, 620.0 FEET SOUTH OF NORTH WALL LAKE DRIVE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.117 12B = -88.133 09 = -88.008 03 = -87.890



Mn/DOT Name: TBM 1 L3597

NGS Name: TBM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BI3593](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	2	132 N	43 W	461607.00	960243.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

1.8 MILES SOUTHEAST OF FERGUS FALLS, 3.8 MILES SOUTHEAST ALONG TRUNK HIGHWAY 94 FROM THE JUNCTION OF TRUNK HIGHWAY 94 AND TRUNK HIGHWAY 210, THEN 2.3 MILES NORTH ON TRUNK HIGHWAY 210, 1160.0 FEET SOUTHEAST OF TRUNK HIGHWAY 210.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -88.123 12B = -88.130 09 = -88.008 03 = -87.920



Mn/DOT Name: TBM 1 VFAUN

NGS Name: TBM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DI3797](#) [Get Map](#)
NGS Quad / Sta Num : 46096224/
USGS Quad: ORWELL LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	12	131 N	44 W	460959.00	960920.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2005	2011	DESTROYED	Horz=NO Vert=NO	NO		RECESSED 2 IN.	MARKER IS STEEL ROD

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
OBJECT DRIVEN INTO THE GROUND	METAL ROD	MNDT

Description: (2005)

Stamping:

8.0 MILES SOUTHWEST OF FERGUS FALLS, 7.20 MILES SOUTH ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND INTERSTATE HIGHWAY 94 AT FERGUS FALLS, TO INTERSTATE HIGHWAY 94 MILEPOINT 55.90, THEN 2.5 MILES WEST ON COUNTY ROAD 112, 21.0 FEET SOUTH OF COUNTY ROAD 112.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1121.225	.016	2/1				VERTICAL ADJUSTMENT	2007 00000425-15
1121.241	.016	2/1				VERTICAL CONTROL SURVEY	2005 VFAUN

Geoid Separations(ft): GEOID18 = -87.513 12B = -87.460 09 = -87.336 03 = -87.342

* No Horizontal Positions in the Database *



Mn/DOT Name: TBM 1 VPELR

NGS Name: TBM 1 VPELR

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ7117](#) [Get Map](#)
NGS Quad / Sta Num : 46096211/
USGS Quad: ERHARD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	32	135 N	43 W	462748.69	960654.90	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2011	2011	GOOD	Horz=NO Vert=NO	NO		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE POST (PREFABRICATED)	CONCRETE POST	MNDT

Description: (2011)

Stamping:

1.75 MILES SOUTHWEST OF ERHARD, 1.75 MILES SOUTHWEST ALONG TRUNK HIGHWAY 59 FROM THE JUNCTION OF TRUNK HIGHWAY 59 AND COUNTY ROAD 24 IN ERHARD, AT TRUNK HIGHWAY 59 MILEPOINT 233.75, 119.9 FEET SOUTH OF 345TH STREET, 73.0 FEET EAST OF TRUNK HIGHWAY 59, 41.2 FEET SOUTH OF A CABLE BOX, 9.3 FEET SOUTHWEST OF A POWER POLE WITH TWO GUY WIRES, 1.0 FOOT WEST OF A WITNESS POST. TBM 1 VPELR IS THE HIGHEST POINT OF THE REMAINS FROM THE CONCRETE MONUMENT.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1285.798	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1285.831	.016	2/1				VERTICAL ADJUSTMENT	2013 00000792
1285.834	.016	2/1				VERTICAL CONTROL SURVEY	2012 VPELR

Geoid Separations(ft): GEOID18 = -88.067 12B = -88.061 09 = -87.943 03 = -87.838

* No Horizontal Positions in the Database *



Mn/DOT Name: TBM 10 59228

NGS Name: TBM 10

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ2627](#)
NGS Quad / Sta Num : 46095331/
USGS Quad: STALKER LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	19	131 N	41 W	460834.00	955230.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

3.03 MILES SOUTHEAST OF DALTON.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.168 12B = -87.172 09 = -87.050 03 = -87.021



Mn/DOT Name: TBM 10 L3597

NGS Name: TBM 10

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [B13602](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	3	132 N	40 W	461630.00	954131.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

1.0 MILE SOUTHEAST OF BATTLE LAKE, 1.0 MILE EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK
HIGHWAY 210 AND TRUNK HIGHWAY 78 NEAR BATTLE LAKE, 400.0 FEET NORTHEAST OF TRUNK HIGHWAY 210

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.497 12B = -87.503 09 = -87.388 03 = -87.313



Mn/DOT Name: TBM 11 59228

NGS Name: TBM 11

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ2628](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	18	131 N	41 W	460918.00	955324.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON ROD

Disk Type
UNMONUMENTED

Mon. Agency
NGS

Description:

Stamping:

1.8 MILES SOUTHEAST OF DALTON, 0.3 MILE SOUTH ALONG TRUNK HIGHWAY 35 FROM THE JUNCTION OF TRUNK HIGHWAY 35 AND TRUNK HIGHWAY 12, THEN 1.5 MILES SOUTHEAST ON TRUNK HIGHWAY 82, THEN 0.4 MILE EAST ON TRUNK HIGHWAY 42, 1160.0 FEET NORTH OF TRUNK HIGHWAY 42.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.228 12B = -87.234 09 = -87.106 03 = -87.070



Mn/DOT Name: TBM 11 L3597

NGS Name: TBM 11

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [B13603](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	1	132 N	40 W	461624.00	953923.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON ROD

Disk Type

UNMONUMENTED

Mon. Agency

NGS

Description:

Stamping:

1.2 MILES WEST OF CLITHERALL, 1.4 MILES WEST-NORTHWEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 5, THEN 0.4 MILE NORTH-NORTHWEST ON KLAR JO ROAD, 830.0 FEET SOUTHEAST OF KLAR JO ROAD.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.382 12B = -87.388 09 = -87.270 03 = -87.211



Mn/DOT Name: TBM 12 59228

NGS Name: TBM 12

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ2629](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	12	131 N	42 W	460959.00	955415.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

IRON ROD

Disk Type

UNMONUMENTED

Mon. Agency

NGS

Description:

Stamping:

0.74 MILE SOUTHEAST OF DALTON.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.293 12B = -87.306 09 = -87.172 03 = -87.132



Mn/DOT Name: TBM 12 L3597

NGS Name: TBM 12

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BI3604](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	1	132 N	40 W	461626.00	953851.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON ROD

Disk Type
UNMONUMENTED

Mon. Agency
NGS

Description:

Stamping:

0.85 MILE WEST OF CLITHERHALL, 0.2 MILE NORTH ALONG TRUNK HIGHWAY 5 FROM THE JUNCTION OF TRUNK HIGHWAY 5 AND TRUNK HIGHWAY 210, THEN 0.3 MILE WEST ALONG WEST MAIN AVENUE, THEN 0.5 MILE EAST ON ERICKSON ROAD, 800.0 FEET NORTHWEST OF ERICKSON ROAD.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.359 12B = -87.362 09 = -87.244 03 = -87.188



Mn/DOT Name: TBM 13 59228

NGS Name: TBM 13

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	11	131 N	42 W	461049.00	955549.00		

NGS ACRN: [BZ2630](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

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<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

0.84 MILE NORTHWEST OF DALTON.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.401 12B = -87.411 09 = -87.283 03 = -87.237



Mn/DOT Name: TBM 14 59228

NGS Name: TBM 14

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3140](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	3	131 N	42 W	461124.00	955650.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON ROD

Disk Type
UNMONUMENTED

Mon. Agency
NGS

Description:

Stamping:

1.9 MILES NORTHWEST OF DALTON, 0.1 MILE WEST ALONG TRUNK HIGHWAY 12 FROM THE JUNCTION OF TRUNK HIGHWAY 12 AND TRUNK HIGHWAY 35, THEN 1.5 MILES NORTHWEST ALONG TRUNK HIGHWAY 5, 2700.0 FEET WEST OF TRUNK HIGHWAY 5.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.493 12B = -87.500 09 = -87.372 03 = -87.323



Mn/DOT Name: TBM 15 59228

NGS Name: TBM 15

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3141](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	33	132 N	42 W	461232.00	955823.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON ROD

Disk Type
UNMONUMENTED

Mon. Agency
NGS

Description:

Stamping:

3.7 MILES NORTHWEST OF DALTON, 0.4 MILE WEST ALONG TRUNK HIGHWAY 12 FROM THE JUNCTION OF TRUNK HIGHWAY 12 AND TRUNK HIGHWAY 35, THEN 3.5 MILES WEST ON TRUNK HIGHWAY 82, THEN 0.8 MILE NORTH ON TRUNK HIGHWAY 29, THEN 0.4 MILE EAST ON HORSESHOE LOOP, THEN 0.2 MILE EAST ON TRUNK HIGHWAY 82, 470.0 FEET SOUTHEAST OF TRUNK HIGHWAY 82.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.677 12B = -87.680 09 = -87.549 03 = -87.483



Mn/DOT Name: TBM 16 59228

NGS Name: TBM 16

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3142](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	29	132 N	42 W	461313.00	955907.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

4.59 MILES NORTHWEST OF DALTON.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.789 12B = -87.789 09 = -87.661 03 = -87.582



Mn/DOT Name: TBM 17 59228

NGS Name: TBM 17

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3143](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	20	132 N	42 W	461350.00	955948.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

5.3 MILES SOUTHEAST OF FERGUS FALLS, 3.8 MILES SOUTHEAST ALONG TRUNK HIGHWAY 94 FROM THE JUNCTION OF TRUNK HIGHWAY 94 AND TRUNK HIGHWAY 210, THEN 2.7 MILES NORTH ON TRUNK HIGHWAY 210, THEN 3.9 MILES SOUTH ON TRUNK HIGHWAY 29, 600.0 FEET EAST OF TRUNK HIGHWAY 29.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.877 12B = -87.877 09 = -87.759 03 = -87.677



Mn/DOT Name: TBM 18 59228

NGS Name: TBM 18

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3144](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	18	132 N	42 W	461445.00	960102.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

3.8 MILES SOUTHEAST OF FERGUS FALLS, 3.8 MILES SOUTHEAST ALONG TRUNK HIGHWAY 94 FROM THE JUNCTION OF TRUNK HIGHWAY 94 AND TRUNK HIGHWAY 210, THEN 2.7 MILES NORTH ON TRUNK HIGHWAY 210, THEN 2.5 MILES SOUTH ON TRUNK HIGHWAY 29, 5.0 FEET NORTHEAST OF TRUNK HIGHWAY 29.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.995 12B = -87.992 09 = -87.874 03 = -87.792



Mn/DOT Name: TBM 19 59228

NGS Name: TBM 19

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3145](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	11	132 N	43 W	461551.00	960236.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON ROD

Disk Type
UNMONUMENTED

Mon. Agency
NGS

Description:

Stamping:

IN FERGUS FALLS, 3.8 MILES SOUTHEAST ALONG TRUNK HIGHWAY 94 FROM THE JUNCTION OF TRUNK HIGHWAY 94 AND TRUNK HIGHWAY 210, THEN 2.7 MILES NORTH ON TRUNK HIGHWAY 210, THEN 0.5 MILE SOUTH ON TRUNK HIGHWAY 29, 1500.0 FEET SOUTHWEST OF TRUNK HIGHWAY 29.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.107 12B = -88.110 09 = -87.989 03 = -87.900



Mn/DOT Name: TBM 2 L3597

NGS Name: TBM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BI3594](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	31	133 N	42 W	461720.00	960108.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description: Stamping:

2.84 MILES NORTHEAST OF FERGUS FALLS.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.172 12B = -88.172 09 = -88.061 03 = -87.959



Mn/DOT Name: TBM 2 VFAUN

NGS Name: TBM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DI3796](#)
NGS Quad / Sta Num : 46096224/
USGS Quad: ORWELL LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	15	131 N	44 W	460943.00	961059.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2005	2011	DESTROYED	Horz=NO Vert=NO	NO		RECESSED 2 IN.	MARKER IS STEEL ROD

Monument Type

OBJECT DRIVEN INTO THE GROUND

Disk Type

METAL ROD

Mon. Agency

MNDT

Description: (2005)

Stamping:

8.0 MILES SOUTHWEST OF FERGUS FALLS, 7.20 MILES SOUTH ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND INTERSTATE HIGHWAY 94 AT FERGUS FALLS, TO INTERSTATE HIGHWAY 94 MILEPOINT 55.90, 3.9 MILES WEST ON COUNTY ROAD 112, 0.30 MILE SOUTH ON COUNTY ROAD 15, 19.0 FEET WEST OF COUNTY ROAD 15.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1090.332	.016	2/1				VERTICAL ADJUSTMENT	2007 00000425-15
1090.349	.016	2/1				VERTICAL CONTROL SURVEY	2005 VFAUN

Geoid Separations(ft): GEOID18 = -87.503 12B = -87.451 09 = -87.336 03 = -87.339

* No Horizontal Positions in the Database *



Mn/DOT Name: TBM 20 10 L23961

NGS Name: TBM 20 10

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK8998](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	10	133 N	40 W	462028.00	954205.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	MNDT

Description:

Stamping:

4.0 MILES NORTH OF BATTLE LAKE, 4.6 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210, THEN 0.8 MILE EAST ON 260TH STREET, 260.0 FEET NORTH OF 260TH STREET.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.825 12B = -87.821 09 = -87.707 03 = -87.595



Mn/DOT Name: TBM 20 11 L23961

NGS Name: TBM 20 11

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK8999](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	16	133 N	40 W	461959.00	954310.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	MNDT

Description:

Stamping:

3.7 MILES NORTH OF BATTLE LAKE, 4.0 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210, 240.0 FEET WEST OF TRUNK HIGHWAY 78.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.834 12B = -87.834 09 = -87.723 03 = -87.605



Mn/DOT Name: TBM 20 12 L23961

NGS Name: TBM 20 12

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9000](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	21	133 N	40 W	461923.00	954313.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	MNDT

Description:

Stamping:

3.0 MILES NORTH OF BATTLE LAKE, 3.4 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210, 450.0 FEET WEST OF TRUNK HIGHWAY 78.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.798 12B = -87.798 09 = -87.687 03 = -87.575



Mn/DOT Name: TBM 20 13 L23961

NGS Name: TBM 20 13

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9001](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	21	133 N	40 W	461848.00	954309.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	MNDT

Description:

Stamping:

2.3 MILES NORTH OF BATTLE LAKE, 2.7 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210, 180.0 FEET WEST OF TRUNK HIGHWAY 78.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.756 12B = -87.759 09 = -87.647 03 = -87.539



Mn/DOT Name: TBM 20 14 L23961

NGS Name: TBM 20 14

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9002](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>	<u>Mon. Agency</u>
SE	28	133 N	40 W	461806.00	954311.00			1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION	
<u>Monument Type</u> IRON ROD																
<u>Disk Type</u> UNMONUMENTED																
<u>Mon. Agency</u> MN DT																

Description:

Stamping:

1.49 MILES NORTHWEST OF BATTLE LAKE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.707 12B = -87.710 09 = -87.602 03 = -87.497



Mn/DOT Name: TBM 20 15 L23961

NGS Name: TBM 20 15

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9003](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>	<u>Mon. Agency</u>
SE	28	133 N	40 W	461751.00	954309.00			1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION	
<u>Monument Type</u> IRON ROD																
<u>Disk Type</u> UNMONUMENTED																
<u>Mon. Agency</u> MN DT																

Description:

Stamping:

1.21 MILES NORTHWEST OF BATTLE LAKE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.684 12B = -87.690 09 = -87.582 03 = -87.480



Mn/DOT Name: TBM 20 16 L23961

NGS Name: TBM 20 16

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9004](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>	<u>Mon. Agency</u>
SE	33	133 N	40 W	461720.00	954307.00			1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION	
<u>Monument Type</u> IRON ROD																
<u>Disk Type</u> UNMONUMENTED																
<u>Mon. Agency</u> MN DT																

Description:

Stamping:

0.63 MILE NORTHWEST OF BATTLE LAKE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.641 12B = -87.647 09 = -87.542 03 = -87.444



Mn/DOT Name: TBM 20 59228

NGS Name: TBM 20

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3146](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	2	132 N	43 W	461630.00	960333.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON ROD

Disk Type
UNMONUMENTED

Mon. Agency
NGS

Description:

Stamping:

IN FERGUS FALLS, 3.8 MILES SOUTHEAST ALONG TRUNK HIGHWAY 94 FROM THE JUNCTION OF TRUNK HIGHWAY 94 AND TRUNK HIGHWAY 210, THEN 1.9 MILES NORTH ON TRUNK HIGHWAY 210, THEN 0.4 MILE NORTH ON PEBBLE LAKE ROAD, 100.0 FEET SOUTHWEST OF PEBBLE LAKE ROAD.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.156 12B = -88.159 09 = -88.041 03 = -87.953



Mn/DOT Name: TBM 20 8 L23961

NGS Name: TBM 20 8

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK8996](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	2	133 N	40 W	462131.00	954050.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON ROD

Disk Type
UNMONUMENTED

Mon. Agency
MN DT

Description:

Stamping:

5.7 MILES NORTHEAST OF BATTLE LAKE, 7.2 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210, 30.0 FEET NORTH OF TRUNK HIGHWAY 78.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.848 12B = -87.844 09 = -87.723 03 = -87.611



Mn/DOT Name: TBM 20 9 L23961

NGS Name: TBM 20 9

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK8997](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	11	133 N	40 W	462048.00	954150.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	MNDT

Description: Stamping:

4.67 MILES NORTHEAST OF BATTLE LAKE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.834 12B = -87.831 09 = -87.720 03 = -87.605



Mn/DOT Name: TBM 21 59228

NGS Name: TBM 21

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3148](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	33	133 N	43 W	461739.00	960533.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:
ON THE NORTHWEST EDGE OF FERGUS FALLS.

