



Mn/DOT Name: 1 PR

NGS Name: 1 PR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	27	56 N	8 W	471808.00	911937.00		

<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	1978	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SEE DESCRIPTION	USGS

Description: (1978)                      Stamping: 1 PR 1978

0.5 MILE NORTH AND 2.5 MILES WEST OF SILVER BAY, 148.0 FEET NORTHEAST OF THE JUNCTION OF COUNTY ROAD 4 AND A ROAD TO AN INACTIVE QUARRY, 41.0 FEET EAST OF COUNTY ROAD 4, 1.6 FEET EAST OF THE EDGE OF A BEDROCK.

**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>	
1165.165	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT	

Geoid Separations(ft): GEOID18 = -95.131    12B = -95.075    09 = -95.049    03 = -94.990

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 112.08

NGS Name: 112.08

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0337](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	1	52 N	11 W	470108.00	914033.00	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>
1933	1933	GOOD	Horz=NO Vert=YES	NO		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	SEE DESCRIPTION	DOD

Description: (1933)

Stamping:

IN TWO HARBORS, ON THE WINDOWSILL OF THE NORTHEAST WINDOW OF THE LOWER STORY OF A DOCK GARAGE BUILDING BETWEEN DOCKS NUMBER 1 AND 2, ON THE PART OF THE SILL THAT EXTENDS BEYOND THE NORTH WINDOW OPENING AND IS MARKED BY TWO PARALLEL LINES ABOUT 1-3/4 INCHES APART. LINES CUT IN STONE.

Station Notes

THE MARK IS TWO PARALLEL LINES, ABOUT 1.75 INCHES APART, CUT IN STONE. YEAR SET 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>
613.047	.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>
613.004	.007	1/2				UNKNOWN/APPROXIMATE	1992	UNCHECKD

Geoid Separations(ft): GEOID18 = -94.806 12B = -94.790 09 = -94.695 03 = -94.616

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 117 PENNY 1868

NGS Name: 117 PENNY 1868

County: LAKE, MN (Sheet 1)

NGS ACRN: [DL4628](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	28	56 N	7 W	471826.00	911343.00		

<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>
1868	2010	UNKNOWN	Horz=NO Vert=NO	NO			NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	SEE DESCRIPTION	NGS

**Description:** **Stamping:**

1.61 MILES NORTHEAST OF SILVER BAY, 1.2 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND WATER PLANT ROAD/OUTER DRIVE, THEN 0.4 MILE SOUTH ON WILLIAMS DRIVE, THEN 0.2 MILE SOUTH ON BRUCE CIRCLE, THEN 734.0 FEET EAST-SOUTHEAST. IN LAKE SUPERIOR.

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

**Geoid Separations(ft): GEOID18 = -96.516 12B = -96.470 09 = -96.414 03 = -96.325**

Mn/DOT Name: 14

NGS Name: 14

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4490](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	52 N	10 W	470046.02	913950.48	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>
1982	2012	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	USACE

Description: (2008)                      Stamping: 14

IN TWO HARBORS, 0.4 MILE SOUTH ALONG WATERFRONT DRIVE FROM THE JUNCTION OF WATERFRONT DRIVE AND TRUNK HIGHWAY 61 IN TWO HARBORS, THEN 0.3 MILE EAST ON SOUTH AVENUE, THEN 0.4 MILE SOUTH ON 3RD STREET TO THE SOUTH END OF A PARKING LOT, THEN WALK APPROXIMATELY 500.0 FEET ALONG A WALK PATH AROUND A LIGHTHOUSE TOWARDS A LAKE EDGE AND STATION 14 NEAR THE WATER LINE, 100.0 FEET SOUTH OF A WALK PATH, 12.0 FEET NORTH OF LAKE SUPERIOR, 200.0 FEET SOUTH OF A PILOT HOUSE.

**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>
603.516	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691
603.516	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3

**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>
603.503	.262			508.605	.197	2007	GPS - RTRN	2011	RTRN2011
603.411	.262			508.592	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -95.013    12B = -94.997    09 = -94.901    03 = -94.819

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 00 46.01913	91 39 50.47407			556676.678	183656.050	.131	3	GPS - RTRN	2011	RTRN2011

  

<u>NAD83(1996)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 00 46.01956	91 39 50.47535			556676.590	183656.096	.131	3	GPS - RTRN	2008	RTRN2008

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2982878.112	518446.844			1973564.769	17084777.926	.131	3	GPS - RTRN	2011	RTRN2011

  

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2982878.022	518446.886			1973564.680	17084777.968	.131	3	GPS - RTRN	2008	RTRN2008

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/14-DM4490-3N-18JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/14-DM4490-3N-18JUN2008.jpg</a>	N	Jun 18, 2008
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/14-DM4490-2-18JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/14-DM4490-2-18JUN2008.jpg</a>		Jun 18, 2008
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/14-DM4490-1-18JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/14-DM4490-1-18JUN2008.jpg</a>		Jun 18, 2008

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



Mn/DOT Name: 19

NGS Name: 19

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091313/  
 USGS Quad: KANE 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	19	56 N	10 W	471928.00	913950.00		

<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	1950	GOOD	Horz=YES Vert=YES	NO	5924		SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	SURVEY DISK	MNDT

Description: (1950)                      Stamping: 1929 ADJ NO. 19

0.2 MILE NORTH OF MCNAIR, IN THE SOUTHEAST CORNER OF COUNTY ROAD 2 BRIDGE NUMBER 5924 OVER THE LANGLEY RIVER.

**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>	
1668.989	.033	3				VERTICAL CONTROL SURVEY	1956	USGS-VERT	

Geoid Separations(ft): GEOID18 = -92.785    12B = -92.808    09 = -92.670    03 = -92.598

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 2 PR

NGS Name: 2 PR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	15	56 N	8 W	471957.00	911931.00		

<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	1978	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SEE DESCRIPTION	USGS

**Description:** (1978)                      **Stamping:** 2 PR 1978

2.25 MILES NORTH AND 2.5 MILES WEST OF SILVER BAY, AT THE CREST OF A LONG HILL, 39.0 FEET WEST OF COUNTY ROAD 4, 101.0 FEET SOUTH OF A TRAIL EAST, 490.0 FEET SOUTH OF THE NORTH 1 OF 3 DRIVEWAYS, 3.5 FEET WEST OF THE EDGE OF A ROCK OUTCROP.

**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>	
1308.439	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT	

**Geoid Separations(ft): GEOID18 = -94.629    12B = -94.580    09 = -94.531    03 = -94.481**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 20 FJH TT

NGS Name: 20 FJH TT

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	3	53 N	11 W	470552.58	914231.78		

<u>Year Set</u>	<u>Last Recovery</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	1955	SEE DESCRIPTION	Horz=NO Vert=YES	NO			SEE DESCRIPTION

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

**Description:** (2008)                      **Stamping:** TT 20 FJH 1955

AT STEWART, NEAR THE SOUTHEAST CORNER OF SECTION 3 TOWNSHIP 53 AND RANGE 11W; 55.0 FEET SOUTH AND 22.0 MILES EAST OF THE EAST TRACK OF THE CHICAGO; MINNEAPOLIS, ST. PAUL AND THE PACIFIC RAILROAD AT A ROAD CROSSING; IN A LARGE FLAT ROCK EDGE.

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

**Geoid Separations(ft): GEOID18 = -93.665    12B = -93.638    09 = -93.569    03 = -93.487**



Mn/DOT Name: 3 PR

NGS Name: 3 PR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	56 N	8 W	472059.00	911749.00		

<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	1978	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SEE DESCRIPTION	USGS

**Description:** (1978)                      **Stamping:** 3 PR 1978

4.0 MILES NORTH AND 1.0 MILE WEST OF SILVER BAY, 0.6 MILE NORTHEAST ALONG COUNTY ROAD 4 FROM THE LAX LAKE RESORT, 43.0 FEET NORTHWEST OF COUNTY ROAD 4, 99.0 FEET NORTHEAST OF A T-DRIVE NORTHWEST, 7.5 FEET NORTH OF THE EDGE OF A ROCK OUTCROP.

**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>	
1294.778	.033	3							VERTICAL CONTROL SURVEY	1979	USGS-VERT	

Geoid Separations(ft): GEOID18 = -94.701    12B = -94.659    09 = -94.616    03 = -94.531

\* No Horizontal Positions in the Database \*





Mn/DOT Name: 33806 R

NGS Name: 33806 R

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	23	55 N	8 W	471430.00	911922.00		

<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>
1971	2000	DESTROYED	Horz=NO Vert=NO	YES			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

**Description:** (2000)                      **Stamping:** 3806 R 1971

1.75 MILES SOUTHWEST OF BEAVER BAY, 53.0 FEET RIGHT OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 STATION 1584+60, 10.0 FEET SOUTH OF THE SOUTHEAST CORNER OF A FLAGPOLE, 13.0 FEET SOUTHWEST OF THE SOUTHEAST CORNER OF A HOUSE, 18.0 FEET NORTHWEST OF A SPRUCE TREE, 30.0 FEET NORTHWEST 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>	
714.759	.033	3					VERTICAL CONTROL SURVEY	1971	CS3806	

**Geoid Separations(ft): GEOID18 = -96.397    12B = -96.368    09 = -96.279    03 = -96.161**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 34 WR

NGS Name: 34 WR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091312/  
 USGS Quad: LEGLER 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>
SW	8	55 N	9 W	471537.00	913024.00		

<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>
1951	1951	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	SEE DESCRIPTION	USGS

Description: (1951)                      Stamping: 34 WR 1951

0.5 MILE WEST AND 1.6 MILES NORTHEAST OF THE BUDD HILL LOOKOUT TOWER, IN THE CONCRETE FOOTING FOR AN OLD RAILROAD WATER TANK, NEAR THE WEST SPLIT ROCK RIVER.

**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>	
1317.264	.033	3				VERTICAL CONTROL SURVEY	1956	USGS-VERT	

Geoid Separations(ft): GEOID18 = -93.628    12B = -93.596    09 = -93.478    03 = -93.481

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 35 WR

NGS Name: 35 WR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091243/  
 USGS Quad: SILVER BAY SW

				<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	4	55 N	9 W	471653.00	912924.00		

<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>
1951	1951	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SEE DESCRIPTION	USGS

**Description:** (1951)                      **Stamping:** 35 WR 1951

0.5 MILE WEST OF THE BUDD HILL LOOKOUT TOWER THEN 1.6 MILES NORTHEAST ON AN OLD RAILROAD GRADE THEN 1.5 MILES NORTHEAST ALONG A RAILROAD GRADE ON A TRAIL THEN 0.5 MILE NORTH ON A RAILROAD GRADE, 100.0 FEET NORTH OF THE JUNCTION OF 2 RAILROAD GRADES, 22.0 FEET WEST OF THE EAST RAILROAD GRADE, 14.0 FEET EAST OF THE WEST RAILROAD GRADE.

**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>	
1404.567	.033	3					VERTICAL CONTROL SURVEY	1979	USGS-VERT	

**Geoid Separations(ft):** GEOID18 = -93.504    12B = -93.481    09 = -93.366    03 = -93.369

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 36 WR

NGS Name: 36 WR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091312/  
 USGS Quad: LEGLER 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	30	56 N	9 W	471814.00	913058.00		

<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>
1951	1951	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SEE DESCRIPTION	USGS

Description: (1951)                      Stamping: 36 WR 1951

3.0 MILES SOUTH AND 8.0 MILES EAST OF MCNAIR, ALONG THE MINE COUNTY RAILROAD, AT THE NORTH EDGE OF A SMALL CLEARING.

**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>	
1552.766	.033	3							VERTICAL CONTROL SURVEY	1956	USGS-VERT	

Geoid Separations(ft): GEOID18 = -93.005    12B = -92.999    09 = -92.874    03 = -92.880

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 3803 V

NGS Name: 3803 V

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5442](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	3	56 N	7 W	472150.50	911301.90	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>
2007	2007	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 15 FT)	SURVEY DISK	MNDT

Description: (2007)                      Stamping: 3803 V 2007

2.0 MILES NORTHWEST OF ILLGEN CITY, 2.0 MILES NORTHWEST ALONG TRUNK HIGHWAY 1 FROM THE JUNCTION OF TRUNK HIGHWAY 1 AND TRUNK HIGHWAY 61 IN ILLGEN CITY, AT TRUNK HIGHWAY 1 MILEPOINT 345.40, 41.9 FEET SOUTHWEST OF TRUNK HIGHWAY 1, 52.1 FEET NORTHWEST OF VALLEY DRIVE ROAD NUMBER 5987/5985, 2.1 FEET 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>	
1060.670	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
1060.664	.016	2/1					VERTICAL CONTROL SURVEY	2011	VBCKY-R	
1060.664	.016	2/1					VERTICAL CONTROL SURVEY	2009	VBCKY	

Geoid Separations(ft): GEOID18 = -95.617    12B = -95.577    09 = -95.564    03 = -95.456

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3803_V-DM5442-3N-07AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3803_V-DM5442-3N-07AUG2007.jpg</a>	N	Aug 7, 2007
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3803_V-DM5442-2-07AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3803_V-DM5442-2-07AUG2007.jpg</a>		Aug 7, 2007
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3803_V-DM5442-1-07AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3803_V-DM5442-1-07AUG2007.jpg</a>		Aug 7, 2007

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



Mn/DOT Name: 3803 W

NGS Name: 3803 W

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5441](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

		<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
NE	10	472122.30	911216.70	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>
2007	2007	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 12 FT)	SURVEY DISK	MNDT

Description: (2007)                      Stamping: 3803 W 2007

1.0 MILE NORTHWEST OF ILLGEN CITY, 1.1 MILES NORTHWEST ALONG TRUNK HIGHWAY 1 FROM THE JUNCTION OF TRUNK HIGHWAY 1 AND TRUNK HIGHWAY 61 IN ILLGEN CITY, AT TRUNK HIGHWAY 1 MILEPOINT 346.20, 41.6 FEET SOUTH-SOUTHWEST OF TRUNK HIGHWAY 1, 24.0 FEET EAST OF DRIVEWAY NUMBER 5863, 2.4 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>	
980.244	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
980.241	.016	2/1					VERTICAL CONTROL SURVEY	2011	VBCKY-R	
980.241	.016	2/1					VERTICAL CONTROL SURVEY	2009	VBCKY	

Geoid Separations(ft): GEOID18 = -95.961    12B = -95.922    09 = -95.905    03 = -95.794

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3803_W-DM5441-3S-07AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3803_W-DM5441-3S-07AUG2007.jpg</a>	S	Aug 7, 2007
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3803_W-DM5441-2-07AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3803_W-DM5441-2-07AUG2007.jpg</a>		Aug 7, 2007
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3803_W-DM5441-1-07AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3803_W-DM5441-1-07AUG2007.jpg</a>		Aug 7, 2007

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



Mn/DOT Name: 3803 X

NGS Name: 3803 X

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5440](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	11	56 N	7 W	472054.95	911121.55	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>
2007	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	SURVEY DISK	MNDT

Description: (2007) Stamping: 3803 X 2007

0.5 MILE NORTHWEST OF ILLGEN CITY, 0.15 MILE NORTH-NORTHWEST ALONG TRUNK HIGHWAY 1 FROM THE JUNCTION OF TRUNK HIGHWAY 1 AND TRUNK HIGHWAY 61 IN ILLGEN CITY, AT TRUNK HIGHWAY 1 MILEPOINT 347.15, 46.0 FEET WEST-SOUTHWEST OF TRUNK HIGHWAY 1, 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>				
754.795	.016	2/1				2021	00000963	VERTICAL ADJUSTMENT			
754.811	.016	2/1				2019	VNSHORE	VERTICAL CONTROL SURVEY			
754.815	.016	2/1				2011	00000691	VERTICAL ADJUSTMENT			
754.815	.016	2/1				2011	VBCKY-R	VERTICAL CONTROL SURVEY			
754.815	.016	2/1				2009	VBCKY	VERTICAL CONTROL SURVEY			

**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>				
754.989	.262		658.654	.197	2011	2017	RTRN2017	GPS - RTRN			

Geoid Separations(ft): GEOID18 = -96.374 12B = -96.335 09 = -96.292 03 = -96.184

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>		
<u>Latitude</u>	<u>Longitude</u>										
47 20 54.94710	91 11 21.55492			676967.592	303951.956	.131	3	2017	RTRN2017	GPS - RTRN	

**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 - North Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>		
<u>X</u>	<u>Y</u>										
3098245.755	643455.062			2089097.509	17209588.783	.131	3	2017	RTRN2017	GPS - RTRN	

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3803_X-DM5440-3W-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3803_X-DM5440-3W-19SEP2017.jpg</a>	W	Sep 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3803_X-DM5440-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3803_X-DM5440-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3803_X-DM5440-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3803_X-DM5440-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: 3804 A

NGS Name: 3804 A

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5560](#) [Get Map](#)  
NGS Quad / Sta Num : 47091323/  
USGS Quad: TWO HARBORS

				<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	1	52 N	11 W	470131.40	914040.00	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>
2007	2017	GOOD	Horz=NO Vert=NO	YES			MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	SURVEY DISK	MNDT

Description: (2007) Stamping: 3804 A 2007

IN TWO HARBORS, IN A RAILROAD ABUTMENT IN THE SOUTHEAST CORNER OF A RAILROAD BRIDGE OVER TRUNK HIGHWAY 61, 0.5 MILE WEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 25.50, 88.3 FEET SOUTH OF TRUNK HIGHWAY 61, 10.6 FEET EAST OF THE EAST RAIL OF THE RAILROAD TRACKS, 0.7 FOOT SOUTH OF THE EDGE OF A RAIL.

Station Notes

THE SURVEY MARK IS ON RAILROAD PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

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>		
700.471	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691		
700.471	.016	2/1				VERTICAL CONTROL SURVEY	2010	VSHOR4		

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>		
700.422	.262		605.816	.197	2007	GPS - RTRN	2011	RTRN2011		

Geoid Separations(ft): GEOID18 = -94.711 12B = -94.691 09 = -94.606 03 = -94.521

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2007)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>				
47 01 31.41368	91 40 39.93489	553348.861	188327.822	.131	3	GPS - RTRN	2011	RTRN2011				

State Plane and UTM Coordinates (Feet)

<u>NAD83(2007)</u>		<u>MN State Plane - North 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>			
2979366.601	522981.870	1970061.111	17089317.007	.131	3	GPS - RTRN	2011	RTRN2011			

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_A-DM5560-3N-13NOV2009.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_A-DM5560-3N-13NOV2009.jpg</a>	N	Nov 13, 2009
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_A-DM5560-2-13NOV2009.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_A-DM5560-2-13NOV2009.jpg</a>		Nov 13, 2009
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_A-DM5560-1-13NOV2009.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_A-DM5560-1-13NOV2009.jpg</a>		Nov 13, 2009

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





Mn/DOT Name: 3804 B

NGS Name: 3804 B

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5561](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	52 N	11 W	470100.00	914210.20	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>
2007	2017	GOOD	Horz=NO Vert=NO	YES			NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

Description: (2007)                      Stamping: 3804 B 2007

1.5 MILES SOUTHWEST OF TWO HARBORS, IN A RAILROAD ABUTMENT IN THE SOUTHEAST CORNER OF A RAILROAD BRIDGE OVER TRUNK HIGHWAY 61, 0.85 MILE SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 11 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 24.30, 63.0 FEET SOUTHEAST OF NORTHBOUND TRUNK HIGHWAY 61, 4.6 FEET NORTHEAST OF THE EAST RAIL OF THE RAILROAD TRACKS, AT RAILROAD MILEPOINT 2.51.

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>	
782.489	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
782.489	.016	2/1				VERTICAL CONTROL SURVEY	2010	VSHOR4	

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>	
782.462	.262		688.040	.197	2007	GPS - RTRN	2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -94.524    12B = -94.508    09 = -94.419    03 = -94.347

Lat/Lon and County Coordinates (Feet)

NAD83(2007)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 00 59.92046	91 42 09.91306	547046.621	185272.855	.131	3	GPS - RTRN	2011	RTRN2011	

State Plane and UTM Coordinates (Feet)

NAD83(2007)

<u>MN State Plane - North 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>
2973191.590	519677.962	1963882.849	17086023.367	.131	3	GPS - RTRN	2011	RTRN2011

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_B-DM5561-3NW-22AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_B-DM5561-3NW-22AUG2007.jpg</a>	NW	Aug 22, 2007
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_B-DM5561-2-22AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_B-DM5561-2-22AUG2007.jpg</a>		Aug 22, 2007
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_B-DM5561-1-22AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_B-DM5561-1-22AUG2007.jpg</a>		Aug 22, 2007

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



Mn/DOT Name: 3804 C

NGS Name: 3804 C

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5562](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	10	52 N	11 W	470021.81	914302.88	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>
2007	2017	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 12 FT)	SURVEY DISK	MNDT

**Description:** (2007)                      **Stamping:** 3804 C 2007

2.0 MILES SOUTHWEST OF TWO HARBORS, 1.85 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 11 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 23.25, 63.1 FEET NORTHWEST OF SOUTHBOUND TRUNK HIGHWAY 61, 30.5 FEET NORTHEAST OF DRIVEWAY NUMBER 827, 10.0 FEET NORTHWEST OF CABLE BOX NUMBER C141, 2.6 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>
760.058	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963
760.061	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE
760.061	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691
760.061	.016	2/1					VERTICAL CONTROL SURVEY	2010	VSHOR4

**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>
760.336	.262			665.881	.197	2011	GPS - RTRN	2017	RTRN2017
760.117	.262			665.753	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -94.465    12B = -94.452    09 = -94.363    03 = -94.291

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 00 21.80835	91 43 02.87607			543292.392	181492.751	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 00 21.80931	91 43 02.87629			543292.379	181492.849	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2969591.338	515751.249			1960277.702	17082103.227	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2969591.321	515751.346			1960277.685	17082103.324	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_C-DM5562-3NW-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_C-DM5562-3NW-04OCT2017.jpg</a>	NW	Oct 4, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_C-DM5562-2-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_C-DM5562-2-04OCT2017.jpg</a>		Oct 4, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_C-DM5562-1-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_C-DM5562-1-04OCT2017.jpg</a>		Oct 4, 2017

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



Mn/DOT Name: 3804 D

NGS Name: 3804 D

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5563](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091414/  
 USGS Quad: TWO HARBORS OE S

				<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	52 N	11 W	465947.53	914348.95	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>
2007	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (2007) Stamping: 3804 D 2007

3.0 MILES SOUTHWEST OF TWO HARBORS, 2.75 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 11 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 22.40, 45.4 FEET NORTHWEST OF SOUTHBOUND TRUNK HIGHWAY 61, 211.5 FEET NORTHEAST OF ISACKSON ROAD, 1.7 FEET 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>
756.232	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963
756.242	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE
756.242	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691
756.242	.016	2/1					VERTICAL CONTROL SURVEY	2010	VSHOR4

**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>
756.268	.262			661.872	.197	2011	GPS - RTRN	2017	RTRN2017
756.281	.262			661.977	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -94.399 12B = -94.396 09 = -94.304 03 = -94.235

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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 59 47.53439	91 43 48.95232			540022.665	178091.544	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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 59 47.53380	91 43 48.95359			540022.575	178091.486	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2966460.026	512222.462			1957141.975	17078580.208	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2966459.939	512222.401			1957141.888	17078580.146	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_D-DM5563-3NW-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_D-DM5563-3NW-04OCT2017.jpg</a>	NW	Oct 4, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_D-DM5563-2-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_D-DM5563-2-04OCT2017.jpg</a>		Oct 4, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_D-DM5563-1-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_D-DM5563-1-04OCT2017.jpg</a>		Oct 4, 2017

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



Mn/DOT Name: 3804 E

NGS Name: 3804 E

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5564](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091414/  
 USGS Quad: TWO HARBORS OE S

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	16	52 N	11 W	465903.96	914436.07	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (2007) Stamping: 3804 E 2007

4.0 MILES SOUTHWEST OF TWO HARBORS, 3.8 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 11 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 21.30, 44.5 FEET NORTHWEST OF SOUTHBOUND TRUNK HIGHWAY 61, 40.0 FEET SOUTHWEST OF THE LARSMONT ROAD SIGN, 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	Reference	
760.041	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963	
760.061	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE	
760.061	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
760.061	.016	2/1				VERTICAL CONTROL SURVEY	2010	VSHOR4	

**Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)**

NAVD88				Ellipsoid (NAD83)			Project Info		
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference	
760.084	.262		665.734	.197	2011	GPS - RTRN	2017	RTRN2017	
760.061			665.734	.010	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940	
760.061			665.734	.010	2011	GPS - STATIC	2013	HBBAY	
760.071	.131		665.806	.066	2007	GPS - STATIC	2012	HBBAY	
760.061	.262		665.806	.197	2007	GPS - RTRN	2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -94.350 12B = -94.350 09 = -94.255 03 = -94.189

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)			Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude		X	Y	Acc	Order	Determination Method	Year	Reference
46 59 03.95664	91 44 36.06712		536658.790	173750.059	.131	3	GPS - RTRN	2017	RTRN2017
46 59 03.95654	91 44 36.06686		536658.808	173750.049	.013		ADJUSTMENT	2013	GPS2940
46 59 03.95654	91 44 36.06686		536658.808	173750.049	.013	C	GPS - STATIC	2013	HBBAY

NAD83(2007)			Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude		X	Y	Acc	Order	Determination Method	Year	Reference
46 59 03.95686	91 44 36.06781		536658.743	173750.083	.033	C	GPS - STATIC	2012	HBBAY
46 59 03.95682	91 44 36.06768		536658.752	173750.079	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

NAD83(2011)		MN State Plane - North Zone				UTM - Zone 15			Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference		
2963272.105	507750.443	1953948.244	17074114.343	.131	3	GPS - RTRN	2017	RTRN2017		
2963272.123	507750.433	1953948.262	17074114.333	.013		ADJUSTMENT	2013	GPS2940		
2963272.123	507750.433	1953948.262	17074114.333	.013	C	GPS - STATIC	2013	HBBAY		

NAD83(2007)		MN State Plane - North Zone				UTM - Zone 15			Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference		
2963272.057	507750.464	1953948.196	17074114.364	.033	C	GPS - STATIC	2012	HBBAY		
2963272.066	507750.461	1953948.205	17074114.360	.131	3	GPS - RTRN	2011	RTRN2011		



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_E-DM5564-3NW-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_E-DM5564-3NW-02OCT2017.jpg</a>	NW	Oct 2, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_E-DM5564-2-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_E-DM5564-2-02OCT2017.jpg</a>		Oct 2, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_E-DM5564-1-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_E-DM5564-1-02OCT2017.jpg</a>		Oct 2, 2017

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



Mn/DOT Name: 3804 F

NGS Name: 3804 F

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5565](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	20	52 N	11 W	465828.17	914521.75	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>
2007	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (2007) Stamping: 3804 F 2007

5.0 MILES SOUTHWEST OF TWO HARBORS, 4.7 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 11 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 20.40, 44.8 FEET NORTHWEST OF SOUTHBOUND TRUNK HIGHWAY 61, 1.7 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>		
685.770	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963		
685.793	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE		
685.793	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691		
685.793	.016	2/1				VERTICAL CONTROL SURVEY	2010	VSHOR4		

**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>		
685.799	.262		591.515	.197	2011	GPS - RTRN	2017	RTRN2017		
685.793			591.515	.009	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940		
685.793			591.515	.009	2011	GPS - STATIC	2013	HBBAY		
685.793	.131		591.603	.066	2007	GPS - STATIC	2012	HBBAY		
685.740	.262		591.551	.197	2007	GPS - RTRN	2011	RTRN2011		

Geoid Separations(ft): GEOID18 = -94.285 12B = -94.281 09 = -94.189 03 = -94.121

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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 58 28.17381	91 45 21.74584			533410.820	170196.479	.131	3	GPS - RTRN	2017	RTRN2017
46 58 28.17370	91 45 21.74535			533410.853	170196.468	.013		ADJUSTMENT	2013	GPS2940
46 58 28.17370	91 45 21.74535			533410.853	170196.468	.013	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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 58 28.17399	91 45 21.74631			533410.788	170196.499	.033	C	GPS - STATIC	2012	HBBAY
46 58 28.17372	91 45 21.74511			533410.870	170196.469	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>MN State Plane - North 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>			
		2960168.527	504070.306	1950840.041	17070440.017	.131	3	GPS - RTRN	2017	RTRN2017			
		2960168.561	504070.296	1950840.075	17070440.007	.013		ADJUSTMENT	2013	GPS2940			
		2960168.561	504070.296	1950840.075	17070440.007	.013	C	GPS - STATIC	2013	HBBAY			

<u>NAD83(2007)</u>				<u>MN State Plane - North 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>			
		2960168.494	504070.324	1950840.008	17070440.035	.033	C	GPS - STATIC	2012	HBBAY			
		2960168.578	504070.298	1950840.092	17070440.009	.131	3	GPS - RTRN	2011	RTRN2011			



**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_F-DM5565-3NW-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_F-DM5565-3NW-02OCT2017.jpg</a>	NW	Oct 2, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_F-DM5565-2-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_F-DM5565-2-02OCT2017.jpg</a>		Oct 2, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_F-DM5565-1-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_F-DM5565-1-02OCT2017.jpg</a>		Oct 2, 2017

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



Mn/DOT Name: 3804 G

NGS Name: 3804 G

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5584](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	30	52 N	11 W	465743.94	914624.69	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>
2007	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (2011) Stamping: 3804 G 2007

6.0 MILES SOUTHWEST OF TWO HARBORS, 5.9 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 11 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 19.25, 50.8 FEET NORTHWEST OF NORTHBOUND TRUNK HIGHWAY 61, 49.7 FEET SOUTHEAST OF SOUTHBOUND TRUNK HIGHWAY 61, 91.4 FEET SOUTHWEST OF COUNTY ROAD 11 (SALAKKA ROAD), 1.5 FEET 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>			
725.228	.016	2/1				2021	00000963			
725.241	.016	2/1				2019	VNSHORE			
725.241	.016	2/1				2011	00000691			
725.238	.016	2/1				2010	VSHOR4			

**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>			
725.291	.262		631.114	.197	2011	2017	RTRN2017			
725.241			631.029	.013	2011	2013	GPS2940			
725.241			631.029	.013	2011	2013	HBBAY			
725.228	.131		631.157	.066	2007	2012	HBBAY			
725.143	.262		631.065	.197	2007	2011	RTRN2011			

Geoid Separations(ft): GEOID18 = -94.176 12B = -94.176 09 = -94.081 03 = -94.009

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>	
<u>Latitude</u>	<u>Longitude</u>									
46 57 43.93845	91 46 24.68998			528945.000	165814.407	.131	3	2017	RTRN2017	
46 57 43.93870	91 46 24.68974			528945.017	165814.432	.016		2013	GPS2940	
46 57 43.93870	91 46 24.68974			528945.017	165814.432	.016	C	2013	HBBAY	

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>	
<u>Latitude</u>	<u>Longitude</u>									
46 57 43.93891	91 46 24.69053			528944.963	165814.454	.033	C	2012	HBBAY	
46 57 43.93740	91 46 24.69108			528944.921	165814.302	.131	3	2011	RTRN2011	

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>MN State Plane - North 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>						
2955881.090	499513.830	1946547.036	17065891.435	.131	3	2017	RTRN2017						
2955881.106	499513.856	1946547.052	17065891.461	.016		2013	GPS2940						
2955881.106	499513.856	1946547.052	17065891.461	.016	C	2013	HBBAY						

<u>NAD83(2007)</u>				<u>MN State Plane - North 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>						
2955881.051	499513.876	1946546.997	17065891.481	.033	C	2012	HBBAY						
2955881.016	499513.723	1946546.961	17065891.328	.131	3	2011	RTRN2011						





Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_G-DM5584-3SW-06NOV2009.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_G-DM5584-3SW-06NOV2009.jpg</a>	SW	Nov 6, 2009
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_G-DM5584-2-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_G-DM5584-2-02OCT2017.jpg</a>		Oct 2, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_G-DM5584-1-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_G-DM5584-1-02OCT2017.jpg</a>		Oct 2, 2017

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



Mn/DOT Name: 3804 H

NGS Name: 3804 H

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5583](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	30	52 N	11 W	465733.46	914642.31	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>
2007	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	BENCH MARK DISK	MNDT

**Description:** (2007) **Stamping:** 3804 H 2007

6.0 MILES SOUTHWEST OF TWO HARBORS, 6.2 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 11 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 18.90, 63.8 FEET NORTHWEST OF SOUTHBOUND TRUNK HIGHWAY 61, 5.4 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>
751.636	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963
751.649	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE
751.649	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691
751.645	.016	2/1					VERTICAL CONTROL SURVEY	2010	VSHOR4

**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>
751.816	.262			657.679	.197	2011	GPS - RTRN	2017	RTRN2017
751.570	.262			657.525	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -94.144 12B = -94.140 09 = -94.045 03 = -93.973

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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 57 33.45829	91 46 42.31359			527698.671	164780.641	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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 57 33.45890	91 46 42.31595			527698.508	164780.707	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2954676.993	498431.241			1945341.677	17064811.007	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2954676.828	498431.300			1945341.513	17064811.066	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_H-DM5583-3NW-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_H-DM5583-3NW-02OCT2017.jpg</a>	NW	Oct 2, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_H-DM5583-2-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_H-DM5583-2-02OCT2017.jpg</a>		Oct 2, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_H-DM5583-1-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_H-DM5583-1-02OCT2017.jpg</a>		Oct 2, 2017

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



Mn/DOT Name: 3804 J

NGS Name: 3804 J

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5568](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	31	52 N	11 W	465651.03	914705.42	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	2018	GOOD	Horz=NO Vert=YES	YES	38510	FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

**Description:** (1978)                      **Stamping:** 3804 J 1978

7.0 MILES SOUTHWEST OF TWO HARBORS, IN AN ABUTMENT AT THE SOUTHEAST CORNER OF BRIDGE NUMBER 38510 (COUNTY ROAD OVER KNIFE RIVER), 6.6 MILES SOUTHWEST ALONG SCENIC DRIVE (COUNTY ROAD 61) AND NEW TRUNK HIGHWAY 61 IN TWO HARBORS, THEN 0.05 MILE NORTHWEST ALONG CHURCH ROAD, 17.5 FEET SOUTHWEST OF CHURCH ROAD, 62.5 FEET NORTHWEST OF COUNTY ROAD 61.

**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>
618.893	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963
618.896	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE
618.896	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691
618.896	.016	2/1					VERTICAL CONTROL SURVEY	2010	VSHOR4

**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>
618.805	.262			524.773	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -94.144    12B = -94.144    09 = -94.032    03 = -93.966

**Lat/Lon and County Coordinates (Feet)**

<u>NAVD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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 56 51.03301	91 47 05.42315	525997.785	160519.852	.131	3	GPS - RTRN	2011	RTRN2011	

**State Plane and UTM Coordinates (Feet)**

<u>NAVD83(2007)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2953147.313	494106.167	1943805.934	17060489.614	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_J-DM5568-3N-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_J-DM5568-3N-16AUG2011.jpg</a>	N	Aug 16, 2011
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_J-DM5568-2-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_J-DM5568-2-16AUG2011.jpg</a>		Aug 16, 2011
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_J-DM5568-1-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_J-DM5568-1-16AUG2011.jpg</a>		Aug 16, 2011

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



Mn/DOT Name: 3804 K  
County: LAKE, MN (Sheet 1)

NGS Name: 3804 K

NGS ACRN: [DO8094](#) [Get Map](#)  
NGS Quad / Sta Num : 47091323/  
USGS Quad: TWO HARBORS

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	36	53 N	11 W	470132.58	914104.05		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2011	2017	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

**Description:** **Stamping:** 3804 K 2011

IN TWO HARBORS, 3.0 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 11 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 25.45, 64.5 FEET EAST OF 13TH STREET, 30.6 FEET EAST OF A FIRE HYDRANT, 1.5 FEET EAST OF A WITNESS POST.

**Station Notes**

THE MARK FALLS UNDER A PARKING LOT.

\* 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
722.915			628.280	.037	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940
722.915			628.280	.037	2011	GPS - STATIC	2013	HBBAY
722.899	.131		628.375	.066	2007	GPS - STATIC	2012	HBBAY

Geoid Separations(ft): GEOID18 = -94.629 12B = -94.613 09 = -94.527 03 = -94.445

**Lat/Lon and County Coordinates (Feet)**

**NAD83(2011)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 01 32.58184	91 41 04.05248	551680.856	188482.193	.023		ADJUSTMENT	2013	GPS2940
47 01 32.58184	91 41 04.05248	551680.856	188482.193	.023	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 01 32.58200	91 41 04.05346	551680.788	188482.211	.033	C	GPS - STATIC	2012	HBBAY

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2977693.840	523069.534	1968388.950	17089407.176	.023		ADJUSTMENT	2013	GPS2940
2977693.840	523069.534	1968388.950	17089407.176	.023	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2977693.772	523069.549	1968388.882	17089407.191	.033	C	GPS - STATIC	2012	HBBAY

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_K-DO8094-3N-21SEP2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_K-DO8094-3N-21SEP2011.jpg</a>	N	Sep 21, 2011
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_K-DO8094-2-21SEP2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_K-DO8094-2-21SEP2011.jpg</a>		Sep 21, 2011
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_K-DO8094-1-21SEP2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_K-DO8094-1-21SEP2011.jpg</a>		Sep 21, 2011

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



Mn/DOT Name: 3804 L

NGS Name: 3804 L

County: LAKE, MN (Sheet 1)

NGS ACRN: [DR1374](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	2	53 N	11 W	470129.56	914128.61	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>
2017	2019	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 13 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017) Stamping: 3804 L 2017

IN TWO HARBORS, 0.05 MILE SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 11 (7TH AVENUE) IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 25.1, 37.3 FEET NORTHWEST OF SOUTHBOUND TRUNK HIGHWAY 61, 26.0 FEET SOUTHWEST OF A DRIVEWAY TO SUNSHINE THRIFT SHOP, 1.5 NORTHWEST 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>					
760.934	.016	2/1				2021	00000963	VERTICAL ADJUSTMENT				
760.947	.016	2/1				2019	VNSHORE	VERTICAL CONTROL SURVEY				

**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>					
760.983			666.416	.023	2011	2019	GPS3328	HORIZONTAL ADJUSTMENT				
760.947	.131		666.613	.066	1996	2019	Hlake2	GPS - STATIC				
760.983			666.416	.023	2011	2019	Hlake2	GPS - STATIC				
761.061	.262		666.514	.197	2011	2017	RTRN2017	GPS - RTRN				

Geoid Separations(ft): GEOID18 = -94.563 12B = -94.544 09 = -94.462 03 = -94.380

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>						
47 01 29.55908	91 41 28.61270	549972.999	188212.844	.016		2019	GPS3328	ADJUSTMENT					
47 01 29.55908	91 41 28.61270	549972.999	188212.844	.016	C	2019	Hlake2	GPS - STATIC					
47 01 29.55888	91 41 28.61217	549973.035	188212.823	.131	3	2017	RTRN2017	GPS - RTRN					

<u>NAD83(1996)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>						
47 01 29.55883	91 41 28.61318	549972.965	188212.819	.033	C	2019	Hlake2	GPS - STATIC					

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>MN State Plane - North 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>		
2975998.174	522732.250	1966693.251	17089072.549	.016		2019	GPS3328	ADJUSTMENT	
2975998.174	522732.250	1966693.251	17089072.549	.016	C	2019	Hlake2	GPS - STATIC	
2975998.211	522732.231	1966693.288	17089072.529	.131	3	2017	RTRN2017	GPS - RTRN	

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>		
2975998.141	522732.224	1966693.219	17089072.523	.033	C	2019	Hlake2	GPS - STATIC	

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_L-DR1374-3NW-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_L-DR1374-3NW-18OCT2017.jpg</a>	NW	Oct 18, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_L-DR1374-2-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_L-DR1374-2-18OCT2017.jpg</a>		Oct 18, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_L-DR1374-1-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_L-DR1374-1-18OCT2017.jpg</a>		Oct 18, 2017

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



Mn/DOT Name: 3804 S

NGS Name: 3804 S

County: LAKE, MN (Sheet 1)

NGS ACRN: [DO8095](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	52 N	11 W	465704.03	914719.75	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>
2011	2017	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 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2013) Stamping: 3804 S 2011

7.1 MILES SOUTHWEST OF TWO HARBORS, 6.95 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 11 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 18.15, IN THE CENTER MEDIAN, 60.0 FEET SOUTHWEST OF SOUTHBOUND TRUNK HIGHWAY 61, 71.4 FEET NORTHWEST OF NORTHBOUND TRUNK HIGHWAY 61, 83.4 FEET SOUTHWEST OF A CROSSOVER WITH COUNTY ROAD 103, 52.2 FEET SOUTHWEST OF A POWER POLE NUMBER 103, 1.5 FEET NORTHWEST OF A WITNESS POST.

Station Pair: KNILA - LAKE, 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>			<u>Year</u>	<u>Reference</u>	
680.415	.016	2/1				2021	00000963	VERTICAL ADJUSTMENT				
680.422	.016	2/1				2019	VNSHORE	VERTICAL CONTROL SURVEY				

**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>			<u>Year</u>	<u>Reference</u>	
680.360	.262		586.272	.197	2011	2017	RTRN2017	GPS - RTRN				
680.419			586.291	.015	2011	2013	GPS2940	HORIZONTAL ADJUSTMENT				
680.419			586.291	.015	2011	2013	HBBAY	GPS - STATIC				
680.412	.131		586.439	.066	2007	2012	HBBAY	GPS - STATIC				

Geoid Separations(ft): GEOID18 = -94.088 12B = -94.088 09 = -93.979 03 = -93.914

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>			<u>Geodetic Position</u>			<u>Lake County - Lake (North Shore) Zone</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>Order (/Class)</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>			<u>Year</u>	<u>Reference</u>
46 57 04.03298	91 47 19.74629		525034.405	161859.375	.131	3	2017	RTRN2017	GPS - RTRN			
46 57 04.03277	91 47 19.74681		525034.368	161859.355	.020		2013	GPS2940	ADJUSTMENT			
46 57 04.03277	91 47 19.74681		525034.368	161859.355	.020	C	2013	HBBAY	GPS - STATIC			

<u>NAD83(2007)</u>			<u>Geodetic Position</u>			<u>Lake County - Lake (North Shore) Zone</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>Order (/Class)</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>			<u>Year</u>	<u>Reference</u>
46 57 04.03298	91 47 19.74763		525034.312	161859.377	.033	C	2012	HBBAY	GPS - STATIC			

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>			<u>MN State Plane - North Zone</u>			<u>UTM - Zone 15</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>Order (/Class)</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>			<u>Year</u>	<u>Reference</u>
2952131.342	495406.200		1942792.254	17061790.772	.131	3	2017	RTRN2017	GPS - RTRN			
2952131.306	495406.179		1942792.218	17061790.750	.020		2013	GPS2940	ADJUSTMENT			
2952131.306	495406.179		1942792.218	17061790.750	.020	C	2013	HBBAY	GPS - STATIC			

<u>NAD83(2007)</u>			<u>MN State Plane - North Zone</u>			<u>UTM - Zone 15</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>Order (/Class)</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>			<u>Year</u>	<u>Reference</u>
2952131.249	495406.199		1942792.161	17061790.771	.033	C	2012	HBBAY	GPS - STATIC			



**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_S-DO8095-3SE-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_S-DO8095-3SE-02OCT2017.jpg</a>	SE	Oct 2, 2017
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_S-DO8095-2-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_S-DO8095-2-02OCT2017.jpg</a>		Oct 2, 2017
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_S-DO8095-1-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3804_S-DO8095-1-02OCT2017.jpg</a>		Oct 2, 2017

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



Mn/DOT Name: 3805 A

NGS Name: 3805 A

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4477](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	22	54 N	9 W	470835.67	912808.29	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>
1996	2017	GOOD	Horz=NO Vert=YES	YES	38010	FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	SURVEY DISK	MNDT

**Description:** (2011) **Stamping:** 3805 A 2007

1.5 MILES NORTHEAST OF CASTLE DANGER, IN THE SOUTHWEST CORNER OF TRUNK HIGHWAY 61 BRIDGE NUMBER 38010, AT THE JUNCTION OF TRUNK HIGHWAY 61 AND A BRIDGE OVER GOOSEBERRY FALLS, AT TRUNK HIGHWAY 61 MILEPOINT 39.35, 25.90 FEET NORTHWEST TRUNK HIGHWAY 61.

**Station Notes**

THE DISK WAS SET IN BRIDGE WHEN BUILT IN 1996, THEN STAMPED WHEN USED IN 2007. THE MARK IS NO GOOD FOR GEODETIC WORK.

**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>
750.172	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963
750.172	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE
750.172	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691
750.172	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3

**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>
750.117	.262		654.438	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -95.840 12B = -95.781 09 = -95.682 03 = -95.636

**Lat/Lon and County Coordinates (Feet)**

**NAD83(2007)**

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 08 35.67177	91 28 08.28768	606227.143	230252.593	.131	3	GPS - RTRN	2011	RTRN2011	

**State Plane and UTM Coordinates (Feet)**

**NAD83(2007)**

<u>MN State Plane - North 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>
3030523.920	566984.407	2021272.417	17133231.424	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_A-DM4477-3NW-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_A-DM4477-3NW-04OCT2017.jpg</a>	NW	Oct 4, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_A-DM4477-2-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_A-DM4477-2-04OCT2017.jpg</a>		Oct 4, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_A-DM4477-1-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_A-DM4477-1-04OCT2017.jpg</a>		Oct 4, 2017

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





Mn/DOT Name: 3805 B

NGS Name: 3805 B

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4478](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	28	54 N	9 W	470758.26	912900.40	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>
2007	2020	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: (2009) Stamping: 3805 B 2007

12.0 MILES NORTHEAST OF TWO HARBORS, 12.1 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 38.25, 68.6 FEET NORTHWEST OF SOUTHBOUND TRUNK HIGHWAY 61, 36.5 FEET NORTHEAST OF DRIVEWAY NUMBER 3155, 57.5 FEET NORTHEAST OF A POWER POLE WITH A GUY WIRE, 3.0 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>		
689.746	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963		
689.746	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE		
689.746	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691		
689.746	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3		

**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>		
689.753	.262		593.965	.197	2011	GPS - OPUS	2020	GPSBM		
689.844	.262		594.116	.197	2011	GPS - RTRN	2020	RTRN2020		
689.664	.262		593.936	.197	2011	GPS - RTRN	2017	RTRN2017		
689.746			593.926	.026	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940		
689.746			593.926	.026	2011	GPS - STATIC	2013	HBBAY		
689.762	.131		594.126	.066	2007	GPS - STATIC	2012	HBBAY		
689.641	.262		594.018	.197	2007	GPS - RTRN	2011	RTRN2011		

Geoid Separations(ft): GEOID18 = -95.790 12B = -95.728 09 = -95.620 03 = -95.581

**Lat/Lon and County Coordinates (Feet)**

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 07 58.25683	91 29 00.39512	602553.106	226530.900	.131	3	GPS - OPUS	2020	GPSBM	
47 07 58.25678	91 29 00.39584	602553.056	226530.896	.131	3	GPS - RTRN	2020	RTRN2020	
47 07 58.25727	91 29 00.39498	602553.117	226530.945	.131	3	GPS - RTRN	2017	RTRN2017	
47 07 58.25683	91 29 00.39458	602553.144	226530.900	.033		ADJUSTMENT	2013	GPS2940	
47 07 58.25683	91 29 00.39458	602553.144	226530.900	.033	C	GPS - STATIC	2013	HBBAY	

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 07 58.25714	91 29 00.39560	602553.074	226530.932	.033	C	GPS - STATIC	2012	HBBAY	
47 07 58.25574	91 29 00.39678	602552.989	226530.792	.131	3	GPS - RTRN	2011	RTRN2011	

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
3027002.010	563118.890	2017745.422	17129372.050	.131	3	GPS - OPUS	2020	GPSBM
3027001.960	563118.884	2017745.372	17129372.044	.131	3	GPS - RTRN	2020	RTRN2020
3027002.019	563118.935	2017745.430	17129372.095	.131	3	GPS - RTRN	2017	RTRN2017
3027002.047	563118.891	2017745.459	17129372.051	.033		ADJUSTMENT	2013	GPS2940
3027002.047	563118.891	2017745.459	17129372.051	.033	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
3027001.976	563118.921	2017745.388	17129372.081	.033	C	GPS - STATIC	2012	HBBAY
3027001.898	563118.777	2017745.309	17129371.937	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_B-DM4478-3NW-27JUL2020.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_B-DM4478-3NW-27JUL2020.jpg</a>	NW	Jul 27, 2020
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_B-DM4478-2-27JUL2020.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_B-DM4478-2-27JUL2020.jpg</a>		Jul 27, 2020
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_B-DM4478-1-27JUL2020.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_B-DM4478-1-27JUL2020.jpg</a>		Jul 27, 2020

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



Mn/DOT Name: 3805 C

NGS Name: 3805 C

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4479](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	28	54 N	9 W	470738.71	912927.59	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2007	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 10 FT)	SURVEY DISK	MNDT

**Description:** (2007)                      **Stamping:** 3805 C 2007

11.5 NORTHEAST OF TWO HARBORS, 11.6 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 37.80, 70.6 FEET NORTHWEST OF TRUNK HIGHWAY 61, 56.0 FEET SOUTH OF WHITE TAIL WAY ROAD DRIVEWAY NUMBER 3115, 2.6 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
662.328	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963
662.328	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE
662.328	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691
662.331	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3

**Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)**

NAVD88				Ellipsoid (NAD83)			Project Info		
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
662.348	.262			566.646	.197	2011	GPS - RTRN	2017	RTRN2017
662.328				566.528	.024	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940
662.328				566.528	.024	2011	GPS - STATIC	2013	HBBAY
662.335	.131			566.738	.066	2007	GPS - STATIC	2012	HBBAY
662.157	.262			566.564	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -95.764    12B = -95.702    09 = -95.597    03 = -95.554

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)			Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude		X	Y	Acc	Order	Determination Method	Year	Reference
47 07 38.71469	91 29 27.58680		600635.274	224587.266	.131	3	GPS - RTRN	2017	RTRN2017
47 07 38.71506	91 29 27.58806		600635.188	224587.305	.033		ADJUSTMENT	2013	GPS2940
47 07 38.71506	91 29 27.58806		600635.188	224587.305	.033	C	GPS - STATIC	2013	HBBAY

NAD83(2007)			Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude		X	Y	Acc	Order	Determination Method	Year	Reference
47 07 38.71517	91 29 27.58903		600635.121	224587.318	.033	C	GPS - STATIC	2012	HBBAY
47 07 38.71461	91 29 27.58993		600635.058	224587.262	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

NAD83(2011)		MN State Plane - North Zone				UTM - Zone 15			Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference		
3025163.609	561100.189	2015904.370	17127356.565	.131	3	GPS - RTRN	2017	RTRN2017		
3025163.521	561100.224	2015904.282	17127356.601	.033		ADJUSTMENT	2013	GPS2940		
3025163.521	561100.224	2015904.282	17127356.601	.033	C	GPS - STATIC	2013	HBBAY		

NAD83(2007)		MN State Plane - North Zone				UTM - Zone 15			Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference		
3025163.454	561100.234	2015904.215	17127356.611	.033	C	GPS - STATIC	2012	HBBAY		
3025163.393	561100.176	2015904.154	17127356.553	.131	3	GPS - RTRN	2011	RTRN2011		



**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_C-DM4479-3NW-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_C-DM4479-3NW-27SEP2017.jpg</a>	NW	Sep 27, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_C-DM4479-2-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_C-DM4479-2-27SEP2017.jpg</a>		Sep 27, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_C-DM4479-1-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_C-DM4479-1-27SEP2017.jpg</a>		Sep 27, 2017

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



Mn/DOT Name: 3805 D

NGS Name: 3805 D

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4481](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

				<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	1	53 N	10 W	470605.00	913238.00	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>
2007	2011	GOOD	Horz=NO Vert=NO	YES	38008	FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	BENCH MARK DISK	MNDT

**Description:** (2007) **Stamping:** 3805 D 2007

8.0 NORTHEAST OF TWO HARBORS, IN AN ABUTMENT IN THE SOUTHEAST CORNER OF THE NORTHEAST END OF A TRUNK HIGHWAY 61 BRIDGE OVER CROW CREEK, 8.4 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOST 34.7, 22.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61. THE DISK WAS SET IN THE BRIDGE WHEN IT WAS BUILT IN 1968, THEN STAMPED WHEN IT WAS USED IN 2007.

**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>
697.692	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691
697.692	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3

**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>
697.584	.262			602.226	.197	2011	GPS - RTRN	2017	RTRN2017
697.535	.262			602.286	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -95.410 12B = -95.357 09 = -95.252 03 = -95.207

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>								<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>			
47 06 06.13603	91 32 39.13687	587205.445	215467.804	.131	3	GPS - RTRN	2017	RTRN2017	

  

<u>NAD83(2007)</u>								<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>			
47 06 06.13409	91 32 39.13814	587205.353	215467.609	.131	3	GPS - RTRN	2011	RTRN2011	

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3012110.112	551451.372			2002839.254	17117729.668	.131	3	GPS - RTRN	2017	RTRN2017

  

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3012110.028	551451.174			2002839.170	17117729.470	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_D-DM4481-3SE-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_D-DM4481-3SE-27SEP2017.jpg</a>	SE	Sep 27, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_D-DM4481-2-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_D-DM4481-2-27SEP2017.jpg</a>		Sep 27, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_D-DM4481-1-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_D-DM4481-1-27SEP2017.jpg</a>		Sep 27, 2017

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



Mn/DOT Name: 3805 E

NGS Name: 3805 E

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4482](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

				<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	12	53 N	10 W	470543.16	913313.72	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>
2007	2017	GOOD	Horz=NO Vert=YES	YES	38003	FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
WALL - HEAVY RETAINING	SURVEY DISK	MNDT

**Description:** (2011) **Stamping:** 3805 E 2007

8.0 NORTHEAST OF TWO HARBORS, IN THE SECOND TUNNEL HEADWALL NORTH OF TWO HARBORS, IN THE NORTHWEST CORNER OF THE WEST END OF TRUNK HIGHWAY 61 TUNNEL NUMBER 38003, 7.85 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 34.7, 37.7 FEET NORTH OF TRUNK HIGHWAY 61.

**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>	
682.568	.016	2/1						VERTICAL ADJUSTMENT	2021	00000963	
682.568	.016	2/1						VERTICAL CONTROL SURVEY	2019	VNSHORE	
682.568	.016	2/1						VERTICAL ADJUSTMENT	2011	00000691	
682.571	.016	2/1						VERTICAL CONTROL SURVEY	2009	VSHOR3	

**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>	
682.545	.262			587.217	.197	2011		GPS - RTRN	2017	RTRN2017	
682.449	.262			587.223	.197	2007		GPS - RTRN	2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -95.384 12B = -95.328 09 = -95.226 03 = -95.180

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 05 43.16183	91 33 13.71892			584766.844	213188.190	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 05 43.16077	91 33 13.72139			584766.670	213188.086	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>			<u>Project Info</u>			
<u>MN State Plane - North 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>									
3009764.751	549076.209			2000490.859	17115358.612	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>			<u>Project Info</u>			
<u>MN State Plane - North 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>									
3009764.582	549076.098			2000490.690	17115358.502	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_E-DM4482-3NW-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_E-DM4482-3NW-27SEP2017.jpg</a>	NW	Sep 27, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_E-DM4482-2-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_E-DM4482-2-27SEP2017.jpg</a>		Sep 27, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_E-DM4482-1-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_E-DM4482-1-27SEP2017.jpg</a>		Sep 27, 2017

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



Mn/DOT Name: 3805 F

NGS Name: 3805 F

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4483](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	53 N	10 W	470500.20	913457.69	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>
2007	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (2007) Stamping: 3805 F 2007

6.0 MILES NORTHEAST OF TWO HARBORS, 5.85 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 32.10, 88.4 FEET WEST-NORTHWEST OF TRUNK HIGHWAY 61, 16.9 FEET SOUTHWEST OF A POWER POLE NUMBER W2 256, 1.9 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>		
687.111	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963		
687.111	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE		
687.111	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691		
687.108	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3		

**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>		
687.144	.262		592.013	.197	2011	GPS - RTRN	2017	RTRN2017		
687.111			591.951	.038	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940		
687.111			591.951	.038	2011	GPS - STATIC	2013	HBBAY		
687.105	.131		592.079	.066	2007	GPS - STATIC	2012	HBBAY		
687.069	.262		592.039	.197	2007	GPS - RTRN	2011	RTRN2011		

Geoid Separations(ft): GEOID18 = -95.174 12B = -95.131 09 = -95.029 03 = -94.967

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 05 00.19826	91 34 57.68931	577485.704	208981.095	.131	3	GPS - RTRN	2017	RTRN2017
47 05 00.19832	91 34 57.68901	577485.725	208981.101	.026		ADJUSTMENT	2013	GPS2940
47 05 00.19832	91 34 57.68901	577485.725	208981.101	.026	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 05 00.19848	91 34 57.68971	577485.677	208981.118	.033	C	GPS - STATIC	2012	HBBAY
47 05 00.19696	91 34 57.68850	577485.758	208980.963	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
3002658.023	544581.656	1993379.064	17110875.894	.131	3	GPS - RTRN	2017	RTRN2017
3002658.044	544581.663	1993379.085	17110875.900	.026		ADJUSTMENT	2013	GPS2940
3002658.044	544581.663	1993379.085	17110875.900	.026	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
3002657.995	544581.678	1993379.036	17110875.916	.033	C	GPS - STATIC	2012	HBBAY
3002658.082	544581.526	1993379.123	17110875.763	.131	3	GPS - RTRN	2011	RTRN2011



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_F-DM4483-3NW-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_F-DM4483-3NW-27SEP2017.jpg</a>	NW	Sep 27, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_F-DM4483-2-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_F-DM4483-2-27SEP2017.jpg</a>		Sep 27, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_F-DM4483-1-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_F-DM4483-1-27SEP2017.jpg</a>		Sep 27, 2017

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





Mn/DOT Name: 3805 G

NGS Name: 3805 G

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4484](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

				<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	15	53 N	10 W	470411.17	913529.67	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>
2007	2017	GOOD	Horz=NO Vert=YES	YES	38014	FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	SURVEY DISK	MNDT

Description: (2011) Stamping: 3805 G 2007

5.0 MILES NORTHEAST OF TWO HARBORS, IN AN ABUTMENT IN THE SOUTHEAST CORNER OF WALKING PATH BRIDGE NUMBER 38014, 4.85 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 31.0, 10.0 FEET SOUTHEAST OF THE GITCHI GAMI STATE TRAIL, AT THE NORTH END OF THE SILVER CREEK CLIFF TUNNEL. THE DISK WAS SET IN THE PEDESTRIAN BRIDGE WHEN IT WAS BUILT IN 2004, THEN STAMPED WHEN IT WAS USED IN 2007.

**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>
713.735	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963
713.735	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE
713.735	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691
713.735	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3

**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>
713.722	.262			618.513	.197	2011	GPS - RTRN	2017	RTRN2017
713.699	.262			618.595	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -95.246 12B = -95.207 09 = -95.105 03 = -95.039

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 04 11.17090	91 35 29.66501			575171.545	204059.809	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 04 11.16961	91 35 29.66577			575171.490	204059.679	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3000542.514	539572.086			1991256.507	17105870.773	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3000542.464	539571.955			1991256.456	17105870.642	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_G-DM4484-3NE-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_G-DM4484-3NE-27SEP2017.jpg</a>	NE	Sep 27, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_G-DM4484-2-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_G-DM4484-2-27SEP2017.jpg</a>		Sep 27, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_G-DM4484-1-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_G-DM4484-1-27SEP2017.jpg</a>		Sep 27, 2017

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



Mn/DOT Name: 3805 H

NGS Name: 3805 H

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4485](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	31	53 N	10 W	470206.00	913851.00	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>
2007	2012	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: (2007)                      Stamping: 3805 H 2007

1.0 MILE NORTHEAST OF TWO HARBORS, 1.15 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 27.30, 51.2 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 71.9 FEET NORTHEAST OF SUPERIOR SHORES DRIVE, 2.0 FEET NORTH OF A WITNESS POST.

**Station Notes**

FOUND THE CAP LOOSE DESTROYED.  
 THE DISK WAS TURNED IN 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>	
626.154	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
626.157	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3	

Geoid Separations(ft): GEOID18 = -94.960 12B = -94.941 09 = -94.849 03 = -94.767

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_H-DM4485-3SE-28AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_H-DM4485-3SE-28AUG2007.jpg</a>	SE	Aug 28, 2007
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_H-DM4485-2-28AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_H-DM4485-2-28AUG2007.jpg</a>		Aug 28, 2007
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_H-DM4485-1-28AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_H-DM4485-1-28AUG2007.jpg</a>		Aug 28, 2007

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



Mn/DOT Name: 3805 H RESET

NGS Name: 3805 H RESET

County: LAKE, MN (Sheet 1)

NGS ACRN: [DO8096](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	31	53 N	10 W	470206.78	913851.73	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>
2011	2021	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: 3805 H RESET 2011

1.0 MILE NORTHEAST OF TWO HARBORS, 1.15 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 27.30, 51.2 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 71.9 FEET NORTHEAST OF SUPERIOR SHORES DRIVE, 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>
625.924	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963
625.924	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE

**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>
625.973	.262			531.013	.197	2011	GPS - OPUS	2021	GPSBM
625.993	.262			531.032	.197	2011	GPS - RTRN	2021	RTRN2021
626.035	.262			531.091	.197	2011	GPS - RTRN	2017	RTRN2017
625.924				530.967	.038	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940
625.924				530.967	.038	2011	GPS - STATIC	2013	HBBAY
625.917	.131			531.068	.066	2007	GPS - STATIC	2012	HBBAY
625.934	.262			531.085	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -94.960    12B = -94.941    09 = -94.849    03 = -94.767

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Lake County - Lake (North Shore) Zone</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>								
47 02 06.77522	91 38 51.73141	560919.625	191749.874	.131	3	GPS - OPUS	2021	GPSBM	
47 02 06.77537	91 38 51.73131	560919.632	191749.889	.131	3	GPS - RTRN	2021	RTRN2021	
47 02 06.77556	91 38 51.73111	560919.647	191749.908	.131	3	GPS - RTRN	2017	RTRN2017	
47 02 06.77561	91 38 51.73132	560919.632	191749.914	.026		ADJUSTMENT	2013	GPS2940	
47 02 06.77561	91 38 51.73132	560919.632	191749.914	.026	C	GPS - STATIC	2013	HBBAY	

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>								
47 02 06.77575	91 38 51.73214	560919.576	191749.929	.033	C	GPS - STATIC	2012	HBBAY	
47 02 06.77493	91 38 51.73085	560919.663	191749.844	.131	3	GPS - RTRN	2011	RTRN2011	

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North 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>
2986794.374	526703.280	1977492.474	17093026.151	.131	3	GPS - OPUS	2021	GPSBM
2986794.380	526703.295	1977492.481	17093026.166	.131	3	GPS - RTRN	2021	RTRN2021
2986794.394	526703.315	1977492.494	17093026.186	.131	3	GPS - RTRN	2017	RTRN2017
2986794.379	526703.320	1977492.480	17093026.190	.026		ADJUSTMENT	2013	GPS2940
2986794.379	526703.320	1977492.480	17093026.190	.026	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North 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>
2986794.322	526703.333	1977492.423	17093026.203	.033	C	GPS - STATIC	2012	HBBAY
2986794.413	526703.251	1977492.514	17093026.122	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_H_RESET-DO8096-3SE-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_H_RESET-DO8096-3SE-17AUG2021.jpg</a>	SE	Aug 17, 2021
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_H_RESET-DO8096-2-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_H_RESET-DO8096-2-17AUG2021.jpg</a>		Aug 17, 2021
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_H_RESET-DO8096-1-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_H_RESET-DO8096-1-17AUG2021.jpg</a>		Aug 17, 2021

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



Mn/DOT Name: 3805 J

NGS Name: 3805 J

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	28	54 N	9 W	470735.00	912936.00		

<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>
1971	2000	DESTROYED	Horz=NO Vert=NO	YES			SEE DESCRIPTION

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

Description: (2000)                      Stamping: 3805 J 1971

11.25 MILES NORTHEAST OF TWO HARBORS, 60.0 FEET LEFT OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 STATION 2224+00, 76.0 FEET NORTHEAST OF A TELEPHONE POLE, 0.9 MILE NORTHEAST OF MILEPOST 37, AND 1.0 FOOT NORTHWEST 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>	
655.967	.033	3				VERTICAL CONTROL SURVEY	1971	CS3805	

**Geoid Separations(ft): GEOID18 = -95.748    12B = -95.686    09 = -95.577    03 = -95.535**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 3805 K

NGS Name: 3805 K

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	28	54 N	9 W	470824.00	912826.00		

<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>
1971	2000	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (2000)                      Stamping: 3805 K 1971

12.1 MILES NORTHEAST OF TWO HARBORS, 66.0 FEET RIGHT OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 STATION 2182+75, 24.0 FEET EAST-SOUTHEAST OF A POWER POLE, 0.65 MILE NORTHEAST OF MILEPOST 38, AND 11.0 FEET NORTHWEST 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>	
702.049	.033	3				VERTICAL CONTROL SURVEY	1971	CS3805	

**Geoid Separations(ft): GEOID18 = -95.817    12B = -95.758    09 = -95.656    03 = -95.610**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 3805 L

NGS Name: 3805 L

County: LAKE, MN (Sheet 1)

NGS ACRN: [DO8097](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	63 N	9 W	470636.53	913114.66	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>
2011	2021	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (2011) Stamping: 3805 L 2011

9.4 MILES NORTHEAST OF TWO HARBORS, 9.4 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2) IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 36.0, 72.4 FEET NORTHWEST OF TRUNK HIGHWAY 61, 58.8 FEET SOUTHEAST OF DRIVEWAY NUMBER GROUSE RUN 2663, 47.0 FEET NORTHWEST OF A GUARD RAIL, 1.4 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>			
670.881	.016	2/1				2021	00000963			
670.884	.016	2/1				2019	VNSHORE			

**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>			
670.904	.262		575.294	.197	2011	2021	GPSBM			
670.904	.262		575.297	.197	2011	2021	RTRN2021			
670.927	.262		575.379	.197	2011	2017	RTRN2017			
670.878			575.265	.021	2011	2013	GPS2940			
670.878			575.265	.021	2011	2013	HBBAY			
670.898	.131		575.445	.066	2007	2012	HBBAY			

Geoid Separations(ft): GEOID18 = -95.610 12B = -95.548 09 = -95.439 03 = -95.400

**Lat/Lon and County Coordinates (Feet)**

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>		
47 06 36.52592	91 31 14.65842	593109.165	218431.055	.131	3	2021	GPSBM		
47 06 36.52551	91 31 14.65769	593109.215	218431.012	.131	3	2021	RTRN2021		
47 06 36.52606	91 31 14.65871	593109.145	218431.069	.131	3	2017	RTRN2017		
47 06 36.52620	91 31 14.65835	593109.171	218431.083	.030		2013	GPS2940		
47 06 36.52620	91 31 14.65835	593109.171	218431.083	.030	C	2013	HBBAY		

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>		
47 06 36.52631	91 31 14.65932	593109.104	218431.095	.033	C	2012	HBBAY		

**State Plane and UTM Coordinates (Feet)**

<u>MN State Plane - North 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>		
3017890.258	554648.184	2008622.892	17120916.999	.131	3	2021	GPSBM		
3017890.309	554648.144	2008622.943	17120916.959	.131	3	2021	RTRN2021		
3017890.237	554648.198	2008622.872	17120917.013	.131	3	2017	RTRN2017		
3017890.262	554648.213	2008622.896	17120917.028	.030		2013	GPS2940		
3017890.262	554648.213	2008622.896	17120917.028	.030	C	2013	HBBAY		

<u>MN State Plane - North 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>		
3017890.195	554648.222	2008622.829	17120917.038	.033	C	2012	HBBAY		



**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_L-DO8097-3NW-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_L-DO8097-3NW-17AUG2021.jpg</a>	NW	Aug 17, 2021
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_L-DO8097-2-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_L-DO8097-2-17AUG2021.jpg</a>		Aug 17, 2021
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_L-DO8097-1-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_L-DO8097-1-17AUG2021.jpg</a>		Aug 17, 2021

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





Mn/DOT Name: 3805 M

NGS Name: 3805 M

County: LAKE, MN (Sheet 1)

NGS ACRN: [DO8098](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

				<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	22	54 N	9 W	470545.18	913327.87	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>
2011	2019	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) (<10 FT) (DEPTH 7 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2011) Stamping: 3805 M 2011

7.7 MILES NORTHEAST OF TWO HARBORS, 7.45 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 33.80, 60.4 FEET NORTH OF TRUNK HIGHWAY 61, 15.6 FEET SOUTHEAST OF A GATE 11 ROAD, 1.5 FEET SOUTHEAST OF A WITNESS POST.

Station Pair: TUNTWO - LAKE, 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>					
673.860	.016	2/1				2021	00000963					
673.860	.016	2/1				2019	VNSHORE					

**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>					
673.883			578.545	.014	2011	2019	GPS3328					
673.860	.131		578.700	.066	1996	2019	Hlake2					
673.883			578.545	.014	2011	2019	Hlake2					
673.821	.262		578.555	.197	2011	2017	RTRN2017					
673.883			578.545	.016	2011	2013	GPS2940					
673.883			578.545	.016	2011	2013	HBBAY					
673.883	.131		578.703	.066	2007	2012	HBBAY					

Geoid Separations(ft): GEOID18 = -95.321 12B = -95.269 09 = -95.167 03 = -95.118

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Geodetic Position</u>						<u>Lake County - Lake (North Shore) Zone</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</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>		
47 05 45.17699	91 33 27.87447	47 05 45.17699	91 33 27.87447	583791.672	213411.931	.013		ADJUSTMENT	2019	GPS3328		
47 05 45.17699	91 33 27.87447	47 05 45.17699	91 33 27.87447	583791.672	213411.931	.013	C	GPS - STATIC	2019	Hlake2		
47 05 45.17685	91 33 27.87378	47 05 45.17685	91 33 27.87378	583791.719	213411.916	.131	3	GPS - RTRN	2017	RTRN2017		
47 05 45.17699	91 33 27.87447	47 05 45.17699	91 33 27.87447	583791.672	213411.931	.016		ADJUSTMENT	2013	GPS2940		
47 05 45.17699	91 33 27.87447	47 05 45.17699	91 33 27.87447	583791.672	213411.931	.016	C	GPS - STATIC	2013	HBBAY		

  

<u>NAD83(2007)</u>		<u>Geodetic Position</u>						<u>Lake County - Lake (North Shore) Zone</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</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>		
47 05 45.17710	91 33 27.87523	47 05 45.17710	91 33 27.87523	583791.619	213411.944	.033	C	GPS - STATIC	2012	HBBAY		

  

<u>NAD83(1996)</u>		<u>Geodetic Position</u>						<u>Lake County - Lake (North Shore) Zone</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</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>		
47 05 45.17615	91 33 27.87484	47 05 45.17615	91 33 27.87484	583791.644	213411.847	.033	C	GPS - STATIC	2019	Hlake2		

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - North 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>	
3008781.469	549260.769	1999508.091	17115544.615	.013		ADJUSTMENT	2019	GPS3328	
3008781.469	549260.769	1999508.091	17115544.615	.013	C	GPS - STATIC	2019	HLAKE2	
3008781.517	549260.756	1999508.139	17115544.602	.131	3	GPS - RTRN	2017	RTRN2017	
3008781.469	549260.769	1999508.091	17115544.615	.016		ADJUSTMENT	2013	GPS2940	
3008781.469	549260.769	1999508.091	17115544.615	.016	C	GPS - STATIC	2013	HBBAY	

NAD83(2007)

MN State Plane - North 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>	
3008781.416	549260.779	1999508.038	17115544.625	.033	C	GPS - STATIC	2012	HBBAY	

NAD83(1996)

MN State Plane - North 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>	
3008781.445	549260.684	1999508.067	17115544.530	.033	C	GPS - STATIC	2019	HLAKE2	

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_M-DO8098-3N-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_M-DO8098-3N-27SEP2017.jpg</a>	N	Sep 27, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_M-DO8098-2-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_M-DO8098-2-27SEP2017.jpg</a>		Sep 27, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_M-DO8098-1-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_M-DO8098-1-27SEP2017.jpg</a>		Sep 27, 2017

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



Mn/DOT Name: 3805 N

NGS Name: 3805 N

County: LAKE, MN (Sheet 1)

NGS ACRN: [DO8099](#) [Get Map](#)  
NGS Quad / Sta Num : 47091322/  
USGS Quad: CASTLE DANGER

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
SE	15	53 N	10 W	Latitude	Longitude	Order	Order
				470418.38	913522.57	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2011	2017	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 5 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2011) **Stamping:** 3805 N 2011

5.4 MILES NORTHEAST OF TWO HARBORS, 4.95 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 31.15, 43.9 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 46.0 FEET SOUTHWEST OF DRIVEWAY NUMBER 0006, 20.2 FEET NORTHEAST OF AN ENTRANCE TO AN OVERLOOK, 16.1 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
683.995	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963
683.995	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE

**Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)**

NAVD88			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
683.991	.262		588.785	.197	2011	GPS - RTRN	2017	RTRN2017
684.037			588.805	.038	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940
684.037			588.805	.038	2011	GPS - STATIC	2013	HBBAY
684.021	.131		588.923	.066	2007	GPS - STATIC	2012	HBBAY

Geoid Separations(ft): GEOID18 = -95.246 12B = -95.207 09 = -95.102 03 = -95.039

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 04 18.38375	91 35 22.56559	575677.838	204780.417	.131	3	GPS - RTRN	2017	RTRN2017
47 04 18.38374	91 35 22.56554	575677.841	204780.416	.026		ADJUSTMENT	2013	GPS2940
47 04 18.38374	91 35 22.56554	575677.841	204780.416	.026	C	GPS - STATIC	2013	HBBAY

NAD83(2007)		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 04 18.38391	91 35 22.56627	575677.791	204780.434	.033	C	GPS - STATIC	2012	HBBAY

**State Plane and UTM Coordinates (Feet)**

NAD83(2011)		UTM - Zone 15				Project Info		
MN State Plane - North Zone		X	Y	Acc	Order	Determination Method	Year	Reference
3001019.580	540312.313	1991734.573	17106610.092	.131	3	GPS - RTRN	2017	RTRN2017
3001019.583	540312.312	1991734.576	17106610.091	.026		ADJUSTMENT	2013	GPS2940
3001019.583	540312.312	1991734.576	17106610.091	.026	C	GPS - STATIC	2013	HBBAY

NAD83(2007)		UTM - Zone 15				Project Info		
MN State Plane - North Zone		X	Y	Acc	Order	Determination Method	Year	Reference
3001019.532	540312.328	1991734.525	17106610.107	.033	C	GPS - STATIC	2012	HBBAY

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_N-DO8099-3N-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_N-DO8099-3N-27SEP2017.jpg</a>	N	Sep 27, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_N-DO8099-2-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_N-DO8099-2-27SEP2017.jpg</a>		Sep 27, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_N-DO8099-1-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_N-DO8099-1-27SEP2017.jpg</a>		Sep 27, 2017

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



Mn/DOT Name: 3805 Q

NGS Name: 3805 Q

County: LAKE, MN (Sheet 1)

NGS ACRN: [DO8100](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	29	53 N	10 W	470252.04	913747.39	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>
2011	2021	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

**Description:** (2013) **Stamping:** 3805 Q 2011

2.8 MILES NORTHEAST OF TWO HARBORS, 2.35 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2) IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 28.5, 184.0 FEET NORTHEAST OF TRUNK HIGHWAY 61, 12.4 FEET NORTHWEST OF THE EDGE OF A CLIFF, 42.4 FEET SOUTH OF THE EDGE OF A GRAVEL LOT, 30.0 FEET NORTH OF THE STEWART RIVER NORTH EDGE, 8.0 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>	
615.793	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
615.793	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	

**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>	
615.927	.262			520.885	.197	2011	GPS - OPUS	2021	GPSBM	
615.826	.262			520.783	.197	2011	GPS - RTRN	2021	RTRN2021	
615.868	.262			520.855	.197	2011	GPS - RTRN	2017	RTRN2017	
615.783				520.754	.038	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940	
615.783				520.754	.038	2011	GPS - STATIC	2013	HBBAY	
615.780	.131			520.868	.066	2007	GPS - STATIC	2012	HBBAY	

Geoid Separations(ft): GEOID18 = -95.042 12B = -95.016 09 = -94.915 03 = -94.839

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 02 52.04069	91 37 47.39401			565471.308	196241.388	.131	3	GPS - OPUS	2021	GPSBM
47 02 52.04093	91 37 47.39308			565471.373	196241.411	.131	3	GPS - RTRN	2021	RTRN2021
47 02 52.04086	91 37 47.39304			565471.376	196241.404	.131	3	GPS - RTRN	2017	RTRN2017
47 02 52.04130	91 37 47.39391			565471.317	196241.450	.026		ADJUSTMENT	2013	GPS2940
47 02 52.04130	91 37 47.39391			565471.317	196241.450	.026	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 02 52.04151	91 37 47.39467			565471.264	196241.472	.033	C	GPS - STATIC	2012	HBBAY

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2991162.849	531372.772			1981866.852	17097687.777	.131	3	GPS - OPUS	2021	GPSBM
2991162.913	531372.797			1981866.916	17097687.802	.131	3	GPS - RTRN	2021	RTRN2021
2991162.916	531372.790			1981866.918	17097687.795	.131	3	GPS - RTRN	2017	RTRN2017
2991162.855	531372.834			1981866.857	17097687.839	.026		ADJUSTMENT	2013	GPS2940
2991162.855	531372.834			1981866.857	17097687.839	.026	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2991162.802	531372.854			1981866.804	17097687.859	.033	C	GPS - STATIC	2012	HBBAY



**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_Q-DO8100-3SE-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_Q-DO8100-3SE-17AUG2021.jpg</a>	SE	Aug 17, 2021
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_Q-DO8100-2-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_Q-DO8100-2-17AUG2021.jpg</a>		Aug 17, 2021
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_Q-DO8100-1-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_Q-DO8100-1-17AUG2021.jpg</a>		Aug 17, 2021

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

Mn/DOT Name: 3805 R

NGS Name: 3805 R

County: LAKE, MN (Sheet 1)

NGS ACRN: <a href="#">DO8101</a>	<a href="#">Get Map</a>
NGS Quad / Sta Num : 47091323/	
USGS Quad: TWO HARBORS	

	<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	31	53 N	10 W	
	470134.88	913953.00	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>
2011	2017	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 14 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2011)                      Stamping: 3805 R 2011