Stamping:

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.228 12B = -88.225 09 = -88.117 03 = -88.031



Mn/DOT Name: TBM 22 59228

NGS Name: TBM 22

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3149](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	28	133 N	43 W	461815.00	960634.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

2.0 MILES NORTHWEST OF FERGUS FALLS, 1.0 MILE NORTH FROM THE JUNCTION OF TRUNK HIGHWAY 94 AND TRUNK HIGHWAY 210, 3260.0 FEET EAST OF TRUNK HIGHWAY 94 ON RAILROAD PROPERTY.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.254 12B = -88.251 09 = -88.143 03 = -88.061



Mn/DOT Name: TBM 23 59228

NGS Name: TBM 23

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3150](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>	<u>Mon. Agency</u>
SW	20	133 N	43 W	461849.00	960732.00			1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION	NGS
<u>Monument Type</u> IRON ROD																
<u>Disk Type</u> UNMONUMENTED																

Description: **Stamping:**
3.15 MILES NORTHWEST OF FERGUS FALLS.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.277 12B = -88.268 09 = -88.159 03 = -88.087



Mn/DOT Name: TBM 24 59228

NGS Name: TBM 24

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3151](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	12	133 N	44 W	462033.00	961004.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

6.1 MILES NORTHWEST OF FERGUS FALLS, 3.6 MILES NORTHWEST ON TRUNK HIGHWAY 94, THEN 2.0 MILES WEST ALONG TRUNK HIGHWAY 88, 380.0 FEET NORTHEAST OF TRUNK HIGHWAY 88.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -88.313 12B = -88.304 09 = -88.195 03 = -88.136



Mn/DOT Name: TBM 25 59228

NGS Name: TBM 25

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3152](#) [Get Map](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	11	133 N	44 W	462116.00	961042.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

6.7 MILES NORTHWEST OF FERGUS FALLS, 3.6 MILES NORTHWEST ON TRUNK HIGHWAY 94, THEN 3.0 MILES WEST ALONG TRUNK HIGHWAY 88, 180.0 FEET SOUTHWEST OF TRUNK HIGHWAY 88 ON RAILROAD PROPERTY.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -88.313 12B = -88.304 09 = -88.192 03 = -88.140



Mn/DOT Name: TBM 26 59228

NGS Name: TBM 26

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3153](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	34	134 N	44 W	462245.00	961208.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

8.9 MILES NORTHWEST OF FERGUS FALLS, 3.6 MILES NORTHWEST ON TRUNK HIGHWAY 94, THEN 5.0 MILES WEST ALONG TRUNK HIGHWAY 88, 360.0 FEET SOUTHWEST OF TRUNK HIGHWAY 88.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -88.304 12B = -88.297 09 = -88.189 03 = -88.133



Mn/DOT Name: TBM 27 59228

NGS Name: TBM 27

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	27	134 N	44 W	462330.00	961256.00		

NGS ACRN: [BZ3154](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

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<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON ROD

Disk Type
UNMONUMENTED

Mon. Agency
NGS

Description:

Stamping:

6.56 MILES SOUTHEAST OF ROTHSAÿ.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.297 12B = -88.294 09 = -88.182 03 = -88.126



Mn/DOT Name: TBM 28 59228

NGS Name: TBM 28

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3155](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	16	134 N	44 W	462457.00	961415.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

4.3 MILES SOUTHEAST OF ROTHSAY, 4.4 MILES SOUTH ALONG TRUNK HIGHWAY 88 FROM THE JUNCTION OF TRUNK HIGHWAY 88 AND TRUNK HIGHWAY 11, 5.0 FEET NORTHEAST OF TRUNK HIGHWAY 88.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -88.281 12B = -88.281 09 = -88.172 03 = -88.107



Mn/DOT Name: TBM 29 59228

NGS Name: TBM 29

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3156](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	17	134 N	44 W	462537.00	961447.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description: (2015)

Stamping:

2.1 MILES WEST OF WEST LINCOLN AVENUE, 3.3 MILES NORTH ALONG INTERSTATE HIGHWAY I-94, 8.6 MILES WEST ALONG TRUNK HIGHWAY 52 AND COUNTY HIGHWAY 88, 341.0 FEET WEST OF 320TH STREET.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.274 12B = -88.274 09 = -88.163 03 = -88.090



Mn/DOT Name: TBM 3 L3597

NGS Name: TBM 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [B13595](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	33	133 N	42 W	461723.00	955854.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

4.59 MILES EAST OF FERGUS FALLS.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.143 12B = -88.153 09 = -88.031 03 = -87.920



Mn/DOT Name: TBM 30 59228

NGS Name: TBM 30

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3157](#)
NGS Quad / Sta Num : 46096241/
USGS Quad: ROTHSA

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	8	134 N	44 W	462624.00	961526.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

2.5 MILES SOUTHEAST OF ROTHSA, 3.2 MILES SOUTH ALONG TRUNK HIGHWAY 11 FROM THE JUNCTION OF TRUNK HIGHWAY 11 AND INTERSTATE HIGHWAY 94, THEN 2.4 MILES SOUTHEAST ON TRUNK HIGHWAY 88, THEN 0.1 MILE WEST ON 330TH STREET, 730.0 FEET SOUTH OF 330TH STREET.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -88.258 12B = -88.261 09 = -88.146 03 = -88.074



Mn/DOT Name: TBM 31 59228

NGS Name: TBM 31

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3158](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	8	134 N	44 W	462617.00	961429.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

3.17 MILES SOUTHEAST OF ROTHSAÿ.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.245 12B = -88.245 09 = -88.133 03 = -88.061



Mn/DOT Name: TBM 32 59228

NGS Name: TBM 32

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3159](#) [Get Map](#)
NGS Quad / Sta Num : 46096214/
USGS Quad: ELIZABETH

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	9	134 N	44 W	462612.00	961348.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description: Stamping:

3.58 MILES SOUTHEAST OF ROTHSAÿ.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.231 12B = -88.231 09 = -88.123 03 = -88.048



Mn/DOT Name: TBM 33 59228

NGS Name: TBM 33

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3160](#)
NGS Quad / Sta Num : 46096241/
USGS Quad: ROTHSA

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	6	134 N	44 W	462709.00	961602.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

1.5 MILES SOUTHEAST OF ROTHSA, 0.8 MILE SOUTH ALONG TRUNK HIGHWAY 11 FROM THE JUNCTION OF TRUNK HIGHWAY 11 AND TRUNK HIGHWAY 94, THEN 1.4 MILES SOUTHEAST ON INTERSTATE HIGHWAY 88, 750.0 FEET SOUTHWEST OF TRUNK HIGHWAY 88.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -88.235 12B = -88.235 09 = -88.123 03 = -88.048



Mn/DOT Name: TBM 34 59228

NGS Name: TBM 34

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3161](#)
NGS Quad / Sta Num : 46096241/
USGS Quad: ROTHSA

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	31	135 N	44 W	462750.00	961636.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description: Stamping:

0.78 MILE SOUTHEAST OF ROTHSA.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.205 12B = -88.205 09 = -88.100 03 = -88.021



Mn/DOT Name: TBM 4 L3597

NGS Name: TBM 4

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [B13596](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	35	133 N	42 W	461722.00	955636.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

3.43 MILES WEST OF UNDERWOOD.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.090 12B = -88.107 09 = -87.989 03 = -87.857



Mn/DOT Name: TBM 5 L3037

NGS Name: TBM 5

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BM1412](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	34	133 N	43 W	461700.00	960429.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:
IN FERGUS FALLS.

Stamping:

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -88.199 12B = -88.195 09 = -88.081 03 = -87.992



Mn/DOT Name: TBM 5 L3597

NGS Name: TBM 5

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BI3597](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	36	133 N	42 W	461709.00	955419.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

1.6 MILES WEST OF UNDERWOOD, 1.5 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK
HIGHWAY 210 AND TRUNK HIGHWAY 35, 160.0 FEET NORTH OF TRUNK HIGHWAY 210

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -88.021 12B = -88.048 09 = -87.930 03 = -87.792



Mn/DOT Name: TBM 6 L3597

NGS Name: TBM 6

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [B13598](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	33	133 N	41 W	461710.00	955055.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

1.0 MILE EAST OF UNDERWOOD, 340.0 FEET NORTH ALONG TRUNK HIGHWAY 35 FROM THE JUNCTION OF TRUNK HIGHWAY 35 AND TRUNK HIGHWAY 210, THEN 1.1 MILES EAST ON TRUNK HIGHWAY 122, 1360.0 FEET NORTH OF TRUNK HIGHWAY 122.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.936 12B = -87.959 09 = -87.848 03 = -87.707



Mn/DOT Name: TBM 61 1 L23961

NGS Name: TBM 61 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9008](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	6	132 N	40 W	461624.00	954543.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON ROD

Disk Type
UNMONUMENTED

Mon. Agency
MN DT

Description:

Stamping:

2.4 MILES SOUTHWEST OF BATTLE LAKE, 2.4 MILES SOUTH ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 NEAR BATTLE LAKE, THEN 0.4 MILE NORTH ON 350TH AVENUE, 20.0 FEET WEST OF 350TH AVENUE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.677 12B = -87.684 09 = -87.588 03 = -87.477



Mn/DOT Name: TBM 61 2 L23961

NGS Name: TBM 61 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9009](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	6	132 N	40 W	461644.00	954547.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	MNDT

Description:

Stamping:

2.4 MILES WEST OF BATTLE LAKE, 2.4 MILES SOUTH ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 78 NEAR BATTLE LAKE, THEN 0.7 MILE NORTH ON 350TH AVENUE, 270.0 FEET WEST OF 350TH AVENUE.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.710 12B = -87.716 09 = -87.618 03 = -87.503



Mn/DOT Name: TBM 61 3 L23961

NGS Name: TBM 61 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9010](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	31	133 N	40 W	461700.00	954550.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	MNDT

Description:

Stamping:

2.4 MILES WEST OF BATTLE LAKE, 0.4 MILE NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 NEAR BATTLE LAKE, THEN 2.3 WEST ON TRUNK HIGHWAY 83, 500.0 FEET SOUTHWEST OF TRUNK HIGHWAY 83.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.736 12B = -87.743 09 = -87.644 03 = -87.523



Mn/DOT Name: TBM 61 A L23961

NGS Name: TBM 61 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AK9020](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>	<u>Mon. Agency</u>
SE	33	133 N	42 W	461711.00	955835.00			1975	1975	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION	
<u>Monument Type</u> IRON ROD																
<u>Disk Type</u> UNMONUMENTED																
<u>Mon. Agency</u> MN DT																

Description:

Stamping:

5.0 MILES WEST OF UNDERWOOD, 5.1 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND TRUNK HIGHWAY 35, THEN 0.2 MILE NORTH ON AURDAL RIVER ROAD, 250.0 FEET EAST OF AURDAL RIVER ROAD.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -88.126 12B = -88.140 09 = -88.018 03 = -87.903



Mn/DOT Name: TBM 7 L3597

NGS Name: TBM 7

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [B13599](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>	<u>Mon. Agency</u>
SE	35	133 N	41 W	461716.00	954831.00			1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION	NGS
<u>Monument Type</u> IRON ROD																
<u>Disk Type</u> UNMONUMENTED																

Description:

Stamping:

3.04 MILES EAST OF UNDERWOOD.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.867 12B = -87.880 09 = -87.775 03 = -87.641



Mn/DOT Name: TBM 8 59228

NGS Name: TBM 8

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ2625](#)
NGS Quad / Sta Num : 46095332/
USGS Quad: ASHBY

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	33	131 N	41 W	460711.00	955048.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

2.3 MILES NORTH OF ASHBY, 2.4 MILES NORTHWEST ALONG TRUNK HIGHWAY 82 FROM THE JUNCTION OF TRUNK HIGHWAY 82 AND TRUNK HIGHWAY 4, THEN 0.4 MILE NORTH ON TRUNK HIGHWAY 117, THEN 0.3 MILE EAST ON TRUNK HIGHWAY 69, 1000.0 FEET SOUTH OF TRUNK HIGHWAY 69.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.080 12B = -87.080 09 = -86.955 03 = -86.932



Mn/DOT Name: TBM 8 L3597

NGS Name: TBM 8

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [B13600](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	36	133 N	41 W	461722.00	954652.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON ROD

Disk Type
UNMONUMENTED

Mon. Agency
NGS

Description:

Stamping:

3.3 MILES NORTHWEST OF BATTLE LAKE, 0.4 MILE NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210, THEN 2.8 MILES WEST ON TRUNK HIGHWAY 83, THEN 1.2 MILES NORTHWEST ON TRUNK HIGHWAY 122, THEN 0.3 MILE SOUTHEAST ON TURTLE ROAD, 100.0 FEET NORTHWEST OF TURTLE ROAD.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.812 12B = -87.821 09 = -87.713 03 = -87.588



Mn/DOT Name: TBM 9 59228

NGS Name: TBM 9

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ2626](#) [Get Map](#)
NGS Quad / Sta Num : 46095331/
USGS Quad: STALKER LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	29	131 N	41 W	460751.00	955137.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description: Stamping:

3.32 MILES NORTHWEST OF ASHBY.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.119 12B = -87.123 09 = -87.004 03 = -86.975



Mn/DOT Name: TBM 9 L3597

NGS Name: TBM 9

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BI3601](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	32	133 N	40 W	461710.00	954445.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

1.5 MILES NORTHWEST OF BATTLE LAKE, 0.4 MILE NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 NEAR BATTLE LAKE, THEN 1.5 MILES EAST ON TRUNK HIGHWAY 83, 1400.0 FEET NORTH OF TRUNK HIGHWAY 83.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -87.700 12B = -87.707 09 = -87.605 03 = -87.493



Mn/DOT Name: TBM CHECK POINT 2001 VPELI

NGS Name: TBM CHECK POINT 2001

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DG9843](#) [Get Map](#)
NGS Quad / Sta Num : 46096123/
USGS Quad: LAKE OLAF

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	32	136 N	44 W	463331.00	961434.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2001	2011	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	UNMONUMENTED	MNDT

Description:

Stamping:

7.6 MILES WEST OF PELICAN RAPIDS, 8.3 MILES WEST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAYS 108 (1ST AVENUE NORTHWEST) AND 59 (BROADWAY) IN PELICAN RAPIDS.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>		
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1330.070	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1330.155	.016	2/1				VERTICAL ADJUSTMENT	2006	00000497
1330.132	.016	2/1				VERTICAL CONTROL SURVEY	2001	VPELI

Geoid Separations(ft): GEOID18 = -87.693 12B = -87.677 09 = -87.575 03 = -87.493

* No Horizontal Positions in the Database *



Mn/DOT Name: TBM CITY 59228

NGS Name: TBM CITY

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BZ3147](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	34	133 N	43 W	461700.00	960425.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:
IN FERGUS FALLS.

Stamping:

Leveling-Derived Orthometric Heights (Feet)

GA1912

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1189.273	.007	1				VERTICAL ADJUSTMENT		1914	GA1912

Geoid Separations(ft): GEOID18 = -88.195 12B = -88.195 09 = -88.081 03 = -87.992

* No Horizontal Positions in the Database *



Mn/DOT Name: TBM CITY L3037

NGS Name: TBM CITY

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [BM1413](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	3	132 N	43 W	461655.00	960421.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	1934	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	UNMONUMENTED	NGS

Description:

Stamping:

IN FERGUS FALLS, 2.4 MILES EAST ALONG WEST LINCOLN AVENUE FROM THE JUNCTION OF WEST LINCOLN AVENUE AND TRUNK HIGHWAY 94, THEN 0.1 MILE SOUTH ON SOUTH CASCADE STREET, 20.0 FEET WEST OF SOUTH CASCADE STREET.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -88.192 12B = -88.192 09 = -88.074 03 = -87.985



Mn/DOT Name: TBM PBM M 61 MNDT L22167-1

NGS Name: TBM PBM M 61 MNDT

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	36	133 N	43 W	461723.00	960226.00		

NGS ACRN: [AO3664](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1967	1967	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type
IRON ROD

Disk Type
UNMONUMENTED

Mon. Agency
MNDT

Description:

Stamping:

IN FERGUS FALLS, 1.9 MILES EAST ALONG WEST LINCOLN AVENUE FROM THE JUNCTION OF WEST LINCOLN AVENUE AND TRUNK HIGHWAY 94, THEN 0.9 MILE NORTH ON NORTH BROADWAY, THEN 1.3 MILES EAST ON WEST FIR AVENUE, THEN 0.6 MILE EAST ON EAST FIR AVENUE, THEN 0.4 MILE SOUTH ON WATER PLANT ROAD, 1150.0 FEET SOUTH-SOUTHEAST OF WATER PLANT ROAD.

** No Horizontal or Vertical Positions in the Database **

Geoid Separations(ft): GEOID18 = -88.189 12B = -88.189 09 = -88.081 03 = -87.982



Mn/DOT Name: TEN MILE LAKE LUTHERAN CHURCH

NGS Name: TEN MILE LAKE LUTHERAN CHURCH

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO1120](#) [Get Map](#)
NGS Quad / Sta Num : 46095334/1020
USGS Quad: DALTON

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	22	131 N	42 W	460838.49	955624.27		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2013	NOT FOUND	Horz=? Vert=?	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	CHURCH SPIRE	MNDT

Description: (1978)

Stamping:

1.0 MILE NORTHEAST OF TEN MILES LAKE, 2.5 MILES SOUTHWEST OF DALTON.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.198 12B = -87.201 09 = -87.063 03 = -87.027

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 08 38.48917	95 56 24.26582	443366.318	113805.819	.328	4	ADJUSTMENT	1999	17648
46 08 38.48907	95 56 24.26558	443366.334	113805.809	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 08 38.48857	95 56 24.25409	443367.143	113805.756	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>Geodetic Position</u>								<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 08 38.63900	95 56 23.06100			.100	4	CLASSICAL SURVEY	1963	13276	

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2196323.589	749823.403	895465.866	16779010.004	.328	4	ADJUSTMENT	1999	17648
2196323.606	749823.392	895465.883	16779009.993	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2196324.413	749823.324	895466.690	16779009.913	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - Central Zone</u>								<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
1571729.095	421750.687			.100	4	CLASSICAL SURVEY	1963	13276	



Mn/DOT Name: TENT MNDT TEMP

NGS Name: TENT TEMP

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AD9309](#) [Get Map](#)
NGS Quad / Sta Num : 46095423/
USGS Quad: DENT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	33	136 N	40 W	463322.00	954425.42		2

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1982	2023	GOOD	Horz=NO Vert=NO	NO		RECESSED 2 IN.	MARKER IS STEEL ROD

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE POST (PREFABRICATED)	SURVEY DISK	MNDT

Description: (1982) **Stamping:** TENT 1982

0.95 MILE WEST OF DENT, AT TRUNK HIGHWAY 108 MILEPOINT 30.5, 25.0 FEET SOUTH OF TRUNK HIGHWAY 108, 8.5 FEET WEST OF A DRIVEWAY, 40.20 FEET NORTHEAST OF A NAIL AND A DISK, 59.28 FEET NORTHWEST OF A NAIL AND A DISK IN A 14.0 INCH DIAMETER BOXELDER TREE. THE STATION, A 2.0 INCH DIAMETER BY 2.0 INCH DIAMETER ALUMINUM CAP RIVETED TO A DRIVEN 30.0 INCH TELSPAR.