IN TWO HARBORS, 0.15 MILE NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 26.35, 54.3 FEET NORTHWEST OF TRUNK HIGHWAY 61, 23.1 FEET SOUTHWEST OF AN ENTRANCE, 1.4 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>				
640.616	.016	2/1				2021	00000963				
640.616	.016	2/1				2019	VNSHORE				

**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>				
640.701	.262		545.865	.197	2011	2017	RTRN2017				
640.609			545.750	.037	2011	2013	GPS2940				
640.609			545.750	.037	2011	2013	HBBAY				
640.616	.131		545.852	.066	2007	2012	HBBAY				

Geoid Separations(ft): GEOID18 = -94.855 12B = -94.836 09 = -94.747 03 = -94.662

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 01 34.88160	91 39 53.00051	556607.392	188609.377	.131	3	GPS - RTRN	2017	RTRN2017		
47 01 34.88185	91 39 53.00060	556607.387	188609.403	.023		ADJUSTMENT	2013	GPS2940		
47 01 34.88185	91 39 53.00060	556607.387	188609.403	.023	C	GPS - STATIC	2013	HBBAY		

  

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 01 34.88191	91 39 53.00143	556607.329	188609.410	.033	C	GPS - STATIC	2012	HBBAY		

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</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>
2982611.153	523393.261	1973305.384	17089723.373	.131	3	GPS - RTRN	2017	RTRN2017
2982611.146	523393.286	1973305.378	17089723.398	.023		ADJUSTMENT	2013	GPS2940
2982611.146	523393.286	1973305.378	17089723.398	.023	C	GPS - STATIC	2013	HBBAY

  

<u>NAD83(2007)</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>
2982611.088	523393.291	1973305.320	17089723.403	.033	C	GPS - STATIC	2012	HBBAY

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_R-DO8101-3NW-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_R-DO8101-3NW-04OCT2017.jpg</a>	NW	Oct 4, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_R-DO8101-2-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_R-DO8101-2-04OCT2017.jpg</a>		Oct 4, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_R-DO8101-1-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3805_R-DO8101-1-04OCT2017.jpg</a>		Oct 4, 2017

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



Mn/DOT Name: 3806 A

NGS Name: 3806 A

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4475](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

		<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Latitute</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
SE	22	470846.76	912717.49	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>
1971	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	BENCH MARK DISK	MNDT

Description: (2011) Stamping: 3806 A 1971

13.5 MILES NORTHEAST OF TWO HARBORS, 0.75 MILE NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE BRIDGE OVER GOOSEBERRY FALLS TO TRUNK HIGHWAY 61 MILEPOINT 40.2, THEN TURN ON DRIVEWAY NUMBER 3296 AND GO 0.2 MILE SOUTHWEST ON A BIKE PATH TO A MARK. 128.5 FEET SOUTHWEST OF STATION J 341, 38.0 FEET NORTHWEST OF A BIKE PATH, 13.5 FEET NORTHWEST 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>			
724.831	.016	2/1				VERTICAL ADJUSTMENT		2021	00000963			
724.831	.016	2/1				VERTICAL CONTROL SURVEY		2019	VNSHORE			
724.831	.016	2/1				VERTICAL ADJUSTMENT		2011	00000691			
724.831	.016	2/1				VERTICAL CONTROL SURVEY		2009	VSHOR3			

<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>			
724.693	.033	3				VERTICAL CONTROL SURVEY		1971	CS3806			

**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>			
724.789	.262		628.831	.197	2011	GPS - RTRN		2017	RTRN2017			
724.831			628.752	.028	2011	HORIZONTAL ADJUSTMENT		2013	GPS2940			
724.831			628.752	.028	2011	GPS - STATIC		2013	HBBAY			
724.835	.131		628.978	.066	2007	GPS - STATIC		2012	HBBAY			
724.720	.262		628.867	.197	2007	GPS - RTRN		2011	RTRN2011			

Geoid Separations(ft): GEOID18 = -96.014 12B = -95.955 09 = -95.853 03 = -95.807

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>		
47 08 46.76246	91 27 17.48685	609759.474	231309.920	.131	3	GPS - RTRN		2017	RTRN2017		
47 08 46.76232	91 27 17.48659	609759.492	231309.905	.033		ADJUSTMENT		2013	GPS2940		
47 08 46.76232	91 27 17.48659	609759.492	231309.905	.033	C	GPS - STATIC		2013	HBBAY		

<u>NAD83(2007)</u>		<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>		
47 08 46.76270	91 27 17.48773	609759.414	231309.945	.033	C	GPS - STATIC		2012	HBBAY		
47 08 46.76115	91 27 17.48857	609759.353	231309.789	.131	3	GPS - RTRN		2011	RTRN2011		

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North 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>
3034010.872	568182.215	2024760.449	17134423.717	.131	3	GPS - RTRN	2017	RTRN2017
3034010.890	568182.201	2024760.467	17134423.703	.033		ADJUSTMENT	2013	GPS2940
3034010.890	568182.201	2024760.467	17134423.703	.033	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North 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>
3034010.811	568182.238	2024760.387	17134423.740	.033	C	GPS - STATIC	2012	HBBAY
3034010.756	568182.080	2024760.332	17134423.582	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_A-DM4475-3NW-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_A-DM4475-3NW-26SEP2017.jpg</a>	NW	Sep 26, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_A-DM4475-2-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_A-DM4475-2-26SEP2017.jpg</a>		Sep 26, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_A-DM4475-1-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_A-DM4475-1-26SEP2017.jpg</a>		Sep 26, 2017

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





Mn/DOT Name: 3806 AA  
County: LAKE, MN (Sheet 1)

NGS Name: 3806 AA

NGS ACRN: [DO8102](#) [Get Map](#)  
NGS Quad / Sta Num : 47091242/  
USGS Quad: SILVER BAY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	12	55 N	8 W	471534.07	911749.90		C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2011	2014	DESTROYED	Horz=NO Vert=NO	YES		RECESSED 1 IN.	BAR MAG IN DRILL HOLE

Monument Type	Disk Type	Mon. Agency
UNKNOWN	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2011)                      **Stamping:** 3806 AA 2011

IN BEAVER BAY, AT TRUNK HIGHWAY 61 AND COUNTY ROAD 4 (LAX LAKE ROAD) IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 51.10, 84.6 FEET NORTHWEST OF TRUNK HIGHWAY 61, 51.8 FEET NORTHEAST OF COUNTY ROAD 4 (LAX LAKE ROAD), 12.0 FEET NORTHWEST OF A PATH, 1.5 FEET NORTHEAST OF A WITNESS POST.

**Station Notes**

THE STATION REPORTED DESTROYED BY LAKE COUNTY HIGHWAY DEPARTMENT DUE TO CONSTRUCTION OF A TRAILHEAD SHELTER AND A TRAIL.

\* 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		
687.387			590.986	.016	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940		
687.387			590.986	.016	2011	GPS - STATIC	2013	HBBAY		
687.367	.131		591.072	.066	2007	GPS - STATIC	2012	HBBAY		

Geoid Separations(ft): GEOID18 = -96.434    12B = -96.401    09 = -96.306    03 = -96.220

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)		Geodetic Position				Lake County - Lake (North Shore) Zone			Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference		
47 15 34.07128	91 17 49.90459	649680.481	271875.732	.016		ADJUSTMENT	2013	GPS2940		
47 15 34.07128	91 17 49.90459	649680.481	271875.732	.016	C	GPS - STATIC	2013	HBBAY		

NAD83(2007)		Geodetic Position				Lake County - Lake (North Shore) Zone			Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference		
47 15 34.07180	91 17 49.90541	649680.426	271875.785	.033	C	GPS - STATIC	2012	HBBAY		

**State Plane and UTM Coordinates (Feet)**

NAD83(2011)		MN State Plane - North Zone				UTM - Zone 15			Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference		
3072271.106	610312.243	2063077.122	17176488.763	.016		ADJUSTMENT	2013	GPS2940		
3072271.106	610312.243	2063077.122	17176488.763	.016	C	GPS - STATIC	2013	HBBAY		

NAD83(2007)		MN State Plane - North Zone				UTM - Zone 15			Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference		
3072271.049	610312.294	2063077.064	17176488.814	.033	C	GPS - STATIC	2012	HBBAY		

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AA-DO8102-3NW-20SEP2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AA-DO8102-3NW-20SEP2011.jpg</a>	NW	Sep 20, 2011
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AA-DO8102-2-20SEP2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AA-DO8102-2-20SEP2011.jpg</a>		Sep 20, 2011
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AA-DO8102-1-20SEP2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AA-DO8102-1-20SEP2011.jpg</a>		Sep 20, 2011

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





Mn/DOT Name: 3806 AD  
County: LAKE, MN (Sheet 1)

NGS Name: 3806 AD

NGS ACRN: [DO8104](#) [Get Map](#)  
NGS Quad / Sta Num : 47091234/  
USGS Quad: SPLIT ROCK POINT

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	6	54 N	8 W	471115.57	912400.43	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2011	2019	GOOD	Horz=YES Vert=YES	YES		RECESSED 3 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (2011)                      **Stamping:** 3806 AD 2011

6.4 MILES SOUTHWEST OF BEAVER BAY, 7.05 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 (LAX LAKE ROAD) IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 43.9, 53.6 FEET NORTHWEST OF TRUNK HIGHWAY 61, 1.7 FEET NORTHWEST OF A WITNESS POST.

Station Pair: SHTR - LAKE, MN

**Leveling-Derived Orthometric Heights (Feet)**

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj				Year	Reference		
686.505	.016	2/1				VERTICAL ADJUSTMENT			2021	00000963		
686.505	.016	2/1				VERTICAL CONTROL SURVEY			2019	VNSHORE		

**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		
686.449			590.192	.031	2011	HORIZONTAL ADJUSTMENT			2019	GPS3328		
686.505	.131		590.386	.066	1996	GPS - STATIC			2019	HLAKE2		
686.449			590.192	.031	2011	GPS - STATIC			2019	HLAKE2		
686.413	.262		590.219	.197	2011	GPS - RTRN			2017	RTRN2017		
686.459			590.225	.032	2011	HORIZONTAL ADJUSTMENT			2013	GPS2940		
686.459			590.225	.032	2011	GPS - STATIC			2013	HBBAY		
686.482	.131		590.386	.066	2007	GPS - STATIC			2012	HBBAY		

Geoid Separations(ft): GEOID18 = -96.243 12B = -96.194 09 = -96.089 03 = -96.027

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)		Lake County - Lake (North Shore) Zone						Project Info	
Geodetic Position		X	Y	Acc	Order	Determination Method	Year	Reference	
Latitude	Longitude								
47 11 15.56578	91 24 00.42567	623651.752	246133.483	.020		ADJUSTMENT	2019	GPS3328	
47 11 15.56578	91 24 00.42567	623651.752	246133.483	.020	C	GPS - STATIC	2019	HLAKE2	
47 11 15.56490	91 24 00.42515	623651.786	246133.393	.131	3	GPS - RTRN	2017	RTRN2017	
47 11 15.56495	91 24 00.42503	623651.794	246133.398	.036		ADJUSTMENT	2013	GPS2940	
47 11 15.56495	91 24 00.42503	623651.794	246133.398	.036	C	GPS - STATIC	2013	HBBAY	

NAD83(2007)		Lake County - Lake (North Shore) Zone						Project Info	
Geodetic Position		X	Y	Acc	Order	Determination Method	Year	Reference	
Latitude	Longitude								
47 11 15.56529	91 24 00.42620	623651.714	246133.434	.033	C	GPS - STATIC	2012	HBBAY	

NAD83(1996)		Lake County - Lake (North Shore) Zone						Project Info	
Geodetic Position		X	Y	Acc	Order	Determination Method	Year	Reference	
Latitude	Longitude								
47 11 15.56555	91 24 00.42619	623651.715	246133.460	.033	C	GPS - STATIC	2019	HLAKE2	

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
3047297.411	583549.229	2038067.533	17149767.678	.020		ADJUSTMENT	2019	GPS3328
3047297.411	583549.229	2038067.533	17149767.678	.020	C	GPS - STATIC	2019	HLAKE2
3047297.449	583549.141	2038067.571	17149767.590	.131	3	GPS - RTRN	2017	RTRN2017
3047297.457	583549.146	2038067.579	17149767.595	.036		ADJUSTMENT	2013	GPS2940
3047297.457	583549.146	2038067.579	17149767.595	.036	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
3047297.376	583549.179	2038067.498	17149767.628	.033	C	GPS - STATIC	2012	HBBAY

**NAD83(1996)**

MN State Plane - North Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
3047297.376	583549.205	2038067.498	17149767.654	.033	C	GPS - STATIC	2019	HLAKE2

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AD-DO8104-3NW-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AD-DO8104-3NW-26SEP2017.jpg</a>	NW	Sep 26, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AD-DO8104-2-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AD-DO8104-2-26SEP2017.jpg</a>		Sep 26, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AD-DO8104-1-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AD-DO8104-1-26SEP2017.jpg</a>		Sep 26, 2017

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



Mn/DOT Name: 3806 AE

NGS Name: 3806 AE

County: LAKE, MN (Sheet 1)

NGS ACRN: [DO8105](#) [Get Map](#)  
NGS Quad / Sta Num : 47091234/  
USGS Quad: SPLIT ROCK POINT

				<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	12	54 N	9 W	471035.88	912449.83	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>
2011	2017	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 7 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2011) Stamping: 3806 AE 2011

7.5 MILES SOUTHWEST OF BEAVER BAY, 8.05 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 (LAX LAKE ROAD) IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 42.9, 66.5 FEET NORTHWEST OF TRUNK HIGHWAY, 24.2 FEET SOUTHWEST OF AN 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>	
655.146	.016	2/1						VERTICAL ADJUSTMENT	2021	00000963	
655.146	.016	2/1						VERTICAL CONTROL SURVEY	2019	VNSHORE	

**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>	
655.031	.262			558.874	.197	2011		GPS - RTRN	2017	RTRN2017	
655.068				558.870	.031	2011		HORIZONTAL ADJUSTMENT	2013	GPS2940	
655.068				558.870	.031	2011		GPS - STATIC	2013	HBBAY	
655.084	.131			559.034	.066	2007		GPS - STATIC	2012	HBBAY	

Geoid Separations(ft): GEOID18 = -96.210 12B = -96.158 09 = -96.056 03 = -960000

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 10 35.87545	91 24 49.83147			620166.301	242174.659	.131	3	GPS - RTRN	2017	RTRN2017
47 10 35.87515	91 24 49.83167			620166.287	242174.629	.033		ADJUSTMENT	2013	GPS2940
47 10 35.87515	91 24 49.83167			620166.287	242174.629	.033	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 10 35.87546	91 24 49.83284			620166.207	242174.662	.033	C	GPS - STATIC	2012	HBBAY

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>			<u>Project Info</u>			
<u>MN State Plane - North 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>									
3043973.594	579454.242			2034738.183	17145678.469	.131	3	GPS - RTRN	2017	RTRN2017
3043973.581	579454.211			2034738.170	17145678.439	.033		ADJUSTMENT	2013	GPS2940
3043973.581	579454.211			2034738.170	17145678.439	.033	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>			<u>Project Info</u>			
<u>MN State Plane - North 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>									
3043973.500	579454.241			2034738.089	17145678.468	.033	C	GPS - STATIC	2012	HBBAY

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AE-DO8105-3NW-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AE-DO8105-3NW-26SEP2017.jpg</a>	NW	Sep 26, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AE-DO8105-2-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AE-DO8105-2-26SEP2017.jpg</a>		Sep 26, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AE-DO8105-1-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AE-DO8105-1-26SEP2017.jpg</a>		Sep 26, 2017

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





Mn/DOT Name: 3806 AG  
 County: LAKE, MN (Sheet 1)

NGS Name: 3806 AG

NGS ACRN: [DR1386](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	22	55 N	8 W	471418.88	911942.34	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>
2017	2019	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 13 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

**Description:** (2017)                      **Stamping:** 3806 AG 2017

2.0 MILES SOUTHWEST OF BEAVER BAY, 2.05 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 48.90, 47.3 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 0.3 MILES NORTHEAST OF PIKE BAY LOOP, 23.8 FEET SOUTHWEST OF DRIVEWAY NUMBER 4468, 11.5 FEET NORTHWEST OF A BIKE PATH, 1.5 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>	
716.616	.016	2/1						VERTICAL ADJUSTMENT	2021	00000963	
716.596	.016	2/1						VERTICAL CONTROL SURVEY	2019	VNSHORE	

**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>	
716.632				620.268	.022	2011		HORIZONTAL ADJUSTMENT	2019	GPS3328	
716.596	.131			620.461	.066	1996		GPS - STATIC	2019	Hlake2	
716.632				620.268	.022	2011		GPS - STATIC	2019	Hlake2	
716.678	.262			620.333	.197	2011		GPS - RTRN	2017	RTRN2017	

Geoid Separations(ft): GEOID18 = -96.368 12B = -96.342 09 = -96.256 03 = -96.132

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 14 18.87912	91 19 42.34417	641794.504	264390.031	.016		ADJUSTMENT	2019	GPS3328
47 14 18.87912	91 19 42.34417	641794.504	264390.031	.016	C	GPS - STATIC	2019	Hlake2
47 14 18.87855	91 19 42.34349	641794.550	264389.972	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(1996)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 14 18.87887	91 19 42.34466	641794.470	264390.006	.033	C	GPS - STATIC	2019	Hlake2

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
3064692.398	602516.891	2055487.947	17168705.947	.016		ADJUSTMENT	2019	GPS3328
3064692.398	602516.891	2055487.947	17168705.947	.016	C	GPS - STATIC	2019	Hlake2
3064692.446	602516.835	2055487.996	17168705.890	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(1996)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
3064692.365	602516.866	2055487.914	17168705.921	.033	C	GPS - STATIC	2019	Hlake2

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AG-DR1386-3SE-17OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AG-DR1386-3SE-17OCT2017.jpg</a>	SE	Oct 17, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AG-DR1386-2-17OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AG-DR1386-2-17OCT2017.jpg</a>		Oct 17, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AG-DR1386-1-17OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AG-DR1386-1-17OCT2017.jpg</a>		Oct 17, 2017

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



Mn/DOT Name: 3806 AH  
County: LAKE, MN (Sheet 1)

NGS Name: 3806 AH

NGS ACRN: [DR1385](#) [Get Map](#)  
NGS Quad / Sta Num : 47091231/  
USGS Quad: SPLIT ROCK POINT NE

				Reference	Reference	Vert	Horz
1/4	Sec	Twp	Rng	Latitude	Longitude	Order	Order
NW	27	55 N	8 W	471333.18	912036.73	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2017	2019	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 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017) Stamping: 3806 AH 2017

3.0 MILES SOUTHWEST OF BEAVER BAY, 3.2 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 47.80, 46.9 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 30.7 FEET SOUTHWEST OF KINGS LANDING DRIVE, 40.1 FEET NORTHWEST OF A BIKE PATH.

**Leveling-Derived Orthometric Heights (Feet)**

NAVD88			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
684.277	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963
684.264	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE

**Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)**

NAVD88			Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
684.326			587.935	.024	2011	HORIZONTAL ADJUSTMENT	2019	GPS3328
684.264	.131		588.132	.066	1996	GPS - STATIC	2019	H LAKE2
684.326			587.935	.024	2011	GPS - STATIC	2019	H LAKE2
684.339	.262		587.975	.197	2011	GPS - RTRN	2017	RTRN2017

Geoid Separations(ft): GEOID18 = -96.397 12B = -96.368 09 = -96.276 03 = -96.148

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)		Lake County - Lake (North Shore) Zone					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 13 33.18429	91 20 36.72812	637961.711	259825.689	.016		ADJUSTMENT	2019	GPS3328
47 13 33.18429	91 20 36.72812	637961.711	259825.689	.016	C	GPS - STATIC	2019	H LAKE2
47 13 33.18406	91 20 36.72769	637961.740	259825.665	.131	3	GPS - RTRN	2017	RTRN2017

NAD83(1996)		Lake County - Lake (North Shore) Zone					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 13 33.18405	91 20 36.72862	637961.676	259825.665	.033	C	GPS - STATIC	2019	H LAKE2

**State Plane and UTM Coordinates (Feet)**

NAD83(2011)		UTM - Zone 15				Project Info		
MN State Plane - North Zone		X	Y	Acc	Order	Determination Method	Year	Reference
3061046.019	597802.906	2051835.109	17163998.193	.016		ADJUSTMENT	2019	GPS3328
3061046.019	597802.906	2051835.109	17163998.193	.016	C	GPS - STATIC	2019	H LAKE2
3061046.050	597802.883	2051835.139	17163998.171	.131	3	GPS - RTRN	2017	RTRN2017

NAD83(1996)		UTM - Zone 15				Project Info		
MN State Plane - North Zone		X	Y	Acc	Order	Determination Method	Year	Reference
3061045.986	597802.881	2051835.075	17163998.168	.033	C	GPS - STATIC	2019	H LAKE2

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AH-DR1385-3SE-17OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AH-DR1385-3SE-17OCT2017.jpg</a>	SE	Oct 17, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AH-DR1385-2-17OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AH-DR1385-2-17OCT2017.jpg</a>		Oct 17, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AH-DR1385-1-17OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AH-DR1385-1-17OCT2017.jpg</a>		Oct 17, 2017

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





Mn/DOT Name: 3806 AJ  
County: LAKE, MN (Sheet 1)

NGS Name: 3806 AJ

NGS ACRN: [DR1383](#) [Get Map](#)  
NGS Quad / Sta Num : 47091234/  
USGS Quad: SPLIT ROCK POINT

				<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	6	54 N	8 W	471134.66	912326.35	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>
2017	2019	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 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017) Stamping: 3806 AJ 2017

6.5 MILES SOUTHWEST OF BEAVER BAY, 6.4 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 44.50, 59.8 FEET NORTHWEST OF TRUNK HIGHWAY 61, 17.9 FEET NORTHEAST OF AN ENTRANCE, 1.35 MILES SOUTHWEST OF SPLIT ROCK LIGHTHOUSE ROAD, 1.5 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>
730.130	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963
730.130	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE

**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>
730.071				633.791	.024	2011	HORIZONTAL ADJUSTMENT	2019	GPS3328
730.130	.131			633.988	.066	1996	GPS - STATIC	2019	Hlake2
730.071				633.791	.024	2011	GPS - STATIC	2019	Hlake2
730.071	.262			633.821	.197	2011	GPS - RTRN	2017	RTRN2017

Geoid Separations(ft): GEOID18 = -96.299 12B = -96.253 09 = -96.145 03 = -96.073

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 11 34.66121	91 23 26.34593			626040.108	248025.526	.016		ADJUSTMENT	2019	GPS3328
47 11 34.66121	91 23 26.34593			626040.108	248025.526	.016	C	GPS - STATIC	2019	Hlake2
47 11 34.66087	91 23 26.34603			626040.100	248025.491	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(1996)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 11 34.66097	91 23 26.34642			626040.073	248025.502	.033	C	GPS - STATIC	2019	Hlake2

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3049607.869	585535.305			2040380.550	17151749.911	.016		ADJUSTMENT	2019	GPS3328
3049607.869	585535.305			2040380.550	17151749.911	.016	C	GPS - STATIC	2019	Hlake2
3049607.863	585535.270			2040380.544	17151749.877	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3049607.836	585535.280			2040380.517	17151749.886	.033	C	GPS - STATIC	2019	Hlake2

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AJ-DR1383-3NW-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AJ-DR1383-3NW-18OCT2017.jpg</a>	NW	Oct 18, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AJ-DR1383-2-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AJ-DR1383-2-18OCT2017.jpg</a>		Oct 18, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AJ-DR1383-1-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_AJ-DR1383-1-18OCT2017.jpg</a>		Oct 18, 2017

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





Mn/DOT Name: 3806 B

NGS Name: 3806 B

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	54 N	9 W	470905.00	912655.00		

<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>
1971	2000	DESTROYED	Horz=NO Vert=NO	YES			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (2000)                      Stamping: 3806 B 1971

14.0 MILES NORTHEAST OF TWO HARBORS, AT TRUNK HIGHWAY 61 STATION 2073+00, NEAR THE NORTHEAST CORNER OF A TRUNK HIGHWAY 61 BOX CULVERT, 1.25 MILES NORTHEAST OF THE NORTHEAST END OF TRUNK HIGHWAY 61 BRIDGE NUMBER 3585 OVER THE GOOSEBERRY RIVER, 2.0 FEET SOUTHWEST OF A WITNESS POST, 24.0 FEET WEST OF TRUNK HIGHWAY 61.

**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>		
681.587	.033	3							VERTICAL CONTROL SURVEY	1971	CS3806	

**Geoid Separations(ft): GEOID18 = -96.037    12B = -95.981    09 = -95.879    03 = -95.830**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 3806 C

NGS Name: 3806 C

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	54 N	9 W	470940.00	912610.00		

<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>
1971	2008	DESTROYED	Horz=NO Vert=NO	YES			SEE DESCRIPTION

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

Description: (1971)                      Stamping: 3806 C 1971

IN THE NORTHEAST CORNER OF A TRUNK HIGHWAY 61 BOX CULVERT, 14.8 MILES NORTHEAST OF TWO HARBORS, 20.0 FEET LEFT OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 STATION 2027+10, 73.0 FEET NORTHEAST OF FIRE SIGN V412, 3.0 FEET SOUTHWEST 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>	
659.126	.033	3				VERTICAL CONTROL SURVEY	1971	CS3806	

**Geoid Separations(ft): GEOID18 = -96.092    12B = -96.033    09 = -95.935    03 = -95.886**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 3806 D

NGS Name: 3806 D

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0596](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	13	54 N	9 W	470954.56	912540.22	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>
1971	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	BENCH MARK DISK	MNDT

**Description:** (2011) **Stamping:** 3806 D 1971

5.0 MILES NORTHEAST OF CASTLE DANGER, 2.55 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND A BRIDGE OVER GOOSEBERRY FALLS, AT TRUNK HIGHWAY 61 MILEPOINT 41.85 IN THE NORTHEAST END OF A ROCK OUTCROP, ON THE INSIDE EDGE OF A HIGHWAY CURVE, 348.0 FEET SOUTHWEST OF DRIVEWAY NUMBER 3535, 25.0 FEET NORTHWEST OF TRUNK HIGHWAY 61, 2.3 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>		
646.377	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963		
646.377	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE		
646.377	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691		
646.377	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3		
646.377	.007	1/2				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>		
646.259	.033	3				VERTICAL CONTROL SURVEY	1987	CS3806		
646.236	.033	3				VERTICAL CONTROL SURVEY	1971	CS3806		

**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>		
646.518	.262		550.412	.197	2011	GPS - RTRN	2017	RTRN2017		
646.590	.262		550.586	.197	2007	GPS - RTRN	2011	RTRN2011		

Geoid Separations(ft): GEOID18 = -96.168 12B = -96.109 09 = -96.007 03 = -95.958

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 09 54.56378	91 25 40.21902	616608.620	238053.450	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 09 54.56442	91 25 40.22055	616608.515	238053.517	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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							
3040584.071	575194.134	2031342.900	17141424.299	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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							
3040583.964	575194.197	2031342.793	17141424.361	.131	3	GPS - RTRN	2011	RTRN2011



**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_D-SH0596-3NW-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_D-SH0596-3NW-26SEP2017.jpg</a>	NW	Sep 26, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_D-SH0596-2-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_D-SH0596-2-26SEP2017.jpg</a>		Sep 26, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_D-SH0596-1-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_D-SH0596-1-26SEP2017.jpg</a>		Sep 26, 2017

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



Mn/DOT Name: 3806 E

NGS Name: 3806 E

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	54 N	9 W	471016.00	912516.00		

<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>
1971	2000	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	MNDT

Description: (2000)                      Stamping: 3806 E 1971

IN THE NORTHWEST CORNER OF TRUNK HIGHWAY 61 BOX CULVERT, 8.75 MILES SOUTHWEST OF BEAVER BAY, 21.0 FEET RIGHT OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 STATION 1976+87, 0.3 MILE NORTHEAST OF TRUNK HIGHWAY 61 MILEPOST 42, AND 2.0 FEET SOUTHWEST 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>	
619.261	.033	3				VERTICAL CONTROL SURVEY	1971	CS3806	

Geoid Separations(ft): GEOID18 = -96.184    12B = -96.125    09 = -96.023    03 = -95.974

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 3806 F

NGS Name: 3806 F

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4473](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	7	54 N	8 W	471058.00	912429.00	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>
1971	2007	DESTROYED	Horz=NO Vert=NO	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:** (2007)                      **Stamping:** 3806 F 1971

IN THE NORTHEAST CORNER OF TRUNK HIGHWAY 61 TRIPLE CONCRETE BOX CULVERT, 7.65 MILES SOUTHWEST OF BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 43.40, 0.4 MILE NORTHEAST OF MILEPOST 43, 72.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, AT THE SPLIT ROCK RIVER IN THE NORTHEAST CORNER OF A BRIDGE, 1.0 FOOT 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>	
613.939	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
613.936	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3	

<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>	
613.903	.033	3					VERTICAL CONTROL SURVEY	1971	CS3806	

Geoid Separations(ft): GEOID18 = -96.197    12B = -96.145    09 = -96.046    03 = -95.984

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_F-DM4473-3SE-02JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_F-DM4473-3SE-02JUL2007.jpg</a>	SE	Jul 2, 2007
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_F-DM4473-2-02JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_F-DM4473-2-02JUL2007.jpg</a>		Jul 2, 2007
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_F-DM4473-1-02JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_F-DM4473-1-02JUL2007.jpg</a>		Jul 2, 2007

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





Mn/DOT Name: 3806 G

NGS Name: 3806 G

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0758](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/1010  
 USGS Quad: SPLIT ROCK POINT

				<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	6	54 N	8 W	471122.18	912342.91	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>
1977	2017	NOT FOUND	Horz=NO Vert=NO	YES			NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	BENCH MARK DISK	MNDT

Description: (2000)                      Stamping: 3806 G 1971

6.85 MILES SOUTHWEST OF BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 44.15, BETWEEN OLD AND NEW HIGHWAYS, 54.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 45.0 FEET NORTH OF A 10.0 INCH DIAMETER BIRCH TREE, 18.0 FEET NORTH-NORTHEAST OF A WITNESS POST.

Station Notes

THE ROAD HAS BEEN MOVED NORTHWEST AND THE MARK NOW FALLS IN THE WOODS.

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>	
704.634	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
704.634	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3	

  

<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>	
704.526	.033	3					VERTICAL CONTROL SURVEY	1971	CS3806	

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>	
704.529	.262			608.394	.197	2007	GPS - RTRN	2011	RTRN2011	
704.657	.262			608.618	.197	1996	HORIZONTAL ADJUSTMENT	1999	17648	

Geoid Separations(ft): GEOID18 = -96.289    12B = -96.243    09 = -96.135    03 = -96.069

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2007)</u>								<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>			
47 11 22.18728	91 23 42.90889	624873.577	246782.433	.131	3	GPS - RTRN	2011	RTRN2011	

  

<u>NAD83(1996)</u>								<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>			
47 11 22.17563	91 23 42.90586	624873.765	246781.249	.131	3	ADJUSTMENT	1999	17648	
47 11 22.18346	91 23 42.90368	624873.930	246782.039	.131	3	ADJUSTMENT	1991	17497	

  

<u>NAD83(1986)</u>								<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>			
47 11 22.18042	91 23 42.90050	624874.144	246781.728	3.281		CLASSICAL SURVEY	1988	HBEA1	
47 11 22.18051	91 23 42.90052	624874.143	246781.736	.131	3	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>	
47 11 22.44793	91 23 42.29026			.100	3	CLASSICAL SURVEY	1979	15983	

**State Plane and UTM Coordinates (Feet)**

**NAD83(2007)**

MN State Plane - North 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>	
3048492.167	584246.562	2039263.116	17150463.085	.131	3	GPS - RTRN	2011	RTRN2011	

**NAD83(1996)**

MN State Plane - North 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>	
3048492.402	584245.387	2039263.350	17150461.909	.131	3	ADJUSTMENT	1999	17648	
3048492.536	584246.183	2039263.484	17150462.705	.131	3	ADJUSTMENT	1991	17497	

**NAD83(1986)**

MN State Plane - North 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>	
3048492.762	584245.880	2039263.710	17150462.401	3.281		CLASSICAL SURVEY	1988	HBEA1	
3048492.760	584245.889	2039263.708	17150462.411	.131	3	ADJUSTMENT	1986	17289	

**NAD27**

MN State Plane - North 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>	
2423880.749	256189.600			.100	3	CLASSICAL SURVEY	1979	15983	

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_G-SH0758-3SE-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_G-SH0758-3SE-04OCT2017.jpg</a>	SE	Oct 4, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_G-SH0758-2-01SEP2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_G-SH0758-2-01SEP2011.jpg</a>		Sep 1, 2011
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_G-SH0758-1-01SEP2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_G-SH0758-1-01SEP2011.jpg</a>		Sep 1, 2011

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



Mn/DOT Name: 3806 H

NGS Name: 3806 H

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0598](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	54 N	8 W	471142.00	912313.00	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>
1971	2007	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 7 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	MNDT

Description: (2000)                      Stamping: 3806 H 1971

6.35 MILES SOUTHWEST OF BEAVER BAY, 53.0 FEET LEFT OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 STATION 1835+30, 60.0 FEET FROM THE SOUTHWEST END OF A CURB AT A WAYSIDE REST, 2.0 FEET NORTHWEST OF A WITNESS POST.

**Station Notes**

DESTROYED, THE DISK WAS REMOVED.

**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>	
740.471	.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>	
740.343	.033	3				VERTICAL CONTROL SURVEY	1987	CS3806	
740.081	.033	3				VERTICAL CONTROL SURVEY	1971	CS3806	

Geoid Separations(ft): GEOID18 = -96.322 12B = -96.273 09 = -96.168 03 = -96.092

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 3806 J

NGS Name: 3806 J

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4471](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	54 N	8 W	471158.74	912245.58	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>
1971	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	BENCH MARK DISK	MNDT

Description: (2007) Stamping: 3806 J 1971

6.0 MILES SOUTHWEST OF BEAVER BAY, 5.9 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 45.15, 36.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 11.0 FEET EAST OF THE END OF A CURB AT THE NORTH END OF THE SPLIT ROCK LOOKOUT, 28.7 FEET NORTH OF A POWER POLE, 21.0 FEET NORTHEAST OF THE NORTHEAST CORNER OF A HIGH STONE PILLAR, AT THE NORTHEAST END OF A WAYSIDE PULLOUT, 7.9 FEET SOUTHEAST OF A WITNESS POST.

Station Notes

POSSIBLE TO USE BIKE PATH.

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>
764.237	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963
764.237	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE
764.237	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691
764.237	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3

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>
764.083	.033	3				VERTICAL CONTROL SURVEY	1971	CS3806

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>
764.401	.262		668.089	.197	2011	GPS - RTRN	2017	RTRN2017

Geoid Separations(ft): GEOID18 = -96.355 12B = -96.309 09 = -96.207 03 = -96.119

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 11 58.74324	91 22 45.58390	628898.411	250414.796	.131	3	GPS - RTRN	2017	RTRN2017

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - North 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>
3052367.925	588037.014	2043143.865	17154247.016	.131	3	GPS - RTRN	2017	RTRN2017

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_J-DM4471-3SW-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_J-DM4471-3SW-26SEP2017.jpg</a>	SW	Sep 26, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_J-DM4471-2-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_J-DM4471-2-26SEP2017.jpg</a>		Sep 26, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_J-DM4471-1-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_J-DM4471-1-26SEP2017.jpg</a>		Sep 26, 2017

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



Mn/DOT Name: 3806 K

NGS Name: 3806 K

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4470](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	54 N	8 W	471200.28	912201.55	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>
1971	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	BENCH MARK DISK	MNDT

Description: (2007) Stamping: 3806 K 1971

5.55 MILES SOUTHWEST OF BEAVER BAY, 5.2 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY TO TRUNK HIGHWAY 61 MILEPOINT 45.85, THEN 0.4 MILE SOUTHEAST ON THE SPLIT ROCK LIGHTHOUSE ROAD THROUGH A PARK ENTRANCE TO A MAIN BUILDING, THEN WALK 0.05 MILE SOUTHWEST TO A LIGHT HOUSE, 11.0 FEET SOUTHWEST OF THE CORNER OF THE SPLIT ROCK LIGHTHOUSE AT GROUND LEVEL, 33.0 FEET EAST OF A FENCE CORNER, 35.0 FEET SOUTHWEST OF A STAIRWAY EDGE, 59.0 FEET SOUTH OF THE JUNCTION OF THE SIDEWALKS.

**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>	
721.731	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
721.731	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	
721.731	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
721.734	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3	

<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>	
721.570	.033	3					VERTICAL CONTROL SURVEY	1971	CS3806	

**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>	
721.718	.262			625.212	.197	2011	GPS - RTRN	2017	RTRN2017	
721.573	.262			625.179	.197	2007	GPS - RTRN	2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -96.548 12B = -96.506 09 = -96.394 03 = -96.296

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Lake County - Lake (North Shore) Zone</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>								
47 12 00.27631	91 22 01.54832	631941.640	250516.129	.131	3	GPS - RTRN	2017	RTRN2017	

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>								
47 12 00.27489	91 22 01.54898	631941.592	250515.986	.131	3	GPS - RTRN	2011	RTRN2011	

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>MN State Plane - North 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>	
3055404.428	588260.218	2046180.162	17154465.616	.131	3	GPS - RTRN	2017	RTRN2017	

<u>NAD83(2007)</u>		<u>MN State Plane - North 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>	
3055404.386	588260.073	2046180.119	17154465.471	.131	3	GPS - RTRN	2011	RTRN2011	



**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_K-DM4470-3E-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_K-DM4470-3E-25SEP2017.jpg</a>	E	Sep 25, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_K-DM4470-2-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_K-DM4470-2-25SEP2017.jpg</a>		Sep 25, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_K-DM4470-1-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_K-DM4470-1-25SEP2017.jpg</a>		Sep 25, 2017

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



Mn/DOT Name: 3806 L

NGS Name: 3806 L

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4469](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	55 N	8 W	471221.00	912205.00	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>
1971	2007	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	BENCH MARK DISK	MNDT

Description: (2007) Stamping: 3806 L 1971

5.2 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 45.85, 74.0 FEET RIGHT OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 STATION 1771+00, 51.0 FEET EAST OF A SPRUCE TREE, 37.0 FEET NORTH-NORTHEAST OF A BIRCH TREE, OPPOSITE AN ENTRANCE TO THE SPLIT ROCK LIGHTHOUSE, 15.8 FEET SOUTHEAST OF A POWER POLE, 13.0 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>	
716.669	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
716.669	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3	

<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>	
716.495	.033	3					VERTICAL CONTROL SURVEY	1971	CS3806	

Geoid Separations(ft): GEOID18 = -96.411 12B = -96.371 09 = -96.273 03 = -96.165

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_L-DM4469-3NW-21JUN2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_L-DM4469-3NW-21JUN2007.jpg</a>	NW	Jun 21, 2007
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_L-DM4469-2-21JUN2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_L-DM4469-2-21JUN2007.jpg</a>		Jun 21, 2007
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_L-DM4469-1-21JUN2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_L-DM4469-1-21JUN2007.jpg</a>		Jun 21, 2007

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



Mn/DOT Name: 3806 M

NGS Name: 3806 M

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	28	55 N	8 W	471304.00	912112.00		

<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>
1971	2017	DESTROYED	Horz=NO Vert=NO	YES			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

**Description:** (2000)                      **Stamping:** 3806 M 1971

4.1 MILES SOUTHWEST OF BEAVER BAY, 43.0 FEET LEFT OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 STATION 1712+93, 12.0 FEET NORTHEAST OF A WHITE BIRCH TREE, 19.0 FEET NORTHEAST OF A TELEPHONE POLE NUMBER 3, 13.0 FEET EAST OF A WITNESS POST.

**Station Notes**

DESTROYED BY ROAD CONSTRUCTION.

**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>			
705.277	.033	3				VERTICAL CONTROL SURVEY		1971	CS3806			

**Geoid Separations(ft):** GEOID18 = -96.411    12B = -96.374    09 = -96.283    03 = -96.158

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_M-3SE-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_M-3SE-25SEP2017.jpg</a>	SE	Sep 25, 2017
Monument:			
Disk:			

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





Mn/DOT Name: 3806 N

NGS Name: 3806 N

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	28	55 N	8 W	471325.00	912048.00		

<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>
1971	2017	DESTROYED	Horz=NO Vert=NO	YES			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

**Description:** (1971)                      **Stamping:** 3806 N 1971

3.55 MILES SOUTHWEST OF BEAVER BAY, 39.0 FEET LEFT OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 STATION 1684+36, 59.0 FEET EAST OF AERO SERVICE BM 80, 17.0 FEET NORTH-NORTHWEST OF A BIRCH TREE, 6.0 FEET EAST OF A WITNESS POST.

**Station Notes**  
 DESTROYED BY ROAD CONSTRUCTION.

**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>					
698.886	.033	3				1971	CS3806					

**Geoid Separations(ft): GEOID18 = -96.394    12B = -96.365    09 = -96.273    03 = -96.145**

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_N-3SE-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_N-3SE-25SEP2017.jpg</a>	SE	Sep 25, 2017
Monument:			
Disk:			

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



Mn/DOT Name: 3806 P

NGS Name: 3806 P

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	27	55 N	8 W	471338.00	912030.00		

<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>
1971	2017	DESTROYED	Horz=NO Vert=NO	YES			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

**Description:** (2000)                      **Stamping:** 3806 P 1971

3.0 MILES SOUTHWEST OF BEAVER BAY, 72.0 FEET LEFT OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 STATION 1651+52, 40.0 FEET NORTHEAST OF A TELEPHONE POLE NUMBER 9, 21.0 FEET NORTHWEST OF TWIN 5.0 INCH DIAMETER WHITE BIRCH TREES, 32.0 FEET EAST-NORTHEAST OF A WITNESS POST.

**Station Notes**

DESTROYED BY ROAD CONSTRUCTION.

**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>	
694.408	.033	3				VERTICAL CONTROL SURVEY	1971	CS3806	

**Geoid Separations(ft):** GEOID18 = -96.397    12B = -96.371    09 = -96.279    03 = -96.151

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_P-3SE-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_P-3SE-25SEP2017.jpg</a>	SE	Sep 25, 2017
Monument:			
Disk:			

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



Mn/DOT Name: 3806 Q

NGS Name: 3806 Q

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0604](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	22	55 N	8 W	471359.20	911954.30	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>
1971	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	BENCH MARK DISK	MNDT

Description: (2011) Stamping: 3806 Q 1971

2.55 MILES SOUTHWEST ON TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY TO TRUNK HIGHWAY 61 MILEPOINT 48.60, THEN 0.15 MILE SOUTH ON PINE BAY LOOP, 50.0 FEET EAST OF PINE BAY LOOP, 29.5 FEET NORTHWEST OF THE NORTHWEST CORNER OF A HOUSE, 26.0 FEET NORTH OF A DRIVEWAY, 10.0 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>	
696.593	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963	
696.573	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE	
696.593	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
696.593	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3	
696.593	.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>	
696.442	.033	3				VERTICAL CONTROL SURVEY	1987	CS3806	
696.436	.033	3				VERTICAL CONTROL SURVEY	1971	CS3806	

Geoid Separations(ft): GEOID18 = -96.437 12B = -96.407 09 = -96.315 03 = -96.191

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_Q-SH0604-3E-30AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_Q-SH0604-3E-30AUG2011.jpg</a>	E	Aug 30, 2011
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_Q-SH0604-2-30AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_Q-SH0604-2-30AUG2011.jpg</a>		Aug 30, 2011
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_Q-SH0604-1-30AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_Q-SH0604-1-30AUG2011.jpg</a>		Aug 30, 2011

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



Mn/DOT Name: 3806 S

NGS Name: 3806 S

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	14	55 N	8 W	471457.00	911852.00		

<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>
1971	2000	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (2000)                      Stamping: 3806 S 1971

1.0 MILES SOUTHWEST OF BEAVER BAY, 105.0 FEET RIGHT OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 STATION 1545+66, 24.0 FEET NORTH OF A SPRUCE TREE, 61.0 FEET NORTHWEST OF THE NORTHEAST CORNER OF A BUILDING, 8.0 FEET SOUTHWEST 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>	
743.584	.033	3				VERTICAL CONTROL SURVEY		1971	CS3806	

Geoid Separations(ft): GEOID18 = -96.374    12B = -96.345    09 = -96.250    03 = -96.148

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 3806 T

NGS Name: 3806 T

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	14	55 N	8 W	471518.00	911820.00		

<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>
1971	2008	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (1989)                      Stamping: 3806 T

0.4 MILE SOUTHWEST OF BEAVER BAY, 153.0 FEET LEFT OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 STATION 1516+00, 38.0 FEET NORTHEAST OF THE NORTHEAST CORNER OF A DRIVE-IN, THE MONUMENT WAS BURIED 7.0 FEET BELOW THE GROUND DURING A WASTE AND DISPOSAL SITE CONSTRUCTION PROJECT IN 1989.

**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>
703.604	.033	3				VERTICAL CONTROL SURVEY	1971	CS3806

Geoid Separations(ft): GEOID18 = -96.394    12B = -96.365    09 = -96.269    03 = -96.174

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 3806 U

NGS Name: 3806 U

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4465](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	14	55 N	8 W	471505.90	911841.88	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>				
2007	2017	GOOD	Horz=NO Vert=YES		YES		FLUSH	MARKER W/BAR MAGNET				

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (2009) Stamping: 3806 U 2007

1.0 MILE SOUTHWEST OF BEAVER BAY, 0.9 MILE SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 50.30, 50.7 FEET NORTHWEST OF TRUNK HIGHWAY 61, 4.8 FEET SOUTHWEST OF THE EXTENDED CENTERLINE OF MALONEY DRIVE, 1.3 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>	
729.992	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963	
729.976	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE	
729.992	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
729.992	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3	

**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>	
729.992			633.706	.017	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940	
729.992			633.706	.017	2011	GPS - STATIC	2013	HBBAY	
729.985	.131		633.749	.066	2007	GPS - STATIC	2012	HBBAY	
729.966	.262		633.722	.197	2007	GPS - RTRN	2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -96.368 12B = -96.338 09 = -96.243 03 = -96.145

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 15 05.90404	91 18 41.88215	646047.110	269082.737	.020		ADJUSTMENT	2013	GPS2940
47 15 05.90404	91 18 41.88215	646047.110	269082.737	.020	C	GPS - STATIC	2013	HBBAY

  

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 15 05.90439	91 18 41.88287	646047.061	269082.774	.033	C	GPS - STATIC	2012	HBBAY
47 15 05.90456	91 18 41.88184	646047.132	269082.789	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>MN State Plane - North 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>		
3068753.013	607375.985	2059555.183	17173558.204	.020		ADJUSTMENT	2013	GPS2940		
3068753.013	607375.985	2059555.183	17173558.204	.020	C	GPS - STATIC	2013	HBBAY		

  

<u>NAD83(2007)</u>		<u>MN State Plane - North 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>		
3068752.963	607376.019	2059555.132	17173558.238	.033	C	GPS - STATIC	2012	HBBAY		
3068753.033	607376.038	2059555.203	17173558.257	.131	3	GPS - RTRN	2011	RTRN2011		



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_U-DM4465-3NW-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_U-DM4465-3NW-20SEP2017.jpg</a>	NW	Sep 20, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_U-DM4465-2-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_U-DM4465-2-20SEP2017.jpg</a>		Sep 20, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_U-DM4465-1-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_U-DM4465-1-20SEP2017.jpg</a>		Sep 20, 2017

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



Mn/DOT Name: 3806 V

NGS Name: 3806 V

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4466](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	14	55 N	8 W	471434.56	911919.87	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>
2007	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (2009) Stamping: 3806 V 2007

2.0 MILES SOUTHWEST OF BEAVER BAY, 1.7 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 49.30, 47.0 FEET NORTHWEST OF TRUNK HIGHWAY 61, 1.4 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>		
716.921	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963		
716.901	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE		
716.921	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691		
716.924	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3		

**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>		
716.938	.262		620.589	.197	2011	GPS - RTRN	2017	RTRN2017		
716.921			620.639	.020	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940		
716.921			620.639	.020	2011	GPS - STATIC	2013	HBBAY		
716.928	.131		620.665	.066	2007	GPS - STATIC	2012	HBBAY		
716.846	.262		620.586	.197	2007	GPS - RTRN	2011	RTRN2011		

Geoid Separations(ft): GEOID18 = -96.378 12B = -96.348 09 = -96.260 03 = -96.148

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 14 34.56118	91 19 19.87450	643372.033	265952.146	.131	3	GPS - RTRN	2017	RTRN2017
47 14 34.56124	91 19 19.87514	643371.990	265952.153	.023		ADJUSTMENT	2013	GPS2940
47 14 34.56124	91 19 19.87514	643371.990	265952.153	.023	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 14 34.56169	91 19 19.87590	643371.938	265952.200	.033	C	GPS - STATIC	2012	HBBAY
47 14 34.56141	91 19 19.87506	643371.995	265952.170	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</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>
3066205.880	604140.885	2057003.615	17170327.417	.131	3	GPS - RTRN	2017	RTRN2017
3066205.836	604140.890	2057003.571	17170327.422	.023		ADJUSTMENT	2013	GPS2940
3066205.836	604140.890	2057003.571	17170327.422	.023	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</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>
3066205.782	604140.935	2057003.518	17170327.467	.033	C	GPS - STATIC	2012	HBBAY
3066205.841	604140.908	2057003.576	17170327.440	.131	3	GPS - RTRN	2011	RTRN2011





Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_V-DM4466-3NW-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_V-DM4466-3NW-20SEP2017.jpg</a>	NW	Sep 20, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_V-DM4466-2-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_V-DM4466-2-20SEP2017.jpg</a>		Sep 20, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_V-DM4466-1-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_V-DM4466-1-20SEP2017.jpg</a>		Sep 20, 2017

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



Mn/DOT Name: 3806 W  
County: LAKE, MN (Sheet 1)

NGS Name: 3806 W

NGS ACRN: [DM4467](#) [Get Map](#)  
NGS Quad / Sta Num : 47091231/  
USGS Quad: SPLIT ROCK POINT NE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	55 N	8 W	471329.36	912046.65	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>
2007	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (2009) Stamping: 3806 W 2007

3.5 MILES SOUTHWEST OF BEAVER BAY, 3.4 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 47.60, 54.3 FEET NORTHWEST OF TRUNK HIGHWAY 61, 35.0 FEET SOUTHWEST OF AN ENTRANCE, 1.2 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>		
688.391	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963		
688.381	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE		
688.391	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691		
688.391	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3		

**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>		
688.457	.262		592.112	.197	2011	GPS - RTRN	2017	RTRN2017		
688.391			592.033	.034	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940		
688.391			592.033	.034	2011	GPS - STATIC	2013	HBBAY		
688.384	.131		592.138	.066	2007	GPS - STATIC	2012	HBBAY		
688.322	.262		592.069	.197	2007	GPS - RTRN	2011	RTRN2011		

Geoid Separations(ft): GEOID18 = -96.374 12B = -96.345 09 = -96.253 03 = -96.125

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 13 29.35694	91 20 46.64747	637270.395	259449.864	.131	3	GPS - RTRN	2017	RTRN2017
47 13 29.35652	91 20 46.64778	637270.373	259449.822	.026		ADJUSTMENT	2013	GPS2940
47 13 29.35652	91 20 46.64778	637270.373	259449.822	.026	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 13 29.35705	91 20 46.64855	637270.321	259449.876	.033	C	GPS - STATIC	2012	HBBAY
47 13 29.35703	91 20 46.64967	637270.244	259449.876	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
3060370.383	597399.697	2051158.982	17163596.064	.131	3	GPS - RTRN	2017	RTRN2017
3060370.363	597399.654	2051158.961	17163596.021	.026		ADJUSTMENT	2013	GPS2940
3060370.363	597399.654	2051158.961	17163596.021	.026	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
3060370.308	597399.706	2051158.907	17163596.073	.033	C	GPS - STATIC	2012	HBBAY
3060370.231	597399.703	2051158.830	17163596.070	.131	3	GPS - RTRN	2011	RTRN2011



**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_W-DM4467-3NW-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_W-DM4467-3NW-25SEP2017.jpg</a>	NW	Sep 25, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_W-DM4467-2-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_W-DM4467-2-25SEP2017.jpg</a>		Sep 25, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_W-DM4467-1-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_W-DM4467-1-25SEP2017.jpg</a>		Sep 25, 2017

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



Mn/DOT Name: 3806 X

NGS Name: 3806 X

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4468](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	28	55 N	8 W	471247.74	912117.42	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>
2007	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (2009) Stamping: 3806 X 2007

4.5 MILES SOUTHWEST OF BEAVER BAY, 4.4 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 46.70, 62.1 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 1.6 FEET 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>				
711.501	.016	2/1				2021	00000963				
711.501	.016	2/1				2019	VNSHORE				
711.501	.016	2/1				2011	00000691				
711.501	.016	2/1				2009	VSHOR3				

**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>				
711.524	.262		615.081	.197	2011	2017	RTRN2017				
711.501			615.015	.035	2011	2013	GPS2940				
711.501			615.015	.035	2011	2013	HBBAY				
711.514	.131		615.156	.066	2007	2012	HBBAY				
711.465	.262		615.120	.197	2007	2011	RTRN2011				

Geoid Separations(ft): GEOID18 = -96.479 12B = -96.443 09 = -96.345 03 = -96.224

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 12 47.73847	91 21 17.41846			635072.868	255270.730	.131	3	GPS - RTRN	2017	RTRN2017
47 12 47.73816	91 21 17.41919			635072.817	255270.700	.033		ADJUSTMENT	2013	GPS2940
47 12 47.73816	91 21 17.41919			635072.817	255270.700	.033	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 12 47.73860	91 21 17.42003			635072.760	255270.745	.033	C	GPS - STATIC	2012	HBBAY
47 12 47.73837	91 21 17.41900			635072.831	255270.721	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3058342.332	593136.152			2049124.881	17159336.284	.131	3	GPS - RTRN	2017	RTRN2017
3058342.283	593136.119			2049124.831	17159336.252	.033		ADJUSTMENT	2013	GPS2940
3058342.283	593136.119			2049124.831	17159336.252	.033	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3058342.224	593136.163			2049124.772	17159336.295	.033	C	GPS - STATIC	2012	HBBAY
3058342.295	593136.141			2049124.844	17159336.273	.131	3	GPS - RTRN	2011	RTRN2011



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_X-DM4468-3SE-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_X-DM4468-3SE-25SEP2017.jpg</a>	SE	Sep 25, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_X-DM4468-2-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_X-DM4468-2-25SEP2017.jpg</a>		Sep 25, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_X-DM4468-1-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_X-DM4468-1-25SEP2017.jpg</a>		Sep 25, 2017

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



Mn/DOT Name: 3806 Y

NGS Name: 3806 Y

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4474](#) [Get Map](#)  
 NGS Quad / Sta Num : 46093214/  
 USGS Quad: SPLIT ROCK 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	12	54 N	9 W	471020.17	912508.48	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>
2007	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	SURVEY DISK	MNDT

**Description:** (2009) **Stamping:** 3806 Y 2007

2.0 MILES NORTHEAST OF CASTLE DANGER, IN AN ABUTMENT IN THE SOUTHWEST CORNER OF A TRUNK HIGHWAY 61 BIKE BRIDGE, 0.9 MILE NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND A BRIDGE OVER GOOSEBERRY FALLS AT CASTLE DANGER, AT TRUNK HIGHWAY 61 MILEPOINT 42.45, 24.4 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 1.1 FEET NORTHWEST OF THE SOUTHWEST CORNER OF A PEDESTRIAN BRIDGE.

**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>
645.025	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963
645.025	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE
645.025	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691
645.025	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3

**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>
644.930	.262			548.788	.197	2011	GPS - RTRN	2017	RTRN2017
645.025	.262			548.985	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -96.197 12B = -96.142 09 = -96.040 03 = -95.991

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 10 20.17050	91 25 08.47955			618849.027	240607.233	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 10 20.16895	91 25 08.48132			618848.901	240607.078	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3042720.250	577835.421			2033482.642	17144061.849	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3042720.131	577835.261			2033482.523	17144061.689	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_Y-DM4474-3NE-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_Y-DM4474-3NE-26SEP2017.jpg</a>	NE	Sep 26, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_Y-DM4474-2-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_Y-DM4474-2-26SEP2017.jpg</a>		Sep 26, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_Y-DM4474-1-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_Y-DM4474-1-26SEP2017.jpg</a>		Sep 26, 2017

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



Mn/DOT Name: 3806 Z

NGS Name: 3806 Z

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4476](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	22	54 N	9 W	470837.06	912804.73	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>
1996	2017	GOOD	Horz=NO Vert=NO	YES	38010	FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	SURVEY DISK	MNDT

**Description:** (2011) **Stamping:** 3806 Z 2007

1.5 MILES NORTHEAST OF CASTLE DANGER, IN AN ABUTMENT IN THE NORTHEAST CORNER OF TRUNK HIGHWAY 61 BRIDGE NUMBER 38010 AT THE JUNCTION OF TRUNK HIGHWAY 61 AND A BRIDGE OVER GOOSEBERRY FALLS, AT TRUNK HIGHWAY 61 MILEPOINT 39.35, 34.50 FEET SOUTHEAST OF TRUNK HIGHWAY 61.

**Station Notes**

THE DISK WAS SET IN BRIDGE WHEN BUILT IN 1996, THEN STAMPED WHEN IT WAS USED IN 2007. THE MARK IS NO GOOD FOR GEODETIC USE.

**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>
757.190	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963
757.190	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE
757.190	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691
757.193	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3

**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>
756.990	.262			661.298	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -95.850 12B = -95.790 09 = -95.689 03 = -95.646

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 08 37.05908	91 28 04.73251			606475.529	230388.479	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3030766.652	567130.117			2021515.318	17133376.737	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_Z-DM4476-3SE-03JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_Z-DM4476-3SE-03JUL2007.jpg</a>	SE	Jul 3, 2007
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_Z-DM4476-2-03JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_Z-DM4476-2-03JUL2007.jpg</a>		Jul 3, 2007
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_Z-DM4476-1-03JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3806_Z-DM4476-1-03JUL2007.jpg</a>		Jul 3, 2007

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



Mn/DOT Name: 3807 1

NGS Name: 3807 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4464](#) [Get Map](#)  
NGS Quad / Sta Num : 47091242/  
USGS Quad: SILVER BAY

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	55 N	8 W	471538.00	911743.00	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>
1971	2017	DESTROYED	Horz=NO Vert=NO	YES	9395		NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE WALKWAY	BENCH MARK DISK	MNDT

Description: (2007) Stamping: 3807 1 1971

0.3 MILE NORTHEAST OF BEAVER BAY, IN THE SOUTH SIDEWALK AT THE NORTHEAST CORNER OF TRUNK HIGHWAY 61 BRIDGE NUMBER 9395 OVER THE BEAVER RIVER, AT TRUNK HIGHWAY 61 MILEPOINT 51.25, 31.0 FEET SOUTHEAST OF A CONCRETE MEDIAN, AT TRUNK HIGHWAY 61 STATION 1481+31. IN THE NORTHEAST CORNER OF A SIDEWALK.

Station Notes

THE BRIDGE WAS RE-DECKED.

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>		
677.197	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691		
677.200	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3		

  

<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>		
677.039	.033	3				VERTICAL CONTROL SURVEY	1971	CS3807		

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>		
677.141	.262		580.829	.197	2007	GPS - RTRN	2011	RTRN2011		

Geoid Separations(ft): GEOID18 = -96.443 12B = -96.411 09 = -96.312 03 = -96.230

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 15 37.81383	91 17 42.99473	650163.418	272246.879	.131	3	GPS - RTRN	2011	RTRN2011	

State Plane and UTM Coordinates (Feet)

<u>NAD83(2007)</u>		<u>UTM - Zone 15</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>MN State Plane - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
		2063545.250	17176878.198	.131	3	GPS - RTRN	2011	RTRN2011

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_1-DM4464-3SE-30AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_1-DM4464-3SE-30AUG2011.jpg</a>	SE	Aug 30, 2011
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_1-DM4464-2-30AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_1-DM4464-2-30AUG2011.jpg</a>		Aug 30, 2011
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_1-DM4464-1-30AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_1-DM4464-1-30AUG2011.jpg</a>		Aug 30, 2011

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





Mn/DOT Name: 3807 A  
County: LAKE, MN (Sheet 1)

NGS Name: 3807 A

NGS ACRN: [DM4463](#) [Get Map](#)  
NGS Quad / Sta Num : 47091242/  
USGS Quad: SILVER BAY

				<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	12	55 N	8 W	471605.38	911702.61	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>
1971	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
WALL - LIGHT RETAINING	BENCH MARK DISK	MNDT

Description: (2007) Stamping: 3807 A 1971

IN EAST BEAVER BAY, IN THE NORTH CORNER OF A RETAINING WALL, AT TRUNK HIGHWAY 61 MILEPOINT 52.10, 71.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 31.0 FEET SOUTHWEST OF THE CORNER OF A BUILDING, 27.0 FEET EAST OF A DRIVEWAY, THE WALL HAS TIPPED.

**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>	
677.758	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
677.751	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	
677.748	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
677.751	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3	

<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>	
677.741	.033	3					VERTICAL CONTROL SURVEY	1971	CS3807	

**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>	
677.797	.262			581.380	.197	2011	GPS - RTRN	2017	RTRN2017	
677.650	.262			581.321	.197	2007	GPS - RTRN	2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -96.453 12B = -96.417 09 = -96.329 03 = -96.253

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>	
<u>Latitude</u>	<u>Longitude</u>									
47 16 05.37736	91 17 02.60829			652995.297	274992.756	.131	3	2017	RTRN2017	

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>	
<u>Latitude</u>	<u>Longitude</u>									
47 16 05.37735	91 17 02.61000			652995.179	274992.757	.131	3	2011	RTRN2011	

**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 - North Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>	
<u>X</u>	<u>Y</u>									
3075457.902	613559.483			2066268.289	17179730.769	.131	3	2017	RTRN2017	

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>MN State Plane - North Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>	
<u>X</u>	<u>Y</u>									
3075457.784	613559.479			2066268.171	17179730.766	.131	3	2011	RTRN2011	

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_A-DM4463-3SE-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_A-DM4463-3SE-20SEP2017.jpg</a>	SE	Sep 20, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_A-DM4463-2-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_A-DM4463-2-20SEP2017.jpg</a>		Sep 20, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_A-DM4463-1-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_A-DM4463-1-20SEP2017.jpg</a>		Sep 20, 2017

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



Mn/DOT Name: 3807 B

NGS Name: 3807 B

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0612](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	6	55 N	7 W	471648.25	911614.70	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>
1971	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	BENCH MARK DISK	MNDT

Description: (2007)                      Stamping: 3807 B 1971

IN EAST BEAVER BAY, 1.9 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOST 53.15, 41.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 126.0 FEET SOUTHWEST OF THE SOUTHWEST END OF A GUARDRAIL, 90.0 FEET NORTH OF GATE 3 TO A TACONITE PLANT, 1.6 FEET NORTHWEST OF A WITNESS POST.

Station Pair:    MARK - LAKE, 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>	
687.584	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963	
687.584	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE	
687.584	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
687.584	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3	
687.584	.007	1/2				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>	
687.403	.033	3				VERTICAL CONTROL SURVEY	1987	CS3807	
687.426	.033	3				VERTICAL CONTROL SURVEY	1971	CS3807	

**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>	
687.623	.262		591.213	.197	2011	GPS - OPUS	2020	GPSBM	
687.863	.262		591.498	.197	2011	GPS - RTRN	2020	RTRN2020	
687.584			591.200	.024	2011	HORIZONTAL ADJUSTMENT	2019	GPS3328	
687.584	.131		591.396	.066	1996	GPS - STATIC	2019	Hlake2	
687.584			591.200	.024	2011	GPS - STATIC	2019	Hlake2	
687.604	.262		591.239	.197	2011	GPS - RTRN	2017	RTRN2017	
687.584			591.180	.017	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940	
687.584			591.180	.017	2011	GPS - STATIC	2013	HBBAY	
687.597	.131		591.288	.066	2007	GPS - STATIC	2012	HBBAY	
687.522	.262		591.226	.197	2007	GPS - RTRN	2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -96.407    12B = -96.365    09 = -96.296    03 = -96.220

**Lat/Lon and County Coordinates (Feet)**

**NAD83(2011)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 16 48.24620	91 16 14.70122	656370.491	279281.062	.131	3	GPS - OPUS	2020	GPSBM
47 16 48.24365	91 16 14.70198	656370.434	279280.805	.131	3	GPS - RTRN	2020	RTRN2020
47 16 48.24660	91 16 14.70088	656370.515	279281.103	.016		ADJUSTMENT	2019	GPS3328
47 16 48.24660	91 16 14.70088	656370.515	279281.103	.016	C	GPS - STATIC	2019	HLAKE2
47 16 48.24630	91 16 14.70062	656370.532	279281.072	.131	3	GPS - RTRN	2017	RTRN2017
47 16 48.24584	91 16 14.70061	656370.532	279281.025	.020		ADJUSTMENT	2013	GPS2940
47 16 48.24584	91 16 14.70061	656370.532	279281.025	.020	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 16 48.24625	91 16 14.70154	656370.469	279281.068	.033	C	GPS - STATIC	2012	HBBAY
47 16 48.24479	91 16 14.70237	656370.409	279280.921	.131	3	GPS - RTRN	2011	RTRN2011

**NAD83(1996)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 16 48.24635	91 16 14.70138	656370.480	279281.078	.033	C	GPS - STATIC	2019	HLAKE2

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3078657.988	617979.395	2069474.499	17184145.285	.131	3	GPS - OPUS	2020	GPSBM
3078657.942	617979.136	2069474.453	17184145.026	.131	3	GPS - RTRN	2020	RTRN2020
3078658.010	617979.436	2069474.522	17184145.326	.016		ADJUSTMENT	2019	GPS3328
3078658.010	617979.436	2069474.522	17184145.326	.016	C	GPS - STATIC	2019	HLAKE2
3078658.029	617979.406	2069474.541	17184145.296	.131	3	GPS - RTRN	2017	RTRN2017
3078658.031	617979.360	2069474.542	17184145.249	.020		ADJUSTMENT	2013	GPS2940
3078658.031	617979.360	2069474.542	17184145.249	.020	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3078657.966	617979.400	2069474.477	17184145.289	.033	C	GPS - STATIC	2012	HBBAY
3078657.912	617979.251	2069474.423	17184145.140	.131	3	GPS - RTRN	2011	RTRN2011

**NAD83(1996)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3078657.977	617979.410	2069474.488	17184145.300	.033	C	GPS - STATIC	2019	HLAKE2

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_B-SH0612-3SE-27JUL2020.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_B-SH0612-3SE-27JUL2020.jpg</a>	SE	Jul 27, 2020
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_B-SH0612-2-27JUL2020.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_B-SH0612-2-27JUL2020.jpg</a>		Jul 27, 2020
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_B-SH0612-1-27JUL2020.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_B-SH0612-1-27JUL2020.jpg</a>		Jul 27, 2020

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



Mn/DOT Name: 3807 C

NGS Name: 3807 C

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	32	56 N	7 W	471721.00	911545.00		

<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>
1971	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

**Description:** (2000)                      **Stamping:** 3807 C 1971

0.48 MILES SOUTHWEST OF SILVER BAY, 65.0 FEET RIGHT OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 STATION 1345+28, 29.0 FEET SOUTHWEST OF A TELEPHONE POLE NUMBER 6, 74.0 FEET SOUTHWEST OF A FENCE CORNER, 3.0 FEET NORTH OF A WITNESS POST.

**Station Notes**  
 FOUND THE DISK REMOVED FROM A ROCK.

**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>		
737.193	.033	3							VERTICAL CONTROL SURVEY	1971	CS3807	

**Geoid Separations(ft):** GEOID18 = -96.345    12B = -96.299    09 = -96.243    03 = -96.161

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 3807 D

NGS Name: 3807 D

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4461](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	32	56 N	7 W	471741.88	911527.75	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>
1971	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	BENCH MARK DISK	MNDT

Description: (2011) Stamping: 3807 D 1971

142.0 FEET NORTHWEST OF TRUNK HIGHWAY 61 IN SILVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 54.3, 70.0 FEET NORTHWEST OF COUNTY ROAD 5.

Station Notes

THE MARK IS IN A ROCK CLIMBING AREA.

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>	
772.653	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963	
772.653	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE	
772.653	.016	2/1				VERTICAL ADJUSTMENT	2014	00000832	
772.653	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
772.649	.016	2/1				VERTICAL CONTROL SURVEY	2011	VSBAY	
772.649	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3	

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>	
772.498	.033	3				VERTICAL CONTROL SURVEY	1971	CS3807	

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>	
772.685	.262		676.439	.197	2011	GPS - RTRN	2017	RTRN2017	
772.597	.262		676.393	.197	2007	GPS - RTRN	2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -96.299 12B = -96.250 09 = -96.201 03 = -96.115

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 17 41.87932	91 15 27.75146	659696.060	284661.562	.131	3	GPS - RTRN	2017	RTRN2017	

NAD83(2007)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 17 41.87880	91 15 27.75327	659695.934	284661.511	.131	3	GPS - RTRN	2011	RTRN2011	

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - North 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>	
3081764.606	623488.538	2072588.876	17189649.054	.131	3	GPS - RTRN	2017	RTRN2017	

NAD83(2007)

<u>MN State Plane - North 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>	
3081764.483	623488.482	2072588.752	17189648.998	.131	3	GPS - RTRN	2011	RTRN2011	



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_D-DM4461-3NW-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_D-DM4461-3NW-19SEP2017.jpg</a>	NW	Sep 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_D-DM4461-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_D-DM4461-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_D-DM4461-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_D-DM4461-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: 3807 E

NGS Name: 3807 E

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	32	56 N	7 W	471746.00	911529.00		

<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>
1971	2007	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	MNDT

Description: (2000)                      Stamping: 3807 E 1971

0.2 MILE NORTHEAST OF SILVER BAY, 46.0 FEET RIGHT OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 STATION 1314+30, IN THE NORTH CORNER OF A WEST HEADWALL OF TRUNK HIGHWAY 61 BOX CULVERT, 2.0 FEET NORTHWEST OF A WITNESS POST.

**Station Notes**

NEW BOX CULVERT IN PLACE.

**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>					
732.013	.033	3				1971	CS3807					

Geoid Separations(ft): GEOID18 = -96.266    12B = -96.220    09 = -96.174    03 = -96.089

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 3807 F

NGS Name: 3807 F

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	29	56 N	7 W	471817.00	911436.00		

<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>
1971	2007	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	MNDT

**Description:** (2000)                      **Stamping:** 3807 F 1971

1.1 MILES NORTHEAST OF SILVER BAY, IN THE SOUTHEAST CORNER OF AN EAST HEADWALL OF TRUNK HIGHWAY 61 BOX CULVERT, 35.0 FEET LEFT OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 STATION 1268+75, 1.0 FOOT SOUTHWEST 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>	
768.440	.033	3				VERTICAL CONTROL SURVEY	1971	CS3807	

**Geoid Separations(ft): GEOID18 = -96.329    12B = -96.279    09 = -96.233    03 = -96.142**

\* No Horizontal Positions in the Database \*





Mn/DOT Name: 3807 G

NGS Name: 3807 G

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4575](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	56 N	7 W	472012.79	911203.62	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>
2007	2017	GOOD	Horz=NO Vert=YES	YES	38007	FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	SURVEY DISK	MNDT

**Description:** (2007)                      **Stamping:** 3807 G 2007

1.0 MILE SOUTHWEST OF ILLGEN CITY, IN AN ABUTMENT IN THE SOUTHEAST CORNER OF TRUNK HIGHWAY 61 BRIDGE NUMBER 38007 OVER THE BAPTISM RIVER, 0.95 MILE SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND TRUNK HIGHWAY 1 IN ILLGEN CITY, AT TRUNK HIGHWAY 61 MILEPOINT 58.40, 29.4 FEET SOUTHEAST OF TRUNK HIGHWAY 61. THE DISK WAS SET IN A DRILL HOLE IN 2007, THE BRIDGE WAS BUILT IN 1968.

**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>
681.163	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963
681.170	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE
681.170	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691
681.170	.016	2/1					VERTICAL CONTROL SURVEY	2008	VSHOR2

**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>
681.229	.262			584.871	.197	2011	GPS - RTRN	2017	RTRN2017

Geoid Separations(ft): GEOID18 = -96.397 12B = -96.358 09 = -96.309 03 = -96.201

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 20 12.78938	91 12 03.62379	674004.178	299725.878	.131	3	GPS - RTRN	2017	RTRN2017	

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>							
3095454.828	639113.780	2086300.502	17205252.098	.131	3	GPS - RTRN	2017	RTRN2017

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_G-DM4575-3NE-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_G-DM4575-3NE-19SEP2017.jpg</a>	NE	Sep 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_G-DM4575-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_G-DM4575-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_G-DM4575-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_G-DM4575-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: 3807 H

NGS Name: 3807 H

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4457](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	22	56 N	7 W	471920.74	911257.48	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>
2007	2017	GOOD	Horz=NO Vert=NO	YES	38013	FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	SURVEY DISK	MNDT

**Description:** (2011) **Stamping:** 3807 H 2007

2.0 MILES SOUTHWEST OF ILLGEN CITY, IN AN ABUTMENT IN THE SOUTHEAST CORNER OF TRUNK HIGHWAY 61 BRIDGE NUMBER 38013 OVER THE PALISADE CREEK, 2.15 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND TRUNK HIGHWAY 1 IN ILLGEN CITY, AT TRUNK HIGHWAY 61 MILEPOINT 57.20, 33.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61.

**Station Notes**

THE DISK WAS SET IN THE BRIDGE WHEN IT WAS BUILT IN 2005 THEN STAMPED WHEN USED IN 2007. IF THE COORDINATES AND/OR ELEVATIONS ARE ESTABLISHED OR PUBLISHED ON THIS GEODETIC CONTROL DISK, THEY SHOULD BE USED WITH CAUTION. THE GEODETIC CONTROL DISK IS LOCATED ON AN INTEGRAL ABUTMENT AND/OR A JOINTLESS BRIDGE AND IS SUBJECT TO MOVEMENT BEYOND GEODETIC TOLERANCES.

**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>
682.105	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963
682.115	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE
682.115	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691
682.118	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3

**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>
682.111	.262			585.737	.197	2011	GPS - RTRN	2017	RTRN2017
682.098	.262			585.773	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -96.417 12B = -96.378 09 = -96.325 03 = -96.227

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 19 20.73866	91 12 57.47538			670212.013	294510.782	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 19 20.73775	91 12 57.47512			670212.030	294510.690	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3091875.587	633751.098			2082713.764	17199895.330	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3091875.607	633751.006			2082713.784	17199895.238	.131	3	GPS - RTRN	2011	RTRN2011



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_H-DM4457-3SE-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_H-DM4457-3SE-19SEP2017.jpg</a>	SE	Sep 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_H-DM4457-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_H-DM4457-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_H-DM4457-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_H-DM4457-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: 3807 J

NGS Name: 3807 J

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4459](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	28	56 N	7 W	471852.07	911339.61	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>
2007	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (2007) Stamping: 3807 J 2007

2.0 MILES NORTHEAST OF SILVER BAY, 2.0 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 5 IN SILVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 56.3, 68.5 FEET NORTHWEST OF TRUNK HIGHWAY 61, 1.3 FEET SOUTHEAST OF A WITNESS POST.

Station Pair: ANDREW - LAKE, 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>			<u>Year</u>	<u>Reference</u>	
730.451	.016	2/1				2021	00000963	VERTICAL ADJUSTMENT		2021	00000963	
730.451	.016	2/1				2019	VNSHORE	VERTICAL CONTROL SURVEY		2019	VNSHORE	
730.451	.016	2/1				2011	00000691	VERTICAL ADJUSTMENT		2011	00000691	
730.451	.016	2/1				2009	VSHOR3	VERTICAL CONTROL SURVEY		2009	VSHOR3	

**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>			<u>Year</u>	<u>Reference</u>	
730.455	.262		634.123	.197	2011	2017	RTRN2017	GPS - RTRN		2017	RTRN2017	
730.451			634.090	.021	2011	2013	GPS2940	HORIZONTAL ADJUSTMENT		2013	GPS2940	
730.451			634.090	.021	2011	2013	HBBAY	GPS - STATIC		2013	HBBAY	
730.445	.131		634.165	.066	2007	2012	HBBAY	GPS - STATIC		2012	HBBAY	
730.461	.262		634.175	.197	2007	2011	RTRN2011	GPS - RTRN		2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -96.378 12B = -96.335 09 = -96.286 03 = -96.191

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>			<u>Geodetic Position</u>					<u>Lake County - Lake (North Shore) Zone</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>			
47 18 52.06684	91 13 39.60859		667263.148	291652.078	.131	3	GPS - RTRN	2017	RTRN2017			
47 18 52.06677	91 13 39.60878		667263.135	291652.072	.023		ADJUSTMENT	2013	GPS2940			
47 18 52.06677	91 13 39.60878		667263.135	291652.072	.023	C	GPS - STATIC	2013	HBBAY			

<u>NAD83(2007)</u>			<u>Geodetic Position</u>					<u>Lake County - Lake (North Shore) Zone</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>			
47 18 52.06707	91 13 39.60952		667263.084	291652.103	.033	C	GPS - STATIC	2012	HBBAY			
47 18 52.06713	91 13 39.60951		667263.085	291652.109	.131	3	GPS - RTRN	2011	RTRN2011			

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>MN State Plane - North Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>	<u>Year</u>	<u>Reference</u>
3089044.197	630776.556	2079878.322	17196925.340	.131	3	2017	RTRN2017
3089044.184	630776.549	2079878.309	17196925.332	.023		2013	GPS2940
3089044.184	630776.549	2079878.309	17196925.332	.023	C	2013	HBBAY

<u>NAD83(2007)</u>		<u>MN State Plane - North 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>
3089044.133	630776.578	2079878.258	17196925.361	.033	C	2012	HBBAY
3089044.133	630776.584	2079878.258	17196925.368	.131	3	2011	RTRN2011



**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_J-DM4459-3NW-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_J-DM4459-3NW-19SEP2017.jpg</a>	NW	Sep 19, 2017
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_J-DM4459-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_J-DM4459-2-19SEP2017.jpg</a>		Sep 19, 2017
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_J-DM4459-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_J-DM4459-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: 3807 K

NGS Name: 3807 K

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4460](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

		<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>
SE	29	56 N	7 W	471821.79	911433.62	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>
2007	2021	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (2009) Stamping: 3807 K 2007

1.0 MILE NORTHEAST OF SILVER BAY, 1.1 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 5 IN SILVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 55.40, 90.8 FEET NORTHWEST OF TRUNK HIGHWAY 61, 227.0 FEET SOUTHWEST OF MT ROCKWOOD DRIVE, 2.6 FEET SOUTHEAST OF A WITNESS POST.