Station Notes

THE SURVEY MARK IS UNSUITABLE FOR MNDOT GEODETIC SURVEYS.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1365.798	.262		1278.508	.197	2011	GPS - RTRN	2023	RTRN2023
1364.531	.197		1277.419	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1364.597						RECIPROCAL VERTICAL ANGLE	1982	HORZ

Geoid Separations(ft): GEOID18 = -87.290 12B = -87.283 09 = -87.165 03 = -87.054

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 33 21.99580	95 44 25.41535	494030.414	264018.986	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 33 21.99462	95 44 25.41528	494030.419	264018.866	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 33 21.99133	95 44 25.41617	494030.357	264018.533	.066	2	ADJUSTMENT	1997	16997

NAD27

<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>						<u>Year</u>	<u>Reference</u>
46 33 22.14060	95 44 24.24940			.100		CLASSICAL SURVEY	1950	UNK



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2249753.066	899053.224	951261.628	16927415.917	.131	3	GPS - RTRN	2023	RTRN2023

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2249753.069	899053.104	951261.629	16927415.798	.066	2	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2249753.000	899052.772	951261.555	16927415.467	.066	2	ADJUSTMENT	1997	16997

NAD27

MN State Plane - Central Zone		<u>X</u>	<u>Y</u>	Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1625156.695	570979.443			.100		CLASSICAL SURVEY	1950	UNK

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TENT_TEMP-AD9309-3S-31JUL2023.jpg	S	Jul 31, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TENT_TEMP-AD9309-2-31JUL2023.jpg		Jul 31, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TENT_TEMP-AD9309-1-31JUL2023.jpg		Jul 31, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: THOMAS

NGS Name: THOMAS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	10	131 N	42 W	461036.80	955611.50		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2009	2009	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 20 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2009)

Stamping: THOMAS 2009

1.1 MILES WEST OF DALTON, 0.65 MILE WEST ALONG COUNTY ROAD 82 FROM THE JUNCTION OF COUNTY ROAD 82 AND COUNTY ROAD 12 (WEST MAIN STREET) IN DALTON, 123.0 FEET NORTH OF COUNTY ROAD 82, 21.0 FEET SOUTH OF DRIVEWAY NUMBER 14708, 111.0 FEET NORTHEAST OF A POWER POLE, 33.6 FEET SOUTH OF A RIGHT-OF-WAY POST, 92.7 FEET NORTHWEST OF A POWER POLE, 48.7 FEET NORTH OF A RIGHT-OF-WAY POST, 1.6 FEET SOUTH OF A WITNESS POST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.378 12B = -87.392 09 = -87.260 03 = -87.218

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/THOMAS-3N-05NOV2009.jpg	N	Nov 5, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/THOMAS-2-05NOV2009.jpg		Nov 5, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/THOMAS-1-05NOV2009.jpg		Nov 5, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: TORG

NGS Name: TORG

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DS2955](#) [Get Map](#)
NGS Quad / Sta Num : 46095324/
USGS Quad: EAGLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	3	131 N	40 W	461140.50	954205.59		C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 69 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: TORG 2014

6.5 MILES SOUTH OF BATTLE LAKE, 5.6 MILES SOUTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE TO TRUNK HIGHWAY 78 MILEPOINT 16.0, THEN 0.30 MILE EAST ON COUNTY ROAD 81, 33.2 FEET SOUTH OF COUNTY ROAD 81, 78.5 FEET WEST OF A DRIVEWAY NUMBER 15839, 46.9 FEET NORTH OF AN EAST/WEST FENCE, 1.5 FEET EAST OF A WITNESS POST.

Station Pair: 5619 F - OTTER TAIL, MN

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order</u> (/Class)	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1369.167			1282.018	.012	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1369.223	.131		1282.133	.066	1996	GPS - STATIC	2024	HTH78B
1369.167			1282.018	.012	2011	GPS - STATIC	2024	HTH78B
1369.079	.262		1281.963	.197	2011	GPS - RTRN	2023	RTRN2023
1369.085	.262		1281.956	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.116 12B = -87.129 09 = -87.021 03 = -86.978

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 11 40.49531	95 42 05.59400	503827.569	132164.559	.010		ADJUSTMENT	2024	GPS3771
46 11 40.49531	95 42 05.59400	503827.569	132164.559	.010	C	GPS - STATIC	2024	HTH78B
46 11 40.49522	95 42 05.59463	503827.524	132164.551	.131	3	GPS - RTRN	2023	RTRN2023
46 11 40.49501	95 42 05.59387	503827.578	132164.529	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 11 40.49517	95 42 05.59429	503827.548	132164.545	.033	C	GPS - STATIC	2024	HTH78B

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2257106.128	767057.243	956527.123	16795291.829	.010		ADJUSTMENT	2024	GPS3771
2257106.128	767057.243	956527.123	16795291.829	.010	C	GPS - STATIC	2024	HTH78B
2257106.083	767057.235	956527.079	16795291.821	.131	3	GPS - RTRN	2023	RTRN2023
2257106.136	767057.213	956527.131	16795291.798	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2257106.107	767057.229	956527.102	16795291.816	.033	C	GPS - STATIC	2024	HTH78B

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TORG-3S-16OCT2023.jpg	S	Oct 16, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TORG-2-16OCT2023.jpg		Oct 16, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TORG-1-16OCT2023.jpg		Oct 16, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: TORGY

NGS Name: TORGY

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095331/
USGS Quad: STALKER LAKE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	7	131 N	40 W	461048.80	954504.48		3	2000	2009	GOOD	Horz=YES Vert=YES	NO		RECESSED 4 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2000)

Stamping: TORGY 2000

8.05 MILES EAST OF DALTON, 8.05 MILES EAST ALONG COUNTY ROAD 12 FROM THE JUNCTION OF COUNTY ROAD 12 AND COUNTY ROAD 35 IN DALTON, 48.0 FEET SOUTH OF COUNTY ROAD 12, 260.0 FEET WEST OF 355TH AVENUE, 50.8 FEET EAST OF A POWER POLE, 3.6 FEET EAST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Year</u>	<u>Reference</u>
1431.857	.262		1344.846	.197	1996	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.145 12B = -87.159 09 = -87.057 03 = -87.008

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Project Info</u>		
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Year</u>	<u>Reference</u>	
46 10 48.79754	95 45 04.48199	491240.158	126928.793	2009	RTRN2009	

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>		
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Year</u>	<u>Reference</u>	
2244425.645	762056.122	943766.850	16790489.472	2009	RTRN2009	



Mn/DOT Name: TRIPP

NGS Name: TRIPP

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NW	29	133 N	44 W	461840.39	961457.70		3	2000	2014	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2011)

Stamping: TRIPP 2000

8.5 MILES NORTHWEST OF FERGUS FALLS, 6.8 MILES WEST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, TO TRUNK HIGHWAY 210 MILEPOINT 17.55, THEN 2.0 MILES NORTH ON 110TH AVENUE, THEN 0.5 MILE EAST ON COUNTY ROAD 11, 26.0 FEET SOUTH OF COUNTY ROAD 11, 13.0 FEET WEST OF A FIELD ENTRANCE, 6.5 FEET EAST OF A WITNESS POST. THE ROD DEPTH IS UNKNOWN.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1080.126	.262			991.924	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -88.359 12B = -88.343 09 = -88.241 03 = -88.202

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 18 40.39235	96 14 57.69885			365373.624	175156.122	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2119490.163	812598.395			819600.888	16843009.953	.131	3	GPS - RTRN	2009 RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TRIPP-3S-09OCT2008.jpg	S	Oct 9, 2008
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TRIPP-2-09OCT2008.jpg		Oct 9, 2008
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TRIPP-1-09OCT2008.jpg		Oct 9, 2008

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: TT 15 MF

NGS Name: TT 15 MF

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096231/
USGS Quad: CAMPBELL NE

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<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	36	132 N	45 W	461208.00	961554.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1950	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type

CONCRETE MONUMENT (CAST-IN-PLACE)

Disk Type

SEE DESCRIPTION

Mon. Agency

USGS

Description: (2008)

Stamping: TT 15 MF 1950

5.5 MILES SOUTH AND 2.0 MILES EAST OF FOXHOME, 5.1 MILES SOUTH ALONG COUNTY HIGHWAY 19 (HOEFLING STREET) FROM THE JUNCTION OF COUNTY HIGHWAY 19 (HOEFLING STREET) AND DENNISTON AVENUE IN FOXHOME, THEN 2.0 MILES EAST ALONG TEE-ROAD 297, NEAR THE QUARTER CORNER BETWEEN SECTIONS 31 AND 36, 28.0 FEET SOUTH AND 32.0 FEET WEST OF THE CROSSROADS.

Station Notes

FOUND THE ROD WITH THE CAP MISSING.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1039.030	.033	3				VERTICAL CONTROL SURVEY	1973 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.956 12B = -87.903 09 = -87.821 03 = -87.792

* No Horizontal Positions in the Database *



Mn/DOT Name: TT 16 MF

NGS Name: TT 16 MF

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096224/
USGS Quad: ORWELL LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	8	131 N	44 W	461050.00	961444.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1950	1973	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	USGS

Description: (1950)

Stamping: TT 16 MF 1950

124.0 FEET SOUTH AND 33.0 FEET EAST OF THE CROSSROADS, 4.0 FEET NORTH AND 90.0 FEET OF A SOUTH CORNER FENCE POST, THE FENCES ARE SOUTH-EAST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1050.670	.033	3				VERTICAL CONTROL SURVEY	1973 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.769 12B = -87.700 09 = -87.624 03 = -87.611

* No Horizontal Positions in the Database *



Mn/DOT Name: TT 17 MF

NGS Name: TT 17 MF

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096224/
USGS Quad: ORWELL LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	18	131 N	44 W	460909.00	961444.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1950	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	USGS

Description: (1950)

Stamping: TT 17 MF 1950

3.0 MILES WEST OF WESTERN, 3.0 MILES WEST ALONG 130TH STREET AND COUNTY ROAD 15 IN WESTERN, 130.0 FEET NORTH AND 43.0 FEET WEST OF 130TH STREET, 1.0 FOOT NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1041.697	.033	3				VERTICAL CONTROL SURVEY	1973 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.523 12B = -87.447 09 = -87.372 03 = -87.365

* No Horizontal Positions in the Database *



Mn/DOT Name: TT 18 MF

NGS Name: TT 18 MF

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096223/
USGS Quad: STONY LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	31	131 N	44 W	460642.00	961443.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1950	2009	NOT FOUND	Horz=? Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	USGS

Description: (1950) Stamping: TT 18 MF 1950

6.0 MILES NORTH AND 7.0 MILES WEST OF WENDELL, 1135.0 FEET WEST AND 34.0 FEET SOUTH OF A ROAD CROSSING, 1.0 FOOT WEST OF A WITNESS POST.

Station Notes

PULLED THE TIES, THEY FALL IN A DITCH BOTTOM.

Leveling-Derived Orthometric Heights (Feet)

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1026.786	.033	3				VERTICAL CONTROL SURVEY	1973 USGS-VERT

Geoid Separations(ft): GEOID18 = -87.218 12B = -87.175 09 = -87.080 03 = -87.037

* No Horizontal Positions in the Database *



Mn/DOT Name: TUMULI MNDT

NGS Name: TUMULI

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0597](#) [Get Map](#)
NGS Quad / Sta Num : 46095334/1011
USGS Quad: DALTON

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	15	131 N	42 W	460926.83	955703.07	2	2

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1962	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	SURVEY DISK	MNDT

Description: (1973) **Stamping:** TUMULI 1962

1.5 MILES SOUTHWEST OF DALTON, 1.15 MILES NORTHWEST ON INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 35, 176.5 FEET EAST OF AN INTERSTATE HIGHWAY 94 NORTHEAST RIGHT-OF-WAY FENCE, 1.5 FEET SOUTH OF AN EAST-WEST FENCE LINE, 3.7 FEET SOUTHWEST OF A WITNESS POST, 220.27 FEET NORTHEAST OF TUMULI RM 3, 239.10 FEET EAST-SOUTHEAST OF TUMULI RM 4.

Leveling-Derived Orthometric Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj			Year	Reference
1341.244	.016	2/0						VERTICAL ADJUSTMENT	1991	00000025

NGVD29				Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj			Year	Reference
1340.542	.016	2						VERTICAL CONTROL SURVEY	1972	Q460953
1340.542	.016	2						VERTICAL CONTROL SURVEY	1972	L22167-A
1340.542	.016	2						VERTICAL CONTROL SURVEY	1971	L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj			Year	Reference
1341.237	.197			1254.184	.131	1996		HORIZONTAL ADJUSTMENT	1999	17648

Geoid Separations(ft): GEOID18 = -87.270 12B = -87.277 09 = -87.136 03 = -87.096

Lat/Lon and County Coordinates (Feet)

NAD83(1996)		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 09 26.82816	95 57 03.07259	440648.183	118710.734	.066	2	ADJUSTMENT	1999	17648
46 09 26.82812	95 57 03.07243	440648.194	118710.730	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 09 26.82733	95 57 03.06080	440649.012	118710.647	.066	2	ADJUSTMENT	1986	17289

NAD27		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order	Reference
46 09 26.97700	95 57 01.86560			.100	2	CLASSICAL SURVEY 1963 13276



State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2193697.079	754777.121	892916.581	16784005.847	.066	2	ADJUSTMENT	1999	17648
2193697.091	754777.117	892916.592	16784005.842	.066	2	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2193697.908	754777.019	892917.407	16784005.732	.066	2	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1569102.633	426704.265			.100	2	CLASSICAL SURVEY	1963	13276



Mn/DOT Name: TUMULI RM 1

NGS Name: TUMULI RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP5023](#) [Get Map](#)
NGS Quad / Sta Num : 46095334/1011
USGS Quad: DALTON

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	15	131 N	42 W	460926.00	955702.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2009	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 2 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: Stamping: TUMULI NO 1 1962

1.5 MILES SOUTHWEST OF DALTON, 1.15 MILES NORTHWEST ON INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 35, 1.5 FEET SOUTH OF AN EAST-WEST FENCE LINE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.267 12B = -87.277 09 = -87.136 03 = -87.096



Mn/DOT Name: TUMULI RM 2

NGS Name: TUMULI RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP5024](#) [Get Map](#)
NGS Quad / Sta Num : 46095334/1011
USGS Quad: DALTON

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	15	131 N	42 W	460926.00	955705.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1962	2009	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 2 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: Stamping: TUMULI NO 2 1962

1.5 MILES SOUTHWEST OF DALTON, 1.15 MILES NORTHWEST ON INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 35, 2.0 FEET SOUTH OF AN EAST-WEST FENCE LINE.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.267 12B = -87.277 09 = -87.136 03 = -87.096



Mn/DOT Name: TUMULI RM 3

NGS Name: TUMULI RM 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R00598](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	15	131 N	42 W	460924.96	955704.66	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1963	2023	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2015)

Stamping: TUMULI NO 3 1963

1.5 MILES SOUTHWEST OF DALTON, 1.15 MILES NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 35 (THE JUNCTION IS 2.0 MILES SOUTH-SOUTHWEST OF DALTON), AT INTERSTATE HIGHWAY 94 MILEPOINT 66.55, 193.7 FEET EAST-NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 8.0 FEET NORTHWEST OF A BRACE POST, 2.0 FEET WEST OF AN EAST RIGHT-OF-WAY FENCE, 289.0 FEET SOUTH OF STATION TUMULI RM 4, 1.0 FOOT SOUTH OF A WITNESS POST.