Station Notes

THE MARK IS ON TOP OF A CLIFF.

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>			
779.378	.016	2/1					VERTICAL ADJUSTMENT		2021	00000963			
779.378	.016	2/1					VERTICAL CONTROL SURVEY		2019	VNSHORE			
779.378	.016	2/1					VERTICAL ADJUSTMENT		2011	00000691			
779.378	.016	2/1					VERTICAL CONTROL SURVEY		2009	VSHOR3			

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>			
779.421	.262			683.109	.197	2011	GPS - OPUS		2021	GPSBM			
779.421	.262			683.109	.197	2011	GPS - RTRN		2021	RTRN2021			
779.421	.262			683.158	.197	2011	GPS - RTRN		2017	RTRN2017			
779.378				683.096	.020	2011	HORIZONTAL ADJUSTMENT		2013	GPS2940			
779.378				683.096	.020	2011	GPS - STATIC		2013	HBBAY			
779.395	.131			683.161	.066	2007	GPS - STATIC		2012	HBBAY			
779.365	.262			683.145	.197	2007	GPS - RTRN		2011	RTRN2011			

Geoid Separations(ft): GEOID18 = -96.312 12B = -96.263 09 = -96.217 03 = -96.125

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>				<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>					
47 18 21.79069	91 14 33.62032	663492.264	288644.471	.131	3	GPS - OPUS	2021	GPSBM					
47 18 21.79073	91 14 33.62025	663492.268	288644.475	.131	3	GPS - RTRN	2021	RTRN2021					
47 18 21.79023	91 14 33.61981	663492.298	288644.423	.131	3	GPS - RTRN	2017	RTRN2017					
47 18 21.79030	91 14 33.62033	663492.262	288644.431	.020		ADJUSTMENT	2013	GPS2940					
47 18 21.79030	91 14 33.62033	663492.262	288644.431	.020	C	GPS - STATIC	2013	HBBAY					

<u>NAD83(2007)</u>				<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>					
47 18 21.79060	91 14 33.62109	663492.210	288644.462	.033	C	GPS - STATIC	2012	HBBAY					
47 18 21.78958	91 14 33.61991	663492.290	288644.357	.131	3	GPS - RTRN	2011	RTRN2011					

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North 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>
3085397.488	627620.254	2076227.403	17193774.837	.131	3	GPS - OPUS	2021	GPSBM
3085397.493	627620.258	2076227.407	17193774.841	.131	3	GPS - RTRN	2021	RTRN2021
3085397.524	627620.208	2076227.439	17193774.792	.131	3	GPS - RTRN	2017	RTRN2017
3085397.488	627620.214	2076227.403	17193774.798	.020		ADJUSTMENT	2013	GPS2940
3085397.488	627620.214	2076227.403	17193774.798	.020	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North 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>
3085397.435	627620.243	2076227.350	17193774.827	.033	C	GPS - STATIC	2012	HBBAY
3085397.519	627620.142	2076227.433	17193774.726	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_K-DM4460-3NW-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_K-DM4460-3NW-17AUG2021.jpg</a>	NW	Aug 17, 2021
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_K-DM4460-2-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_K-DM4460-2-17AUG2021.jpg</a>		Aug 17, 2021
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_K-DM4460-1-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_K-DM4460-1-17AUG2021.jpg</a>		Aug 17, 2021

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



Mn/DOT Name: 3807 K 1

NGS Name: 3807 K 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [DN9495](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	19	56 N	7 W	471810.54	911506.66	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>
2011	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (2011) Stamping: 3807 K 1 2011

0.65 MILE NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 5 IN SILVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 54.95, THEN 0.1 MILE NORTHWEST ALONG DRIVEWAY NUMBER 5163 (AN ENTRANCE TO SILVER BAY TRUCK STATION), 73.5 FEET NORTHWEST OF DRIVEWAY NUMBER 5163, 72.7 FEET WEST OF THE SOUTH CORNER OF A CONCRETE STRUCTURE, 1.0 FOOT 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>		
752.909	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963		
752.909	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE		
752.909	.016	2/1				VERTICAL ADJUSTMENT	2014	00000832		
752.905	.016	2/1				VERTICAL CONTROL SURVEY	2011	VSBBAY		

**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>		
752.922	.262		656.744	.197	2011	GPS - RTRN	2017	RTRN2017		
752.905			656.695	.019	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940		
752.905			656.695	.019	2011	GPS - STATIC	2013	HBBAY		
752.918	.131		656.767	.066	2007	GPS - STATIC	2012	HBBAY		
752.886	.262		656.744	.197	2007	GPS - RTRN	2011	RTRN2011		

Geoid Separations(ft): GEOID18 = -96.227 12B = -96.178 09 = -96.138 03 = -96.043

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 18 10.54012	91 15 06.65549			661197.277	287541.532	.131	3	GPS - RTRN	2017	RTRN2017
47 18 10.53982	91 15 06.65606			661197.238	287541.502	.020		ADJUSTMENT	2013	GPS2940
47 18 10.53982	91 15 06.65606			661197.238	287541.502	.020	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 18 10.54001	91 15 06.65673			661197.192	287541.522	.033	C	GPS - STATIC	2012	HBBAY
47 18 10.53957	91 15 06.65773			661197.122	287541.478	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3083148.856	626426.173			2073977.296	17192584.244	.131	3	GPS - RTRN	2017	RTRN2017
3083148.817	626426.142			2073977.257	17192584.213	.020		ADJUSTMENT	2013	GPS2940
3083148.817	626426.142			2073977.257	17192584.213	.020	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3083148.770	626426.160			2073977.210	17192584.231	.033	C	GPS - STATIC	2012	HBBAY
3083148.702	626426.113			2073977.142	17192584.185	.131	3	GPS - RTRN	2011	RTRN2011





Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_K_1-DN9495-3NW-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_K_1-DN9495-3NW-20SEP2017.jpg</a>	NW	Sep 20, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_K_1-DN9495-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_K_1-DN9495-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_K_1-DN9495-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_K_1-DN9495-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: 3807 L

NGS Name: 3807 L

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4462](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	31	56 N	7 W	471712.34	911556.78	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>
2007	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (2009) Stamping: 3807 L 2007

0.5 MILE SOUTHWEST OF SILVER BAY, 0.6 MILE SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 5 IN SILVER BAY, AT TRUNK HIGHWAY 61 MILEPOST 53.60, 47.9 FEET NORTHWEST OF TRUNK HIGHWAY 61, 1.3 FEET SOUTHEAST OF A WITNESS POST.

**Leveling-Derived Orthometric Heights (Feet)**

<u>NAVD88</u>							<u>Project Info</u>	
<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</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>			
745.770	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963
745.770	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE
745.770	.016	2/1				VERTICAL ADJUSTMENT	2014	00000832
745.770	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691
745.770	.016	2/1				VERTICAL CONTROL SURVEY	2011	VSBAY
745.770	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3

**Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)**

<u>NAVD88</u>							<u>Project Info</u>	
<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</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>			
745.806	.262		649.507	.197	2011	GPS - RTRN	2017	RTRN2017
745.770			649.425	.018	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940
745.770			649.425	.018	2011	GPS - STATIC	2013	HBBAY
745.766	.131		649.530	.066	2007	GPS - STATIC	2012	HBBAY
745.730	.262		649.490	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -96.345 12B = -96.299 09 = -96.240 03 = -96.161

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>							<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</u>				<u>Determination Method</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>			
47 17 12.33735	91 15 56.77569	657646.422	281701.408	.131	3	GPS - RTRN	2017	RTRN2017
47 17 12.33681	91 15 56.77566	657646.424	281701.353	.020		ADJUSTMENT	2013	GPS2940
47 17 12.33681	91 15 56.77566	657646.424	281701.353	.020	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>							<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</u>				<u>Determination Method</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>			
47 17 12.33715	91 15 56.77660	657646.359	281701.388	.033	C	GPS - STATIC	2012	HBBAY
47 17 12.33610	91 15 56.77807	657646.256	281701.284	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>							<u>Project Info</u>	
<u>MN State Plane - North Zone</u>		<u>UTM - Zone 15</u>				<u>Determination Method</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>			
3079835.633	620448.777	2070655.652	17186612.572	.131	3	GPS - RTRN	2017	RTRN2017
3079835.636	620448.722	2070655.655	17186612.517	.020		ADJUSTMENT	2013	GPS2940
3079835.636	620448.722	2070655.655	17186612.517	.020	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>							<u>Project Info</u>	
<u>MN State Plane - North Zone</u>		<u>UTM - Zone 15</u>				<u>Determination Method</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>			
3079835.571	620448.755	2070655.590	17186612.550	.033	C	GPS - STATIC	2012	HBBAY
3079835.472	620448.647	2070655.491	17186612.442	.131	3	GPS - RTRN	2011	RTRN2011



**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_L-DM4462-3NW-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_L-DM4462-3NW-19SEP2017.jpg</a>	NW	Sep 19, 2017
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_L-DM4462-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_L-DM4462-2-19SEP2017.jpg</a>		Sep 19, 2017
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_L-DM4462-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_L-DM4462-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: 3807 M

NGS Name: 3807 M

County: LAKE, MN (Sheet 1)

NGS ACRN: [DO8107](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	15	56 N	7 W	472009.59	911210.96	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>
2011	2019	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: (2011) Stamping: 3807 M 2011

4.0 MILES NORTHEAST OF SILVER BAY, 3.95 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 5 IN SILVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 58.25, 107.2 FEET NORTHWEST OF TRUNK HIGHWAY 61, 1.5 FEET SOUTHEAST OF A WITNESS POST.

Station Pair: AMBER - LAKE, 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>			<u>Year</u>	<u>Reference</u>	
685.569	.016	2/1				2021	00000963	VERTICAL ADJUSTMENT				
685.573	.016	2/1				2019	VNSHORE	VERTICAL CONTROL SURVEY				

**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>			<u>Year</u>	<u>Reference</u>	
685.596			589.218	.017	2011	2019	GPS3328	HORIZONTAL ADJUSTMENT				
685.573	.131		589.418	.066	1996	2019	Hlake2	GPS - STATIC				
685.596			589.218	.017	2011	2019	Hlake2	GPS - STATIC				
685.589	.262		589.248	.197	2011	2017	RTRN2017	GPS - RTRN				
685.589			589.218	.023	2011	2013	GPS2940	HORIZONTAL ADJUSTMENT				
685.589			589.218	.023	2011	2013	HBBAY	GPS - STATIC				
685.596	.131		589.293	.066	2007	2012	HBBAY	GPS - STATIC				

Geoid Separations(ft): GEOID18 = -96.378 12B = -96.342 09 = -96.292 03 = -96.184

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Geodetic Position</u>						<u>Lake County - Lake (North Shore) Zone</u>				<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</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>			
47 20 09.59340	91 12 10.96014	47 20 09.59340	91 12 10.96014	673493.851	299409.984	.013		ADJUSTMENT	2019	GPS3328			
47 20 09.59340	91 12 10.96014	47 20 09.59340	91 12 10.96014	673493.851	299409.984	.013	C	GPS - STATIC	2019	Hlake2			
47 20 09.59331	91 12 10.95907	47 20 09.59331	91 12 10.95907	673493.925	299409.973	.131	3	GPS - RTRN	2017	RTRN2017			
47 20 09.59340	91 12 10.96014	47 20 09.59340	91 12 10.96014	673493.851	299409.984	.026		ADJUSTMENT	2013	GPS2940			
47 20 09.59340	91 12 10.96014	47 20 09.59340	91 12 10.96014	673493.851	299409.984	.026	C	GPS - STATIC	2013	HBBAY			

  

<u>NAD83(2007)</u>		<u>Geodetic Position</u>						<u>Lake County - Lake (North Shore) Zone</u>				<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</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>			
47 20 09.59355	91 12 10.96107	47 20 09.59355	91 12 10.96107	673493.787	299410.000	.033	C	GPS - STATIC	2012	HBBAY			

  

<u>NAD83(1996)</u>		<u>Geodetic Position</u>						<u>Lake County - Lake (North Shore) Zone</u>				<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</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>			
47 20 09.59313	91 12 10.95996	47 20 09.59313	91 12 10.95996	673493.863	299409.956	.033	C	GPS - STATIC	2019	Hlake2			

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - North 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>
3094957.656	638777.673	2085802.891	17204916.762	.013		ADJUSTMENT	2019	GPS3328
3094957.656	638777.673	2085802.891	17204916.762	.013	C	GPS - STATIC	2019	HLAKE2
3094957.730	638777.665	2085802.965	17204916.755	.131	3	GPS - RTRN	2017	RTRN2017
3094957.656	638777.673	2085802.891	17204916.762	.026		ADJUSTMENT	2013	GPS2940
3094957.656	638777.673	2085802.891	17204916.762	.026	C	GPS - STATIC	2013	HBBAY

NAD83(2007)

MN State Plane - North 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>
3094957.592	638777.686	2085802.827	17204916.776	.033	C	GPS - STATIC	2012	HBBAY

NAD83(1996)

MN State Plane - North 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>
3094957.669	638777.646	2085802.904	17204916.735	.033	C	GPS - STATIC	2019	HLAKE2

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_M-DO8107-3NW-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_M-DO8107-3NW-19SEP2017.jpg</a>	NW	Sep 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_M-DO8107-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_M-DO8107-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_M-DO8107-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_M-DO8107-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: 3807 N

NGS Name: 3807 N

County: LAKE, MN (Sheet 1)

NGS ACRN: [DO8108](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				Reference	Reference	Vert	Horz
1/4	Sec	Twp	Rng	Latitude	Longitude	Order	Order
NW	22	56 N	7 W	471923.71	911256.28	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2011	2017	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 18 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2011) **Stamping:** 3807 N 2011

2.9 MILES NORTHEAST OF SILVER BAY, 2.9 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 5 IN SILVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 57.25, 80.4 FEET NORTHWEST OF TRUNK HIGHWAY 61, 59.0 FEET NORTHEAST OF EDWARDSON ROAD, 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	Reference
677.230	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963
677.239	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE

**Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)**

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
677.226	.262			580.858	.197	2011	GPS - RTRN	2017	RTRN2017
677.269				580.855	.021	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940
677.269				580.855	.021	2011	GPS - STATIC	2013	HBBAY
677.262	.131			580.947	.066	2007	GPS - STATIC	2012	HBBAY

Geoid Separations(ft): GEOID18 = -96.407 12B = -96.368 09 = -96.315 03 = -96.217

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)				Lake County - Lake (North Shore) Zone				Project Info		
Geodetic Position				X	Y	Acc	Order	Determination Method	Year	Reference
Latitude	Longitude									
47 19 23.71452	91 12 56.28360			670298.878	294810.975	.131	3	GPS - RTRN	2017	RTRN2017
47 19 23.71479	91 12 56.28329			670298.900	294811.002	.020		ADJUSTMENT	2013	GPS2940
47 19 23.71479	91 12 56.28329			670298.900	294811.002	.020	C	GPS - STATIC	2013	HBBAY

NAD83(2007)				Lake County - Lake (North Shore) Zone				Project Info		
Geodetic Position				X	Y	Acc	Order	Determination Method	Year	Reference
Latitude	Longitude									
47 19 23.71501	91 12 56.28413			670298.842	294811.025	.033	C	GPS - STATIC	2012	HBBAY

**State Plane and UTM Coordinates (Feet)**

NAD83(2011)				UTM - Zone 15				Project Info		
MN State Plane - North Zone				X	Y	Acc	Order	Determination Method	Year	Reference
X	Y									
3091950.316	634054.508			2082788.933	17200198.593	.131	3	GPS - RTRN	2017	RTRN2017
3091950.337	634054.536			2082788.954	17200198.620	.020		ADJUSTMENT	2013	GPS2940
3091950.337	634054.536			2082788.954	17200198.620	.020	C	GPS - STATIC	2013	HBBAY

NAD83(2007)				UTM - Zone 15				Project Info		
MN State Plane - North Zone				X	Y	Acc	Order	Determination Method	Year	Reference
X	Y									
3091950.278	634054.557			2082788.895	17200198.641	.033	C	GPS - STATIC	2012	HBBAY

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_N-DO8108-3NE-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_N-DO8108-3NE-19SEP2017.jpg</a>	NE	Sep 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_N-DO8108-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_N-DO8108-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_N-DO8108-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3807_N-DO8108-1-19SEP2017.jpg</a>		Sep 19, 2017

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





Mn/DOT Name: 3808 C

NGS Name: 3808 C

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4572](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	11	56 N	7 W	472048.28	911116.15	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>
2007	2017	GOOD	Horz=YES Vert=YES	YES		PROJECTS 6 IN.	MARKER W/BAR MAGNET

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

**Description:** (2007)                      **Stamping:** 3808 C 2007

IN ILLGEN CITY, AT THE JUNCTION OF TRUNK HIGHWAY 61 AND TRUNK HIGHWAY 1 IN ILLGEN CITY, AT TRUNK HIGHWAY 61 MILEPOINT 59.25, 83.60 FEET NORTHWEST OF SOUTHBOUND TRUNK HIGHWAY 61, 105.0 FEET SOUTHWEST OF TRUNK HIGHWAY 1, 29.0 FEET SOUTHWEST OF A CABLE PEDESTAL, 0.6 FOOT SOUTHEAST OF A WITNESS POST. PREFAB CONCRETE POST SET IN 1971 THEN STAMPED WHEN IT WAS USED IN 2007.

**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>					
718.709	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963					
718.726	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE					
718.726	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691					
718.726	.016	2/1					VERTICAL CONTROL SURVEY	2011	VBCKY-R					
718.726	.016	2/1					VERTICAL CONTROL SURVEY	2009	VBCKY					
718.726	.016	2/1					VERTICAL CONTROL SURVEY	2008	VSHOR2					

**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>					
718.752	.262			622.354	.197	2011	GPS - RTRN	2017	RTRN2017					

Geoid Separations(ft): GEOID18 = -96.437    12B = -96.397    09 = -96.348    03 = -96.243

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>						
47 20 48.28325	91 11 16.15172	677329.197	303271.065	.131	3	GPS - RTRN		2017	RTRN2017						

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>MN State Plane - North 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>						
3098634.388	642789.322	2089485.119	17208922.544	.131	3	GPS - RTRN		2017	RTRN2017						

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3808_C-DM4572-3NW-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3808_C-DM4572-3NW-19SEP2017.jpg</a>	NW	Sep 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3808_C-DM4572-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3808_C-DM4572-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3808_C-DM4572-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/3808_C-DM4572-1-19SEP2017.jpg</a>		Sep 19, 2017

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





Mn/DOT Name: 4 PR

NGS Name: 4 PR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	6	56 N	7 W	472201.00	911638.00		

<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	1978	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	SURVEY DISK	USGS

**Description:** (1978)                      **Stamping:** 4 PR 1978

5.0 MILES NORTH OF SILVER BAY, 2.3 MILES NORTHEAST ALONG COUNTY HIGHWAY 4 FROM THE LAX LAKE RESORT, 62.0 FEET NORTH OF A HIGHWAY, 52.0 FEET SOUTHWEST OF A CULVERT, 24.0 FEET NORTH OF THE EDGE OF A ROCK OUTCROP, IN THE CENTER OF AN OUTCROP.

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

**Geoid Separations(ft): GEOID18 = -94.685    12B = -94.649    09 = -94.609    03 = -94.524**



Mn/DOT Name: 42 RC

NGS Name: 42 RC

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	25	53 N	10 W	470315.00	914003.00		

<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>
1952	1996	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)	SEE DESCRIPTION	USGS

Description: (1962)                      Stamping: 42 RC 1952

2.0 MILES NORTH OF TWO HARBORS, 2.0 MILES NORTH ALONG COUNTY HIGHWAY 2 FROM THE JUNCTION OF COUNTY HIGHWAY 2 AND TRUNK HIGHWAY 61, 262.0 FEET SOUTH AND 28.0 FEET WEST OF A CROSSROADS.

**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>	
869.427	.033	3				VERTICAL CONTROL SURVEY	1958	USGS-VERT	

**Geoid Separations(ft): GEOID18 = -94.511    12B = -94.485    09 = -94.409    03 = -94.317**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 43 RC USGS  
 County: LAKE, MN (Sheet 1)

NGS Name: 43 RC USGS

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	7	53 N	10 W	470505.00	914002.00		

<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>
1952	1952	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

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

Description: (1952)                      Stamping: 43 RC 1952

4.0 MILES NORTH OF TWO HARBORS, 4.0 MILES NORTH OF THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61,  
 342.0 FEET NORTH AND 26.0 FEET EAST OF A TEE-ROAD EAST, 100.0 FEET NORTH OF A PRIVATE DRIVE EAST.

**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>	
1016.619	.033	3				VERTICAL CONTROL SURVEY	1958	USGS-VERT	

**Geoid Separations(ft): GEOID18 = -94.186    12B = -94.153    09 = -94.075    03 = -93.996**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 44 RC USGS  
 County: LAKE, MN (Sheet 1)

NGS Name: 44 RC USGS

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	36	54 N	11 W	470650.00	913954.00		

<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>
1952	1952	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

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

Description: (1952)                      Stamping: 44 RC 1952

6.0 MILES NORTH OF TWO HARBORS, 6.0 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61, 2.5 MILES SOUTH AND 1.5 MILES EAST OF ALGER, 0.2 MILE NORTHEAST OF A BRIDGE OVER THE SILVER CREEK, 440.0 FEET NORTH AND 37.0 FEET WEST OF A ROAD NEAR THE NORTH END OF A CURVE, OPPOSITE A SMALL RED TAVERN.

**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>	
1273.400	.033	3							VERTICAL CONTROL SURVEY	1958	USGS-VERT	

**Geoid Separations(ft): GEOID18 = -93.838    12B = -93.815    09 = -93.730    03 = -93.665**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 51 WR

NGS Name: 51 WR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091342/  
 USGS Quad: BRIMSON

				<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	7	56 N	11 W	472126.00	914652.00		

<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	1950	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SEE DESCRIPTION	USGS

Description: (1950)                      Stamping: 51 WR 1950

3.0 MILES SOUTH AND 1.0 MILE WEST OF THE TOIMI COOP STORE, 180.0 FEET SOUTH AND 30.0 FEET EAST OF THE JUNCTION OF A NORTH-SOUTH ROAD AND A ROAD WEST, 150.0 FEET WEST OF THE NORTHWEST CORNER OF A FARMHOUSE, 14.0 FEET NORTH OF A DRIVEWAY, 12.0 FEET EAST OF A STONE FENCE.

**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>	
1653.652	.033	3					VERTICAL CONTROL SURVEY	1956	USGS-VERT	

Geoid Separations(ft): GEOID18 = -93.556    12B = -93.573    09 = -93.455    03 = -93.330

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 52 WR

NGS Name: 52 WR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091342/  
 USGS Quad: BRIMSON

				<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	18	56 N	11 W	472005.00	914658.00		

<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	1950	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

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

Description: (1950)                      Stamping: 52 WR 1950

4.5 MILES SOUTH AND 1.0 MILE WEST OF THE TOIMI COOP STORE, 145.0 FEET SOUTH AND 60.0 FEET WEST OF THE SOUTHWEST CORNER OF A FARMHOUSE, 15.0 FEET WEST OF A LARGE ROCK PILE, 1.0 FOOT NORTH OF A FENCE.

**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>	
1600.765	.033	3				VERTICAL CONTROL SURVEY	1956	USGS-VERT	

Geoid Separations(ft): GEOID18 = -93.441    12B = -93.464    09 = -93.343    03 = -93.231

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 54 WR

NGS Name: 54 WR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091342/  
 USGS Quad: BRIMSON

				<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	29	56 N	11 W	471805.00	914548.00		

<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	1950	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SEE DESCRIPTION	USGS

Description: (1950)                      Stamping: 54 WR 1950

0.2 MILE SOUTH AND 5.6 MILES SOUTHWEST OF MCNAIR, 2.1 MILES NORTHEAST OF A BRIDGE OVER THE CLOQUET RIVER,  
 36.0 FEET SOUTHEAST OF A GRAVEL ROAD.

**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>	
1580.482	.033	3							VERTICAL CONTROL SURVEY	1956	USGS-VERT	

Geoid Separations(ft): GEOID18 = -93.140    12B = -93.159    09 = -93.044    03 = -92.943

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 55 WR

NGS Name: 55 WR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091313/  
 USGS Quad: KANE 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	34	56 N	11 W	471756.00	914330.00		

<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	1950	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

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

Description: (1950)                      Stamping: 55 WR 1950

0.2 MILE SOUTH AND 3.7 MILES SOUTHWEST OF MCNAIR, NEAR THE POINT OF THE INTERSECTION OF A GRAVEL ROAD CURVE, 33.0 FEET SOUTH OF A ROAD, 14.0 FEET EAST OF A TWIN SPRUCE TREE.

**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>	
1632.264	.033	3							VERTICAL CONTROL SURVEY	1956	USGS-VERT	

Geoid Separations(ft): GEOID18 = -92.949    12B = -92.959    09 = -92.851    03 = -92.769

\* No Horizontal Positions in the Database \*





Mn/DOT Name: 56 WR

NGS Name: 56 WR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091313/  
 USGS Quad: KANE 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	26	56 N	11 W	471834.00	914149.00		

<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	1950	GOOD	Horz=YES Vert=YES	YES			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SEE DESCRIPTION	USGS

Description: (1950)                      Stamping: 56 WR 1950

0.2 MILE SOUTH AND 2.0 MILES SOUTHWEST OF MCNAIR, 20.0 FEET EAST OF A GRAVEL ROAD, IN THE TOP OF A 7.0 FOOT BY 5.0 FOOT ROCK.

**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>	
1654.708	.033	3				VERTICAL CONTROL SURVEY	1956	USGS-VERT	

Geoid Separations(ft): GEOID18 = -92.877    12B = -92.890    09 = -92.775    03 = -92.697

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 57 WR

NGS Name: 57 WR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091313/  
 USGS Quad: KANE 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>
SW	29	56 N	10 W	471817.00	913818.00		

<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	1950	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

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

Description: (1950)                      Stamping: 57 WR 1950

1.2 MILES SOUTH AND 1.4 MILES EAST OF MCNAIR, 34.0 FEET NORTH AND 63.0 FEET EAST OF A GRAVEL ROAD AT THE JUNCTION OF A ROAD TO SOME CABINS.

**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>		
1708.130	.033	3							VERTICAL CONTROL SURVEY	1956	USGS-VERT	

Geoid Separations(ft): GEOID18 = -92.697    12B = -92.720    09 = -92.579    03 = -92.536

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 58 WR

NGS Name: 58 WR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091312/  
 USGS Quad: LEGLER 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	21	56 N	10 W	471853.00	913608.00		

<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	1950	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

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

Description: (1950)                      Stamping: 58 WR 1950

1.2 MILES SOUTH AND 3.6 MILES EAST OF MCNAIR, 18.0 FEET WEST OF A FOREST ROAD, 4.0 FEET SOUTH OF AN 8.0 INCH DIAMETER BIRCH TREE.

**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>	
1763.172	.033	3				VERTICAL CONTROL SURVEY	1956	USGS-VERT	

Geoid Separations(ft): GEOID18 = -92.647    12B = -92.661    09 = -92.529    03 = -92.503

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 59 WR

NGS Name: 59 WR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091312/  
 USGS Quad: LEGLER 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	23	56 N	10 W	471920.00	913406.00		

<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	1950	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

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

Description: (1950)                      Stamping: 59 WR 1950

1.2 MILES SOUTH AND 5.5 MILES EAST OF MCNAIR, 18.0 FEET NORTH OF A FOREST ROAD, 35.0 FEET NORTH OF THE NORTHWEST CORNER OF A SHACK.

**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>	
1668.474	.033	3							VERTICAL CONTROL SURVEY	1956	USGS-VERT	

Geoid Separations(ft): GEOID18 = -92.638    12B = -92.644    09 = -92.523    03 = -92.506

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 60 RC

NGS Name: 60 RC

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0310](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

				<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	6	53 N	9 W	470620.00	913147.00		

<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>
1952	2008	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SEE DESCRIPTION	USGS

**Description:** (1952)                      **Stamping:** 60 RC 1952

8.7 MILES NORTHEAST OF TWO HARBORS, 0.8 MILE NORTHEAST OF A TRUNK HIGHWAY 61 BRIDGE OVER CROW CREEK,  
 35.0 FEET NORTH OF TRUNK HIGHWAY 61, 105.0 FEET WEST-SOUTHWEST OF AN EXTENDED PRIVATE DRIVE SOUTHEAST,  
 6.0 FEET NORTH OF A HIGHWAY DITCH.

**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>	
691.813	.033	3				VERTICAL CONTROL SURVEY	1958	USGS-VERT	

**Geoid Separations(ft): GEOID18 = -95.554    12B = -95.495    09 = -95.387    03 = -95.344**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 60 WR

NGS Name: 60 WR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091312/  
 USGS Quad: LEGLER 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	19	56 N	9 W	471933.00	913128.00		

<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	1950	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SEE DESCRIPTION	USGS

**Description:** (1950)                      **Stamping:** 60 WR 1950

1.2 MILES SOUTH ON TRUNK HIGHWAY 2 THEN 7.8 MILES EAST ON FOREST SERVICE ROAD VIA THE MARBLE LOOKOUT TOWER, 45.0 FEET SOUTH AND 6.0 FEET WEST OF THE JUNCTION OF A MAIN ROAD AND A DIM LOGGING ROAD SOUTHWEST, IN THE TOP OF AN OVAL SHAPED ROCK.

**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>	
1668.123	.033	3					VERTICAL CONTROL SURVEY	1956	USGS-VERT	

**Geoid Separations(ft): GEOID18 = -92.739    12B = -92.743    09 = -92.621    03 = -92.618**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 61 RC

NGS Name: 61 RC

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

				<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	12	53 N	10 W	470544.00	913324.00		

<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>
1952	1989	DESTROYED	Horz=NO Vert=NO	YES			SEE DESCRIPTION

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

**Description:** (1989)                      **Stamping:** 61 RC 1954

6.9 MILES NORTHEAST OF THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 IN TWO HARBORS, 0.9 MILE  
 SOUTHWEST OF A BRIDGE OVER CROW CREEK, 1.0 MILE NORTHEAST OF THE ENCAMPMENT RIVER, 68.0 FEET NORTH  
 AND 110.0 FEET EAST OF TRUNK HIGHWAY 61 AT A ROAD NORTHEAST, 41.0 FEET EAST OF A ROAD NORTHEAST.

**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>	
677.502	.033	3					VERTICAL CONTROL SURVEY	1958	USGS-VERT	

**Geoid Separations(ft): GEOID18 = -95.341    12B = -95.289    09 = -95.187    03 = -95.138**

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/61_RC-3N-10APR2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/61_RC-3N-10APR2007.jpg</a>	N	Apr 10, 2007
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/61_RC-2-10APR2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/61_RC-2-10APR2007.jpg</a>		Apr 10, 2007
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/61_RC-1-10APR2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/61_RC-1-10APR2007.jpg</a>		Apr 10, 2007

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



Mn/DOT Name: 61 WR

NGS Name: 61 WR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091243/  
 USGS Quad: SILVER BAY SW

				<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	21	56 N	9 W	471920.00	912943.00		

<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	1950	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SEE DESCRIPTION	USGS

Description: (1950)                      Stamping: 61 WR 1950

1.2 MILES SOUTH AND 10.1 MILES EAST OF MCNAIR, 0.9 MILE EAST OF AN ABANDONED LOGGING CAMP.

**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>		
1585.085	.033	3							VERTICAL CONTROL SURVEY	1979	USGS-VERT	

**Geoid Separations(ft): GEOID18 = -92.939    12B = -92.939    09 = -92.815    03 = -92.818**

\* No Horizontal Positions in the Database \*





Mn/DOT Name: 62 WR

NGS Name: 62 WR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091243/  
 USGS Quad: SILVER BAY SW

				<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	9	56 N	9 W	472039.00	912856.00		

<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	1950	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SEE DESCRIPTION	USGS

Description: (1950)                      Stamping: 62 WR 1950

1.2 MILES SOUTH THEN 10.2 MILES EAST AND 1.8 MILES NORTH OF MCNAIR, 1.8 MILES NORTH OF A FOREST ROAD, 14.0 FEET EAST OF A TRAIL, AT THE NORTH EDGE OF A SMALL CLEARING.

**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>	
1662.638	.033	3				VERTICAL CONTROL SURVEY	1979	USGS-VERT	

**Geoid Separations(ft): GEOID18 = -92.811    12B = -92.808    09 = -92.687    03 = -92.690**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 69 WR

NGS Name: 69 WR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091313/  
 USGS Quad: KANE 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	25	56 N	11 W	471837.00	914050.00		

<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	1950	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SEE DESCRIPTION	USGS

**Description:** (1950)                      **Stamping:** 69 WR 1950

6.0 MILES NORTH OF THE POST OFFICE AT WALES, ALONG A RAILROAD, 1.5 RAILS NORTH OF RAILROAD MILEPOST 6, 85.0 FEET EAST OF THE EAST RAIL OF THE RAILROAD TRACKS, 13.0 FEET NORTHWEST OF A 9.0 INCH DIAMETER BALSAM TREE, IN THE TOP OF A TRIANGULAR SHAPED ROCK.

**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>	
1667.323	.033	3							VERTICAL CONTROL SURVEY	1956	USGS-VERT	

**Geoid Separations(ft): GEOID18 = -92.815    12B = -92.831    09 = -92.713    03 = -92.641**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 70 WR

NGS Name: 70 WR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091313/  
 USGS Quad: KANE 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>
SW	35	56 N	11 W	471715.00	914225.00		

<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	1950	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SEE DESCRIPTION	USGS

Description: (1950)                      Stamping: 70 WR 1950

4.0 MILES NORTH OF THE WALES POST OFFICE, 35.0 FEET EAST OF THE EAST RAIL OF THE RAILROAD TRACKS, 21.0 RAILS  
 NORTHEAST OF RAILROAD MILEPOST 4, AT A LONG CURVE.

**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>	
1671.634	.033	3							VERTICAL CONTROL SURVEY	1956	USGS-VERT	

Geoid Separations(ft): GEOID18 = -92.844    12B = -92.848    09 = -92.756    03 = -92.687

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 71 PENNY 1868

NGS Name: 71 PENNY 1868

County: LAKE, MN (Sheet 1)

NGS ACRN: [DL4626](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	5	54 N	8 W	471116.00	912303.00		

<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>
1868	2010	UNKNOWN	Horz=NO Vert=NO	NO			NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	SEE DESCRIPTION	NGS

**Description:** **Stamping:**  
 17.67 MILES NORTHEAST OF TWO HARBORS, 18.3 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND 6TH STREET/WATERFRONT DRIVE, THEN ABOUT 0.5 MILE SOUTHEAST OF TRUNK HIGHWAY 61. IN LAKE SUPERIOR.

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

Geoid Separations(ft): GEOID18 = -96.509 12B = -96.460 09 = -96.342 03 = -96.279



Mn/DOT Name: 71 WR

NGS Name: 71 WR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091313/  
 USGS Quad: KANE 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>
SW	10	55 N	11 W	471537.00	914340.00		

<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	1950	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

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

Description: (1950)                      Stamping: 71 WR 1950

2.0 MILES NORTH OF THE WALES POST OFFICE, 45.0 FEET EAST OF THE EAST RAIL OF THE RAILROAD TRACKS, 2 RAILS NORTH OF RAILROAD MILEPOST 2.

**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>	
1644.672	.033	3							VERTICAL CONTROL SURVEY	1956	USGS-VERT	

Geoid Separations(ft): GEOID18 = -92.831    12B = -92.831    09 = -92.746    03 = -92.684

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 72 PENNY 1861

NGS Name: 72 PENNY 1861

County: LAKE, MN (Sheet 1)

NGS ACRN: [DL4625](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	32	53 N	10 W	470133.00	913844.00		

<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>
1868	2010	UNKNOWN	Horz=NO Vert=NO	NO			NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	SEE DESCRIPTION	NGS

**Description:**

**Stamping:**

1.21 MILES EAST OF TWO HARBORS, 1.0 MILE NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND 6TH STREET/WATERFRONT DRIVE, THEN 0.5 MILE SOUTHEAST ON BURLINGTON ROAD, THEN 0.1 MILE SOUTH-SOUTHWEST OF BURLINGTON ROAD IN LAKE SUPERIOR.

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

Geoid Separations(ft): GEOID18 = -95.098 12B = -95.079 09 = -94.987 03 = -94.905



Mn/DOT Name: 72 WR

NGS Name: 72 WR

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	21	55 N	11 W	471417.00	914442.00		

<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	1950	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

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

Description: (1950)                      Stamping: 72 WR 1950

AT WALES, 27.0 FEET NORTH AND 45.0 FEET WEST OF THE SOUTHWEST CORNER OF A POST OFFICE, 49.0 FEET NORTH OF A GRAVEL ROAD, 37.0 FEET EAST OF THE EAST RAIL OF THE RAILROAD TRACKS, 32.0 FEET NORTHEAST OF A RAILROAD CROSSING SIGN.

**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>	
1640.463	.033	3				VERTICAL CONTROL SURVEY		1958	USGS-VERT	

Geoid Separations(ft): GEOID18 = -92.815    12B = -92.818    09 = -92.733    03 = -92.677

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 75 PENNY 1868

NGS Name: 75 PENNY 1868

County: LAKE, MN (Sheet 1)

NGS ACRN: [DL4627](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	55 N	8 W	471223.00	912122.00		

<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>
1868	2010	UNKNOWN	Horz=NO Vert=NO	NO			NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	SEE DESCRIPTION	NGS

**Description:** **Stamping:**  
 4.42 MILES SOUTHWEST OF BEAVER BAY, 4.5 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61/MAIN STREET FROM THE JUNCTION OF TRUNK HIGHWAY 61/MAIN STREET AND OLD TOWNE ROAD, THEN 0.2 MILE SOUTHEAST OF A ROAD.

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

Geoid Separations(ft): GEOID18 = -96.584 12B = -96.542 09 = -96.437 03 = -96.322





Mn/DOT Name: 909 9068 DISC USE

NGS Name: 909 9068 DISC

County: LAKE, MN (Sheet 1)

NGS ACRN: [RM0368](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	31	52 N	11 W	465642.00	914656.00	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>
1960	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MAT FOUNDATION (NON-PAVEMENT)	SURVEY DISK	USACE

Description: (1979)                      Stamping:

IN KNIFE RIVER, IN THE NORTHWEST END OF A KNIFE RIVER MARINA DOCK, 46.0 FEET SOUTH OF THE SOUTH CORNER OF A HARBOR OFFICE, 3.2 FEET SOUTHEAST OF THE NORTHWEST END OF A DOCK, 2.8 FEET NORTHWEST OF A FUEL TANK FILLER COVER, 2.0 FEET NORTHEAST OF THE SOUTHWEST EDGE OF A DOCK.

Station Notes

FOUND CORPS OF ENGINEERS U.S ARMY KR-108 YEAR 1982 AT THE ABOVE COORDINATES, PAN EAST.

**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>	
604.864	.007	1/2					VERTICAL ADJUSTMENT	1991	00000025	

**Geoid Separations(ft): GEOID18 = -94.180    12B = -94.180    09 = -94.065    03 = -94.002**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 909 9068 KNIFE USLS

NGS Name: 909 9068 KNIFE

County: LAKE, MN (Sheet 1)

NGS ACRN: [RM0367](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	31	52 N	11 W	465644.28	914702.51	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>
1960	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	CHISELED SQUARE	USLS

Description: (2007)

Stamping:

IN KNIFE RIVER, AT THE KNIFE RIVER MARINA, 0.1 MILE SOUTHEAST ALONG COUNTY ROAD 104 (MARINA ROAD) FROM THE JUNCTION OF MARINA ROAD AND COUNTY ROAD 61 TO THE JUNCTION OF OLD HARBOR ROAD, COUNTY ROAD 104 AND GRANITE POINT ROAD, 81.2 FEET SOUTHEAST OF THE SOUTHEAST RAIL OF THE RAILROAD TRACKS, 37.3 FEET WEST OF GRANITE POINT ROAD, 16.1 FEET SOUTHEAST OF OLD HARBOR ROAD SOUTHWEST, 23.8 FEET NORTHEAST OF A POWER POLE WITH 2 GUY WIRES. STATION 909 9068 KNIFE USLS IS A CHISELED SQUARE IN A ROCK OUTCROP.

Station Notes

THERE IS NO SURE CENTERPOINT TO SET UP FOR GPS.

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>
621.108	.016	2/1				VERTICAL ADJUSTMENT			2021	00000963
621.111	.016	2/1				VERTICAL CONTROL SURVEY			2019	VNSHORE
621.118	.016	2/1				VERTICAL ADJUSTMENT			2011	00000691
621.118	.016	2/1				VERTICAL CONTROL SURVEY			2010	VSHOR4
621.118	.007	1/2				VERTICAL ADJUSTMENT			1991	00000025

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>
621.118			526.918	.015	2011	HORIZONTAL ADJUSTMENT			2013	GPS2940
621.118			526.918	.015	2011	GPS - STATIC			2013	HBBAY
621.127	.131		527.072	.066	2007	GPS - STATIC			2012	HBBAY
621.068	.262		527.023	.197	2007	GPS - RTRN			2011	RTRN2011

Geoid Separations(ft): GEOID18 = -94.160 12B = -94.160 09 = -94.045 03 = -93.983

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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 56 44.28005	91 47 02.50769	526184.394	159831.210	.020		ADJUSTMENT			2013	GPS2940
46 56 44.28005	91 47 02.50769	526184.394	159831.210	.020	C	GPS - STATIC			2013	HBBAY

NAD83(2007)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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 56 44.28029	91 47 02.50851	526184.337	159831.236	.033	C	GPS - STATIC			2012	HBBAY
46 56 44.27827	91 47 02.50886	526184.309	159831.032	.131	3	GPS - RTRN			2011	RTRN2011

State Plane and UTM Coordinates (Feet)

NAD83(2011)

<u>MN State Plane - North 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>
2953361.213	493425.526	1944018.734	17059808.865	.020		ADJUSTMENT			2013	GPS2940
2953361.213	493425.526	1944018.734	17059808.865	.020	C	GPS - STATIC			2013	HBBAY

NAD83(2007)

<u>MN State Plane - North 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>
2953361.156	493425.549	1944018.677	17059808.888	.033	C	GPS - STATIC			2012	HBBAY
2953361.135	493425.344	1944018.656	17059808.683	.131	3	GPS - RTRN			2011	RTRN2011



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/909_9068_KNIFE-RM0367-3SW-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/909_9068_KNIFE-RM0367-3SW-02OCT2017.jpg</a>	SW	Oct 2, 2017
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/909_9068_KNIFE-RM0367-2-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/909_9068_KNIFE-RM0367-2-02OCT2017.jpg</a>		Oct 2, 2017
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/909_9068_KNIFE-RM0367-1-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/909_9068_KNIFE-RM0367-1-02OCT2017.jpg</a>		Oct 2, 2017

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



Mn/DOT Name: 909 9068 LEDGE ROCK USLS

NGS Name: 909 9068 LEDGE ROCK

County: LAKE, MN (Sheet 1)

NGS ACRN: [RM0370](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	31	52 N	11 W	465655.20	914641.00	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>
1948	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	SPIKE	USLS

Description: (1979)

Stamping:

IN KNIFE RIVER, ON THE SOUTH SIDE OF THE MOUTH OF THE KNIFE RIVER, ON THE SOUTH SIDE OF THE REMAINS OF AN OLD CONCRETE WHARF, 15.0 FEET FROM THE WATER LINE, 169.0 FEET NORTHEAST OF THE NORTHEAST END OF A ROCK WALL, 64.0 FEET EAST OF 2 TREES. THE STATION IS A 3/8 INCH DIAMETER SQUARE BRONZE PIN IN 2.0 INCH CHISELED SQUARE IN A ROCK LEDGE.

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>	
605.058	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025	

Geoid Separations(ft): GEOID18 = -94.206 12B = -94.203 09 = -94.094 03 = -94.025

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 909 9068 WALL USLS

NGS Name: 909 9068 WALL

County: LAKE, MN (Sheet 1)

NGS ACRN: [RM0369](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	31	52 N	11 W	465653.82	914643.10	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>
1954	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
WALL	CHISELED SQUARE	USLS

Description: (2011)

Stamping:

IN KNIFE RIVER, 0.1 MILE SOUTHEAST ALONG MARINA ROAD FROM THE JUNCTION OF COUNTY ROAD 104 (MARINA ROAD) TO AMERICAN DOCK ROAD, THEN 0.15 MILE EAST ALONG AMERICAN DOCK ROAD (COUNTY ROAD UT 4), THEN CONTINUE 0.1 MILE EAST ALONG DRIVEWAY NUMBER 292, STATION 909 9068 WALL USLS IS ON THE SOUTHEAST SIDE OF A HOUSE, ON THE SOUTH SIDE AND NEAR THE MOUTH OF THE KNIFE RIVER, ON THE LAKE SIDE OF A GRAVEL ROAD, IN THE LAKEWARD EDGE OF A STONE WALL, 11.7 FEET NORTHEAST OF THE SOUTHWEST END OF A WALL AT A GATEWAY, STATION 909 9068 WALL USLS IS A 2.0 INCH SQUARE CHISELED IN A WALL, 10.0 FEET SOUTH OF A 12.0 INCH DIAMETER PINE TREE.

**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>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Order (/Class)</u>	<u>Year</u>	<u>Reference</u>					
609.602	.016	2/1						2021	00000963					
609.595	.016	2/1						2019	VNSHORE					
609.595	.016	2/1						2011	00000691					
609.595	.016	2/1						2010	VSHOR4					
609.595	.007	1/2						1991	00000025					

**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>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Order (/Class)</u>	<u>Year</u>	<u>Reference</u>					
609.507	.262			515.419	.197	2007		2011	RTRN2011					

Geoid Separations(ft): GEOID18 = -94.203 12B = -94.196 09 = -94.088 03 = -94.022

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>				<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>						
46 56 53.81603	91 46 43.09742	527552.852	160766.420	.131	3		GPS - RTRN	2011	RTRN2011						

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2007)</u>				<u>MN State Plane - North 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>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>						
2954691.282	494414.506	1945349.880	17060795.515	.131	3		GPS - RTRN	2011	RTRN2011						

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/909_9068_WALL-RM0369-3SE-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/909_9068_WALL-RM0369-3SE-02OCT2017.jpg</a>	SE	Oct 2, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/909_9068_WALL-RM0369-2-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/909_9068_WALL-RM0369-2-02OCT2017.jpg</a>		Oct 2, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/909_9068_WALL-RM0369-1-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/909_9068_WALL-RM0369-1-02OCT2017.jpg</a>		Oct 2, 2017

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



Mn/DOT Name: 909 9070 DOCK OFFICE

NGS Name: 909 9070 DOCK OFFICE

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0526](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	1	52 N	11 W	470102.00	914035.00	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>
1941	2007	NOT FOUND	Horz=NO Vert=NO	NO			NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	CHISELED SQUARE	USACE

Description: (1979)

Stamping:

0.2 MILE SOUTH OF THE POST OFFICE ON 6TH STREET IN TWO HARBORS TO GUARD GATE 1, THEN 0.2 MILE SOUTHWEST TO A DOCK OFFICE. STATION 909 9070 DOCK OFFICE IS A CHISELED SQUARE ON THE TOP OF THE WEST CORNER STONE OF AN 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>Height</u>	<u>Acc</u>	<u>Adj</u>		<u>Year</u>	<u>Reference</u>	
631.272	.007	1/2							VERTICAL ADJUSTMENT	1991	00000025	

Geoid Separations(ft): GEOID18 = -94.819 12B = -94.800 09 = -94.708 03 = -94.629

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 909 9070 E

NGS Name: 909 9070 E

County: LAKE, MN (Sheet 1)

NGS ACRN: [DF5461](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	1	52 N	11 W	470102.00	914038.00	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>
1979	2018	GOOD	Horz=NO Vert=YES	NO		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOUNDATION	SURVEY DISK	NOS

Description: (1979)                      Stamping: 9070 E 1979

IN TWO HARBORS, ON THE APPROACH END TO ORE DOCK 1, 142.0 FEET SOUTH OF THE WEST CORNER OF THE DOCK OFFICE, 45.8 FEET WEST OF A HYDRANT, 29.3 FEET SOUTHEAST OF THE NORTHEAST CORNER OF A CONCRETE FOUNDATION FOR HIGH VOLTAGE BOXES, 19.0 FEET SOUTHWEST OF A SECOND ROAD UNDER ORE DOCKS, 7.5 FEET NORTHWEST OF THE EAST CORNER OF A CONCRETE TRESTLE FOUNDATION, 0.6 FOOT WEST OF THE NORTHEAST EDGE OF A FOUNDATION.

**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>	
639.536	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963	
639.536	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE	
639.569	.007	1/2				VERTICAL ADJUSTMENT	2004	00000449	
639.569	.016	2/1				VERTICAL CONTROL SURVEY	2002	VH2O1	

Geoid Separations(ft): GEOID18 = -94.810 12B = -94.790 09 = -94.698 03 = -94.619

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 909 9070 ENGINE

NGS Name: 909 9070 ENGINE

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0525](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	1	52 N	11 W	470106.00	914039.00	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>
1947	2007	NOT FOUND	Horz=NO Vert=NO	NO		RECESSED 7 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (<10 FT) (DEPTH 10 FT)	METAL ROD	USACE

Description: (1979)

Stamping:

0.2 MILE SOUTH OF THE POST OFFICE ON 6TH STREET IN TWO HARBORS TO GUARD GATE 1, THEN 0.2 MILE SOUTHWEST TO A DOCK OFFICE AT THE SOUTHWEST CORNER OF THE 1ST BUILDING NORTH OF A POWERHOUSE, 500.0 FEET NORTH OF A DOCK OFFICE, 2.7 FEET SOUTHEAST OF THE SOUTHWEST CORNER OF A BUILDING, 1.0 FOOT SOUTH OF THE SOUTH FACE OF A BUILDING, 35.0 FEET NORTHEAST OF THE NORTHEAST FACE OF A RAILROAD LOADING PLATFORM, 4.0 FEET NORTHEAST OF THE NORTHEAST CORNER OF A SIDEWALK.

**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>	
647.554	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025	

Geoid Separations(ft): GEOID18 = -94.793 12B = -94.773 09 = -94.682 03 = -94.606

\* No Horizontal Positions in the Database \*





Mn/DOT Name: 909 9070 ETG

NGS Name: 909 9070 ETG

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	1	52 N	11 W	470102.00	914034.00		

<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>
1929	1979	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	SEE DESCRIPTION	USACE

**Description:** (1979)

**Stamping:**

0.2 MILE SOUTH OF THE POST OFFICE ON 6TH STREET IN TWO HARBORS TO GUARD GATE 1, THEN 0.2 MILE SOUTHWEST TO A 20.0 FEET BY 20.0 FEET CONCRETE BUILDING, 75.0 FEET SOUTHEAST AND ACROSS A ROAD FROM THE SOUTHEAST FACE OF A DOCK OFFICE, 61.0 FEET NORTHEAST OF THE NORTHEAST SIDE OF LOADING DOCK 1, IN THE NORTHEAST CORNER OF A CONCRETE BUILDING. STATION 909 9070 ETG IS AN ELECTRIC TAPE GAGE SET IN THE CONCRETE FLOOR OF A BUILDING.

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

Geoid Separations(ft): GEOID18 = -94.823 12B = -94.803 09 = -94.711 03 = -94.632



Mn/DOT Name: 909 9070 F

NGS Name: 909 9070 F

County: LAKE, MN (Sheet 1)

NGS ACRN: [DF5460](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	1	52 N	11 W	470103.80	914038.10	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>
1979	2007	GOOD	Horz=NO Vert=YES	NO		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOUNDATION	HYDROGRAPHIC SURVEY DISK NOS	NOS

**Description:** (2009)                      **Stamping:** 9070 F 1979

IN TWO HARBORS, 0.55 MILE SOUTH ON WATERFRONT DRIVE FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND WATERFRONT DRIVE IN TWO HARBORS, THEN 0.25 MILE WEST ON A ROAD TO THE CANADIAN NATIONAL RAIL DOCKS, THROUGH THE GATE ARMS AND GATE B, SOUTHEAST OF A ROAD, NEAR THE APPROACH END TO ORE DOCK 2, 37.1 FEET WEST OF A POLE WITH THREE TRANSFORMER BOXES, 22.1 FEET SOUTHWEST OF THE SECOND ROAD UNDER THE ORE DOCKS, 5.8 FEET NORTHEAST OF THE SOUTHWEST CORNER OF THE CONCRETE TRESTLE FOUNDATION, 0.7 FOOT THROUGH NORTHWEST OF THE SOUTHWEST EDGE OF A FOUNDATION.

**Station Notes**

CONTACT JOEL REED FROM CANADIAN NATIONAL RAIL AT 218-628-4293 OR TOM STEELE AT 218-628-4103.

**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>	
636.869	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
636.869	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3	
636.869	.007	1/2				VERTICAL ADJUSTMENT	2004	00000449	
636.869	.016	2/1				VERTICAL CONTROL SURVEY	2002	VH2O1	

Geoid Separations(ft): GEOID18 = -94.803 12B = -94.783 09 = -94.691 03 = -94.616

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 909 9070 MWL

NGS Name: 909 9070 MWL

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0700](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	1	52 N	11 W	470100.00	914031.00	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>
1979	1980	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	SEE DESCRIPTION	NOS

Description: (1979)                      Stamping:

IN TWO HARBORS. THIS POINT REPRESENTS THE HEIGHT OF THE MEAN WATER LEVEL OF THE 1982-88 EPOCH ON LAKE SUPERIOR. THE MEAN HEIGHT WAS COMPUTED FROM 28 MONTHS OF RECORDED OBSERVATIONS. (04-01-1980 NOS).

**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>	
602.463	.007	1				VERTICAL ADJUSTMENT	1991	00000025	

Geoid Separations(ft): GEOID18 = -94.842    12B = -94.823    09 = -94.728    03 = -94.652

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 909 9070 ORE DOCK

NGS Name: 909 9070 ORE DOCK

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0527](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	1	52 N	11 W	470104.10	914036.50	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>
1941	2008	GOOD	Horz=NO Vert=YES	NO		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOUNDATION	RIVET	USACE

**Description:** (2009)

**Stamping:**

IN TWO HARBORS, 0.55 MILE SOUTH ALONG WATERFRONT DRIVE FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND WATERFRONT DRIVE IN TWO HARBORS, THEN 0.25 MILE WEST ON A ROAD TO THE CANADIAN NATIONAL RAIL DOCKS, THROUGH THE GATE ARMS AND GATE B SOUTHEAST OF A ROAD, RIVET HAS AN "X" CHISELED ON IT, ON THE NORTH SIDE OF THE INNER END OF ORE DOCK 2, 37.5 FEET NORTHWEST OF THE INNER END OF A DOCK, IN LINE WITH THE NORTH FACE OF A DOCK, STATION 909 9070 ORE DOCK IS SOUTHEAST RIVET IN THE SOUTHWEST ROW OF RIVETS IN A BASE PLATE AT THE SOUTH CORNER OF THE SOUTHEAST FOOTING OF A STEEL BEAM ON AN AERIAL WALKWAY.

**Station Notes**

CONTACT JOEL REED FROM CANADIAN NATIONAL RAIL AT 218-628-4293 OR TOM STEELE AT 218-628-4103.

**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>	
613.099	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
613.089	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3	
613.089	.007	1/2				VERTICAL ADJUSTMENT	2004	00000449	
613.089	.016	2/1				VERTICAL CONTROL SURVEY	2002	VH2O1	
613.089	.007	1				VERTICAL ADJUSTMENT	1991	00000025	

Geoid Separations(ft): GEOID18 = -94.806 12B = -94.790 09 = -94.695 03 = -94.619

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 909 9075 15 USE

NGS Name: 909 9075 15

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0610](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	12	55 N	8 W	471602.00	911659.00	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>
1972	2017	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	TIDAL STATION DISK	USACE

Description: (2000)                      Stamping: 15

0.75 MILE NORTHEAST OF A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY, 0.1 MILE EAST OF TRUNK HIGHWAY 61, ON A GRAVEL ROAD TO THE THORNGRENS BOAT DOCK, 80.4 FEET SOUTHWEST OF THE SOUTHWEST CORNER OF THE MATTSONS FISH SHED, 79.0 FEET SOUTHWEST OF STATION 909 9075 MATTSON USE, 38.5 FEET SOUTH OF A 12.0 INCH DIAMETER PINE TREE, 100.0 FEET EAST OF THE NORTHEAST CORNER OF A DOCK.

**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>	
606.206	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025	

Geoid Separations(ft): GEOID18 = -96.496    12B = -96.456    09 = -96.365    03 = -96.292

\* No Horizontal Positions in the Database \*



Mn/DOT Name: 909 9075 BOULDER

NGS Name: 909 9075 BOULDER

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0609](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	12	56 N	8 W	471602.41	911700.12	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>
1950	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (0 TO 1 METERS)	CHISELED SQUARE	USE

Description: (2009)

Stamping:

0.85 MILE NORTHEAST OF BEAVER BAY, 0.75 MILE NORTHEAST ALONG THE TRUNK HIGHWAY 61 FROM A BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY TO TRUNK HIGHWAY 61 MILEPOINT 52.05, THEN 0.1 MILE EAST ALONG FISH HOUSE ROAD/DRIVEWAY NUMBER 4870 LEADING TO THE THORNGRENS BOAT DOCK, 79.0 FEET NORTH OF THE NORTH END OF THE WEST FACE OF A DOCK, 32.0 FEET NORTH OF A ROAD, 67.0 FEET NORTHWEST OF THE NORTHWEST CORNER OF A CONCRETE BLOCK PUMP HOUSE, ON THE TOP OF A 3.0 FOOT BOULDER.

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>					
622.203	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963					
622.194	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE					
622.203	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691					
622.203	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3					
622.282	.007	1					VERTICAL ADJUSTMENT	1991	00000025					

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>					
622.236	.262			525.881	.197	2007	GPS - RTRN	2011	RTRN2011					

Geoid Separations(ft): GEOID18 = -96.483 12B = -96.447 09 = -96.355 03 = -96.279

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2007)</u>				<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>						
47 16 02.41432	91 17 00.11916	653161.948	274689.715	.131	3	GPS - RTRN		2011	RTRN2011						

State Plane and UTM Coordinates (Feet)

<u>NAD83(2007)</u>				<u>MN State Plane - North 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>						
3075636.565	613263.399	2066446.484	17179434.463	.131	3	GPS - RTRN		2011	RTRN2011						

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/909_9075_BOULDER-SH0609-3S-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/909_9075_BOULDER-SH0609-3S-19SEP2017.jpg</a>	S	Sep 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/909_9075_BOULDER-SH0609-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/909_9075_BOULDER-SH0609-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/909_9075_BOULDER-SH0609-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/909_9075_BOULDER-SH0609-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: 909 9075 MATTSON USE

NGS Name: 909 9075 MATTSON

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0611](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	7	55 N	7 W	471603.00	911657.00	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>
1948	2017	NOT FOUND	Horz=NO Vert=NO	NO		PROJECTS 8 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	TIDAL STATION DISK	USACE

Description: (2000)

Stamping:

0.75 MILE NORTHEAST OF A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY, 0.1 MILE EAST OF TRUNK HIGHWAY 61, ON A GRAVEL ROAD TO THE THORNGRENS BOAT DOCK, IN THE SOUTH FACE OF THE MATTSONS FISH SHED, 150.0 FEET EAST OF THE NORTHEAST CORNER OF A DOCK, 0.7 FOOT EAST OF THE SOUTHWEST CORNER OF A SHED, 79.0 FEET NORTHEAST OF STATION 909 9075 15 USE.

Station Notes

8/30/2011 PULLED TIES/ TALKED TO OWNER.

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>	
610.593	.007	1/2					VERTICAL ADJUSTMENT	1991	00000025	

Geoid Separations(ft): GEOID18 = -96.499 12B = -96.460 09 = -96.368 03 = -96.296

\* No Horizontal Positions in the Database \*



Mn/DOT Name: A 173

NGS Name: A 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0276](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	55 N	8 W	471616.22	911931.09	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>
1935	2007	NOT FOUND	Horz=NO Vert=YES	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: (1935) Stamping: A 173 1935

1.5 MILES NORTHWEST OF BEAVER BAY, 45.0 FEET NORTHWEST OF THE JUNCTION OF A ROAD NORTH TO LAX LAKE AND A ROAD SOUTHWEST TO LONDON, 1.0 FOOT INSIDE OF A FENCE.

**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>	
869.706	.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>	
869.523	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
869.523	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -95.751 12B = -95.712 09 = -95.656 03 = -95.571

\* No Horizontal Positions in the Database \*





Mn/DOT Name: A 336

NGS Name: A 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0532](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	36	53 N	11 W	470153.00	914004.00	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>
1978	2007	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 1 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STEEL ROD (NO SLEEVE) (DEPTH 32 FT)	VERTICAL CONTROL DISK	NGS

**Description:** (1978)                      **Stamping:** A 336 1978

0.4 MILE NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS, AT THE NORTH EMERGENCY ENTRANCE TO THE HOSPITAL, AT THE SOUTH END OF A PINE TREES, 150.0 FEET NORTH OF HOSPITAL DRIVE, 40.0 FEET EAST OF COUNTY ROAD 2, 12.0 FEET EAST OF A LIGHT, 3.0 FEET NORTH OF A POWER POLE.

**Station Notes**

FOUND CONSTRUCTION STAKES, LOOKS LIKE A NEW PEDESTRIAN PATH AND SOME NEW SIDEWALK, POWER POLE TIES DO NOT FIT, ROAD AND LIGHT POLE TIES SEEM GOOD.  
 NEW ROAD AND PARKING LOT (2007).

08/16/2011 THE TIES FALL UNDER A BIKE PATH.

**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>	
711.901	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025	

**Geoid Separations(ft): GEOID18 = -94.764    12B = -94.744    09 = -94.659    03 = -94.570**

**\* No Horizontal Positions in the Database \***



Mn/DOT Name: A 337

NGS Name: A 337

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0552](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	21	55 N	11 W	471407.09	914346.74	1	

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1978	2021	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
ROCK OUTCROP (OVER 3 METERS)	VERTICAL CONTROL DISK	NGS

**Description:** (1978) **Stamping:** A 337 1978

5.25 MILES EAST ALONG COUNTY ROAD 55 FROM THE JUNCTION OF COUNTY ROAD 55 AND COUNTY ROAD 44 IN ROLLINS, AT A DRIVE SOUTH TO A MOBILE HOME, 44.0 FEET SOUTH OF COUNTY ROAD 55, 49.0 FEET WEST OF A DRIVE NUMBER 682, IN THE TOP OF THE WEST END OF A ROCK OUTCROP.

**Leveling-Derived Orthometric Heights (Feet)**

NAVD88				Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1676.148	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025

**Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)**

NAVD88				Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
1676.247	.262		1583.461	.197	2011	GPS - OPUS	2021	GPSBM
1676.148	.262		1583.363	.197	2011	GPS - OPUS	2021	GPSBM

Geoid Separations(ft): GEOID18 = -92.785 12B = -92.785 09 = -92.703 03 = -92.654

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)		Lake County				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 14 07.09595	91 43 46.74086	420414.361	161685.123	.131	3	GPS - OPUS	2021	GPSBM
47 14 07.09609	91 43 46.74076	420414.368	161685.137	.131	3	GPS - OPUS	2021	GPSBM

**State Plane and UTM Coordinates (Feet)**

NAD83(2011)		UTM - Zone 15				Project Info		
MN State Plane - North Zone		X	Y	Acc	Order	Determination Method	Year	Reference
X	Y							
2965069.523	599297.920	1955880.734	17165634.318	.131	3	GPS - OPUS	2021	GPSBM
2965069.530	599297.934	1955880.740	17165634.332	.131	3	GPS - OPUS	2021	GPSBM

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_337-SH0552-3S-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_337-SH0552-3S-17AUG2021.jpg</a>	S	Aug 17, 2021
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_337-SH0552-2-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_337-SH0552-2-17AUG2021.jpg</a>		Aug 17, 2021
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_337-SH0552-1-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_337-SH0552-1-17AUG2021.jpg</a>		Aug 17, 2021

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



Mn/DOT Name: A 340

NGS Name: A 340

County: LAKE, MN (Sheet 1)

NGS ACRN: <a href="#">SH0530</a>	<a href="#">Get Map</a>
NGS Quad / Sta Num : 47091323/	
USGS Quad: TWO HARBORS	

				<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	6	52 N	10 W	470121.78	913940.36	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	2018	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	VERTICAL CONTROL DISK	NGS

**Description:** (2007)                      **Stamping:** A 340 1978

0.25 MILE NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS TO TRUNK HIGHWAY 61 MILEPOINT 26.35, THEN 0.3 MILE SOUTH ON 1ST STREET, AT THE JUNCTION OF 1ST STREET AND 4TH AVENUE, 43.0 FEET WEST OF 1ST STREET IN A LEDGE ROCK, 19.5 FEET SOUTH OF THE SOUTH CURB ON 4TH AVENUE, 84.0 FEET EAST OF A FIRE HYDRANT, 16.0 FEET NORTH OF A 12.0 INCH DIAMETER PINE 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>
662.768	.016	2/1				VERTICAL ADJUSTMENT		2021	00000963
662.764	.016	2/1				VERTICAL CONTROL SURVEY		2019	VNSHORE
662.764	.016	2/1				VERTICAL ADJUSTMENT		2011	00000691
662.764	.016	2/1				VERTICAL CONTROL SURVEY		2010	VSHOR4
662.764	.016	2/1				VERTICAL ADJUSTMENT		2009	00000604
662.764	.016	2/1				VERTICAL CONTROL SURVEY		2009	VSHOR3
662.764	.016	2/1				VERTICAL CONTROL SURVEY		2007	VTWOH
662.764	.007	1/2				VERTICAL ADJUSTMENT		2004	00000449
662.764	.016	2/1				VERTICAL CONTROL SURVEY		2002	VH2O1
662.764	.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>
662.712	.033	3				VERTICAL CONTROL SURVEY		1987	CS3806

**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>
662.541	.262		567.712	.197	2007	GPS - RTRN		2011	RTRN2011

Geoid Separations(ft): GEOID18 = -94.937    12B = -94.921    09 = -94.829    03 = -94.744

**Lat/Lon and County Coordinates (Feet)**

**NAD83(2007)**

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 01 21.78089	91 39 40.35910	557454.717	187263.629	.131	3	GPS - RTRN		2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

**NAD83(2007)**

<u>MN State Plane - North 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>
2983511.491	522082.468	1974203.488	17088411.578	.131	3	GPS - RTRN		2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_340-SH0530-3S-13NOV2009.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_340-SH0530-3S-13NOV2009.jpg</a>	S	Nov 13, 2009
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_340-SH0530-2-13NOV2009.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_340-SH0530-2-13NOV2009.jpg</a>		Nov 13, 2009
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_340-SH0530-1-13NOV2009.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_340-SH0530-1-13NOV2009.jpg</a>		Nov 13, 2009

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



Mn/DOT Name: A 341

NGS Name: A 341

County: LAKE, MN (Sheet 1)

NGS ACRN: <a href="#">SH0531</a>	<a href="#">Get Map</a>
NGS Quad / Sta Num : 47091323/	
USGS Quad: TWO HARBORS	

				Reference	Reference	Vert	Horz
1/4	Sec	Twp	Rng	Latitude	Longitude	Order	Order
SW	31	53 N	10 W	470133.76	913948.84	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1978	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER IS STEEL ROD

Monument Type	Disk Type	Mon. Agency
STEEL ROD (NO SLEEVE) (DEPTH 12 FT)	VERTICAL CONTROL DISK	NGS

Description: (2007)                      Stamping: A 341 1978

0.15 MILE NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 26.30, AT THE CCC TOURIST INFO CABIN, AT THE BASE OF A FLAGPOLE, 180.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 26.0 FEET NORTHEAST OF THE NORTH CORNER OF A CABIN, 1.5 FEET EAST OF A FLAGPOLE, 16.0 FEET SOUTHEAST OF THE SOUTHEAST EDGE OF A BITUMINOUS PARKING LOT.

Station Notes  
THE DISK IS A SPIN ON.

**Leveling-Derived Orthometric Heights (Feet)**

NAVD88							Project Info	
Orthometric Height			Ellipsoid (NAD83)			Determination Method	Year	Reference
Height	Acc	Order (/Class)	Height	Acc	Adj			
634.392	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963
634.392	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE
634.392	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691
634.392	.016	2/1				VERTICAL CONTROL SURVEY	2010	VSHOR4
634.392	.016	2/1				VERTICAL ADJUSTMENT	2009	00000604
634.392	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3
634.392	.016	2/1				VERTICAL CONTROL SURVEY	2007	VTWOH
634.392	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025

**Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)**

NAVD88							Project Info	
Orthometric Height			Ellipsoid (NAD83)			Determination Method	Year	Reference
Height	Acc	Order (/Class)	Height	Acc	Adj			
634.471	.262		539.618	.197	2011	GPS - RTRN	2017	RTRN2017
634.408	.262		539.645	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -94.872 12B = -94.852 09 = -94.764 03 = -94.678

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)							Project Info		
Geodetic Position		Lake County - Lake (North Shore) Zone			Acc	Order	Determination Method	Year	Reference
Latitude	Longitude	X	Y						
47 01 33.75762	91 39 48.84439	556892.840	188489.373	.131	3	GPS - RTRN	2017	RTRN2017	

  

NAD83(2007)							Project Info		
Geodetic Position		Lake County - Lake (North Shore) Zone			Acc	Order	Determination Method	Year	Reference
Latitude	Longitude	X	Y						
47 01 33.75645	91 39 48.84538	556892.769	188489.256	.131	3	GPS - RTRN	2011	RTRN2011	

**State Plane and UTM Coordinates (Feet)**

NAD83(2011)							Project Info		
MN State Plane - North Zone		UTM - Zone 15			Acc	Order	Determination Method	Year	Reference
X	Y	X	Y						
2982901.151	523284.752	1973595.138	17089614.455	.131	3	GPS - RTRN	2017	RTRN2017	

  

NAD83(2007)							Project Info		
MN State Plane - North Zone		UTM - Zone 15			Acc	Order	Determination Method	Year	Reference
X	Y	X	Y						
2982901.085	523284.632	1973595.072	17089614.335	.131	3	GPS - RTRN	2011	RTRN2011	



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_341-SH0531-3SE-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_341-SH0531-3SE-04OCT2017.jpg</a>	SE	Oct 4, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_341-SH0531-2-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_341-SH0531-2-04OCT2017.jpg</a>		Oct 4, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_341-SH0531-1-02JAN2018.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_341-SH0531-1-02JAN2018.jpg</a>		Jan 2, 2018

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



Mn/DOT Name: A 353

NGS Name: A 353

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0585](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	2	52 N	10 W	470111.40	914148.72	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>
1979	2017	GOOD	Horz=NO Vert=YES	YES		RECESSED 2 IN.	MARKER IS STEEL ROD

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STEEL ROD (IN SLEEVE) (DEPTH 22 FT)	VERTICAL CONTROL DISK	NGS

**Description:** (2007)                      **Stamping:** A 353 1979

IN TWO HARBORS, 0.45 MILE SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD11 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 24.70, AT THE EAST CORNER OF THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 61 (SCENIC DRIVE), 106.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 85.5 FEET EAST OF COUNTY ROAD 61 (SCENIC DRIVE), 1.8 FEET EAST OF THE NORTHWEST END OF A FENCE WITH A ROAD SIGN, 1.0 FOOT 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>		
754.280	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963		
754.296	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE		
754.296	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691		
754.296	.016	2/1				VERTICAL CONTROL SURVEY	2010	VSHOR4		
754.296	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025		

**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>		
754.395	.262		659.854	.197	2011	GPS - RTRN	2017	RTRN2017		
754.178	.262		659.726	.197	2007	GPS - RTRN	2011	RTRN2011		

Geoid Separations(ft): GEOID18 = -94.554    12B = -94.537    09 = -94.452    03 = -94.376

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 01 11.39787	91 41 48.71858			548540.253	186403.454	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 01 11.39607	91 41 48.72149			548540.047	186403.276	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>			<u>Project Info</u>			
<u>MN State Plane - North 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>									
2974638.846	520867.210			1965331.490	17087210.089	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>			<u>Project Info</u>			
<u>MN State Plane - North 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>									
2974638.648	520867.024			1965331.292	17087209.903	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_353-SH0585-3SE-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_353-SH0585-3SE-04OCT2017.jpg</a>	SE	Oct 4, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_353-SH0585-2-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_353-SH0585-2-04OCT2017.jpg</a>		Oct 4, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_353-SH0585-1-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/A_353-SH0585-1-04OCT2017.jpg</a>		Oct 4, 2017

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



Mn/DOT Name: A 52

NGS Name: A 52

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0259](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	56 N	7 W	472116.00	911056.00	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	1971	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: (1971) Stamping: A 52 1934

5.6 MILES NORTHEAST OF SILVER BAY, 5.6 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND WATER PLANT ROAD IN SILVER BAY.

**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>	
692.784	.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>	
692.541	.007	1					VERTICAL CONTROL SURVEY	1941	L95 MINN	

Geoid Separations(ft): GEOID18 = -96.391 12B = -96.348 09 = -96.309 03 = -96.201

\* No Horizontal Positions in the Database \*



Mn/DOT Name: AGATE BAY  
County: LAKE, MN (Sheet 1)

NGS Name: AGATE BAY

NGS ACRN: [DM4487](#) [Get Map](#)  
NGS Quad / Sta Num : 47091323/  
USGS Quad: TWO HARBORS

				<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	52 N	10 W	470048.16	913955.54	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>
1982	2018	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
WALL - HEAVY RETAINING	SURVEY DISK	NOS

**Description:** (2008)                      **Stamping:** AGATE BAY 1982

IN TWO HARBORS, 0.4 MILE SOUTH ALONG WATERFRONT DRIVE FROM THE JUNCTION OF WATERFRONT DRIVE AND TRUNK HIGHWAY 61 IN TWO HARBORS, THEN 0.3 MILE EAST ON SOUTH AVENUE, THEN 0.4 MILE SOUTH ON 3RD STREET TO THE SOUTH END OF A PARKING LOT, THEN WALK OUT TO THE NORTH END OF A BREAK WALL, IN A BREAK WALL, 1.8 FEET EAST OF THE WEST SIDE OF A BREAK WALL, 70.0 FEET SOUTH OF THE NORTH EDGE OF A WALL, 49.5 FEET SOUTH OF THE ARMY CORPS OF ENGINEERS STATION (TH 102).

**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>		
609.234	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963		
609.244	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE		
609.244	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691		
609.244	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3		

**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>		
609.247	.262		514.372	.197	2007	GPS - RTRN	2011	RTRN2011		
609.097	.262		514.300	.197	1996	GPS - RTRN	2008	RTRN2008		

Geoid Separations(ft): GEOID18 = -94.990 12B = -94.974 09 = -94.878 03 = -94.796

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 00 48.16076	91 39 55.54235			556330.166	183880.491	.131	3	GPS - RTRN	2011	RTRN2011

<u>NAD83(1996)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 00 48.16159	91 39 55.54089			556330.269	183880.573	.131	3	GPS - RTRN	2008	RTRN2008

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2982522.930	518657.266			1973210.005	17084988.829	.131	3	GPS - RTRN	2011	RTRN2011

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2982523.029	518657.352			1973210.105	17084988.914	.131	3	GPS - RTRN	2008	RTRN2008

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/AGATE_BAY-DM4487-3W-18JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/AGATE_BAY-DM4487-3W-18JUN2008.jpg</a>	W	Jun 18, 2008
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/AGATE_BAY-DM4487-2-18JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/AGATE_BAY-DM4487-2-18JUN2008.jpg</a>		Jun 18, 2008
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/AGATE_BAY-DM4487-1-18JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/AGATE_BAY-DM4487-1-18JUN2008.jpg</a>		Jun 18, 2008

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





Mn/DOT Name: AGATE BAY ARGO

NGS Name: AGATE BAY ARGO

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4491](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	52 N	10 W	470048.16	913948.31	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>
1983	2018	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	NOS

**Description:** (2008)                      **Stamping:** AGATE BAY ARGO 1983

IN TWO HARBORS, 0.4 MILE SOUTH ALONG WATERFRONT DRIVE FROM THE JUNCTION OF WATERFRONT DRIVE AND TRUNK HIGHWAY 61 IN TWO HARBORS, THEN 0.3 MILE EAST ON SOUTH AVENUE, THEN 0.4 MILE SOUTH ON 3RD STREET TO THE SOUTH END OF A PARKING LOT, THEN WALK 500.0 FEET ALONG A WALK PATH AROUND A LIGHTHOUSE TOWARDS THE SOUTHEAST CORNER OF A FENCE, 200.0 FEET SOUTH OF A LIGHT HOUSE, 551.0 FEET SOUTH OF THE SOUTHEAST CORNER OF A CHAIN LINK FENCE.

**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>	
619.274	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
619.274	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	
619.274	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
619.274	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3	

**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>	
619.274				524.251	.038	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940	
619.274				524.251	.038	2011	GPS - STATIC	2013	HBBAY	
619.290	.131			524.372	.066	2007	GPS - STATIC	2012	HBBAY	
619.238	.262			524.336	.197	2007	GPS - RTRN	2011	RTRN2011	
619.162	.262			524.343	.197	1996	GPS - RTRN	2008	RTRN2008	

Geoid Separations(ft): GEOID18 = -95.016    12B = -94.997    09 = -94.901    03 = -94.823

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 00 48.16380	91 39 48.30958			556831.279	183870.095	.026		ADJUSTMENT	2013	GPS2940
47 00 48.16380	91 39 48.30958			556831.279	183870.095	.026	C	GPS - STATIC	2013	HBBAY

  

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 00 48.16377	91 39 48.31046			556831.218	183870.093	.033	C	GPS - STATIC	2012	HBBAY
47 00 48.16190	91 39 48.31018			556831.233	183869.903	.131	3	GPS - RTRN	2011	RTRN2011

  

<u>NAD83(1996)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 00 48.16346	91 39 48.31001			556831.248	183870.061	.131	3	GPS - RTRN	2008	RTRN2008



**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North 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>
2983024.040	518666.882	1973710.991	17084997.681	.026		ADJUSTMENT	2013	GPS2940
2983024.040	518666.882	1973710.991	17084997.681	.026	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North 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>
2983023.979	518666.877	1973710.930	17084997.677	.033	C	GPS - STATIC	2012	HBBAY
2983024.002	518666.688	1973710.953	17084997.487	.131	3	GPS - RTRN	2011	RTRN2011

**NAD83(1996)**

MN State Plane - North 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>
2983024.011	518666.847	1973710.961	17084997.646	.131	3	GPS - RTRN	2008	RTRN2008

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/AGATE_BAY_ARGO-DM4491-3NW-18JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/AGATE_BAY_ARGO-DM4491-3NW-18JUN2008.jpg</a>	NW	Jun 18, 2008
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/AGATE_BAY_ARGO-DM4491-2-18JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/AGATE_BAY_ARGO-DM4491-2-18JUN2008.jpg</a>		Jun 18, 2008
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/AGATE_BAY_ARGO-DM4491-1-18JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/AGATE_BAY_ARGO-DM4491-1-18JUN2008.jpg</a>		Jun 18, 2008

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



Mn/DOT Name: AMBER

NGS Name: AMBER

County: LAKE, MN (Sheet 1)

NGS ACRN: [DR1389](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	14	56 N	7 W	472022.56	911147.02	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>
2017	2019	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 13 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017)                      Stamping: AMBER 2017

0.5 MILE SOUTHWEST OF ILLGEN CITY, 0.65 MILE SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND TRUNK HIGHWAY 1 IN ILLGEN CITY, AT TRUNK HIGHWAY MILEPOINT 58.65, 63.5 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 50.7 FEET SOUTHWEST OF THE EASTBOUND ENTRANCE TO TETTEGOUCHE STATE PARK DRIVEWAY NUMBER 5702, 7.5 FEET NORTHWEST OF A WITNESS POST.