Station Pair: FORMOE - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1338.485	.016	2/1				VERTICAL ADJUSTMENT	2019 00000941
1338.505	.016	2/1				VERTICAL ADJUSTMENT	2017 00000911
1338.495	.016	2/1				VERTICAL CONTROL SURVEY	2016 VI94D4
1338.495	.016	2/0				VERTICAL ADJUSTMENT	1991 00000025

<u>NGVD29</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1337.793	.016	2/0				UNKNOWN/APPROXIMATE	1992 UNCHECKD
1337.793	.016	2				VERTICAL CONTROL SURVEY	1972 Q460953
1337.793	.016	2				VERTICAL CONTROL SURVEY	1972 L22167-A
1337.793	.016	2				VERTICAL CONTROL SURVEY	1971 L22167-A

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1338.485			1251.287	.020	2011	HORIZONTAL ADJUSTMENT	2025 GPS3847
1338.485			1251.287	.020	2011	GPS - STATIC	2025 HTH94B
1338.514	.262		1251.247	.197	2011	GPS - RTRN	2023 RTRN2023
1338.498	.262		1251.225	.197	2011	GPS - RTRN	2015 RTRN2015
1338.413	.262		1251.320	.197	1996	GPS - RTRN	2009 RTRN2009

Geoid Separations(ft): GEOID18 = -87.267 12B = -87.273 09 = -87.132 03 = -87.093

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>			<u>Geodetic Position</u>			<u>Project Info</u>		
			<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 09 24.95653	95 57 04.65726	440536.061	118521.458	.013		ADJUSTMENT	2025	GPS3847
46 09 24.95653	95 57 04.65726	440536.061	118521.458	.013	C	GPS - STATIC	2025	HTH94B
46 09 24.95622	95 57 04.65713	440536.070	118521.426	.131	3	GPS - RTRN	2023	RTRN2023
46 09 24.95550	95 57 04.65593	440536.154	118521.353	.131	3	GPS - RTRN	2015	RTRN2015

<u>NAD83(1996)</u>			<u>Geodetic Position</u>			<u>Project Info</u>		
			<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 09 24.95600	95 57 04.65787	440536.018	118521.404	.066		NCAT	2025	HTH94B
46 09 24.95728	95 57 04.65846	440535.977	118521.534	.131	3	GPS - RTRN	2009	RTRN2009



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2193581.488	754589.979	892798.031	16783820.483	.013		ADJUSTMENT	2025	GPS3847
2193581.488	754589.979	892798.031	16783820.483	.013	C	GPS - STATIC	2025	HTH94B
2193581.497	754589.947	892798.040	16783820.451	.131	3	GPS - RTRN	2023	RTRN2023
2193581.580	754589.872	892798.121	16783820.375	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2193581.445	754589.926	892797.987	16783820.431	.066		NCAT	2025	HTH94B
2193581.406	754590.056	892797.950	16783820.562	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TUMULI_RM_3-RO0598-3E-14AUG2023.jpg	E	Aug 14, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TUMULI_RM_3-RO0598-2-14AUG2023.jpg		Aug 14, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TUMULI_RM_3-RO0598-1-14AUG2023.jpg		Aug 14, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: TUMULI RM 4

NGS Name: TUMULI RM 4

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0596](#)

[Get Map](#)

NGS Quad / Sta Num : 46095334/

USGS Quad: DALTON

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	15	131 N	42 W	460927.57	955706.29	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1963	2015	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	MNDT

Description: (2015)

Stamping: TUMULI NO 4 1963

1.5 MILES SOUTHWEST OF DALTON, 1.15 MILES NORTHWEST ALONG INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 35 (THE JUNCTION IS 2.0 MILES SOUTH-SOUTHWEST OF DALTON), AT INTERSTATE HIGHWAY 94 MILEPOINT 66.50, 193.3 FEET EAST-NORTHEAST OF WESTBOUND INTERSTATE HIGHWAY 94, 289.0 FEET NORTH OF STATION TUMULI RM 3, 2.0 FEET WEST OF AN EAST RIGHT-OF-WAY FENCE, 4.0 FEET NORTH-NORTHWEST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1334.374	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941	
1334.394	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911	
1334.384	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4	
1334.361	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025	

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1333.662	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1333.662	.016	2				VERTICAL CONTROL SURVEY	1972	Q460953	
1333.662	.016	2				VERTICAL CONTROL SURVEY	1972	L22167-A	
1333.662	.016	2				VERTICAL CONTROL SURVEY	1971	L22167-A	

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1334.384	.262		1247.104	.197	2011	GPS - RTRN	2015	RTRN2015	
1334.253	.262		1247.153	.197	1996	GPS - RTRN	2009	RTRN2009	

Geoid Separations(ft): GEOID18 = -87.270 12B = -87.280 09 = -87.139 03 = -87.100

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 09 27.57313	95 57 06.29244	440421.732	118786.876	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 09 27.57450	95 57 06.29388	440421.631	118787.015	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2193472.108	754857.432	892692.827	16784089.702	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2193472.010	754857.572	892692.731	16784089.845	.131	3	GPS - RTRN	2009	RTRN2009



<u>Station Photos</u>			
<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TUMULI_RM_4-RO0596-3E-14SEP2015.jpg	E	Sep 14, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TUMULI_RM_4-RO0596-2-14SEP2015.jpg		Sep 14, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TUMULI_RM_4-RO0596-1-14SEP2015.jpg		Sep 14, 2015
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: TURTLE

NGS Name: TURTLE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SE	19	133 N	40 W	461902.70	954535.00			2000	2009	GOOD	Horz=YES Vert=YES	NO		FLUSH	MARKER W/BAR MAGNET

Monument Type

ALUMINUM ALLOY ROD (NO SLEEVE)

Disk Type

SURVEY DISK

Mon. Agency

MNDT

Description: (2000)

Stamping: TURTLE 2000

3.0 MILES NORTHWEST OF BATTLE LAKE, 0.4 MILE NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, TO TRUNK HIGHWAY 78 MILEPOINT 21.9, THENCE 4.8 MILES WEST AND NORTH ALONG COUNTY ROAD 83, 44.0 FEET WEST OF COUNTY ROAD 83, 16.0 FEET SOUTH OF A FIELD ENTRANCE, 4.0 FEET NORTH OF A WITNESS POST.

Station Notes

THE ROD DEPTH IS UNKNOWN.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.864 12B = -87.871 09 = -87.766 03 = -87.638



Mn/DOT Name: TYLER

NGS Name: TYLER

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46096231/
USGS Quad: CAMPBELL NE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	6	131 N	44 W	461051.02	961554.83		3	2001	2010	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MN-111

Description: (2008)

Stamping: TYLER 2001

10.5 MILES EAST OF DORAN, 10.4 MILES EAST ALONG COUNTY ROAD 8 FROM THE JUNCTION OF COUNTY ROAD 8 AND TRUNK HIGHWAY 9 IN DORAN, 52.1 FEET NORTH OF COUNTY ROAD 2/8, 37.0 FEET EAST OF 240TH AVENUE, 2.0 FEET SOUTH OF A RIGHT-OF-WAY POST, 1.4 FEET EAST OF A WITNESS POST. THE ROD DEPTH IS UNKNOWN.

Station Notes

FOUND THE CAP LOOSE.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order</u> (/Class)		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1040.634	.262			952.994	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.795 12B = -87.733 09 = -87.661 03 = -87.641

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Otter Tail County</u>				<u>Project Info</u>	
<u>Geodetic Position</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>Latitude</u>	<u>Longitude</u>								
46 10 51.02369	96 15 54.83338			361032.951	127634.296	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	
<u>X</u>	<u>Y</u>								
2114271.444	765171.390			813633.544	16795649.593	.131	3	GPS - RTRN	2009 RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TYLER-3E-06AUG2009.jpg	E	Aug 6, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TYLER-2-06AUG2009.jpg		Aug 6, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TYLER-1-06AUG2009.jpg		Aug 6, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: TYLER RESET

NGS Name: TYLER RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5802](#)
NGS Quad / Sta Num : 46096231/
USGS Quad: CAMPBELL NE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	6	131 N	44 W	461051.02	961554.83		C	2010	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 6 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2010)

Stamping: TYLER 2001 2010

10.5 MILES EAST OF DORAN, 10.4 MILES EAST ALONG COUNTY ROAD 8 FROM THE JUNCTION OF COUNTY ROAD 8 AND TRUNK HIGHWAY 9 IN DORAN, 52.1 FEET NORTH OF COUNTY ROAD 2/8, 37.0 FEET EAST OF 105TH AVENUE, 2.0 FEET NORTH OF A RIGHT-OF-WAY POST, 1.4 FEET EAST OF A WITNESS POST.

Station Notes

THE ROD DEPTH IS UNKNOWN.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u> <u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1040.648	.131		952.987	.066	1996	GPS - STATIC	2021 HOTTE
1040.618			952.833	.025	2011	HORIZONTAL ADJUSTMENT	2020 GPS3384
1040.618			952.833	.025	2011	GPS - STATIC	2020 HOTTE

Geoid Separations(ft): GEOID18 = -87.798 12B = -87.733 09 = -87.661 03 = -87.641

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u> <u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 10 51.02342	96 15 54.83253	361033.011	127634.268	.016		ADJUSTMENT	2020	GPS3384
46 10 51.02342	96 15 54.83253	361033.011	127634.268	.016	C	GPS - STATIC	2020	HOTTE

<u>NAD83(1996)</u> <u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 10 51.02310	96 15 54.83303	361032.975	127634.236	.033	C	GPS - STATIC	2021	HOTTE

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u> <u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2114271.503	765171.361	813633.602	16795649.563	.016		ADJUSTMENT	2020	GPS3384
2114271.503	765171.361	813633.602	16795649.563	.016	C	GPS - STATIC	2020	HOTTE

<u>NAD83(1996)</u> <u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2114271.467	765171.330	813633.566	16795649.532	.033	C	GPS - STATIC	2021	HOTTE

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TYLER_RESET-DR5802-3E-08OCT2014.jpg	E	Oct 8, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TYLER_RESET-DR5802-2-08OCT2014.jpg		Oct 8, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/TYLER_RESET-DR5802-1-08OCT2014.jpg		Oct 8, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: U 3

NGS Name: U 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0785](#) [Get Map](#)
NGS Quad / Sta Num : 46095334/
USGS Quad: DALTON

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	3	131 N	42 W	461151.00	955738.00	1	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1903	1935	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	BENCH MARK DISK	NGS

Description: (1935)

Stamping:

2.2 MILES NORTHWEST ALONG THE GREAT NORTHERN RAILWAY FROM DALTON, 0.5 MILE WEST OF MILEPOST 178, IN THE NORTHEAST CORNER OF THE COPING OF A STONE ARCH BRIDGE, 9.0 FEET LOWER THAN THE TRACK, ON THE NORTH RIGHT-OF-WAY, ON THE NORTHEAST CORNER OF THE COPING OF A STONE ARCH BRIDGE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1242.442	.007	1				VERTICAL CONTROL SURVEY	1993	POSTED

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1241.687	.007	1				VERTICAL CONTROL SURVEY	1905	L36 MINN

GA1912

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1242.123	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -87.565 12B = -87.569 09 = -87.437 03 = -87.385

* No Horizontal Positions in the Database *



Mn/DOT Name: U 61

NGS Name: U 61

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0506](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	36	132 N	41 W	461719.00	954758.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1975) Stamping: U 61 1934

3.6 MILES EAST ON A RAILROAD FROM UNDERWOOD, 900.0 FEET EAST OF RAILROAD MILEPOST 36, 30.0 FEET EAST OF A ROAD, 30.0 FEET NORTH OF A RAILROAD.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1339.741	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1338.928	.007	1				VERTICAL CONTROL SURVEY	1941	Q460953
1338.928	.007	1				VERTICAL CONTROL SURVEY	1934	L40 MINN

Geoid Separations(ft): GEOID18 = -87.851 12B = -87.864 09 = -87.759 03 = -87.624

* No Horizontal Positions in the Database *



Mn/DOT Name: UNDERWOOD

NGS Name: UNDERWOOD

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0496](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/1028
USGS Quad: UNDERWOOD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
NE	5	132 N	41 W	461646.42	955149.43	2	C	1974	2024	GOOD	Horz=YES Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	NGS

Description: (1994) Stamping: UNDERWOOD 1974

0.5 MILE SOUTHEAST OF UNDERWOOD, 0.50 MILE EAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN UNDERWOOD, AT TRUNK HIGHWAY 210 MILEPOINT 38.05, 98.0 FEET SOUTH OF TRUNK HIGHWAY 210, 70.0 FEET EAST OF GERMAN LAKE ROAD, 81.36 FEET SOUTH-SOUTHEAST OF UNDERWOOD RM 2, 59.15 FEET WEST OF UNDERWOOD RM 1, 3.0 FEET NORTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1362.537	.016	2/1					VERTICAL ADJUSTMENT	2019	00000941
1362.524	.016	2/1					VERTICAL ADJUSTMENT	2017	00000911
1362.524	.016	2/1					VERTICAL CONTROL SURVEY	2016	VOTTE
1362.550	.016	2/1					VERTICAL ADJUSTMENT	2008	00000425-26
1362.550	.016	2/1					VERTICAL CONTROL SURVEY	2006	VKATC
1362.550	.016	2/1					VERTICAL ADJUSTMENT	1991	00000025

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1361.759	.016	2/1					UNKNOWN/APPROXIMATE	1992	UNCHECKD
1361.759	.016	2					VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1362.537				1274.564	.010	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1362.435	.131			1274.660	.066	1996	GPS - STATIC	2024	HTH210A
1362.537				1274.564	.010	2011	GPS - STATIC	2024	HTH210A
1362.389	.262			1274.450	.197	2011	GPS - RTRN	2023	RTRN2023
1362.415	.262			1274.453	.197	2011	GPS - RTRN	2015	RTRN2015
1362.415	.262			1274.453	.197	2011	GPS - RTRN	2015	RTRN2015
				1274.564	.011	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1362.350	.262			1274.640	.197	1996	GPS - RTRN	2009	RTRN2009
				1274.679	.011	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1362.563	.131			1274.824	.066	1996	HORIZONTAL ADJUSTMENT	2005	GPS2135
1362.563	.131			1274.824	.066	1996	GPS - STATIC	2005	HBATT
1362.563	.131			1274.843	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648
1362.550	.131			1274.824	.066	1996	GPS - STATIC	1997	GPS805-C

Geoid Separations(ft): GEOID18 = -87.936 12B = -87.962 09 = -87.848 03 = -87.710

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 46.42276	95 51 49.43390	462810.932	163191.356	.010		ADJUSTMENT	2025	GPS3793
46 16 46.42276	95 51 49.43390	462810.932	163191.356	.010	C	GPS - STATIC	2024	HTH210A
46 16 46.42341	95 51 49.43363	462810.951	163191.422	.131	3	GPS - RTRN	2023	RTRN2023
46 16 46.42248	95 51 49.43465	462810.879	163191.328	.131	3	GPS - RTRN	2015	RTRN2015
46 16 46.42248	95 51 49.43465	462810.879	163191.328	.131	3	GPS - RTRN	2015	RTRN2015
46 16 46.42276	95 51 49.43390	462810.932	163191.356	.016		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 46.42265	95 51 49.43475	462810.872	163191.346	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 46.42255	95 51 49.43428	462810.905	163191.335	.033	C	GPS - STATIC	2024	HTH210A
46 16 46.42408	95 51 49.43468	462810.878	163191.490	.131	3	GPS - RTRN	2009	RTRN2009
46 16 46.42224	95 51 49.43462	462810.881	163191.304	.033	C	ADJUSTMENT	2005	GPS2135
46 16 46.42224	95 51 49.43462	462810.881	163191.304	.033	C	GPS - STATIC	2005	HBATT
46 16 46.42224	95 51 49.43462	462810.881	163191.304	.033	C	ADJUSTMENT	1999	17648
46 16 46.42224	95 51 49.43462	462810.881	163191.304	.033	C	GPS - STATIC	1997	GPS805-C

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 46.42054	95 51 49.42334	462811.673	163191.130	.033	1	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 16 46.56468	95 51 48.23628			.100	1	CLASSICAL SURVEY	1977	15955

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2216676.411	798833.892	916592.820	16827708.662	.010		ADJUSTMENT	2025	GPS3793
2216676.411	798833.892	916592.820	16827708.662	.010	C	GPS - STATIC	2024	HTH210A
2216676.431	798833.957	916592.842	16827708.727	.131	3	GPS - RTRN	2023	RTRN2023
2216676.358	798833.865	916592.767	16827708.635	.131	3	GPS - RTRN	2015	RTRN2015
2216676.358	798833.865	916592.767	16827708.635	.131	3	GPS - RTRN	2015	RTRN2015
2216676.411	798833.892	916592.820	16827708.662	.016		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2216676.351	798833.882	916592.760	16827708.653	.016		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2216676.384	798833.871	916592.793	16827708.641	.033	C	GPS - STATIC	2024	HTH210A
2216676.359	798834.027	916592.770	16827708.797	.131	3	GPS - RTRN	2009	RTRN2009
2216676.360	798833.840	916592.768	16827708.611	.033	C	ADJUSTMENT	2005	GPS2135
2216676.360	798833.840	916592.768	16827708.611	.033	C	GPS - STATIC	2005	HBATT
2216676.360	798833.840	916592.768	16827708.611	.033	C	ADJUSTMENT	1999	17648
2216676.360	798833.840	916592.768	16827708.611	.033	C	GPS - STATIC	1997	GPS805-C

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2216677.148	798833.652	916593.553	16827708.410	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		<u>X</u>	<u>Y</u>	Acc	Order	Determination Method	Project Info	
<u>X</u>	<u>Y</u>						<u>Year</u>	<u>Reference</u>
1592081.753	470760.182			.100	1	CLASSICAL SURVEY	1977	15955

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/UNDERWOOD-RO0496-3S-21FEB2024.jpg	S	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/UNDERWOOD-RO0496-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/UNDERWOOD-RO0496-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: UNDERWOOD MUN TANK

NGS Name: UNDERWOOD MUN TANK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO1125](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/1029
USGS Quad: UNDERWOOD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>	<u>Mon. Agency</u>
SE	32	133 N	41 W	461657.09	955218.74		4	1974	2015	GOOD	Horz=NO Vert=NO	YES			SEE DESCRIPTION	NGS
Monument Type																
UNKNOWN																
Disk Type																
ELEVATED TANK																

Description: (1974)

Stamping:

AT THE SOUTH EDGE OF UNDERWOOD, 0.05 MILE WEST ALONG THE WEST FRONTAGE ROAD (NORTH SIDE OF TRUNK HIGHWAY 210) FROM THE JUNCTION OF THE WEST FRONTAGE ROAD AND COUNTY ROAD 35 IN UNDERWOOD, THEN 0.1 MILE NORTH ON A GRAVEL ROAD TO A WATER TANK (NORTHWEST OF THE SCHOOL).

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.962 12B = -87.989 09 = -87.874 03 = -87.733

Lat/Lon and County Coordinates (Feet)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 16 57.09083	95 52 18.74440	460754.195	164276.044	.328	4	ADJUSTMENT	1999	17648
46 16 57.09081	95 52 18.74435	460754.199	164276.043	.328	4	ADJUSTMENT	1998	17655

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 16 57.08923	95 52 18.73313	460754.987	164275.881	.328	4	ADJUSTMENT	1986	17289

<u>Geodetic Position</u>							<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 16 57.23418	95 52 17.54713			.100	4	CLASSICAL SURVEY	1977	15955

State Plane and UTM Coordinates (Feet)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2214640.379	799956.323	914574.174	16828863.368	.328	4	ADJUSTMENT	1999	17648
2214640.383	799956.320	914574.178	16828863.366	.328	4	ADJUSTMENT	1998	17655

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2214641.167	799956.145	914574.960	16828863.177	.328	4	ADJUSTMENT	1986	17289

<u>MN State Plane - Central Zone</u>							<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1590045.634	471882.744			.100	4	CLASSICAL SURVEY	1977	15955

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:			
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/UNDERWOOD_MUN_TANK-RO1125-2-09SEP2015.jpg		Sep 9, 2015
Disk:			

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: UNDERWOOD RM 1

NGS Name: UNDERWOOD RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0497](#)[Get Map](#)

NGS Quad / Sta Num : 46095342/

USGS Quad: UNDERWOOD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	5	132 N	41 W	461646.51	955148.60	2	3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1974	2015	GOOD	Horz=NO Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1974)Stamping: UNDERWOOD NO 1 1974

0.5 MILE SOUTHEAST OF UNDERWOOD, 0.5 MILE EAST-SOUTHEAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN UNDERWOOD, AT TRUNK HIGHWAY 210 MILEPOINT 38.5, 130.0 FEET EAST OF GERMAN LAKE ROAD, 118.2 FEET EAST-SOUTHEAST OF UNDERWOOD RM 2, 60.0 FEET SOUTH OF TRUNK HIGHWAY 210, 59.15 FEET NORTHWEST OF STATION UNDERWOOD, 58.2 FEET WEST OF STATION 5602 G, 3.9 FEET NORTH OF A RIGHT-OF-WAY/WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1362.720	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1362.707	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1362.707	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1362.737	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-26
1362.737	.016	2/1				VERTICAL CONTROL SURVEY	2006	VKATC
1362.727	.016	2				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1361.936	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1361.936	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1362.894	.262		1274.932	.197	2011	GPS - RTRN	2015	RTRN2015
1362.894	.262		1274.932	.197	2011	GPS - RTRN	2015	RTRN2015

Geoid Separations(ft): GEOID18 = -87.936 12B = -87.962 09 = -87.848 03 = -87.710

Lat/Lon and County Coordinates (Feet)NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 16 46.51315	95 51 48.60252	462869.348	163200.405	.131	3	GPS - RTRN	2015	RTRN2015
46 16 46.51315	95 51 48.60252	462869.348	163200.405	.131	3	GPS - RTRN	2015	RTRN2015

State Plane and UTM Coordinates (Feet)NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
2216734.977	798841.856	916651.520	16827715.704	.131	3	GPS - RTRN	2015	RTRN2015
2216734.977	798841.856	916651.520	16827715.704	.131	3	GPS - RTRN	2015	RTRN2015

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/UNDERWOOD_RM_1-RO0497-3S-08SEP2015.jpg	S	Sep 8, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/UNDERWOOD_RM_1-RO0497-2-08SEP2015.jpg		Sep 8, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/UNDERWOOD_RM_1-RO0497-1-08SEP2015.jpg		Sep 8, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: UNDERWOOD RM 2

NGS Name: UNDERWOOD RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R00495](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	5	132 N	41 W	461647.10	955150.06	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	2015	GOOD	Horz=NO Vert=YES	YES		RECESSED 30 IN.	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1974) **Stamping:** UNDERWOOD NO 2 1974

0.5 MILE SOUTHEAST OF UNDERWOOD, 0.5 MILE EAST-SOUTHEAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN UNDERWOOD, AT TRUNK HIGHWAY 210 MILEPOINT 38.05, 39.0 FEET SOUTH OF TRUNK HIGHWAY 210, 26.0 FEET EAST OF GERMAN LAKE ROAD, 118.2 FEET WEST-NORTHWEST OF UNDERWOOD RM 1, 81.36 FEET NORTHWEST OF STATION UNDERWOOD, 1.7 FEET NORTH OF A STOP SIGN/WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1357.655	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1357.645	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1357.645	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1357.655	.016	2/1				VERTICAL ADJUSTMENT	2008	00000425-26
1357.655	.016	2/1				VERTICAL CONTROL SURVEY	2006	VKATC
1357.632	.016	2				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1356.841	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1356.841	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1357.573	.262		1269.607	.197	2011	GPS - RTRN	2015	RTRN2015
1357.573	.262		1269.607	.197	2011	GPS - RTRN	2015	RTRN2015
1357.914	.262		1270.204	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.936 12B = -87.966 09 = -87.848 03 = -87.710

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 47.09572	95 51 50.05999	462767.080	163259.614	.131	3	GPS - RTRN	2015	RTRN2015
46 16 47.09572	95 51 50.05999	462767.080	163259.614	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 47.09872	95 51 50.06211	462766.932	163259.918	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2216633.836	798902.941	916551.328	16827778.392	.131	3	GPS - RTRN	2015	RTRN2015
2216633.836	798902.941	916551.328	16827778.392	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2216633.694	798903.247	916551.190	16827778.701	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/UNDERWOOD_RM_2-RO0495-3S-08SEP2015.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/UNDERWOOD_RM_2-RO0495-2-08SEP2015.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/UNDERWOOD_RM_2-RO0495-1-08SEP2015.jpg

<u>Dir</u>	<u>Date</u>
S	Sep 8, 2015
	Sep 8, 2015
	Sep 8, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: UNDERWOOD RM 3

NGS Name: UNDERWOOD RM 3 AZIMUTH

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R00499](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
NE	5	132 N	41 W	461644.56	955129.47	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	2015	GOOD	Horz=NO Vert=YES	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1974) **Stamping:** UNDERWOOD NO 3 1974

0.8 MILE SOUTHEAST OF UNDERWOOD, 0.8 MILE SOUTHEAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND COUNTY ROAD 35 IN UNDERWOOD, AT TRUNK HIGHWAY 210 MILEPOINT 38.3, 74.0 FEET NORTH OF TRUNK HIGHWAY 210, 138.0 FEET EAST OF A FIELD ENTRANCE NORTH, 80.5 FEET EAST OF A RIGHT-OF-WAY MARKER, 2.3 FEET SOUTH OF A POWER POLE WITH A GUY WIRE, 2.3 FEET SOUTHEAST OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1347.320	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1347.310	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1347.310	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE
1347.294	.016	2/1				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1346.503	.016	2/1				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1346.503	.016	2				VERTICAL CONTROL SURVEY	1976	L23961

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1347.179	.262		1259.226	.197	2011	GPS - RTRN	2015	RTRN2015
1347.179	.262		1259.226	.197	2011	GPS - RTRN	2015	RTRN2015
1347.041	.262		1259.345	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.926 12B = -87.953 09 = -87.834 03 = -87.697

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 44.56488	95 51 29.47243	464212.749	163000.581	.131	3	GPS - RTRN	2015	RTRN2015
46 16 44.56488	95 51 29.47243	464212.749	163000.581	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 16 44.56530	95 51 29.47453	464212.601	163000.624	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2218074.270	798617.226	917987.473	16827469.923	.131	3	GPS - RTRN	2015	RTRN2015
2218074.270	798617.226	917987.473	16827469.923	.131	3	GPS - RTRN	2015	RTRN2015

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2218074.123	798617.271	917987.327	16827469.971	.131	3	GPS - RTRN	2009	RTRN2009



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/UNDERWOOD_RM_3_AZIMUTH-RO0499-3N-08SEP2015.jpg	N	Sep 8, 2015
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/UNDERWOOD_RM_3_AZIMUTH-RO0499-2-08SEP2015.jpg		Sep 8, 2015
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/UNDERWOOD_RM_3_AZIMUTH-RO0499-1-08SEP2015.jpg		Sep 8, 2015

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: V 3

NGS Name: V 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0480](#) [Get Map](#)
NGS Quad / Sta Num : 46096221/
USGS Quad: DAYTON HOLLOW DAM

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
NE	19	132 N	42 W	461405.00	960003.00	1	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	2009	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE POST (PREFABRICATED)	BOLT	NGS

Description: (1966)

Stamping:

IN PARKDALE, ALONG A RAILROAD, 255.8 FEET WEST OF RAILROAD MILEPOST 181, AT A PUBLIC ROAD, 2.0 FEET SOUTH OF A RIGHT-OF-WAY FENCE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1232.458	.007	1				VERTICAL CONTROL SURVEY	1993	POSTED

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1231.661	.007	1				VERTICAL CONTROL SURVEY	1929	Q460953
1231.661	.007	1				VERTICAL CONTROL SURVEY	1905	L36 MINN

GA1912

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1232.101	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -87.910 12B = -87.910 09 = -87.795 03 = -87.710

* No Horizontal Positions in the Database *



Mn/DOT Name: V 61

NGS Name: V 61

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0507](#) [Get Map](#)
NGS Quad / Sta Num : 46095342/
USGS Quad: UNDERWOOD

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	31	133 N	40 W	461724.00	954555.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	2009	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 6 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1975) Stamping: V 61 1934

2.0 MILES WEST-NORTHWEST ON A RAILROAD FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND A RAILROAD AT BATTLE LAKE, 0.2 MILE WEST-NORTHWEST OF THE JUNCTION OF COUNTY ROAD 122 AND COUNTY ROAD 83, 16.5 FEET SOUTH OF THE SOUTH RAIL OF THE RAILROAD TRACKS, 126.0 FEET NORTH OF COUNTY ROAD 122, 1.0 FOOT SOUTH OF A WITNESS POST.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1357.192	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1356.418	.016	2				VERTICAL CONTROL SURVEY	1976	L23961
1356.382	.033	3				VERTICAL CONTROL SURVEY	1974	USGS-VERT
1356.382	.007	1				VERTICAL CONTROL SURVEY	1941	Q460953
1356.382	.007	1				VERTICAL CONTROL SURVEY	1934	L40 MINN

Geoid Separations(ft): GEOID18 = -87.772 12B = -87.779 09 = -87.677 03 = -87.556

* No Horizontal Positions in the Database *



Mn/DOT Name: VOLEN

NGS Name: VOLEN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	7	132 N	41 W	461511.57	955305.99		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2000	2009	GOOD	Horz=YES Vert=YES	NO		RECESSED 3 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2000) **Stamping:** VOLEN 2000

2.5 MILES SOUTH OF UNDERWOOD, 2.2 MILES SOUTH AND SOUTHWEST ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 210 IN UNDERWOOD, TO TRUNK HIGHWAY 210 MILEPOINT 37.55, THENCE 0.15 MILE EAST ALONG COUNTY ROAD 39, 31.5 FEET NORTH OF COUNTY ROAD 39, 10.0 FEET WEST OF A FIELD ENTRANCE, 6.0 FEET EAST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>							<u>Project Info</u>	
<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Year</u>	<u>Reference</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>		
1314.787	.262		1227.153	.197	1996	GPS - RTRN	2009 RTRN2009	

Geoid Separations(ft): GEOID18 = -87.851 12B = -87.871 09 = -87.756 03 = -87.634

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Project Info</u>		
<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Year</u>	<u>Reference</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>			
46 15 11.56697	95 53 05.98797	457413.095	153592.510	2009	RTRN2009	

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Project Info</u>		
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Year</u>	<u>Reference</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>			
2211102.533	789337.890	910868.425	16818299.015	2009	RTRN2009	



Mn/DOT Name: VOR FERGUS FALLS FFM

NGS Name: VOR FERGUS FALLS FFM

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0961](#)
NGS Quad / Sta Num : 46096213/
USGS Quad: CARLISLE

[Get Map](#)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	36	133 N	44 W	461721.39	960924.12		4

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1974	1974	GOOD	Horz=? Vert=?	NO			SEE DESCRIPTION

Monument Type

SEE DESCRIPTIVE TEXT

Disk Type

SEE DESCRIPTION

Mon. Agency

NGS

Description: (1974)

Stamping:

4.0 MILES WEST OF FERGUS FALLS, AT THE AIRPORT, 2.0 MILES WEST ON TRUNK HIGHWAY 210 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND TRUNK HIGHWAY 210, 31.55 FEET NORTH OF STATION FERGAIR.

Station Notes

CONTACT THE AIRPORT MANAGER BEFORE USE. FERGUS FALLS MUNICIPAL AIRPORT.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order /(Class)	Height	Acc	Adj	Determination Method	Year Reference
1200.785	.328		1112.839	.328	1996	HORIZONTAL ADJUSTMENT	1999 17648
Geoid Separations(ft): GEOID18 = -88.261 12B = -88.248 09 = -88.136 03 = -88.074							

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 21.39294	96 09 24.12069	388746.702	167008.993	.328	4	ADJUSTMENT	1999	17648
46 17 21.39294	96 09 24.12070	388746.701	167008.993	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

Geodetic Position		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 21.39315	96 09 24.10844	388747.562	167009.009	.328	4	ADJUSTMENT	1986	17289

NAD27

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 17 21.53951	96 09 22.88903			.100	4	CLASSICAL SURVEY	1977	15955

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2142705.374	804021.209	842687.704	16834063.732	.328	4	ADJUSTMENT	1999	17648
2142705.373	804021.209	842687.703	16834063.733	.328	4	ADJUSTMENT	1998	17655

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2142706.234	804021.210	842688.564	16834063.720	.328	4	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
1518110.899	475947.631			.100	4	CLASSICAL SURVEY	1977	15955



Mn/DOT Name: W 3

NGS Name: W 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0104](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
SW	12	132 N	43 W	461529.00	960204.00	1	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1903	1973	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	BOLT	NGS

Description: (1973)

Stamping:

3.8 MILES SOUTHEAST OF FERGUS FALLS, 0.6 MILE SOUTH ALONG COUNTY ROAD 1 (UNION AVENUE) FROM THE JUNCTION OF COUNTY ROAD 1 (UNION AVENUE) AND TRUNK HIGHWAY 210 (WEST LINCOLN AVENUE) IN FERGUS FALLS, THEN 0.9 MILE EAST ALONG WEST CHANNING AVENUE, THEN 1.3 MILES SOUTH-SOUTHEAST ALONG PEBBLE LAKE ROAD, 0.8 MILE NORTH AND EAST ALONG DELAGOON PARK DRIVE, THEN 0.1 MILE EAST ALONG DELAGOON PARK DRIVE, 0.1 MILE NORTH-NORTHEAST AT A FORK ALONG CENTRAL TRAIL LAKES TRAIL, ON THE SOUTH CROPPING OF A STONE ARCH CULVERT OVER A SMALL STREAM.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1204.820	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1204.000	.007	1				VERTICAL CONTROL SURVEY	1972	Q460962
1204.000	.007	1				VERTICAL CONTROL SURVEY	1972	L22167-A
1204.000	.007	1				VERTICAL CONTROL SURVEY	1971	L22167-A
1204.000	.007	1				VERTICAL CONTROL SURVEY	1905	L36 MINN

GA1912

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1204.443	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -88.071 12B = -88.074 09 = -87.953 03 = -87.867

* No Horizontal Positions in the Database *



Mn/DOT Name: W 3 A

NGS Name: W 3 A

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0105](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	2	132 N	43 W	461610.00	960236.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1969	2009	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	SEE DESCRIPTION	MNDT

Description: (1969)

Stamping:

2.0 MILES SOUTHEAST FROM FERGUS FALLS. THE STATION IS LOCATED ABOUT 0.8 MILE EAST OF TRUNK HIGHWAY 59.
THE STATION IS A CHISELED X ON THE SOUTHEAST BOLT OF A RAILROAD SIGNAL (NUMBER 1849) OF 210 SERVICE, 800.0
FEET SOUTH OF RAILROAD MILEPOST 185 NEAR SCRIBNERS FEED SERVICES.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1205.378	.016	2/0				VERTICAL ADJUSTMENT	1991 00000025

Geoid Separations(ft): GEOID18 = -88.126 12B = -88.130 09 = -88.012 03 = -87.920

* No Horizontal Positions in the Database *



Mn/DOT Name: W 61

NGS Name: W 61

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0508](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	4	132 N	40 W	461654.00	954325.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	2015	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	BENCH MARK DISK	NGS

Description: (2010)

Stamping: W 61 1934

0.5 MILE WEST ON RAILROAD FROM BATTLE LAKE, 7 RAILS EAST OF RAILROAD MILEPOST 32, 25.0 FEET EAST OF A ROAD,
40.0 FEET SOUTH OF RAILROAD.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1369.298	.016	2/0				VERTICAL ADJUSTMENT	1991 00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u> <u>Reference</u>
1368.491	.007	1				VERTICAL CONTROL SURVEY	1941 Q460953
1368.491	.007	1				VERTICAL CONTROL SURVEY	1934 L40 MINN

Geoid Separations(ft): GEOID18 = -87.618 12B = -87.624 09 = -87.520 03 = -87.424

* No Horizontal Positions in the Database *



Mn/DOT Name: WALKER

NGS Name: WALKER

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5803](#) [Get Map](#)
NGS Quad / Sta Num : 46095314/
USGS Quad: WALKER LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	15	134 N	40 W	462510.23	954155.00		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2000	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2000)

Stamping: WALKER 2000

2.0 MILES EAST OF AMOR, 2.15 MILES EAST AND NORTHEAST ALONG COUNTY ROAD 1 FROM THE JUNCTION OF COUNTY ROAD 1 AND COUNTY ROAD 74 WEST IN AMOR, THENCE 0.10 MILE NORTH ALONG COUNTY ROAD 14, 54.0 FEET WEST OF COUNTY ROAD 14, 40.5 FEET SOUTH OF 315TH STREET, 5.6 FEET SOUTH-SOUTHEAST OF A POWER POLE, 5.4 FEET SOUTH OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
1362.747	.131			1275.011	.066	1996	GPS - STATIC	2021	HOTTE
1362.816				1274.856	.026	2011	HORIZONTAL ADJUSTMENT	2020	GPS3384
1362.816				1274.856	.026	2011	GPS - STATIC	2020	HOTTE
1362.478	.262			1274.781	.197	1996	GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.962 12B = -87.959 09 = -87.825 03 = -87.697