Station Pair: 3807 M - LAKE, 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>					
707.397	.016	2/1				2021	00000963					
707.407	.016	2/1				2019	VNSHORE					

**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>					
707.433			611.029	.022	2011	2019	GPS3328					
707.407	.131		611.229	.066	1996	2019	Hlake2					
707.433			611.029	.022	2011	2019	Hlake2					
707.417	.262		611.029	.197	2011	2017	RTRN2017					

Geoid Separations(ft): GEOID18 = -96.424 12B = -96.388 09 = -96.335 03 = -96.227

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>			<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>			
47 20 22.56216	91 11 47.01500		675163.447	300698.150	.016		ADJUSTMENT	2019	GPS3328			
47 20 22.56216	91 11 47.01500		675163.447	300698.150	.016	C	GPS - STATIC	2019	Hlake2			
47 20 22.56171	91 11 47.01374		675163.533	300698.103	.131	3	GPS - RTRN	2017	RTRN2017			

<u>NAD83(1996)</u>			<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 20 22.56189	91 11 47.01547		675163.414	300698.123	.033	C	GPS - STATIC	2019	Hlake2		

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>			<u>MN State Plane - North 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>		
3096573.983	640131.738		2087421.030	17206268.291	.016		ADJUSTMENT	2019	GPS3328		
3096573.983	640131.738		2087421.030	17206268.291	.016	C	GPS - STATIC	2019	Hlake2		
3096574.071	640131.695		2087421.118	17206268.247	.131	3	GPS - RTRN	2017	RTRN2017		

<u>NAD83(1996)</u>			<u>MN State Plane - North 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>		
3096573.952	640131.710		2087420.998	17206268.263	.033	C	GPS - STATIC	2019	Hlake2		



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/AMBER-DR1389-3SE-17OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/AMBER-DR1389-3SE-17OCT2017.jpg</a>	SE	Oct 17, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/AMBER-DR1389-2-17OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/AMBER-DR1389-2-17OCT2017.jpg</a>		Oct 17, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/AMBER-DR1389-1-17OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/AMBER-DR1389-1-17OCT2017.jpg</a>		Oct 17, 2017

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



Mn/DOT Name: ANDREW  
County: LAKE, MN (Sheet 1)

NGS Name: ANDREW

NGS ACRN: [DO8113](#) [Get Map](#)  
NGS Quad / Sta Num : 47091213/  
USGS Quad: ILLGEN CITY

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	56 N	7 W	471842.85	911404.13	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>
2011	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	SURVEY DISK	MNDT

Description: (2011)                      Stamping: ANDREW 2011

1.7 MILES NORTHEAST OF SILVER BAY, 1.7 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 15 IN SILVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 55.95, 73.2 FEET NORTHWEST OF TRUNK HIGHWAY 61, 160.7 FEET SOUTHWEST OF DRIVEWAY NUMBER 5349, 1.7 FEET NORTHEAST OF A WITNESS POST.

Station Pair:    3807 J - LAKE, 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>			<u>Year</u>	<u>Reference</u>	
745.750	.016	2/1				2021	00000963	VERTICAL ADJUSTMENT				
745.750	.016	2/1				2019	VNSHORE	VERTICAL CONTROL SURVEY				

**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>			<u>Year</u>	<u>Reference</u>	
745.750	.262		649.477	.197	2011	2017	RTRN2017	GPS - RTRN				
745.799			649.493	.021	2011	2013	GPS2940	HORIZONTAL ADJUSTMENT				
745.799			649.493	.021	2011	2013	HBBAY	GPS - STATIC				
745.799	.131		649.572	.066	2007	2012	HBBAY	GPS - STATIC				

**Geoid Separations(ft):** GEOID18 = -96.322    12B = -96.273    09 = -96.230    03 = -96.135

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 18 42.85120	91 14 04.13206	665558.521	290745.452	.131	3	GPS - RTRN	2017	RTRN2017	
47 18 42.85125	91 14 04.13301	665558.456	290745.458	.023		ADJUSTMENT	2013	GPS2940	
47 18 42.85125	91 14 04.13301	665558.456	290745.458	.023	C	GPS - STATIC	2013	HBBAY	

<u>NAD83(2007)</u>		<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 18 42.85157	91 14 04.13381	665558.401	290745.491	.033	C	GPS - STATIC	2012	HBBAY	

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>MN State Plane - North 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>
3087377.518	629802.300	2078210.411	17195953.672	.131	3	GPS - RTRN	2017	RTRN2017
3087377.453	629802.303	2078210.345	17195953.676	.023		ADJUSTMENT	2013	GPS2940
3087377.453	629802.303	2078210.345	17195953.676	.023	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>		<u>MN State Plane - North 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>
3087377.397	629802.335	2078210.289	17195953.707	.033	C	GPS - STATIC	2012	HBBAY



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ANDREW-DO8113-3NW-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ANDREW-DO8113-3NW-20SEP2017.jpg</a>	NW	Sep 20, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ANDREW-DO8113-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ANDREW-DO8113-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ANDREW-DO8113-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ANDREW-DO8113-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: B 173

NGS Name: B 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0275](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	8	55 N	8 W	471529.89	912202.46	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>
1935	2007	NOT FOUND	Horz=YES Vert=YES	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: (1935) Stamping: B 173 1935

3.8 MILES WEST OF BEAVER BAY, 65.0 FEET EAST OF A TEE-ROAD NORTH, 33.0 FEET NORTH OF LONDON ROAD, 30.0 FEET NORTHEAST OF A METAL CULVERT.

**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>	
1076.192	.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>	
1075.992	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1075.992	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -95.380 12B = -95.334 09 = -95.298 03 = -95.216

\* No Horizontal Positions in the Database \*



Mn/DOT Name: B 336

NGS Name: B 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0533](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	25	53 N	11 W	470230.58	914003.98	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	2018	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER IS STEEL ROD

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STEEL ROD (NO SLEEVE) (DEPTH 24 FT)	VERTICAL CONTROL DISK	NGS

Description: (2007)                      Stamping: B 336 1978

1.2 MILES NORTH OF THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, IN THE NORTHWEST CORNER OF THE COUNTY HIGHWAY DEPARTMENT MAINTENANCE YARD, 234.0 FEET NORTHEAST OF THE NORTHEAST CORNER OF AN OFFICE BUILDING, 400.0 FEET NORTH OF A DRIVE TO OFFICE BUILDING FIRE NUMBER 1513, 100.0 FEET WEST OF COUNTY ROAD 2, 36.0 FEET SOUTH OF A POWER POLE WITH 2 GUY WIRES, 9.0 FEET WEST OF A BIKE PATH, 1.0 FOOT WEST OF A GUY WIRE BASE, 1.0 FOOT 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>	
795.189	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
795.176	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	
795.176	.016	2/1					VERTICAL ADJUSTMENT	2009	00000604	
795.176	.016	2/1					VERTICAL CONTROL SURVEY	2007	VTWOH	
795.176	.007	1/2					VERTICAL ADJUSTMENT	1991	00000025	

Geoid Separations(ft): GEOID18 = -94.642    12B = -94.623    09 = -94.540    03 = -94.449

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/B_336-SH0533-3W-20NOV2006.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/B_336-SH0533-3W-20NOV2006.jpg</a>	W	Nov 20, 2006
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/B_336-SH0533-2-21AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/B_336-SH0533-2-21AUG2007.jpg</a>		Aug 21, 2007
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/B_336-SH0533-1-21AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/B_336-SH0533-1-21AUG2007.jpg</a>		Aug 21, 2007

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





Mn/DOT Name: B 337

NGS Name: B 337

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0551](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	22	55 N	11 W	471404.00	914307.00	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>
1978	2021	NOT FOUND	Horz=NO Vert=NO	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	VERTICAL CONTROL DISK	NGS

Description: (1978)                      Stamping: B 337 1978

6.1 MILES EAST OF THE JUNCTION OF COUNTY ROAD 44 AND COUNTY ROAD 55, AT THE TEE JUNCTION OF A DIRT ROAD NORTH AND COUNTY ROAD 55, AT THE SOUTH END OF A CUT BANK, IN THE STAND OF BIRCH AND HEMLOCK TREES, 86.0 FEET SOUTHWEST OF COUNTY ROAD 55, 5.0 FEET SOUTHWEST OF A 10.0 INCH DIAMETER BLAZED BIRCH TREE, 5.0 FEET EAST OF AN 8.0 INCH DIAMETER HEMLOCK TREE, 2.5 FEET NORTHWEST OF A DIRT ROAD, 1.0 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>	
1691.883	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025	

**Geoid Separations(ft): GEOID18 = -92.775    12B = -92.775    09 = -92.687    03 = -92.644**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: B 340

NGS Name: B 340

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0529](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	6	52 N	10 W	470118.00	913955.00	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>
1978	2017	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STEP	VERTICAL CONTROL DISK	NGS

**Description:** (1997)                      **Stamping:** B 340 1978

AT THE JUNCTION OF 3RD STREET AND 3RD AVENUE IN TWO HARBORS, 33.0 FEET SOUTH OF THE SOUTH CURB ON 3RD AVENUE, 7.5 FEET EAST OF AN ENTRANCE TO A CATHOLIC CHURCH, IN THE CURBING ON THE EAST SIDE OF THE STEPS. NEW COVERED ENTRANCE, THE STEPS ARE CARPETED.

**Station Notes**  
 THE STEPS WERE REMOVED.

**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>	
676.236	.007	1/2					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>	
676.186	.033	3					VERTICAL CONTROL SURVEY	1987	CS3806	

Geoid Separations(ft): GEOID18 = -94.901    12B = -94.885    09 = -94.793    03 = -94.708

\* No Horizontal Positions in the Database \*



Mn/DOT Name: B 341

NGS Name: B 341

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0586](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	31	53 N	10 W	470152.81	913911.40	1	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>
1978	2004	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	STEEL SPIKE ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STEEL ROD (NO SLEEVE) (DEPTH 24 FT)	METAL ROD	MNDT

**Description:** (1995)                      **Stamping:** B 341 1978

0.7 MILE NORTHEAST OF THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT THE JUNCTION OF TRUNK HIGHWAY 61 AND A GRAVEL ROAD SOUTHEAST, 60.0 FEET SOUTHWEST OF A GRAVEL ROAD, 53.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 MILEPOINT 26.85, 41.0 FEET SOUTH OF THE SOUTHWEST END OF A METAL CULVERT, 52.0 FEET WEST OF A POWER POLE, 3.0 FEET NORTHWEST OF A WITNESS POST.

**Station Notes**

DESTROYED DUE TO ROAD CONSTRUCTION, REPORTED BY LAKE COUNTY HIGHWAY DEPARTMENT, PHOTO SENT VERIFYING DESTRUCTION.

**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>	
670.924	.007	1/2					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>	
670.858	.033	3					VERTICAL CONTROL SURVEY	1987	CS3806	

**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>	
			575.977	.065	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800	
			576.068	.069	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300	
670.865	.131		576.150	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648	
670.924	.131		576.150	.066	1996	GPS - STATIC	1997	GPS805-C	
			575.849	.131	1996	HORIZONTAL ADJUSTMENT	1991	17497	

Geoid Separations(ft): GEOID18 = -94.937    12B = -94.918    09 = -94.829    03 = -94.744



Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 01 52.80741	91 39 11.39848	559527.550	190363.840	.033		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 01 52.80757	91 39 11.39939	559527.487	190363.857	.036		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 01 52.80739	91 39 11.39920	559527.500	190363.839	.033	C	ADJUSTMENT	1999	17648
47 01 52.80739	91 39 11.39920	559527.500	190363.839	.033	C	GPS - STATIC	1997	GPS805-C
47 01 52.80241	91 39 11.40245	559527.264	190363.339	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 01 52.79780	91 39 11.40680	559526.953	190362.878	.066	2	ADJUSTMENT	1991	GPS194

NAD27

Geodetic Position		X	Y	Acc	Order	Determination Method	Project Info	
Latitude	Longitude						Year	Reference
47 01 53.03942	91 39 10.77092			.100	2	CLASSICAL SURVEY	1991	17504

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985458.811	525262.830	1976155.093	17091588.115	.033		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985458.748	525262.845	1976155.030	17091588.130	.036		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985458.761	525262.827	1976155.043	17091588.112	.033	C	ADJUSTMENT	1999	17648
2985458.761	525262.827	1976155.043	17091588.112	.033	C	GPS - STATIC	1997	GPS805-C
2985458.546	525262.318	1976154.827	17091587.604	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2985458.253	525261.845	1976154.533	17091587.132	.066	2	ADJUSTMENT	1991	GPS194

NAD27

MN State Plane - North Zone		X	Y	Acc	Order	Determination Method	Project Info	
X	Y						Year	Reference
2360846.297	197203.024			.100	2	CLASSICAL SURVEY	1991	17504



Mn/DOT Name: B 353

NGS Name: B 353

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0583](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	10	52 N	11 W	470001.58	914312.94	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>
1979	2018	GOOD	Horz=NO Vert=YES	YES	CO RD	FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CULVERT - ANY SIZE, ANY TYPE	VERTICAL CONTROL DISK	NGS

**Description:** (2009)                      **Stamping:** B 353 1979

IN THE NORTHEAST END OF THE SOUTHEAST HEADWALL OF A BOX CULVERT, 1.8 MILES SOUTHWEST ALONG COUNTY ROAD 61 (SCENIC DRIVE) FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 61 IN TWO HARBORS, 24.0 FEET SOUTHEAST OF SCENIC COUNTY ROAD 61, 135.0 FEET NORTHEAST OF SANNES ROAD, 10.0 FEET WEST-SOUTHWEST OF DRIVEWAY NUMBER 795 (EXTENDED).

**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>
723.735	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963
723.745	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE
723.758	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691
723.758	.016	2/1					VERTICAL CONTROL SURVEY	2010	VSHOR4
723.758	.007	1/2					VERTICAL ADJUSTMENT	1991	00000025

**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>
723.722	.262			629.343	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -94.485    12B = -94.475    09 = -94.380    03 = -94.311

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 00 01.57765	91 43 12.93506	542550.180	179458.842	.131	3	GPS - RTRN	2011	RTRN2011	

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>							
2968930.887	513689.436	1959614.327	17080043.014	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/B_353-SH0583-3NE-12NOV2009.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/B_353-SH0583-3NE-12NOV2009.jpg</a>	NE	Nov 12, 2009
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/B_353-SH0583-2-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/B_353-SH0583-2-16AUG2011.jpg</a>		Aug 16, 2011
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/B_353-SH0583-1-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/B_353-SH0583-1-16AUG2011.jpg</a>		Aug 16, 2011

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



Mn/DOT Name: B 366 A

NGS Name: B 366 A

County: LAKE, MN (Sheet 1)

NGS ACRN: [DL3656](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	25	53 N	11 W	470240.90	914006.30	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>
2006	2018	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	SURVEY DISK	MNDT

**Description:** (2006)                      **Stamping:** B 366 A 2006

1.5 MILES NORTH OF TWO HARBORS, 1.3 MILES NORTH ALONG COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 26.2, 242.8 FEET WEST-NORTHWEST OF COUNTY ROAD 2, 70.5 FEET SOUTH OF THE SOUTHEAST CORNER OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION BUILDING, 56.5 FEET NORTH-NORTHWEST OF AN ENTRANCE TO THE MINNESOTA DEPARTMENT OF TRANSPORTATION FIRE NUMBER 1561, 0.8 FOOT SOUTH OF A FLAGPOLE FOOTING.

**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>	
816.704	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963	
816.698	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE	
816.698	.016	2/1				VERTICAL ADJUSTMENT	2009	00000604	
816.698	.016	2/1				VERTICAL CONTROL SURVEY	2007	VTWOH	

**Geoid Separations(ft): GEOID18 = -94.600 12B = -94.580 09 = -94.504 03 = -94.409**

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/B_366_A-DL3656-3NW-11OCT2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/B_366_A-DL3656-3NW-11OCT2007.jpg</a>	NW	Oct 11, 2007
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/B_366_A-DL3656-2-11OCT2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/B_366_A-DL3656-2-11OCT2007.jpg</a>		Oct 11, 2007
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/B_366_A-DL3656-1-11OCT2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/B_366_A-DL3656-1-11OCT2007.jpg</a>		Oct 11, 2007

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



Mn/DOT Name: BACHMAN MNDT

NGS Name: BACHMAN

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0760](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	27	54 N	9 W	470752.80	912757.01		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>
1977	2011	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	HORIZONTAL CONTROL DISK	MNDT

**Description:** (2012)                      **Stamping:** BACHMAN 1977

1.5 MILES NORTHEAST OF CASTLE DANGER, 1.0 MILE SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM GOOSEBERRY FALLS, 0.35 MILE SOUTHWEST FROM THE ENTRANCE TO THE GOOSEBERRY STATE PARK TO TRUNK HIGHWAY 61 MILEPOINT 38.6, THEN 0.8 MILE SOUTHEAST ALONG SOUTH NESTER GRADE (PRIVATE ROAD) TO HOUSE NUMBER 3189, THEN WALK SOUTHWEST FOR 700.0 FEET TO ROCK POINT, 9.5 FEET NORTHWEST OF A ROCK OUTCROP, 53.0 FEET EAST-SOUTHEAST OF AN 18.0 INCH DIAMETER CEDAR TREE, 23.97 FEET SOUTH-SOUTHWEST OF BACHMAN MNDT RM 1, 18.47 FEET SOUTH-SOUTHEAST OF BACHMAN MNDT RM 2

**Station Notes**

DEPARTMENT OF NATURAL RESOURCES (DNR) SURVEYORS FOUND BACHMAN MNDT RM 1 AND BACHMAN MNDT RM 2 IN 1995.

\* 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>	<u>Year</u>	<u>Reference</u>
608.457	.262		512.545	.197	2007	GPS - RTRN		2011	RTRN2011
612.860	.197		517.010	.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>	<u>Year</u>	<u>Reference</u>
612.499						RECIPROCAL VERTICAL ANGLE		1977	HORZ

Geoid Separations(ft): GEOID18 = -96.082    12B = -96.017    09 = -95.909    03 = -95.873

**Lat/Lon and County Coordinates (Feet)**

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	<u>Year</u>	<u>Reference</u>
47 07 52.81330	91 27 57.01260	606924.391	225896.162	.131	3	GPS - RTRN		2011	RTRN2011

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	<u>Year</u>	<u>Reference</u>
47 07 52.80248	91 27 57.00980	606924.564	225895.062	.066	2	ADJUSTMENT		1999	17648
47 07 52.80968	91 27 57.00802	606924.701	225895.789	.066	2	ADJUSTMENT		1991	17497

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	<u>Year</u>	<u>Reference</u>
47 07 52.80730	91 27 57.00617	606924.825	225895.546	.066	2	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>	<u>Year</u>	<u>Reference</u>
47 07 53.06483	91 27 56.38713			.100	2	CLASSICAL SURVEY	1979	15983	



**State Plane and UTM Coordinates (Feet)**

**NAD83(2007)**

MN State Plane - North 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>
3031394.937	562659.641	2022136.713	17128906.257	.131	3	GPS - RTRN	2011	RTRN2011

**NAD83(1996)**

MN State Plane - North 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>
3031395.153	562658.549	2022136.928	17128905.165	.066	2	ADJUSTMENT	1999	17648
3031395.261	562659.281	2022137.036	17128905.896	.066	2	ADJUSTMENT	1991	17497

**NAD83(1986)**

MN State Plane - North 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>
3031395.394	562659.043	2022137.169	17128905.658	.066	2	ADJUSTMENT	1986	17289

**NAD27**

MN State Plane - North 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>
2406783.538	234601.796			.100	2	CLASSICAL SURVEY	1979	15983

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BACHMAN-SH0760-3S-17AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BACHMAN-SH0760-3S-17AUG2011.jpg</a>	S	Aug 17, 2011
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BACHMAN-SH0760-2-17AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BACHMAN-SH0760-2-17AUG2011.jpg</a>		Aug 17, 2011
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BACHMAN-SH0760-1-17AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BACHMAN-SH0760-1-17AUG2011.jpg</a>		Aug 17, 2011

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





Mn/DOT Name: BACHMAN MNDT RM 1

NGS Name: BACHMAN RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ1826](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	27	54 N	9 W	470753.03	912756.86		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>
1977	2011	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	REFERENCE MARK DISK	MNDT

**Description:** (2012)                      **Stamping:** BACHMAN NO 1 1977

1.5 MILES NORTHEAST OF CASTLE DANGER. 1.0 MILE SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM A BRIDGE OVER GOOSEBERRY FALLS TO TRUNK HIGHWAY 61 MILEPOINT 38.60 THEN 0.8 MILE SOUTHEAST ALONG SOUTH NESTER GRADE (PRIVATE ROAD) TO HOUSE NUMBER 3189, THEN WALK 700.0 FEET ALONG A SHORELINE, 23.97 FEET NORTH-NORTHEAST OF STATION BACHMAN MNDT, 21.60 FEET NORTHEAST OF BACHMAN 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>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</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>			
610.931	.262		515.019	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -96.082    12B = -96.017    09 = -95.909    03 = -95.873

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>							<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</u>				<u>Determination Method</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>			
47 07 53.02569	91 27 56.85630	606935.604	225917.473	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>		<u>Project Info</u>		
<u>MN State Plane - North Zone</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>					
3031405.286	562681.383	2022147.093	17128927.978	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BACHMAN_RM_1-CJ1826-3N-17AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BACHMAN_RM_1-CJ1826-3N-17AUG2011.jpg</a>	N	Aug 17, 2011
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BACHMAN_RM_1-CJ1826-2-17AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BACHMAN_RM_1-CJ1826-2-17AUG2011.jpg</a>		Aug 17, 2011
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BACHMAN_RM_1-CJ1826-1-17AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BACHMAN_RM_1-CJ1826-1-17AUG2011.jpg</a>		Aug 17, 2011

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



Mn/DOT Name: BACHMAN MNDT RM 2

NGS Name: BACHMAN RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ1827](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	27	54 N	9 W	470752.97	912757.16		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>
1977	2011	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	REFERENCE MARK DISK	MNDT

**Description:** (2012)                      **Stamping:** BACHMAN NO 2 1977

1.5 MILES NORTHEAST OF CASTLE DANGER, 1.0 MILE SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM A BRIDGE OVER GOOSEBERRY FALLS TO TRUNK HIGHWAY 61 MILEPOINT 38.6, THEN 0.8 MILE SOUTHEAST ALONG SOUTH NESTER GRADE (PRIVATE ROAD) TO HOUSE NUMBER 3189, THEN WALK 700.0 FEET ALONG A SHORELINE. 18.47 FEET NORTH-NORTHWEST OF STATION BACHMAN MNDT, 21.60 FEET SOUTHWEST OF BACHMAN MNDT RM 1.

\* 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>
613.276	.262			517.364	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -96.079    12B = -96.014    09 = -95.909    03 = -95.873

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 07 52.96759	91 27 57.15800	606914.635	225911.982	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>							
3031384.555	562675.057	2022126.357	17128921.685	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BACHMAN_RM_2-CJ1827-3S-17AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BACHMAN_RM_2-CJ1827-3S-17AUG2011.jpg</a>	S	Aug 17, 2011
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BACHMAN_RM_2-CJ1827-2-17AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BACHMAN_RM_2-CJ1827-2-17AUG2011.jpg</a>		Aug 17, 2011
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BACHMAN_RM_2-CJ1827-1-17AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BACHMAN_RM_2-CJ1827-1-17AUG2011.jpg</a>		Aug 17, 2011

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



Mn/DOT Name: BEAR LAKE  
County: LAKE, MN (Sheet 1)

NGS Name: BEAR LAKE

NGS ACRN: [SH0763](#) [Get Map](#)  
NGS Quad / Sta Num : 47091242/1001  
USGS Quad: SILVER BAY

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	55 N	8 W	471634.54	912056.86		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>
1952	1978	NOT FOUND	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	TRIANGULATION STATION DISK	NGS

Description: (1976) Stamping: BEAR LAKE 1952

2.5 MILES NORTHWEST OF BEAVER BAY, 1.7 MILES NORTHWEST ON COUNTY ROAD 4 THEN 1.0 MILE WEST-SOUTHWEST ON COUNTY ROAD 3 THEN PACK NORTH ACROSS THE RAILROAD TRACKS AND A CLEARING TO 3 BLAZED TREES THEN PACK 0.75 MILE NORTH ON A TRAIL TO THE TOP OF A ROCKY HILL, 41.71 FEET WEST-SOUTHWEST OF BEAR LAKE RM 1, 52.76 FEET NORTHEAST OF BEAR LAKE 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>
1440.286	.131		1345.132	.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>
1440.286						RECIPROCAL VERTICAL ANGLE	1952	HORZ

Geoid Separations(ft): GEOID18 = -95.302 12B = -95.249 09 = -95.213 03 = -95.144

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Lake 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>
47 16 34.54239	91 20 56.85515	514943.319	176467.673	.033	1	ADJUSTMENT	1999	17648
47 16 34.54426	91 20 56.85362	514943.424	176467.862	.033	1	ADJUSTMENT	1991	17497

<u>NAD83(1986)</u>		<u>Geodetic Position</u>		<u>Lake 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>
47 16 34.54307	91 20 56.85167	514943.559	176467.742	.033	1	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>
47 16 34.83500	91 20 56.24000			.100	1	CLASSICAL SURVEY	1956	11100

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>
3059241.107	616140.900	2050057.804	17182335.883	.033	1	ADJUSTMENT	1999	17648
3059241.208	616141.092	2050057.906	17182336.074	.033	1	ADJUSTMENT	1991	17497

<u>NAD83(1986)</u>		<u>MN State Plane - North 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>
3059241.345	616140.974	2050058.043	17182335.957	.033	1	ADJUSTMENT	1986	17289

<u>NAD27</u>		<u>MN State Plane - North 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>
2434629.646	288087.086			.100	1	CLASSICAL SURVEY	1956	11100



Mn/DOT Name: BEAR LAKE RM 1

NGS Name: BEAR LAKE RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ1851](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/1001  
 USGS Quad: SILVER BAY

				<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	4	55 N	8 W	471634.65	912056.27		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1952	1976	GOOD	Horz=YES Vert=YES	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	REFERENCE MARK DISK	NGS

**Description:** **Stamping:** BEAR LAKE NO 1 1952  
 2.5 MILES NORTHWEST OF BEAVER BAY, 1.7 MILES NORTHWEST ON COUNTY ROAD 4 THEN 1.0 MILE WEST-SOUTHWEST ON COUNTY ROAD 3 THEN PACK NORTH ACROSS THE RAILROAD TRACKS AND A CLEARING TO 3 BLAZED TREES THEN PACK 0.75 MILE NORTH ON A TRAIL TO THE TOP OF A ROCKY HILL, 41.71 FEET EAST-NORTHEAST OF STATION BEAR LAKE.

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

Geoid Separations(ft): GEOID18 = -95.302 12B = -95.252 09 = -95.213 03 = -95.144



Mn/DOT Name: BEAR LAKE RM 2

NGS Name: BEAR LAKE RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ1852](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/1001  
 USGS Quad: SILVER BAY

				<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	4	55 N	8 W	471634.17	912057.38		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1952	1976	GOOD	Horz=YES Vert=YES	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	REFERENCE MARK DISK	NGS

**Description:** **Stamping:** BEAR LAKE NO 2 1952

2.5 MILES NORTHWEST OF BEAVER BAY, 1.7 MILES NORTHWEST ON COUNTY ROAD 4 THEN 1.0 MILE WEST-SOUTHWEST ON COUNTY ROAD 3 THEN PACK NORTH ACROSS THE RAILROAD TRACKS AND A CLEARING TO 3 BLAZED TREES THEN PACK 0.75 MILE NORTH ON A TRAIL TO THE TOP OF A ROCKY HILL, 52.76 FEET SOUTHWEST OF STATION BEAR LAKE.

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

Geoid Separations(ft): GEOID18 = -95.302 12B = -95.252 09 = -95.213 03 = -95.144



Mn/DOT Name: BEAVER BAY

NGS Name: BEAVER BAY

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0762](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	56 N	8 W	471529.71	911720.69		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>
1953	2005	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	TRIANGULATION STATION DISK	NGS

**Description:** (1953)                      **Stamping:** BEAVER BAY 1952

0.5 MILE SOUTHEAST OF BEAVER BAY, 0.05 MILE EAST ON TRUNK HIGHWAY 61 FROM TRADING POST CAFE THEN RIGHT 0.3 MILE ON SAND ROAD (PRIVATE ROAD TO BEAVER BAY CLUB), THEN LEFT 0.05 MILE TO END OF TRUCK TRAVEL AT A TURNAROUND THEN EAST ON A TRAIL SOUTH OF A COTTAGE TO THE END OF A POINT, 30.0 FEET NORTHWEST OF THE EDGE OF A BLUFF, 7.1 FEET EAST OF A WITNESS POST, 18.92 FEET WEST-SOUTHWEST OF BEAVER BAY RESET RM 3, 20.88 FEET NORTH-NORTHWEST OF BEAVER BAY RESET RM 4.

\* 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>		
666.928	.197		570.580	.131	1996	1999	17648		

Geoid Separations(ft): GEOID18 = -96.591    12B = -96.555    09 = -96.450    03 = -96.371

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 15 29.71130	91 17 20.68897	651688.094	271400.253	.066	2	ADJUSTMENT	1999	17648
47 15 29.72007	91 17 20.68616	651688.303	271401.139	.066	2	ADJUSTMENT	1991	17497

<u>NAD83(1986)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 15 29.71708	91 17 20.68406	651688.443	271400.833	.066	2	ADJUSTMENT	1986	17289

<u>NAD27</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 15 29.99253	91 17 20.09640			.100	2	CLASSICAL SURVEY	1979	15983

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>	
3074296.009	609917.733	2065101.133	17176091.289	.066	2	ADJUSTMENT	1999	17648	
3074296.182	609918.626	2065101.307	17176092.182	.066	2	ADJUSTMENT	1991	17497	

<u>NAD83(1986)</u>		<u>MN State Plane - North 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>	
3074296.334	609918.327	2065101.459	17176091.882	.066	2	ADJUSTMENT	1986	17289	

<u>NAD27</u>		<u>MN State Plane - North 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>	
2449683.470	281862.797			.100	2	CLASSICAL SURVEY	1979	15983	



Mn/DOT Name: BEAVER BAY RESET

NGS Name: BEAVER BAY RESET

County: LAKE, MN (Sheet 1)

NGS ACRN: [DE8055](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	12	55 N	8 W	471529.72	911720.69		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>
1987	2012	GOOD	Horz=YES Vert=NO	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	HORIZONTAL CONTROL DISK	NGS

**Description:** (2012)                      **Stamping:** BEAVER BAY 1953 1987

0.5 MILE WEST OF THE TOWN OF BEAVER BAY, 0.01 MILE WEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 (LAX LAKE ROAD) IN BEAVER BAY, TO TRUNK HIGHWAY 61 MILEPOINT 51.05, THEN RIGHT 0.3 MILE ON CLUB ROAD TO THE BEAVER BAY CLUB THEN LEFT 0.05 MILE TO A TURNAROUND THEN SOUTHEASTERLY ON A TRAIL TO A POINT, 30.0 FEET NORTHWEST OF THE EDGE OF A BLUFF, 7.1 FEET EAST OF A WITNESS POST, 18.92 FEET WEST-SOUTHWEST OF BEAVER BAY RESET RM 3, 20.88 FEET NORTH-NORTHWEST OF BEAVER BAY RESET RM 4.

\* 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>
666.865	.262		570.314	.197	2011	GPS - RTRN		2017	RTRN2017
666.760			570.183	.021	2011	HORIZONTAL ADJUSTMENT		2013	GPS2940
666.760			570.206	.021	2011	GPS - STATIC		2013	HBBAY
666.764	.131		570.314	.066	2007	GPS - STATIC		2012	HBBAY
			570.183	.062	2011	HORIZONTAL ADJUSTMENT		2012	GPS2800
666.774	.262		570.324	.197	2007	GPS - RTRN		2011	RTRN2011
			570.265	.053	2007	HORIZONTAL ADJUSTMENT		2007	GPS2300
666.764	.131		570.412	.066	1996	HORIZONTAL ADJUSTMENT		2002	GPS1736
666.764	.131		570.412	.066	1996	GPS - STATIC		2002	HISAB

**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>
666.600						LEVELING		1987	HORZ

Geoid Separations(ft): GEOID18 = -96.591    12B = -96.555    09 = -96.450    03 = -96.371

**Lat/Lon and County Coordinates (Feet)**

**NAD83(2011)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 15 29.72114	91 17 20.68848	651688.145	271401.250	.131	3	GPS - RTRN	2017	RTRN2017
47 15 29.72063	91 17 20.68799	651688.178	271401.197	.020		ADJUSTMENT	2013	GPS2940
47 15 29.72050	91 17 20.68803	651688.175	271401.184	.020	C	GPS - STATIC	2013	HBBAY
47 15 29.72063	91 17 20.68799	651688.178	271401.197	.030		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 15 29.72073	91 17 20.68883	651688.120	271401.209	.033	C	GPS - STATIC	2012	HBBAY
47 15 29.72105	91 17 20.68910	651688.102	271401.241	.131	3	GPS - RTRN	2011	RTRN2011
47 15 29.72073	91 17 20.68883	651688.120	271401.209	.026		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 15 29.72122	91 17 20.68655	651688.278	271401.256	.033	C	ADJUSTMENT	2002	GPS1736
47 15 29.72122	91 17 20.68655	651688.277	271401.255	.033	C	GPS - STATIC	2002	HISAB

**NAD83(1986)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 15 29.72024	91 17 20.67864	651688.825	271401.147	.033	C	GPS - STATIC	1988	3807-44

**NAD27**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 15 30.03600	91 17 20.09600			.100	C	CLASSICAL SURVEY	1950	UNK

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3074296.019	609918.731	2065101.145	17176092.287	.131	3	GPS - RTRN	2017	RTRN2017
3074296.054	609918.680	2065101.180	17176092.236	.020		ADJUSTMENT	2013	GPS2940
3074296.052	609918.667	2065101.178	17176092.222	.020	C	GPS - STATIC	2013	HBBAY
3074296.054	609918.680	2065101.180	17176092.236	.030		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3074295.996	609918.689	2065101.122	17176092.245	.033	C	GPS - STATIC	2012	HBBAY
3074295.977	609918.721	2065101.103	17176092.276	.131	3	GPS - RTRN	2011	RTRN2011
3074295.996	609918.689	2065101.122	17176092.245	.026		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3074296.152	609918.742	2065101.278	17176092.297	.033	C	ADJUSTMENT	2002	GPS1736
3074296.152	609918.742	2065101.278	17176092.297	.033	C	GPS - STATIC	2002	HISAB

**NAD83(1986)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3074296.700	609918.655	2065101.825	17176092.210	.033	C	GPS - STATIC	1988	3807-44

**NAD27**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2449683.390	281867.200			.100	C	CLASSICAL SURVEY	1950	UNK

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RESET-DE8055-3E-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RESET-DE8055-3E-20SEP2017.jpg</a>	E	Sep 20, 2017
Moment:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RESET-DE8055-2-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RESET-DE8055-2-20SEP2017.jpg</a>		Sep 20, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RESET-DE8055-1-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RESET-DE8055-1-20SEP2017.jpg</a>		Sep 20, 2017

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





Mn/DOT Name: BEAVER BAY RESET RM 3

NGS Name: BEAVER BAY RESET RM 3

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	12	55 N	8 W	471529.83	911720.46		3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1987	2017	GOOD	Horz=YES Vert=NO	YES		FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
ROCK (1 TO 3 METERS)	REFERENCE MARK DISK	NGS

**Description:** (2011)                      **Stamping:** BEAVER BAY NO 3 1953 1987

0.5 MILE SOUTHEAST OF BEAVER BAY, 0.1 MILE WEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 (LAX LAKE ROAD) IN BEAVER BAY TO TRUNK HIGHWAY 61 MILEPOINT 51.05, THEN 0.3 MILE SOUTHEAST ALONG CLUB ROAD (PRIVATE ROAD TO BEAVER BAY CLUB), THEN 0.05 MILE EAST TO THE END OF TRUCK TRAVEL AT A TURNAROUND, THEN WALK 800.0 FEET EAST ALONG A TRAIL SOUTH OF A CHIMNEY TO THE END OF A POINT, 18.92 FEET EAST-NORTHEAST OF STATION BEAVER BAY RESET, 28.0 FEET NORTHEAST OF BEAVER BAY RESET RM 4, 24.2 FEET EAST-NORTHEAST OF A WITNESS POST.

**Station Notes**  
 FOUNDATION AND CHIMNEY ARE IN PLACE, BUT THE COTTAGE IS GONE.

\* 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
663.020	.262		566.465	.197	2011	GPS - RTRN	2017	RTRN2017
663.004	.262		566.554	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -96.591    12B = -96.555    09 = -96.450    03 = -96.371

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)		Lake County - Lake (North Shore) Zone						Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
47 15 29.82760	91 17 20.46416	651703.797	271411.777	.131	3	GPS - RTRN	2017	RTRN2017	

NAD83(2007)		Lake County - Lake (North Shore) Zone						Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
47 15 29.82677	91 17 20.46301	651703.874	271411.691	.131	3	GPS - RTRN	2011	RTRN2011	

**State Plane and UTM Coordinates (Feet)**

NAD83(2011)		UTM - Zone 15				Project Info		
MN State Plane - North Zone X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3074311.235	609929.876	2065116.375	17176103.408	.131	3	GPS - RTRN	2017	RTRN2017

NAD83(2007)		UTM - Zone 15				Project Info		
MN State Plane - North Zone X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3074311.316	609929.794	2065116.456	17176103.325	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RESET_RM_3-3E-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RESET_RM_3-3E-20SEP2017.jpg</a>	E	Sep 20, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RESET_RM_3-2-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RESET_RM_3-2-20SEP2017.jpg</a>		Sep 20, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RESET_RM_3-1-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RESET_RM_3-1-20SEP2017.jpg</a>		Sep 20, 2017

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



Mn/DOT Name: BEAVER BAY RESET RM 4

NGS Name: BEAVER BAY RESET RM 4

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	12	55 N	8 W	471529.55	911720.52		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	2017	NOT FOUND	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	REFERENCE MARK DISK	NGS

**Description:** (2011)                      **Stamping:** BEAVER BAY NO 4 1953 1987

0.5 MILE SOUTHEAST OF BEAVER BAY, 0.1 MILE WEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 (LAX LAKE ROAD) IN BEAVER BAY, TO TRUNK HIGHWAY MILEPOINT 51.05, THEN 0.3 MILE SOUTHEAST ALONG CLUB ROAD (A PRIVATE ROAD TO BEAVER BAY CLUB), THEN 0.05 MILE EAST TO THE END OF A TRUCK TRAVEL AT A TURNAROUND, THEN WALK 800.0 FEET EAST ALONG A TRAIL SOUTH OF CHIMNEY TO THE END OF A POINT, 20.88 FEET SOUTH-SOUTHEAST OF STATION BEAVER BAY RESET, 28.0 FEET SOUTHWEST OF BEAVER BAY RESET RM 3, 24.2 FEET SOUTH-SOUTHEAST OF A WITNESS POST.