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position		Otter Tail County				Project Info	
		Latitude	Longitude	X	Y	Acc	Order	Reference	
		46 25 10.23026	95 41 55.00069	504554.103	214197.327	.016		ADJUSTMENT	2020 GPS3384
		46 25 10.23026	95 41 55.00069	504554.103	214197.327	.016	C	GPS - STATIC	2020 HOTTE

NAD83(1996)		Geodetic Position		Otter Tail County				Project Info	
		Latitude	Longitude	X	Y	Acc	Order	Reference	
		46 25 10.22997	95 41 55.00120	504554.068	214197.298	.033	C	GPS - STATIC	2021 HOTTE
		46 25 10.23022	95 41 55.00193	504554.016	214197.323	.131	3	GPS - RTRN	2009 RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)		MN State Plane - Central Zone		UTM - Zone 15				Project Info	
		X	Y	X	Y	Acc	Order	Reference	
		2259351.211	849051.640	960066.333	16877257.696	.016		ADJUSTMENT	2020 GPS3384
		2259351.211	849051.640	960066.333	16877257.696	.016	C	GPS - STATIC	2020 HOTTE

NAD83(1996)		MN State Plane - Central Zone		UTM - Zone 15				Project Info	
		X	Y	X	Y	Acc	Order	Reference	
		2259351.175	849051.612	960066.297	16877257.667	.033	C	GPS - STATIC	2021 HOTTE
		2259351.124	849051.638	960066.246	16877257.695	.131	3	GPS - RTRN	2009 RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WALKER-DR5803-3W-20JUL2020.jpg	W	Jul 20, 2020
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WALKER-DR5803-2-20JUL2020.jpg		Jul 20, 2020
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WALKER-DR5803-1-20JUL2020.jpg		Jul 20, 2020

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: WALL

NGS Name: WALL

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN:
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

[Get Map](#)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	10	132 N	42 W	461527.23	955644.77		3

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2000	2009	GOOD	Horz=YES Vert=YES	NO		RECESSED 3 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2000) Stamping: WALL 2000

4.2 MILES SOUTHWEST OF UNDERWOOD, 2.55 MILES SOUTH AND SOUTHWEST ALONG COUNTY ROAD 35 FROM THE JUNCTION OF COUNTY ROAD 35 AND TRUNK HIGHWAY 210 IN UNDERWOOD, TO TRUNK HIGHWAY 210 MILEPOINT 37.55, THENCE 2.55 MILES WEST ALONG COUNTY ROAD 124, 27.0 FEET SOUTH OF COUNTY ROAD 124, 12.5 FEET WEST OF A FIELD ENTRANCE, 3.0 FEET EAST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1323.852	.262			1236.093	.197	1996		GPS - RTRN	2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.976 12B = -87.989 09 = -87.871 03 = -87.759

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Lat/Lon</u>		<u>County Coordinates</u>		<u>Determination Method</u>		<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>			<u>Year</u>	<u>Reference</u>
46 15	27.22674	95 56	44.77378	442042.158	155217.579	.131	3	GPS - RTRN		2009	RTRN2009

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Determination Method</u>		<u>Project Info</u>	
		<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		
2195766.365	791246.987	895559.665	16820450.025	.131	3	GPS - RTRN		2009	RTRN2009



Mn/DOT Name: WALLACE

NGS Name: WALLACE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR5804](#) [Get Map](#)
NGS Quad / Sta Num : 46095431/
USGS Quad: VERGAS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>	<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
SW	6	137 N	40 W	464233.32	954740.92		C	1999	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE)	SURVEY DISK	MNDT

Description: (2015)

Stamping: WALLACE 1999

3.3 MILES NORTH OF VERGAS, 3.35 MILES NORTHEAST ALONG COUNTY ROAD 4 FROM THE JUNCTION OF COUNTY ROAD 4 AND TRUNK HIGHWAY 228 IN THE NORTH PART OF VERGAS, TO TRUNK HIGHWAY 228 MILEPOINT 0.85, THENCE 2.25 MILES WEST ALONG CAMP CHERITH ROAD, THENCE 0.5 MILE NORTH ALONG 335TH AVENUE, 20.0 FEET EAST OF 335TH AVENUE, 10.0 FEET NORTH OF AN ENTRANCE, 81.0 FEET SOUTH OF DRIVEWAY NUMBER 51510, 1.0 FOOT WEST OF A WITNESS POST.

Station Notes

A DISTRICT 4 DISK WAS USED, UNKNOWN ROD DEPTH.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order</u> (/Class)	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1506.208	.131		1419.298	.066	1996	GPS - STATIC		2021	HOTTE
1506.260			1419.144	.023	2011	HORIZONTAL ADJUSTMENT		2020	GPS3384
1506.260			1419.144	.023	2011	GPS - STATIC		2020	HOTTE
1506.198	.262		1419.318	.197	1996	GPS - RTRN		2009	RTRN2009

Geoid Separations(ft): GEOID18 = -87.126 12B = -87.129 09 = -87.031 03 = -86.880

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 42 33.32281	95 47 40.92385	480421.649	319885.044	.016		ADJUSTMENT	2020	GPS3384
46 42 33.32281	95 47 40.92385	480421.649	319885.044	.016	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

<u>Geodetic Position</u>		<u>Otter Tail County</u>					<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
46 42 33.32248	95 47 40.92435	480421.614	319885.010	.033	C	GPS - STATIC	2021	HOTTE
46 42 33.32215	95 47 40.92489	480421.576	319884.977	.131	3	GPS - RTRN	2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2237182.582	955154.707	939586.010	16983723.114	.016		ADJUSTMENT	2020	GPS3384
2237182.582	955154.707	939586.010	16983723.114	.016	C	GPS - STATIC	2020	HOTTE

NAD83(1996)

<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2237182.546	955154.675	939585.974	16983723.081	.033	C	GPS - STATIC	2021	HOTTE
2237182.508	955154.642	939585.935	16983723.049	.131	3	GPS - RTRN	2009	RTRN2009

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WALLACE-DR5804-3E-07OCT2014.jpg	E	Oct 7, 2014
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WALLACE-DR5804-2-07OCT2014.jpg		Oct 7, 2014
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WALLACE-DR5804-1-07OCT2014.jpg		Oct 7, 2014

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: WEDEL

NGS Name: WEDEL

County: OTTER TAIL, MN (Sheet 1)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	9	134 N	44 W	462622.07	961407.87	2	C

NGS ACRN:	DQ2725	Get Map
NGS Quad / Sta Num :	46096213/	
USGS Quad:	CARLISLE	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2023	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 39 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2015) **Stamping:** WEDEL 2014

4.0 MILES SOUTH-SOUTHEAST OF ROTHSA, 3.7 MILES SOUTH-SOUTHEAST ALONG EASTBOUND INTERSTATE HIGHWAY 94 FROM THE JUNCTION OF INTERSTATE HIGHWAY 94 AND COUNTY ROAD 11 IN ROTHSA, AT INTERSTATE HIGHWAY 94 MILEPOINT 42.00, 49.9 FEET SOUTHWEST OF AN INTERSTATE HIGHWAY 94 FOG LINE, 37.1 FEET NORTHEAST OF A RIGHT-OF-WAY FENCE, 1.5 FEET NORTHEAST OF A WITNESS POST.

Station Pair: COLNESS - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1221.415	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1221.494	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1221.477	.016	2/1				VERTICAL CONTROL SURVEY	2016	VI94D4

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1221.415			1133.242	.013	2011	HORIZONTAL ADJUSTMENT	2025	GPS3847
1221.415			1133.242	.013	2011	GPS - STATIC	2025	HTH94B
1222.740	.262		1134.509	.197	2011	GPS - RTRN	2023	RTRN2023
1221.477	.262		1133.246	.197	2011	GPS - RTRN	2015	RTRN2015
1221.382	.262		1133.151	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -88.235 12B = -88.235 09 = -88.123 03 = -88.048

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
		Latitude	Longitude	X	Y				Year	Reference
46 26 22.07324	96 14 07.87377	369178.208	221904.292	.010				ADJUSTMENT	2025	GPS3847
46 26 22.07324	96 14 07.87377	369178.208	221904.292	.010	C			GPS - STATIC	2025	HTH94B
46 26 22.07297	96 14 07.87276	369178.278	221904.265	.131	3			GPS - RTRN	2023	RTRN2023
46 26 22.07303	96 14 07.87452	369178.155	221904.271	.131	3			GPS - RTRN	2015	RTRN2015
46 26 22.07296	96 14 07.87372	369178.211	221904.264	.131	3			GPS - RTRN	2014	RTRN2014

NAD83(1996)		Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
		Latitude	Longitude	X	Y				Year	Reference
46 26 22.07278	96 14 07.87447	369178.158	221904.246	.066				NCAT	2025	HTH94B

State Plane and UTM Coordinates (Feet)

NAD83(2011)		MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
		X	Y	X	Y				Year	Reference
2124158.667	859262.048	825009.871	16889614.447	.010				ADJUSTMENT	2025	GPS3847
2124158.667	859262.048	825009.871	16889614.447	.010	C			GPS - STATIC	2025	HTH94B
2124158.738	859262.019	825009.941	16889614.417	.131	3			GPS - RTRN	2023	RTRN2023
2124158.614	859262.029	825009.818	16889614.428	.131	3			GPS - RTRN	2015	RTRN2015
2124158.670	859262.020	825009.874	16889614.419	.131	3			GPS - RTRN	2014	RTRN2014

NAD83(1996)		MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
		X	Y	X	Y				Year	Reference
2124158.617	859262.003	825009.820	16889614.402	.066				NCAT	2025	HTH94B



<u>Station Photos</u>			
<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WEDEL-DQ2725-3SW-03AUG2023.jpg	SW	Aug 3, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WEDEL-DQ2725-2-03AUG2023.jpg		Aug 3, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WEDEL-DQ2725-1-03AUG2023.jpg		Aug 3, 2023
** All station images can be viewed at: ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos **			



Mn/DOT Name: WEGGE

NGS Name: WEGGE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4346](#) [Get Map](#)
NGS Quad / Sta Num : 46095343/
USGS Quad: WALL LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	34	133 N	42 W	461711.21	955737.69	2	C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 84 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) Stamping: WEGGE 2014

5.0 MILES EAST OF FERGUS FALLS, 6.8 MILES EAST-NORTHEAST ALONG TRUNK HIGHWAY 210 FROM THE JUNCTION OF TRUNK HIGHWAY 210 AND INTERSTATE HIGHWAY 94 IN FERGUS FALLS, AT TRUNK HIGHWAY 210 MILEPOINT 33.3, 64.6 FEET NORTH-NORTHEAST OF TRUNK HIGHWAY 210, 44.6 FEET EAST-SOUTHEAST OF AN ENTRANCE EXTENDED, 1.5 FEET SOUTH-SOUTHWEST OF A WITNESS POST.

Station Pair: ELKS - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1274.194	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1274.197	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1274.181	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1274.194			1186.041	.017	2011	HORIZONTAL ADJUSTMENT	2025	GPS3793
1274.194	.131		1186.166	.066	1996	GPS - STATIC	2024	HTH210A
1274.194			1186.041	.017	2011	GPS - STATIC	2024	HTH210A
1274.158	.262		1186.047	.197	2011	GPS - RTRN	2023	RTRN2023
1274.230	.262		1186.123	.197	2011	GPS - OPUS	2020	GPSBM
1274.125	.262		1186.018	.197	2011	GPS - OPUS	2020	GPSBM
1274.095	.262		1185.969	.197	2011	GPS - RTRN	2015	RTRN2015
1274.095	.262		1185.969	.197	2011	GPS - RTRN	2015	RTRN2015
1274.095	.262		1185.969	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -88.107 12B = -88.126 09 = -88.002 03 = -87.880

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 17 11.20628	95 57 37.69054	438356.114	165762.545	.010		ADJUSTMENT		2025	GPS3793	
46 17 11.20628	95 57 37.69054	438356.114	165762.545	.010	C	GPS - STATIC		2024	HTH210A	
46 17 11.20637	95 57 37.69048	438356.118	165762.555	.131	3	GPS - RTRN		2023	RTRN2023	
46 17 11.20592	95 57 37.69063	438356.108	165762.509	.131	3	GPS - OPUS		2020	GPSBM	
46 17 11.20636	95 57 37.69024	438356.135	165762.554	.131	3	GPS - OPUS		2020	GPSBM	
46 17 11.20563	95 57 37.68984	438356.163	165762.479	.131	3	GPS - RTRN		2015	RTRN2015	
46 17 11.20563	95 57 37.68984	438356.163	165762.479	.131	3	GPS - RTRN		2015	RTRN2015	
46 17 11.20639	95 57 37.69035	438356.127	165762.557	.131	3	GPS - RTRN		2014	RTRN2014	

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Project Info</u>	
		<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>				<u>Year</u>	<u>Reference</u>
46 17 11.20597	95 57 37.69089	438356.089	165762.514	.033	C	GPS - STATIC		2024	HTH210A	



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2192276.629	801856.970	892236.513	16831117.029	.010		ADJUSTMENT	2025	GPS3793
2192276.629	801856.970	892236.513	16831117.029	.010	C	GPS - STATIC	2024	HTH210A
2192276.633	801856.979	892236.517	16831117.038	.131	3	GPS - RTRN	2023	RTRN2023
2192276.622	801856.934	892236.505	16831116.993	.131	3	GPS - OPUS	2020	GPSBM
2192276.650	801856.978	892236.534	16831117.036	.131	3	GPS - OPUS	2020	GPSBM
2192276.676	801856.903	892236.559	16831116.961	.131	3	GPS - RTRN	2015	RTRN2015
2192276.676	801856.903	892236.559	16831116.961	.131	3	GPS - RTRN	2015	RTRN2015
2192276.642	801856.981	892236.526	16831117.039	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2192276.603	801856.939	892236.487	16831116.998	.033	C	GPS - STATIC	2024	HTH210A

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WEGGE-DQ4346-3NE-21FEB2024.jpg	NE	Feb 21, 2024
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WEGGE-DQ4346-2-21FEB2024.jpg		Feb 21, 2024
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WEGGE-DQ4346-1-21FEB2024.jpg		Feb 21, 2024

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: WENDELL WATER TANK

NGS Name: WENDELL WATER TANK

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP5129](#) [Get Map](#)
NGS Quad / Sta Num : 46096222/
USGS Quad: WENDELL

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	33	130 N	43 W	460717.37	955953.02		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1979	2009	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	TANK	MNDT

Description: (1979)

Stamping:

IN THE SOUTH PART OF WENDELL, 1.0 BLOCK SOUTH OF TRUNK HIGHWAY 55, 1.0 BLOCK EAST OF TRUNK HIGHWAY 55.

Station Notes

NO DISK WAS FOUND IN THE WATER TOWER FOOTINGS.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.054 12B = -87.001 09 = -86.886 03 = -86.844



Mn/DOT Name: WESTERN

NGS Name: WESTERN

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [AC5832](#) [Get Map](#)
NGS Quad / Sta Num : 46096224/1008
USGS Quad: ORWELL LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	26	131 N	44 W	460806.00	961022.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1904	1975	DESTROYED	Horz=NO Vert=NO	NO			STEEL SPIKE ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
PIPE (TILE OR CLAY) FILLED WITH CONCRETE	NAIL	CGS

Description: (1935)

Stamping:

15.0 MILES SOUTHWEST OF FERGUS FALLS. TO REACH FROM FERGUS FALLS, FOLLOW MAIN-TRAVELED ROAD LEADING SOUTHWEST TO THE WESTERN POST OFFICE. DESCRIBED BY COAST AND GEODETIC SURVEY 1935 AS BEING ABOUT 225.0 FEET WEST OF HIGHEST GROUND IN OPEN CULTIVATED FIELD ON A PRIVATE ROAD ALONG THE HALF-SECTION LINE LEADING FROM THE NORTH QUARTER CORNER OF SEC. 26, T. 131 N., R. 44 W. OF THE FIFTH PRINCIPAL MERIDIAN, WESTERN TOWNSHIP, TO THE HOUSE OF WILLIAM B. DEWEY, WHO LIVES NEAR THE CENTER OF THE SECTION, ABOUT 862.0 FEET SOUTH OF THE NORTH QUARTER CORNER, AND 12.75 FEET EAST OF A NORTH-AND-SOUTH FENCE ABOUT ON THE QUARTER-SECTION LINE. THE SURFACE AND UNDERGROUND STATION ARE NAILS IN TERRA-COTTA PIPES FILLED WITH AND SET IN CONCRETE. IN 1935, THE UPPER STATION WAS FLUSH WITH THE SURFACE OF THE GROUND.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.277 12B = -87.231 09 = -87.106 03 = -87.109



Mn/DOT Name: WESTERN POST OFFICE CH SPIRE

NGS Name: WESTERN POST OFFICE CH SPIRE

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0978](#) [Get Map](#)
NGS Quad / Sta Num : 46096224/1036
USGS Quad: ORWELL LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SW	14	131 N	44 W	460908.20	961058.03		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1904	1904	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	CHURCH SPIRE	NGS

Description: (1904) Stamping:
IN WESTERN.

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.418 12B = -87.369 09 = -87.254 03 = -87.257

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>				<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
46 09 08.20019	96 10 58.03360	381856.806	117083.856	.328	4	1999	17648
46 09 08.20010	96 10 58.03357	381856.808	117083.847	.328	4	1998	17655
<u>NAD83(1986)</u>		<u>Geodetic Position</u>				<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
46 09 08.19917	96 10 58.02172	381857.642	117083.747	.328	4	1986	17289
<u>NAD27</u>		<u>Geodetic Position</u>				<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
46 09 08.34700	96 10 56.80800			.100	4	1928	00155
<u>USSD</u>		<u>Geodetic Position</u>				<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
46 09 08.51800	96 10 57.19200				3		17389-73

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>MN State Plane - Central Zone</u>				<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
2134893.667	754238.842	834090.623	16784389.976	.328	4	1999	17648
2134893.669	754238.833	834090.625	16784389.967	.328	4	1998	17655
<u>NAD83(1986)</u>		<u>MN State Plane - Central Zone</u>				<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
2134894.501	754238.719	834091.455	16784389.839	.328	4	1986	17289
<u>NAD27</u>		<u>MN State Plane - Central Zone</u>				<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
1510298.794	426165.550			.100	4	1928	00155



Mn/DOT Name: WESTERN RESET

NGS Name: WESTERN RESET

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0979](#) [Get Map](#)
NGS Quad / Sta Num : 46096224/1008
USGS Quad: ORWELL LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	26	131 N	44 W	460806.25	961022.86		C

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1975	2021	GOOD	Horz=YES Vert=YES	YES		RECESSED 6 IN.	BAR MAG IN DRILL HOLE

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	HORIZONTAL CONTROL DISK	NGS

Description: (2008)

Stamping: WESTERN 1904 1975

9.0 MILES NORTHWEST OF WENDELL, 5.0 MILES NORTH ON COUNTY ROAD 11 FROM THE JUNCTION OF COUNTY ROAD 11 AND TRUNK HIGHWAY 55 IN WENDELL, THEN 4.0 MILES WEST ON COUNTY ROAD 26, THEN 2.0 MILES NORTH ON COUNTY ROAD 15, THEN 0.5 MILE EAST ON 120TH STREET, THEN 0.15 MILE SOUTH ON 150TH AVENUE, 12.0 FEET EAST OF 150TH AVENUE, 245.04 FEET SOUTH OF WESTERN RM 2, 236.0 FEET SOUTH OF A FIELD ENTRANCE, 109.0 FEET NORTH-NORTHWEST OF A POWER POLE, 5.7 FEET WEST OF A WITNESS POST.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1114.246	.262		1026.970	.197	2011	GPS - OPUS	2022	GPSBM
1114.260	.262		1026.983	.197	2011	GPS - RTRN	2021	RTRN2021
			1027.062	.035	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
1114.168	.262		1027.058	.197	1996	GPS - RTRN	2009	RTRN2009
			1027.157	.037	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1114.269	.131		1027.311	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648
1114.273	.131		1027.239	.066	1996	GPS - STATIC	1997	GPS805-C

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1116.993						RECIPROCAL VERTICAL ANGLE	1975	HORZ

Geoid Separations(ft): GEOID18 = -87.277 12B = -87.231 09 = -87.109 03 = -87.109

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 08 06.25434	96 10 22.86199	384296.855	110794.036	.131	3	GPS - OPUS	2022	GPSBM
46 08 06.25432	96 10 22.86181	384296.868	110794.034	.131	3	GPS - RTRN	2021	RTRN2021
46 08 06.25449	96 10 22.86196	384296.857	110794.051	.023		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 08 06.25442	96 10 22.86286	384296.794	110794.044	.023		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 08 06.25498	96 10 22.86207	384296.850	110794.101	.131	3	GPS - RTRN	2009	RTRN2009
46 08 06.25408	96 10 22.86260	384296.812	110794.010	.033	C	ADJUSTMENT	1999	17648
46 08 06.25408	96 10 22.86260	384296.812	110794.010	.033	C	GPS - STATIC	1997	GPS805-C

NAD83(1986)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 08 06.25362	96 10 22.85104	384297.626	110793.959	.033	1	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 08 06.40200	96 10 21.63800			.100	1	CLASSICAL SURVEY	1932	00967

USSD

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
46 08 06.57300	96 10 22.02300				3	CLASSICAL SURVEY		17389-73

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2137216.567	747905.802	836314.898	16778018.677	.131	3	GPS - OPUS	2022	GPSBM
2137216.579	747905.800	836314.910	16778018.674	.131	3	GPS - RTRN	2021	RTRN2021
2137216.569	747905.818	836314.901	16778018.692	.023		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2137216.506	747905.812	836314.837	16778018.687	.023		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2137216.563	747905.867	836314.895	16778018.741	.131	3	GPS - RTRN	2009	RTRN2009
2137216.523	747905.777	836314.854	16778018.652	.033	C	ADJUSTMENT	1999	17648
2137216.523	747905.777	836314.854	16778018.652	.033	C	GPS - STATIC	1997	GPS805-C

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2137217.336	747905.711	836315.666	16778018.573	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
1512621.683	419832.643			.100	1	CLASSICAL SURVEY	1932	00967

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WESTERN_RESET-RP0979-3E-22JUN2021.jpg	E	Jun 22, 2021
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WESTERN_RESET-RP0979-2-22JUN2021.jpg		Jun 22, 2021
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WESTERN_RESET-RP0979-1-22JUN2021.jpg		Jun 22, 2021

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: WESTERN RM

NGS Name: WESTERN RM AZIMUTH

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0981](#) [Get Map](#)
NGS Quad / Sta Num : 46096224/1008
USGS Quad: ORWELL LAKE

				<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>	NGS ACRN: RP0981 Get Map NGS Quad / Sta Num : 46096224/1008USGS Quad: ORWELL LAKE						
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>							
NE	26	131 N	44 W	460758.07	961022.12		2							
<u>Year Set</u>		<u>Last Recovery</u>		<u>Condition</u>	<u>Geodetic Usability</u>		<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>				
1904		2009		GOOD	Horz=NO Vert=YES		YES		FLUSH	MARKER W/BAR MAGNET				
<u>Monument Type</u>							<u>Disk Type</u>	<u>Mon. Agency</u>						
UNKNOWN							NAIL	NGS						

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

<u>NAVD88</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1111.546	.197			1024.601	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648
<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>		<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
1111.874							DIGITIZED FROM MAP	1975	HORZ

Geoid Separations(ft): GEOID18 = -87.264 12B = -87.218 09 = -87.093 03 = -87.093

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>				<u>Lat/Lon and County Coordinates (Feet)</u>				<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>							
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 07 58.06895	96 10 22.11993	384344.334	109964.520	.066	2	ADJUSTMENT	1999	17648	
46 07 58.06895	96 10 22.11993	384344.334	109964.520	.066	2	ADJUSTMENT	1998	17655	
<u>NAD83(1986)</u>				<u>Lat/Lon and County Coordinates (Feet)</u>				<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>							
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 07 58.06849	96 10 22.10836	384345.149	109964.469	.066	2	ADJUSTMENT	1986	17289	
<u>NAD27</u>				<u>Lat/Lon and County Coordinates (Feet)</u>				<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Lat/Lon and County Coordinates (Feet)</u>							
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
46 07 58.21686	96 10 20.89537			.100	2	CLASSICAL SURVEY	1986	10744	

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>				<u>State Plane and UTM Coordinates (Feet)</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>							
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
2137248.680	747075.663	836334.010	16777187.795	.066	2	ADJUSTMENT	1999	17648	
2137248.680	747075.663	836334.010	16777187.795	.066	2	ADJUSTMENT	1998	17655	
<u>NAD83(1986)</u>				<u>State Plane and UTM Coordinates (Feet)</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>							
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
2137249.494	747075.597	836334.822	16777187.716	.066	2	ADJUSTMENT	1986	17289	
<u>NAD27</u>				<u>State Plane and UTM Coordinates (Feet)</u>				<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>							
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>	
1512653.843	419002.533			.100	2	CLASSICAL SURVEY	1986	10744	



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WESTERN_RM_AZIMUTH-RP0981-3S-10AUG2009.jpg	S	Aug 10, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WESTERN_RM_AZIMUTH-RP0981-2-10AUG2009.jpg		Aug 10, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WESTERN_RM_AZIMUTH-RP0981-1-10AUG2009.jpg		Aug 10, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: WESTERN RM 2

NGS Name: WESTERN RM 2

County: OTTER TAIL, MN (Sheet 1)

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	26	131 N	44 W	460807.00	961023.00		3

NGS ACRN: [CP5139](#) [Get Map](#)
NGS Quad / Sta Num : 46096224/1008
USGS Quad: ORWELL LAKE

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1975	2009	GOOD	Horz=YES Vert=YES	YES		FLUSH	STEEL SPIKE ADJ TO MON

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: **Stamping:** WESTERN 1904 NO 2 1975

9.0 MILES NORTHWEST OF WENDELL, 3.0 MILES SOUTH ON COUNTY ROAD 15 FROM THE JUNCTION OF COUNTY ROAD 2 AND COUNTY ROAD 15 AT ROBERTS THEN 0.5 MILE EAST OF 120TH STREET, THEN 0.15 MILE SOUTH ON 150TH AVENUE, ON THE EAST SHOULDER OF A NORTH-SOUTH ROAD, AT THE NORTH EDGE OF A FIELD ENTRANCE AND ON LINE WITH A LINE OF POWER POLES RUNNING NORTH AND SOUTH, 245.04 FEET NORTH OF STATION WESTERN RESET, 39.0 FEET NORTH OF A POWER POLE, 23.0 FEET EAST OF THE CENTER OF 150TH AVENUE, 9.0 FEET NORTH OF THE CENTER OF A FIELD ENTRANCE, 2.0 FEET SOUTH OF A WITNESS POST.

Station Notes

IN 1994, RAILROAD SPIKES WERE SET MAKING THE MARKS MAGNETIC.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order/(Class)	Height	Acc	Adj		Year	Reference	
1114.132	.262		1027.019	.197	1996	GPS - RTRN	2009	RTRN2009	

Geoid Separations(ft): GEOID18 = -87.280 12B = -87.234 09 = -87.113 03 = -87.116

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Acc		Order		Determination Method		Project Info	
Latitude	Longitude	X	Y							Year	Reference
46 08 08.67144	96 10 22.70421	384309.380	111038.834	.131	3	GPS - RTRN				2009	RTRN2009

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Acc		Order		Determination Method		Project Info	
X	Y	X	Y							Year	Reference
2137233.618	748150.294	836335.786	16778262.971	.131	3	GPS - RTRN				2009	RTRN2009

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WESTERN_RM_2-CP5139-3E-10AUG2009.jpg	E	Aug 10, 2009
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WESTERN_RM_2-CP5139-2-10AUG2009.jpg		Aug 10, 2009
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WESTERN_RM_2-CP5139-1-10AUG2009.jpg		Aug 10, 2009

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: WHITE CHURCH 5 MI S STA TANSEM

NGS Name: TANSEM WHITE CHURCH 5 MI SOUTH

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0903](#) [Get Map](#)
NGS Quad / Sta Num : 46096123/1030
USGS Quad: LAKE OLAF

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	3	136 N	44 W	463726.94	961251.09		4

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1906	1906	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	CHURCH SPIRE	NGS

Description: (1906) Stamping:

7.26 MILES NORTHWEST OF PELICAN RAPIDS

* No Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.359 12B = -87.336 09 = -87.231 03 = -87.152

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>							<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>					
46 37 26.94209	96 12 51.08838	374979.707	289227.586	.328	4	ADJUSTMENT	1999	17648
46 37 26.94199	96 12 51.08832	374979.711	289227.576	.328	4	ADJUSTMENT	1998	17655
<u>NAD83(1986)</u>							<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Otter Tail County</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
<u>Latitude</u>	<u>Longitude</u>	<u>X</u>	<u>Y</u>					
46 37 26.94044	96 12 51.08119	374980.207	289227.416	.328	4	ADJUSTMENT	1986	17289
<u>NAD27</u>							<u>Project Info</u>	
<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
<u>Latitude</u>	<u>Longitude</u>							
46 37 27.11000	96 12 49.86000			.100	4	CLASSICAL SURVEY	1928	00155
<u>USSD</u>							<u>Project Info</u>	
<u>Geodetic Position</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
<u>Latitude</u>	<u>Longitude</u>							
46 37 27.31000	96 12 50.24000				3	CLASSICAL SURVEY		17389-73

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>							<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>					
2131204.272	926457.921	833128.787	16956717.921	.328	4	ADJUSTMENT	1999	17648
2131204.276	926457.911	833128.790	16956717.911	.328	4	ADJUSTMENT	1998	17655
<u>NAD83(1986)</u>							<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>UTM - Zone 15</u>		<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>					
2131204.770	926457.742	833129.282	16956717.734	.328	4	ADJUSTMENT	1986	17289
<u>NAD27</u>							<u>Project Info</u>	
<u>MN State Plane - Central Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
<u>X</u>	<u>Y</u>							
1506608.648	598385.842			.100	4	CLASSICAL SURVEY	1928	00155



Mn/DOT Name: WINSLOW

NGS Name: WINSLOW

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [R01147](#) [Get Map](#)
NGS Quad / Sta Num : 46095431/1006
USGS Quad: VERGAS

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	1	137 N	41 W	464236.99	954759.47		1

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1935	1967	GOOD	Horz=? Vert=YES	NO		PROJECTS 6 IN.	SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (1967)

Stamping: WINSLOW 1935

5.0 MILES WEST OF FRAZEE, 5.0 MILES WESTERLY ON COUNTY ROAD 29 FROM THE JUNCTION OF COUNTY ROAD 29 AND TRUNK HIGHWAY 87 (NEAR THE JUNCTION OF TRUNK HIGHWAY 87 AND TRUNK HIGHWAY 10) TO WHERE THE ROAD TURNS SOUTH, THEN 0.1 MILE WEST ON A FARM DRIVE TO A WIRE GATE, THEN THROUGH A GATE 0.2 MILE ON A TRACK ROAD TO A FENCE CORNER THEN SOUTHWEST ON A TRACK ROAD 0.1 MILE TO THE END OF TRUCK TRAVEL THEN PACK SOUTHERLY TO THE HIGHEST POINT ON THE NORTH-SOUTH RIDGE, 48.75 FEET SOUTH OF WINSLOW RM 2, 41.14 FEET NORTHWEST OF WINSLOW RM 1.

* No Leveling-Derived Orthometric Heights in the Database *

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1548.553	.131		1461.660	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648	

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
1548.586						RECIPROCAL VERTICAL ANGLE	1935	HORZ	

Geoid Separations(ft): GEOID18 = -87.116 12B = -87.123 09 = -87.027 03 = -86.880

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 42 36.99133	95 47 59.46530	479129.836	320258.041	.033	1	ADJUSTMENT	1999	17648

NAD83(1986)

Geodetic Position		Otter Tail County		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order		Year	Reference
46 42 36.98941	95 47 59.46522	479129.841	320257.846	.033	1	ADJUSTMENT	1986	17289

NAD27

Geodetic Position		Determination Method			Project Info	
Latitude	Longitude	X	Y	Acc	Order	Reference
46 42 37.13805	95 47 58.29344			.100	1	CLASSICAL SURVEY 1964 13522

State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2235898.053	955551.510	938307.721	16984140.527	.033	1	ADJUSTMENT	1999	17648

NAD83(1986)

MN State Plane - Central Zone		UTM - Zone 15		Determination Method			Project Info	
X	Y	X	Y	Acc	Order		Year	Reference
2235898.055	955551.316	938307.720	16984140.333	.033	1	ADJUSTMENT	1986	17289

NAD27

MN State Plane - Central Zone		Determination Method			Project Info	
X	Y	X	Y	Acc	Order	Reference
1611301.414	627477.596			.100	1	CLASSICAL SURVEY 1964 13522



Mn/DOT Name: WINSLOW AZ MK

NGS Name: WINSLOW AZ MK

County: OTTER TAIL, MN (Sheet 1)

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NW	6	137 N	40 W	464238.00	954728.00		

NGS ACRN: [CP5190](#)
NGS Quad / Sta Num : 46095431/1006
USGS Quad: VERGAS

[Get Map](#)

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	1964	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 6 IN.	SEE DESCRIPTION

Monument Type

SEE DESCRIPTIVE TEXT

Disk Type

AZIMUTH MARK DISK

Mon. Agency

NGS

Description:

Stamping: WINSLOW 1935

5.0 MILES WEST OF FRAZEE, 5.0 MILES WESTERLY ON COUNTY ROAD 29 FROM THE JUNCTION OF COUNTY ROAD 29 AND TRUNK HIGHWAY 87 (NEAR THE JUNCTION OF TRUNK HIGHWAY 87 AND TRUNK HIGHWAY 10) TO WHERE THE ROAD TURNS SOUTH, THEN 0.1 MILE WEST ON A FARM DRIVE TO A WIRE GATE, THEN THROUGH A GATE 0.2 MILE ON A TRACK ROAD TO A FENCE CORNER, THEN SOUTHWEST ON A TRACK ROAD, THEN 0.1 MILE TO THE END OF TRUCK TRAVEL, THEN PACK SOUTHERLY TO THE HIGHEST POINT ON A NORTH-SOUTH RIDGE, GO TO MR. WINSLOWS HOUSE, THEN SOUTH FOR 0.1 MILE TO STATION WINSLOW AZ MK ON THE LEFT (EAST), 15.0 FEET EAST OF THE CENTERLINE OF A ROAD, EAST OF STATION WINSLOW.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -87.129 12B = -87.136 09 = -87.034 03 = -86.886



Mn/DOT Name: WINSLOW AZ MK 2

NGS Name: WINSLOW AZ MK 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP5191](#) [Get Map](#)
NGS Quad / Sta Num : 46095431/1006
USGS Quad: VERGAS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	1	137 N	41 W	464257.00	954748.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1964	2009	NOT FOUND	Horz=? Vert=?	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	AZIMUTH MARK DISK	NGS

Description: **Stamping:** WINSLOW 1935 RESET 1964

5.0 MILES WEST OF FRAZEE, 5.0 MILES WESTERLY ON COUNTY ROAD 29 FROM THE JUNCTION OF COUNTY ROAD 29 AND TRUNK HIGHWAY 87 (NEAR THE JUNCTION OF TRUNK HIGHWAY 87 AND TRUNK HIGHWAY 10) TO WHERE THE ROAD TURNS SOUTH THEN 0.1 MILE WEST ON A FARM DRIVE TO A WIRE GATE THEN THROUGH A GATE 0.2 MILE ON A TRACK ROAD TO A FENCE CORNER THEN SOUTHWEST ON A TRACK ROAD 0.1 MILE TO THE END OF TRUCK TRAVEL THEN PACK SOUTHERLY TO THE HIGHEST POINT ON A NORTH-SOUTH RIDGE, 141.0 FEET SOUTHWEST OF THE SOUTHWEST CORNER OF A QUONSET HUT, 1.5 FEET SOUTH OF A CORNER FENCE POST.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.119 12B = -87.129 09 = -87.031 03 = -86.886



Mn/DOT Name: WINSLOW RM 1

NGS Name: WINSLOW RM 1

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP5192](#) [Get Map](#)
NGS Quad / Sta Num : 46095431/1006
USGS Quad: VERGAS

	<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
<u>1/4</u> NE	<u>Sec</u> 1	<u>Twp</u> 137 N	<u>Rng</u> 41 W	
	464236.73	954759.02		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	1967	GOOD	Horz=? Vert=YES	NO		PROJECTS 36 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (0 TO 1 METERS)	REFERENCE MARK DISK	NGS

Description: (2011)

Stamping: WINSLOW NO 1 1935

5.0 MILES WEST OF FRAZEE, 5.0 MILES WESTERLY ON COUNTY ROAD 29 FROM THE JUNCTION OF COUNTY ROAD 29 AND TRUNK HIGHWAY 87 (NEAR THE JUNCTION OF TRUNK HIGHWAY 87 AND TRUNK HIGHWAY 10) TO WHERE THE ROAD TURNS SOUTH, THEN 0.1 MILE WEST ON A FARM DRIVE TO A WIRE GATE, THEN THROUGH A GATE 0.2 MILE ON A TRACK ROAD TO A FENCE CORNER, THEN SOUTHWEST ON A TRACK ROAD 0.1 MILE TO THE END OF TRUCK TRAVEL THEN PACK SOUTHERLY TO THE HIGHEST POINT ON A NORTH-SOUTH RIDGE, ON THE SOUTH SLOPE OF THE RIDGE, 41.14 FEET SOUTHEAST OF STATION WINSLOW.

* No Horizontal or Vertical Positions in the Database *

Geoid Separations(ft): GEOID18 = -87.116 12B = -87.123 09 = -87.027 03 = -86.880



Mn/DOT Name: WINSLOW RM 2

NGS Name: WINSLOW RM 2

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [CP5193](#) [Get Map](#)
NGS Quad / Sta Num : 46095431/1006
USGS Quad: VERGAS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	1	137 N	41 W	464237.45	954759.67		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1935	1967	GOOD	Horz=? Vert=YES	NO		PROJECTS 30 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (0 TO 1 METERS)	REFERENCE MARK DISK	NGS

Description:

Stamping: WINSLOW NO 2 1935

5.0 MILES WEST OF FRAZEE, 5.0 MILES WESTERLY ON COUNTY ROAD 29 FROM THE JUNCTION OF COUNTY ROAD 29 AND TRUNK HIGHWAY 87 (NEAR THE JUNCTION OF TRUNK HIGHWAY 87 AND TRUNK HIGHWAY 10) TO WHERE THE ROAD TURNS SOUTH THEN 0.1 MILE WEST ON A FARM DRIVE TO WIRE GATE THEN THROUGH A GATE 0.2 MILE ON A TRACK ROAD TO A FENCE CORNER THEN SOUTHWEST ON A TRACK ROAD 0.1 MILE TO THE END OF TRUCK TRAVEL THEN PACK SOUTHERLY THE HIGHEST POINT ON A NORTH-SOUTH RIDGE, ON THE NORTH SLOPE OF THE RIDGE, 48.75 FEET NORTH OF STATION WINSLOW.

*** No Horizontal or Vertical Positions in the Database ***

Geoid Separations(ft): GEOID18 = -87.116 12B = -87.123 09 = -87.027 03 = -86.880



Mn/DOT Name: WOLF

NGS Name: WOLF

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DR9954](#) [Get Map](#)
NGS Quad / Sta Num : 46095423/
USGS Quad: DENT

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	27	136 N	40 W	463324.65	954217.97	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 59 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) **Stamping:** WOLF 2014

0.7 MILE EAST OF DENT, 0.7 MILE EAST ALONG TRUNK HIGHWAY 108 FROM THE JUNCTION OF TRUNK HIGHWAY 108 AND COUNTY ROAD 35 IN DENT, AT TRUNK HIGHWAY 108 MILEPOINT 32.15, 32.4 FEET NORTH OF TRUNK HIGHWAY 108, 39.3 FEET WEST OF 380TH AVENUE, 16.8 FEET WEST-SOUTHWEST OF A WITNESS POST.

Station Pair: HEXUM - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1377.281	.016	2/1				VERTICAL CONTROL SURVEY	2024	VPPEL12

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1377.261			1289.932	.022	2011	HORIZONTAL ADJUSTMENT	2024	GPS3689
1377.251	.131		1290.027	.066	1996	GPS - STATIC	2024	HTH108
1377.261			1289.932	.022	2011	GPS - STATIC	2024	HTH108
1377.297	.262		1289.922	.197	2011	GPS - RTRN	2023	RTRN2023
1377.300	.262		1289.922	.197	2011	GPS - RTRN	2022	RTRN2022
1377.081	.262		1289.725	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.378 12B = -87.359 09 = -87.250 03 = -87.149

Lat/Lon and County Coordinates (Feet)

NAD83(2011)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 33 24.65075	95 42 17.97331	502937.160	264287.287	.013		ADJUSTMENT	2024	GPS3689
46 33 24.65075	95 42 17.97331	502937.160	264287.287	.013	C	GPS - STATIC	2024	HTH108
46 33 24.65081	95 42 17.97331	502937.160	264287.293	.131	3	GPS - RTRN	2023	RTRN2023
46 33 24.65023	95 42 17.97312	502937.173	264287.234	.131	3	GPS - RTRN	2022	RTRN2022
46 33 24.65083	95 42 17.97394	502937.116	264287.295	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		Otter Tail County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 33 24.65052	95 42 17.97383	502937.123	264287.263	.033	C	GPS - STATIC	2024	HTH108

State Plane and UTM Coordinates (Feet)

NAD83(2011)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Year	Reference
2258662.129	899156.546	960173.041	16927377.384	.013		ADJUSTMENT	2024	GPS3689
2258662.129	899156.546	960173.041	16927377.384	.013	C	GPS - STATIC	2024	HTH108
2258662.129	899156.553	960173.042	16927377.391	.131	3	GPS - RTRN	2023	RTRN2023
2258662.141	899156.494	960173.053	16927377.331	.131	3	GPS - RTRN	2022	RTRN2022
2258662.085	899156.555	960172.998	16927377.394	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)		UTM - Zone 15					Project Info	
MN State Plane - Central Zone		X	Y	Acc	Order	Determination Method	Year	Reference
2258662.092	899156.524	960173.004	16927377.362	.033	C	GPS - STATIC	2024	HTH108



Station Photos

<u>Type</u>	<u>File Name</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WOLF-DR9954-3N-31JUL2023.jpg
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WOLF-DR9954-2-31JUL2023.jpg
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/WOLF-DR9954-1-31JUL2023.jpg

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **

<u>Dir</u>	<u>Date</u>
N	Jul 31, 2023
	Jul 31, 2023
	Jul 31, 2023



Mn/DOT Name: X 3

NGS Name: X 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0748](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	34	133 N	43 W	461705.00	960423.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - LARGE	DRILL HOLE	NGS

Description:

Stamping:

IN FERGUS FALLS, 0.1 MILE NORTH ALONG COUNTY ROAD 1 (SOUTH UNION AVENUE) FROM THE JUNCTION OF COUNTY ROAD 1 (SOUTH UNION AVENUE) AND TRUNK HIGHWAY 210 (WEST LINCOLN AVENUE) IN FERGUS FALLS, THEN 0.2 MILE EAST ALONG WEST CAVOUR AVENUE, ON THE SOUTHEAST CORNER OF THE GREAT NORTHERN RAILWAY WATER TANK, IN THE SOUTHEAST CORNER OF THE STONE.

Leveling-Derived Orthometric Heights (Feet)

GA1912

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1194.269	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -88.199 12B = -88.199 09 = -88.084 03 = -87.995

* No Horizontal Positions in the Database *



Mn/DOT Name: X 61

NGS Name: X 61

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0511](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
NE	4	132 N	40 W	461648.00	954244.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	1995	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1995)

Stamping: X 61 1934

IN BATTLE LAKE, 482.0 FEET EAST ALONG FRONT STREET FROM THE JUNCTION OF FRONT STREET AND LAKE AVENUE S
IN BATTLE LAKE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1351.628	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1350.818	.007	1				VERTICAL CONTROL SURVEY	1941	Q460953
1350.818	.007	1				VERTICAL CONTROL SURVEY	1934	L40 MINN

Geoid Separations(ft): GEOID18 = -87.579 12B = -87.585 09 = -87.477 03 = -87.388

* No Horizontal Positions in the Database *



Mn/DOT Name: Y 3

NGS Name: Y 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0749](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u> <u>Latitude</u>	<u>Reference</u> <u>Longitude</u>	<u>Vert</u> <u>Order</u>	<u>Horz</u> <u>Order</u>
SE	34	133 N	43 W	461701.00	960421.00		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1905	1905	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - LARGE	CHISELED SQUARE	NGS

Description:

Stamping:

IN FERGUS FALLS, 0.3 MILE EAST ALONG TRUNK HIGHWAY 210 (WEST LINCOLN AVENUE) FROM THE JUNCTION OF TRUNK HIGHWAY 210 (WEST LINCOLN AVENUE) AND COUNTY ROAD 1 (SOUTH UNION AVENUE) IN FERGUS FALLS, THEN 39.0 FEET NORTH ALONG NORTH CASCADE STREET, ON THE STEP OF THE NORTHERN ENTRANCE OF THE PICKETT BLOCK.

Leveling-Derived Orthometric Heights (Feet)

GA1912

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
1194.574	.007	1				VERTICAL ADJUSTMENT		1914	GA1912

Geoid Separations(ft): GEOID18 = -88.195 12B = -88.195 09 = -88.081 03 = -87.992

* No Horizontal Positions in the Database *



Mn/DOT Name: Y 61

NGS Name: Y 61

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RO0516](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

	<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
<u>1/4</u> <u>Sec</u> <u>Twp</u> <u>Rng</u>				
SW 2 132 N 40 W	461621.00	954054.00	2	

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1934	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1934) Stamping: Y 61 1934

2.0 MILES EAST ON A RAILROAD FROM BATTLE LAKE, 1.5 MILES EAST OF A RAILROAD MILEPOST, 40.0 FEET NORTH OF TRUNK HIGHWAY 210 (OLD HIGHWAY 3), 25.0 FEET SOUTH OF A RAILROAD.

Station Notes

PULLED THE TIES, THEY FALL IN A DITCH BOTTOM.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1337.356	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</u>	<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>
1336.543	.007	1				VERTICAL CONTROL SURVEY	1941	Q460953
1336.543	.007	1				VERTICAL CONTROL SURVEY	1934	L40 MINN

Geoid Separations(ft): GEOID18 = -87.457 12B = -87.460 09 = -87.346 03 = -87.277

* No Horizontal Positions in the Database *



Mn/DOT Name: Z 3

NGS Name: Z 3

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [RP0106](#) [Get Map](#)
NGS Quad / Sta Num : 46096212/
USGS Quad: FERGUS FALLS

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	34	133 N	43 W	461702.20	960435.10	2	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1905	2009	GOOD	Horz=NO Vert=YES	YES			NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
CONCRETE FOOTING - LARGE	BENCH MARK DISK	NGS

Description: (2004)

Stamping: 1191.061 Z 3 1903

AT FERGUS FALLS, 463.0 FEET EAST ALONG TRUNK HIGHWAY 210 (WEST LINCOLN AVENUE) FROM THE JUNCTION OF TRUNK HIGHWAY 210 (WEST LINCOLN AVENUE) AND COUNTY ROAD 1 (SOUTH UNION AVENUE) IN FERGUS FALLS, THEN 161.0 FEET NORTH ALONG NORTH COURT STREET, IN THE EAST WALL OF PLUM CREEK WOMEN'S FASHIONS, 85.0 FEET NORTH OF LINCOLN AVENUE, 75.0 FEET WEST OF COURT STREET, 3.1 FEET ABOVE GROUND LEVEL, IN THE WATER TABLE.

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1191.864	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1191.891	.016	2/1				VERTICAL ADJUSTMENT	2011	00000690
1191.891	.016	2/1				VERTICAL CONTROL SURVEY	2004	VFERG
1191.891	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025

NGVD29

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1191.064	.007	1/2				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1191.061	.007	1				VERTICAL CONTROL SURVEY	1972	Q460962
1191.061	.007	1				VERTICAL CONTROL SURVEY	1972	L22167-A
1191.061	.007	1				VERTICAL CONTROL SURVEY	1971	L22167-A
1191.061	.007	1				VERTICAL CONTROL SURVEY	1929	Q460962
1191.061	.007	1				VERTICAL CONTROL SURVEY	1905	L36 MINN

GA1912

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1191.510	.007	1				VERTICAL ADJUSTMENT	1914	GA1912

Geoid Separations(ft): GEOID18 = -88.199 12B = -88.199 09 = -88.084 03 = -87.995

* No Horizontal Positions in the Database *

Station Photos

Type	File Name	Dir	Date
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/Z_3-RP0106-3W-24NOV2003.jpg	W	Nov 24, 2003
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/Z_3-RP0106-2-24NOV2003.jpg		Nov 24, 2003
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/Z_3-RP0106-1-24NOV2003.jpg		Nov 24, 2003

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **



Mn/DOT Name: ZORNS

NGS Name: ZORNS

County: OTTER TAIL, MN (Sheet 1)

NGS ACRN: [DQ4326](#) [Get Map](#)
NGS Quad / Sta Num : 46095313/
USGS Quad: BATTLE LAKE

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	3	133 N	40 W	462117.84	954225.71	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2014	2024	GOOD	Horz=YES Vert=YES	YES		RECESSED 2 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 89 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2014) **Stamping:** ZORNS 2014

4.5 MILES NORTH OF BATTLE LAKE, 6.0 MILES NORTH ALONG TRUNK HIGHWAY 78 FROM THE JUNCTION OF TRUNK HIGHWAY 78 AND TRUNK HIGHWAY 210 IN BATTLE LAKE, AT TRUNK HIGHWAY 78 MILEPOINT 27.35, 32.5 FEET NORTH OF TRUNK HIGHWAY 78, 1.5 FEET SOUTH OF A WITNESS POST.

Station Pair: DANIEL MNDT - OTTER TAIL, MN

Leveling-Derived Orthometric Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1329.636	.016	2/1				VERTICAL ADJUSTMENT	2019	00000941
1329.650	.016	2/1				VERTICAL ADJUSTMENT	2017	00000911
1329.636	.016	2/1				VERTICAL CONTROL SURVEY	2016	VOTTE

Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)

NAVD88

Orthometric Height			Ellipsoid (NAD83)			Determination Method	Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference
1329.636			1241.727	.012	2011	HORIZONTAL ADJUSTMENT	2024	GPS3771
1329.636	.131		1241.838	.066	1996	GPS - STATIC	2024	HTH78B
1329.636			1241.727	.012	2011	GPS - STATIC	2024	HTH78B
1329.620	.262		1241.733	.197	2011	GPS - RTRN	2023	RTRN2023
1329.522	.262		1241.641	.197	2011	GPS - RTRN	2015	RTRN2015
1329.522	.262		1241.641	.197	2011	GPS - RTRN	2015	RTRN2015
1329.531	.262		1241.651	.197	2011	GPS - RTRN	2014	RTRN2014

Geoid Separations(ft): GEOID18 = -87.887 12B = -87.880 09 = -87.766 03 = -87.644

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 21 17.84044	95 42 25.70474	502405.694	190653.731	.007		ADJUSTMENT	2024	GPS3771
46 21 17.84044	95 42 25.70474	502405.694	190653.731	.007	C	GPS - STATIC	2024	HTH78B
46 21 17.83971	95 42 25.70413	502405.737	190653.657	.131	3	GPS - RTRN	2023	RTRN2023
46 21 17.83961	95 42 25.70429	502405.726	190653.647	.131	3	GPS - RTRN	2015	RTRN2015
46 21 17.83961	95 42 25.70429	502405.726	190653.647	.131	3	GPS - RTRN	2015	RTRN2015
46 21 17.84040	95 42 25.70571	502405.626	190653.727	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

Geodetic Position		Otter Tail County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
46 21 17.84032	95 42 25.70503	502405.674	190653.718	.033	C	GPS - STATIC	2024	HTH78B



State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2256767.560	825554.925	957110.599	16853799.914	.007		ADJUSTMENT	2024	GPS3771
2256767.560	825554.925	957110.599	16853799.914	.007	C	GPS - STATIC	2024	HTH78B
2256767.602	825554.850	957110.639	16853799.839	.131	3	GPS - RTRN	2023	RTRN2023
2256767.590	825554.840	957110.627	16853799.829	.131	3	GPS - RTRN	2015	RTRN2015
2256767.590	825554.840	957110.627	16853799.829	.131	3	GPS - RTRN	2015	RTRN2015
2256767.492	825554.922	957110.531	16853799.912	.131	3	GPS - RTRN	2014	RTRN2014

NAD83(1996)

MN State Plane - Central Zone		UTM - Zone 15					Project Info	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2256767.540	825554.913	957110.578	16853799.903	.033	C	GPS - STATIC	2024	HTH78B

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ZORNS-DQ4326-3N-17OCT2023.jpg	N	Oct 17, 2023
Monument:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ZORNS-DQ4326-2-17OCT2023.jpg		Oct 17, 2023
Disk:	https://www.olmweb.dot.state.mn.us/geod/StationPhotos/otter_tail/ZORNS-DQ4326-1-17OCT2023.jpg		Oct 17, 2023

** All station images can be viewed at: <ftp://ftp.olmweb.dot.state.mn.us/geod/StationPhotos> **