**Station Notes**

FOUNDATION AND CHIMNEY ARE IN PLACE, BUT THE COTTAGE IS GONE. ANOTHER PERSON IS NEEDED TO PULL TIES.

\* 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>
660.241	.262		563.788	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -96.591    12B = -96.555    09 = -96.453    03 = -96.371

**Lat/Lon and County Coordinates (Feet)**

**NAD83(2007)**

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 15 29.55162	91 17 20.51653	651699.718	271383.878	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

**NAD83(2007)**

<u>MN State Plane - North 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>
3074308.279	609901.839	2065113.378	17176075.378	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RESET_RM_4-3S-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RESET_RM_4-3S-20SEP2017.jpg</a>	S	Sep 20, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RESET_RM_4-2-30AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RESET_RM_4-2-30AUG2011.jpg</a>		Aug 30, 2011
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RESET_RM_4-1-30AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RESET_RM_4-1-30AUG2011.jpg</a>		Aug 30, 2011

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



Mn/DOT Name: BEAVER BAY RM 1

NGS Name: BEAVER BAY RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2232](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	56 N	8 W	471529.82	911720.46		

<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>
1953	2017	NOT FOUND	Horz=NO Vert=NO	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	REFERENCE MARK DISK	NGS

**Description:** **Stamping:** BEAVER BAY NO 1 1952

0.5 MILE SOUTHEAST OF BEAVER BAY, 0.05 MILE EAST ON TRUNK HIGHWAY 61 FROM THE TRADING POST CAFE, THEN 0.3 MILE SOUTH ON SAND ROAD (PRIVATE ROAD TO BEAVER BAY CLUB), THEN 0.05 MILE EAST TO THE END OF A TRUCK TRAVEL AT A TURNAROUND, THEN EAST ON A TRAIL SOUTH OF COTTAGE TO THE END OF A POINT, 30.0 FEET WEST OF THE EDGE OF A BLUFF, 34.5 FEET EAST OF A STEEL WITNESS POST.

**Station Notes**  
 BEAVER BAY RESET RM 3 AND BEAVER BAY RESET RM 4 RESET IN ITS PLACE.

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

Geoid Separations(ft): GEOID18 = -96.594 12B = -96.558 09 = -96.453 03 = -96.374



Mn/DOT Name: BEAVER BAY RM 2

NGS Name: BEAVER BAY RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2233](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	56 N	8 W	471529.54	911720.52		

<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>
1953	2017	NOT FOUND	Horz=NO Vert=NO	YES		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	REFERENCE MARK DISK	NGS

**Description:** **Stamping:** BEAVER BAY NO 2 1952

0.5 MILE SOUTHEAST OF BEAVER BAY, 0.05 MILE EAST ON TRUNK HIGHWAY 61 FROM THE TRADING POST CAFE, THEN 0.3 MILE SOUTH ON SAND ROAD (A PRIVATE ROAD TO BEAVER BAY CLUB), THEN 0.05 MILE EAST TO THE END OF A TRUCK TRAVEL AT A TURNAROUND, THEN EAST ON A TRAIL SOUTH OF COTTAGE TO THE END OF A POINT, 10.0 FEET NORTHWEST OF THE EDGE OF A BLUFF, 32.4 FEET SOUTHEAST OF A STEEL WITNESS POST.

**Station Notes**

BEAVER BAY RESET RM 3 AND BEAVER BAY RESET RM 4 WERE SET TO REPLACE THE MARK.

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

Geoid Separations(ft): GEOID18 = -96.594 12B = -96.558 09 = -96.453 03 = -96.374

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RM_2-CJ2233-3SE-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEAVER_BAY_RM_2-CJ2233-3SE-20SEP2017.jpg</a>	SE	Sep 20, 2017
Monument:			
Disk:			

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



Mn/DOT Name: BEBAY MNDT

NGS Name: BEBAY

County: LAKE, MN (Sheet 1)

NGS ACRN: [AC5007](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	55 N	8 W	471558.06	911834.51	2	B

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1995	2017	GOOD	Horz=YES Vert=YES	YES		RECESSED 5 IN.	STEEL SPIKE ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STEEL ROD (IN SLEEVE) (DEPTH 8 FT)	METAL ROD	MNDT

**Description:** (2002)                      **Stamping:** BEBAY 1995

0.75 MILE NORTHWEST OF BEAVER BAY, 0.8 MILE NORTHWEST ALONG COUNTY ROAD 4, FROM THE JUNCTION OF COUNTY ROAD 4 AND TRUNK HIGHWAY 61 IN BEAVER BAY, 70.0 FEET EAST-NORTHEAST OF COUNTY ROAD 4, 40.0 FEET NORTH-NORTHWEST OF THE SUPERIOR HIKING TRAIL PARKING LOT, 39.0 FEET EAST OF A POWER POLE, 3.8 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>	
926.747	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963	
926.727	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE	
926.747	.016	2/1				VERTICAL ADJUSTMENT	2004	00000425-2	
926.753	.016	2/1				VERTICAL CONTROL SURVEY	2002	VBEBAY	

**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>	
926.858	.262		830.769	.197	2011	GPS - RTRN	2022	RTRN2022P	
926.872	.262		830.782	.197	2011	GPS - RTRN	2022	RTRN2022T	
926.806	.262		830.750	.197	2011	GPS - RTRN	2017	RTRN2017	
926.727	.262		830.674	.197	2011	GPS - RTRN	2015	RTRN2015	
926.747			830.671	.010	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940	
926.747			830.664	.010	2011	GPS - STATIC	2013	HBBAY	
926.770	.131		830.763	.066	2007	GPS - STATIC	2012	HBBAY	
			830.671	.010	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800	
			830.756	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300	
926.737	.098		830.825	.049	1996	GPS - STATIC	2004	GPS1954	
926.793	.098		830.825	.049	1996	GPS - STATIC	1997	GPS805-B	
926.793	.131		830.825	.066	1996	GPS - STATIC	1997	GPS805-C	

**Geoid Separations(ft):** GEOID18 = -96.089    12B = -96.056    09 = -95.991    03 = -95.899

**Lat/Lon and County Coordinates (Feet)**

**NAD83(2011)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 15 58.06460	91 18 34.51296	646645.103	274358.440	.131	3	GPS - RTRN	2022	RTRN2022P
47 15 58.06462	91 18 34.51296	646645.103	274358.442	.131	3	GPS - RTRN	2022	RTRN2022T
47 15 58.06369	91 18 34.51436	646645.005	274358.349	.131	3	GPS - RTRN	2017	RTRN2017
47 15 58.06321	91 18 34.51367	646645.052	274358.300	.131	3	GPS - RTRN	2015	RTRN2015
47 15 58.06226	91 18 34.51454	646644.990	274358.205	.007		ADJUSTMENT	2013	GPS2940
47 15 58.06232	91 18 34.51451	646644.992	274358.210	.007	C	GPS - STATIC	2013	HBBAY
47 15 58.06226	91 18 34.51454	646644.990	274358.205	.007		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 15 58.06339	91 18 34.51474	646644.978	274358.319	.033	C	GPS - STATIC	2012	HBBAY
47 15 58.06237	91 18 34.51544	646644.928	274358.217	.007		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 15 58.06212	91 18 34.51518	646644.946	274358.191	.016	B	GPS - STATIC	2004	GPS1954
47 15 58.06212	91 18 34.51518	646644.946	274358.191	.016	B	GPS - STATIC	1997	GPS805-B
47 15 58.06212	91 18 34.51518	646644.946	274358.191	.033	C	GPS - STATIC	1997	GPS805-C

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3069138.840	612670.959	2059948.844	17178851.790	.131	3	GPS - RTRN	2022	RTRN2022P
3069138.840	612670.961	2059948.844	17178851.792	.131	3	GPS - RTRN	2022	RTRN2022T
3069138.746	612670.864	2059948.749	17178851.696	.131	3	GPS - RTRN	2017	RTRN2017
3069138.794	612670.817	2059948.798	17178851.648	.131	3	GPS - RTRN	2015	RTRN2015
3069138.737	612670.719	2059948.740	17178851.551	.007		ADJUSTMENT	2013	GPS2940
3069138.738	612670.725	2059948.742	17178851.557	.007	C	GPS - STATIC	2013	HBBAY
3069138.737	612670.719	2059948.740	17178851.551	.007		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3069138.720	612670.833	2059948.724	17178851.665	.033	C	GPS - STATIC	2012	HBBAY
3069138.674	612670.729	2059948.678	17178851.561	.007		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3069138.693	612670.704	2059948.696	17178851.536	.016	B	GPS - STATIC	2004	GPS1954
3069138.693	612670.704	2059948.696	17178851.536	.016	B	GPS - STATIC	1997	GPS805-B
3069138.693	612670.704	2059948.696	17178851.536	.033	C	GPS - STATIC	1997	GPS805-C

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEBAY-AC5007-3E-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEBAY-AC5007-3E-20SEP2017.jpg</a>	E	Sep 20, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEBAY-AC5007-2-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEBAY-AC5007-2-20SEP2017.jpg</a>		Sep 20, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEBAY-AC5007-1-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BEBAY-AC5007-1-20SEP2017.jpg</a>		Sep 20, 2017

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



Mn/DOT Name: BELM MNDT

NGS Name: BELM

County: LAKE, MN (Sheet 1)

NGS ACRN: [AH3125](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	1	56 N	7 W	472147.65	911025.51	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>
1992	2017	GOOD	Horz=YES Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	HORIZONTAL CONTROL DISK	MNDT

**Description:** (1992)                      **Stamping:** BELM 1992

1.25 MILES NORTHEAST OF ILLGEN CITY, 1.3 MILES NORTHEAST OF THE JUNCTION OF TRUNK HIGHWAY 1 AND TRUNK HIGHWAY 61 IN ILLGEN CITY, AT TRUNK HIGHWAY 61 MILEPOINT 60.65, 83.5 FEET (SLOPE) NORTHWEST OF TRUNK HIGHWAY 61, ON THE TOP OF A ROCK CUT, 13.0 FEET NORTHEAST OF A GUYED POWER POLE, 12.3 FEET NORTHWEST OF A WITNESS POST, STATION BELM MNDT IS FLUSH WITH THE GROUND.

**Station Notes**

DO NOT RUN LEVELS TO THE MARK.

**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>	
711.160	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
711.163	.016	2/1					VERTICAL CONTROL SURVEY	2008	VSHOR2	

**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>	
711.235	.262		614.900	.197	2011	GPS - RTRN		2017	RTRN2017	
711.160			614.710	.025	2011	HORIZONTAL ADJUSTMENT		2013	GPS2940	
711.160			614.795	.025	2011	GPS - STATIC		2013	HBBAY	
711.153	.131		614.851	.066	2007	GPS - STATIC		2012	HBBAY	
			614.710	.056	2011	HORIZONTAL ADJUSTMENT		2012	GPS2800	
711.078	.262		614.766	.197	2007	GPS - RTRN		2011	RTRN2011	
			614.792	.048	2007	HORIZONTAL ADJUSTMENT		2007	GPS2300	
			614.936	.066	1996	GPS - STATIC		1999	GPS1147	
711.088	.131		614.936	.066	1996	HORIZONTAL ADJUSTMENT		1999	17648	
711.186						GPS - STATIC		1992	HORZ	

Geoid Separations(ft): GEOID18 = -96.381    12B = -96.335    09 = -96.312    03 = -96.194

**Lat/Lon and County Coordinates (Feet)**

**NAD83(2011)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 21 47.65237	91 10 25.51426	680907.924	309232.373	.131	3	GPS - RTRN	2017	RTRN2017
47 21 47.65287	91 10 25.51509	680907.868	309232.425	.020		ADJUSTMENT	2013	GPS2940
47 21 47.65271	91 10 25.51525	680907.856	309232.408	.020	C	GPS - STATIC	2013	HBBAY
47 21 47.65287	91 10 25.51509	680907.868	309232.425	.026		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 21 47.65298	91 10 25.51594	680907.809	309232.437	.033	C	GPS - STATIC	2012	HBBAY
47 21 47.65209	91 10 25.51603	680907.802	309232.346	.131	3	GPS - RTRN	2011	RTRN2011
47 21 47.65298	91 10 25.51594	680907.809	309232.437	.023		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 21 47.65324	91 10 25.51390	680907.950	309232.461	.033	C	GPS - STATIC	1999	GPS1147
47 21 47.65324	91 10 25.51390	680907.950	309232.461	.033	C	ADJUSTMENT	1999	17648

**NAD83(1986)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 21 47.65528	91 10 25.50821	680908.345	309232.661	.033	C	GPS - STATIC	1992	HMARA

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3101970.293	648888.984	2092829.631	17215016.652	.131	3	GPS - RTRN	2017	RTRN2017
3101970.235	648889.033	2092829.573	17215016.701	.020		ADJUSTMENT	2013	GPS2940
3101970.224	648889.017	2092829.562	17215016.685	.020	C	GPS - STATIC	2013	HBBAY
3101970.235	648889.033	2092829.573	17215016.701	.026		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3101970.176	648889.043	2092829.514	17215016.711	.033	C	GPS - STATIC	2012	HBBAY
3101970.172	648888.953	2092829.510	17215016.621	.131	3	GPS - RTRN	2011	RTRN2011
3101970.176	648889.043	2092829.514	17215016.711	.023		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3101970.316	648889.073	2092829.654	17215016.741	.033	C	GPS - STATIC	1999	GPS1147
3101970.316	648889.073	2092829.654	17215016.741	.033	C	ADJUSTMENT	1999	17648

**NAD83(1986)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3101970.702	648889.289	2092830.040	17215016.957	.033	C	GPS - STATIC	1992	HMARA

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BELM-AH3125-3SE-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BELM-AH3125-3SE-19SEP2017.jpg</a>	SE	Sep 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BELM-AH3125-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BELM-AH3125-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BELM-AH3125-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BELM-AH3125-1-19SEP2017.jpg</a>		Sep 19, 2017

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





Mn/DOT Name: BENNA MNDT

NGS Name: BENNA

County: LAKE, MN (Sheet 1)

NGS ACRN: [AC5009](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	20	52 N	11 W	465821.70	914529.08	2	B

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1995	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>
ALUMINUM ALLOY ROD (NO SLEEVE) (<10 FT) (DEPTH 8 FT)	METAL ROD	MNDT

Description: (2002)                      Stamping: BENNA 1995

5.0 MILES SOUTHWEST OF TWO HARBORS, 4.85 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 11 AT THE WEST EDGE OF TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 20.3, 0.85 MILE SOUTHWEST OF LARSMONT ROAD, 52.5 FEET SOUTHEAST OF SOUTHBOUND TRUNK HIGHWAY 61, 77.5 FEET NORTHWEST OF NORTHBOUND TRUNK HIGHWAY 61, 56.0 FEET SOUTHWEST OF A CROSSOVER, 3.3 FEET NORTHEAST OF A WITNESS POST.

Station Pair: MOCHA - LAKE, 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>
683.053	.016	2/1				VERTICAL ADJUSTMENT		2021	00000963
683.073	.016	2/1				VERTICAL CONTROL SURVEY		2019	VNSHORE
683.073	.016	2/1				VERTICAL ADJUSTMENT		2011	00000691
683.073	.016	2/1				VERTICAL CONTROL SURVEY		2010	VSHOR4

**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>
683.073			588.772	.008	2011	HORIZONTAL ADJUSTMENT		2019	GPS3328
683.073	.131		588.959	.066	1996	GPS - STATIC		2019	Hlake2
683.073			588.772	.008	2011	GPS - STATIC		2019	Hlake2
683.073			588.772	.008	2011	HORIZONTAL ADJUSTMENT		2018	GPS3119
683.073	.131		588.959	.066	1996	GPS - STATIC		2017	HMNCORS07
683.073			588.772	.008	2011	GPS - STATIC		2017	HMNPH
683.112	.262		588.841	.197	2011	GPS - RTRN		2017	RTRN2017
683.040	.262		588.769	.197	2011	GPS - RTRN		2015	RTRN2015
683.073			588.772	.007	2011	HORIZONTAL ADJUSTMENT		2013	GPS2940
683.073			588.775	.007	2011	GPS - STATIC		2013	HBBAY
683.069	.131		588.893	.066	2007	GPS - STATIC		2012	HBBAY
			588.772	.008	2011	HORIZONTAL ADJUSTMENT		2012	GPS2800
683.017	.262		588.837	.197	2007	GPS - RTRN		2011	RTRN2011
			588.870	.008	2007	HORIZONTAL ADJUSTMENT		2007	GPS2300
683.102	.098		588.959	.049	1996	GPS - STATIC		2004	GPS1954
683.037	.098		588.959	.049	1996	HORIZONTAL ADJUSTMENT		2003	GPS1931
683.037	.131		588.959	.066	1996	GPS - STATIC		2003	HSTLO
683.047	.098		588.959	.049	1996	GPS - STATIC		1997	GPS805-B
683.047	.131		588.959	.066	1996	GPS - STATIC		1997	GPS805-C

Geoid Separations(ft): GEOID18 = -94.275    12B = -94.271    09 = -94.180    03 = -94.111



Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 58 21.70171	91 45 29.07938	532887.605	169552.344	.007		ADJUSTMENT	2019	GPS3328
46 58 21.70171	91 45 29.07938	532887.605	169552.344	.007	C	GPS - STATIC	2019	HLAKE2
46 58 21.70171	91 45 29.07938	532887.605	169552.344	.007		ADJUSTMENT	2018	GPS3119
46 58 21.70171	91 45 29.07938	532887.605	169552.344	.007	C	GPS - STATIC	2017	HMNPH
46 58 21.70144	91 45 29.07927	532887.612	169552.316	.131	3	GPS - RTRN	2017	RTRN2017
46 58 21.70081	91 45 29.07928	532887.610	169552.253	.131	3	GPS - RTRN	2015	RTRN2015
46 58 21.70171	91 45 29.07938	532887.605	169552.344	.007		ADJUSTMENT	2013	GPS2940
46 58 21.70168	91 45 29.07939	532887.604	169552.341	.007	C	GPS - STATIC	2013	HBBAY
46 58 21.70171	91 45 29.07938	532887.605	169552.344	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 58 21.70189	91 45 29.08030	532887.542	169552.364	.033	C	GPS - STATIC	2012	HBBAY
46 58 21.70032	91 45 29.08079	532887.504	169552.206	.131	3	GPS - RTRN	2011	RTRN2011
46 58 21.70189	91 45 29.08030	532887.542	169552.364	.007		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
46 58 21.70170	91 45 29.08022	532887.547	169552.344	.033	C	GPS - STATIC	2019	HLAKE2
46 58 21.70170	91 45 29.08022	532887.547	169552.344	.033	C	GPS - STATIC	2017	HMNCORS07
46 58 21.70170	91 45 29.08022	532887.547	169552.344	.016	B	GPS - STATIC	2004	GPS1954
46 58 21.70170	91 45 29.08022	532887.547	169552.344	.016	B	ADJUSTMENT	2003	GPS1931
46 58 21.70170	91 45 29.08022	532887.547	169552.344	.033	C	GPS - STATIC	2003	HSTLO
46 58 21.70170	91 45 29.08022	532887.547	169552.344	.016	B	GPS - STATIC	1997	GPS805-B
46 58 21.70170	91 45 29.08022	532887.547	169552.344	.033	C	GPS - STATIC	1997	GPS805-C

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2959671.427	503405.844	1950342.088	17069776.511	.007		ADJUSTMENT	2019	GPS3328
2959671.427	503405.844	1950342.088	17069776.511	.007	C	GPS - STATIC	2019	HLAKE2
2959671.427	503405.844	1950342.088	17069776.511	.007		ADJUSTMENT	2018	GPS3119
2959671.427	503405.844	1950342.088	17069776.511	.007	C	GPS - STATIC	2017	HMNPH
2959671.435	503405.817	1950342.096	17069776.484	.131	3	GPS - RTRN	2017	RTRN2017
2959671.436	503405.753	1950342.096	17069776.420	.131	3	GPS - RTRN	2015	RTRN2015
2959671.427	503405.844	1950342.088	17069776.511	.007		ADJUSTMENT	2013	GPS2940
2959671.426	503405.841	1950342.087	17069776.508	.007	C	GPS - STATIC	2013	HBBAY
2959671.427	503405.844	1950342.088	17069776.511	.007		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2959671.363	503405.862	1950342.024	17069776.528	.033	C	GPS - STATIC	2012	HBBAY
2959671.332	503405.702	1950341.993	17069776.369	.131	3	GPS - RTRN	2011	RTRN2011
2959671.363	503405.862	1950342.024	17069776.528	.007		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2959671.369	503405.842	1950342.030	17069776.509	.033	C	GPS - STATIC	2019	HLAKE2
2959671.369	503405.842	1950342.030	17069776.509	.033	C	GPS - STATIC	2017	HMNCORS07
2959671.369	503405.842	1950342.030	17069776.509	.016	B	GPS - STATIC	2004	GPS1954
2959671.369	503405.842	1950342.030	17069776.509	.016	B	ADJUSTMENT	2003	GPS1931
2959671.369	503405.842	1950342.030	17069776.509	.033	C	GPS - STATIC	2003	HSTLO
2959671.369	503405.842	1950342.030	17069776.509	.016	B	GPS - STATIC	1997	GPS805-B
2959671.369	503405.842	1950342.030	17069776.509	.033	C	GPS - STATIC	1997	GPS805-C



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BENNA-AC5009-3SW-12NOV2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BENNA-AC5009-3SW-12NOV2008.jpg</a>	SW	Nov 12, 2008
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BENNA-AC5009-2-12NOV2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BENNA-AC5009-2-12NOV2008.jpg</a>		Nov 12, 2008
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BENNA-AC5009-1-12NOV2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BENNA-AC5009-1-12NOV2008.jpg</a>		Nov 12, 2008

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



Mn/DOT Name: BIANCO  
 County: LAKE, MN (Sheet 1)

NGS Name: BIANCO

NGS ACRN: [DR2012](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091312/  
 USGS Quad: LEGLER 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	24	56 N	10 W	471936.55	913256.61		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>
2017	2017	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 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017)                      Stamping: BIANCO 2017

21.0 MILES NORTH-NORTHEAST OF TWO HARBORS, 19.6 MILES NORTH ALONG COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 IN TWO HARBORS, THEN 6.40 MILES EASTERLY ON COUNTY ROAD 203, 9.7 FEET SOUTH OF COUNTY ROAD 203, 84.3 FEET SOUTHWEST OF THE WEST RAIL OF RAILROAD TRACKS, 1.5 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>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>			
1674.098			1581.431	.020	2011	HORIZONTAL ADJUSTMENT	2019	GPS3302			
			1581.634	.066	1996	GPS - STATIC	2019	Hlake			
1674.098			1581.431	.020	2011	GPS - STATIC	2019	Hlake			

Geoid Separations(ft): GEOID18 = -92.651    12B = -92.654    09 = -92.533    03 = -92.519

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Geodetic Position</u>				<u>Lake 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>		
47 19 36.54751	91 32 56.60886	465342.041	194935.250	.013	C	GPS - STATIC	2019	Hlake		

<u>NAD83(2011)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 19 36.54751	91 32 56.60886	587636.700	297591.720	.013		ADJUSTMENT	2019	GPS3302		

<u>NAD83(1996)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 19 36.54721	91 32 56.60941	587636.662	297591.690	.033	C	GPS - STATIC	2019	Hlake		

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>MN State Plane - North 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>		
3009254.353	633517.122	2000105.336	17199782.069	.013		ADJUSTMENT	2019	GPS3302		
3009254.353	633517.122	2000105.336	17199782.069	.013	C	GPS - STATIC	2019	Hlake		

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>		
3009254.316	633517.091	2000105.299	17199782.038	.033	C	GPS - STATIC	2019	Hlake		

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BIANCO-DR2012-3S-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BIANCO-DR2012-3S-27SEP2017.jpg</a>	S	Sep 27, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BIANCO-DR2012-2-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BIANCO-DR2012-2-27SEP2017.jpg</a>		Sep 27, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BIANCO-DR2012-1-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BIANCO-DR2012-1-27SEP2017.jpg</a>		Sep 27, 2017

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



Mn/DOT Name: BLAINE

NGS Name: BLAINE

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	36	53 N	11 W	470133.18	914002.54		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>
2017	2018	DESTROYED	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 37 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017)                      Stamping: BLAINE 2017

IN TWO HARBORS, AT THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61, 83.5 FEET NORTH OF TRUNK HIGHWAY 61, 29.7 FEET WEST OF COUNTY ROAD 2, 1.5 FEET EAST OF A WITNESS POST.

Station Notes

DISTRICT SURVEYS REPORTED STATION WAS DESTROYED, AUGUST 2018.

\* 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>			
646.915	.262		552.105	.197	2011	GPS - RTRN	2017 RTRN2017	

Geoid Separations(ft): GEOID18 = -94.829    12B = -94.810    09 = -94.721    03 = -94.636

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>							<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>		
47 01 33.17698	91 40 02.53591	555943.216	188450.829	.131	3	GPS - RTRN	2017 RTRN2017	

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>				<u>Project Info</u>			
<u>MN State Plane - North 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>				
2981953.863	523208.332	1972647.997	17089539.491	.131	3	GPS - RTRN	2017 RTRN2017

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BLAINE-3W-16OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BLAINE-3W-16OCT2017.jpg</a>	W	Oct 16, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BLAINE-2-16OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BLAINE-2-16OCT2017.jpg</a>		Oct 16, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BLAINE-1-16OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BLAINE-1-16OCT2017.jpg</a>		Oct 16, 2017

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



Mn/DOT Name: BLAKE

NGS Name: BLAKE

County: LAKE, MN (Sheet 1)

NGS ACRN: [DO8115](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

		<u>Reference</u>		<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Order</u>	<u>Order</u>
NE	11	56 N	7 W	2	C
		<u>Latitude</u>	<u>Longitude</u>		
		472100.09	911101.45		

<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>
2011	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	SURVEY DISK	MNDT

Description: (2011) Stamping: BLAKE 2011

5.5 MILES NORTHEAST OF SILVER BAY, 0.25 MILE NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND TRUNK HIGHWAY 1, AT TRUNK HIGHWAY 61 MILEPOINT 59.6, 60.4 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 81.0 FEET SOUTH OF THE SOUTHWEST END OF A GUARD RAIL, 1.7 FEET 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>
722.653	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963
722.666	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE

**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>
722.686	.262			626.278	.197	2011	GPS - RTRN	2017	RTRN2017
722.643				626.216	.024	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940
722.643				626.216	.024	2011	GPS - STATIC	2013	HBBAY
722.669	.131			626.301	.066	2007	GPS - STATIC	2012	HBBAY

Geoid Separations(ft): GEOID18 = -96.447 12B = -96.404 09 = -96.358 03 = -96.253

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 21 00.09185	91 11 01.44588			678360.246	304451.806	.131	3	GPS - RTRN	2017	RTRN2017
47 21 00.09202	91 11 01.44636			678360.213	304451.824	.023		ADJUSTMENT	2013	GPS2940
47 21 00.09202	91 11 01.44636			678360.213	304451.824	.023	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 21 00.09209	91 11 01.44722			678360.154	304451.831	.033	C	GPS - STATIC	2012	HBBAY

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3099617.054	644010.413			2090469.475	17210142.056	.131	3	GPS - RTRN	2017	RTRN2017
3099617.020	644010.429			2090469.441	17210142.072	.023		ADJUSTMENT	2013	GPS2940
3099617.020	644010.429			2090469.441	17210142.072	.023	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3099616.961	644010.435			2090469.382	17210142.078	.033	C	GPS - STATIC	2012	HBBAY

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BLAKE-DO8115-3SE-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BLAKE-DO8115-3SE-19SEP2017.jpg</a>	SE	Sep 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BLAKE-DO8115-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BLAKE-DO8115-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BLAKE-DO8115-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BLAKE-DO8115-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: BOUNDARY REF MON 834

NGS Name: BOUNDARY MON 834

County: LAKE, MN (Sheet 1)

NGS ACRN: [TA0069](#) [Get Map](#)  
 NGS Quad / Sta Num : 48091233/  
 USGS Quad: ENSIGN LAKE WEST

				<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	2	64 N	9 W	480258.63	912616.89	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>
1913	1935	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	BOUNDARY MONUMENT	IBWC

**Description:** (1935)                      **Stamping:** 834

AT THE EAST END OF BASSWOOD LAKE. STATION BOUNDARY REF MON 834 IS ABOUT 65.62 FEET SOUTHWEST OF THE DAM AT THE OUTLET OF SUCKER LAKE, ON A ROUNDED LEDGE SOUTH OF THE TRAIL, AT PRAIRIE PORTAGE, 66.0 FEET SOUTH OF CARP LAKE DAM, 60.0 FEET NORTH OF THE LEO CHOSA CABIN, ON THE TOP OF A ROCK LEDGE 12.0 FEET ABOVE THE HIGH WATER MARK.

**Station Notes**

A STANDARD 8.0-INCH MANGANESE-BRONZE REFERENCE POST SET IN THE LEDGE.

**Leveling-Derived Orthometric Heights (Feet)**

<u>NAVD88</u>							<u>Project Info</u>	
<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</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>			
1352.530	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025
<u>NGVD29</u>							<u>Project Info</u>	
<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</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>			
1351.762	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1351.762	.007	1				VERTICAL CONTROL SURVEY	1935	L18 MINN

Geoid Separations(ft): GEOID18 = -102.086 12B = -102.136 09 = -102.040 03 = -101.686

\* No Horizontal Positions in the Database \*



Mn/DOT Name: BUCHANAN USLS

NGS Name: BUCHANAN

County: LAKE, MN (Sheet 1)

NGS ACRN: [RM0876](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/1002  
 USGS Quad: KNIFE RIVER

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	52 N	11 W	465627.92	914719.86		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>
1871	2011	NOT FOUND	Horz=NO Vert=YES	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	SEE DESCRIPTION	USLS

Description: (1871)

Stamping:

10.0 MILES SOUTHWEST OF TWO HARBORS, 2.0 MILES EAST OF PALMERS, 0.5 MILE SOUTHWEST OF A GRANITE PIT, 1.25 MILES SOUTHWEST ON COUNTY ROAD 61 FROM RAILROAD UNDERPASS, 0.5 MILE SOUTHWEST OF COUNTY ROAD 61 (LAKE SUPERIOR SCENIC DRIVE), 9.5 FEET EAST OF THE WATER'S EDGE, 26.0 FEET NORTHWEST OF A BIRCH TREE, 10.0 FEET ABOVE THE LEVEL OF THE LAKE. STATION BUCHANAN USLS IS BRASS FRUSTUM LEADED INTO SOLID ROCK.

Station Notes

THE GEODETIC UNIT DID NOT FIND MARK IN 10-16-2007.  
 8/16/2011 THE COORDINATES DON'T MATCH AVAILABLE TIES.

\* 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>
626.639	.197		532.670	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648

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>
626.606						RECIPROCAL VERTICAL ANGLE	1871	HORZ

Geoid Separations(ft): GEOID18 = -94.134 12B = -94.134 09 = -94.019 03 = -93.957

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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 56 27.92302	91 47 19.86437	524942.445	158201.915	.066	2	ADJUSTMENT	1999	17648
46 56 27.92434	91 47 19.86383	524942.485	158202.047	.066	2	ADJUSTMENT	1991	17497

NAD83(1986)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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 56 27.91942	91 47 19.85712	524942.939	158201.538	.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 56 28.15200	91 47 19.20100			.100	2	CLASSICAL SURVEY	1956	11100

USSD

<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 56 28.40600	91 47 19.05200				3	CLASSICAL SURVEY		17389-67





**State Plane and UTM Coordinates (Feet)**

**NAD83(1996)**

MN State Plane - North 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>
2952185.204	491748.071	1942840.559	17058133.727	.066	2	ADJUSTMENT	1999	17648
2952185.239	491748.205	1942840.594	17058133.862	.066	2	ADJUSTMENT	1991	17497

**NAD83(1986)**

MN State Plane - North 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>
2952185.713	491747.714	1942841.067	17058133.371	.066	2	ADJUSTMENT	1986	17289

**NAD27**

MN State Plane - North 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>
2327574.251	163688.044			.100	2	CLASSICAL SURVEY	1956	11100



Mn/DOT Name: BUD HILL  
County: LAKE, MN (Sheet 1)

NGS Name: BUD HILL

NGS ACRN: [SH0776](#) [Get Map](#)  
NGS Quad / Sta Num : 47091321/1002  
USGS Quad: TWO HARBORS NE

				<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	20	55 N	9 W	471429.45	913040.69		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>
1952	1989	GOOD	Horz=YES Vert=YES	NO		PROJECTS 3 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

**Description:** (1976) **Stamping:** BUD HILL 1952

10.0 MILES WEST OF BEAVER BAY, 1.75 MILES NORTHWEST ON COUNTY ROAD 4 FROM THE JUNCTION OF COUNTY ROAD 4 AND TRUNK HIGHWAY 61 AT BEAVER BAY, THEN 6.4 MILES SOUTHWEST AND WEST ON COUNTY ROAD 3 THEN 0.8 MILE SOUTH ON COUNTY ROAD 3 THEN 3.8 MILES WEST ON COUNTY ROAD 3, 19.0 FEET EAST-NORTHEAST OF THE NORTHEAST LEG OF A DISMANTLED FIRE TOWER, 7.6 FEET NORTHWEST OF A WITNESS POST, 65.13 FEET NORTH OF BUD HILL RM 1, 74.23 FEET EAST-SOUTHEAST OF BUD HILL 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>		
1387.792	.262		1294.092	.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>		
1387.792						RECIPROCAL VERTICAL ANGLE	1952	HORZ	

Geoid Separations(ft): GEOID18 = -93.825 12B = -93.783 09 = -93.671 03 = -93.674

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Lake 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>			
47 14 29.45341	91 30 40.69350	474665.106	163803.648	.131	3	ADJUSTMENT	1999	17648		
47 14 29.45511	91 30 40.69068	474665.301	163803.820	.131	3	ADJUSTMENT	1991	17497		

<u>NAD83(1986)</u>		<u>Geodetic Position</u>		<u>Lake 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>			
47 14 29.45358	91 30 40.69115	474665.268	163803.665	.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>Year</u>	<u>Reference</u>	
47 14 29.73000	91 30 40.07400			.100	3	CLASSICAL SURVEY	1956	11100

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>	
3019254.398	602600.704	2010058.322	17168857.195	.131	3	ADJUSTMENT	1999	17648		
3019254.589	602600.880	2010058.514	17168857.371	.131	3	ADJUSTMENT	1991	17497		

<u>NAD83(1986)</u>		<u>MN State Plane - North 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>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>	
3019254.560	602600.724	2010058.484	17168857.216	.131	3	ADJUSTMENT	1986	17289		

<u>NAD27</u>		<u>MN State Plane - North 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>	
2394642.115	274545.205			.100	3	CLASSICAL SURVEY	1956	11100



Mn/DOT Name: BUD HILL RM 1

NGS Name: BUD HILL RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2296](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091321/1002  
 USGS Quad: TWO HARBORS NE

				<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	20	55 N	9 W	471428.83	913040.91		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1952	1976	GOOD	Horz=YES Vert=YES	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	REFERENCE MARK DISK	NGS

**Description:** **Stamping:** BUD HILL NO 1 1952

10.0 MILES WEST OF BEAVER BAY, 1.75 MILES NORTHWEST ON COUNTY ROAD 4 FROM THE JUNCTION OF COUNTY ROAD 4 AND TRUNK HIGHWAY 61 AT BEAVER BAY THEN 6.4 MILES SOUTHWEST AND WEST ON COUNTY ROAD 3 THEN 0.8 MILE SOUTH ON COUNTY ROAD 3 THEN 3.8 MILES WEST ON COUNTY ROAD 3, 31.0 FEET SOUTH OF THE SOUTHEAST LEG OF THE LOOKOUT TOWER.

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

Geoid Separations(ft): GEOID18 = -93.825 12B = -93.786 09 = -93.671 03 = -93.674



Mn/DOT Name: BUD HILL RM 2

NGS Name: BUD HILL RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2297](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091321/1002  
 USGS Quad: TWO HARBORS NE

				<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	20	55 N	9 W	471430.00	913041.67		

<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>
1952	1976	GOOD	Horz=YES Vert=YES	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	REFERENCE MARK DISK	NGS

**Description:** **Stamping:** BUD HILL NO 2 1952

10.0 MILES WEST OF BEAVER BAY, 1.75 MILES NORTHWEST ON COUNTY ROAD 4 FROM THE JUNCTION OF COUNTY ROAD 4 AND TRUNK HIGHWAY 61 AT BEAVER BAY, THEN 6.4 MILES SOUTHWEST AND WEST ON COUNTY ROAD 3 THEN 0.8 MILE SOUTH ON COUNTY ROAD 3 THEN 3.8 MILES WEST ON COUNTY ROAD 3, 64.0 FEET NORTHWEST OF THE NORTHWEST LEG OF THE LOOKOUT TOWER, 12.0 FEET WEST OF THE CENTERLINE OF A DRIVE.

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

Geoid Separations(ft): GEOID18 = -93.825 12B = -93.786 09 = -93.671 03 = -93.674



Mn/DOT Name: BURLINGTON

NGS Name: BURLINGTON

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0787](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/1005  
 USGS Quad: TWO HARBORS

				<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	32	53 N	10 W	470149.19	913829.46		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>
1943	2011	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	TRIANGULATION STATION DISK	NGS

**Description:** (2009)                      **Stamping:** BURLINGTON 2 1943

1.5 MILES EAST-NORTHEAST OF TWO HARBORS, ON A HILL AT THE NORTHEAST SIDE OF BURLINGTON BAY, 0.85 MILE NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 TO MILEPOINT 27.0, THEN 0.75 MILE EAST AND SOUTH ON ROCKY POINT ROAD TO THE TOP OF A STEEP GRADE, THEN 0.1 MILE NORTHWEST ON DRIVEWAY NUMBER 1573, THEN PACK 300.0 FEET NORTHWEST ON A TRAIL, 37.12 FEET SOUTHWEST OF BURLINGTON RM 1, 76.26 FEET NORTHWEST OF BURLINGTON RM 2, 22.0 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>Determination Method</u>		<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>			<u>Year</u>	<u>Reference</u>
742.315	.262		647.331	.197	2007	GPS - RTRN		2011	RTRN2011
742.321	.197		647.443	.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>
742.190						RECIPROCAL VERTICAL ANGLE		1943	HORZ

Geoid Separations(ft): GEOID18 = -95.095    12B = -95.075    09 = -94.983    03 = -94.901

**Lat/Lon and County Coordinates (Feet)**

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 01 49.19960	91 38 29.45507	562424.846	189936.935	.131	3	GPS - RTRN		2011	RTRN2011

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 01 49.19190	91 38 29.45526	562424.816	189936.156	.066	2	ADJUSTMENT		1999	17648
47 01 49.19764	91 38 29.45311	562424.978	189936.734	.066	2	ADJUSTMENT		1991	17497

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 01 49.19537	91 38 29.45191	562425.056	189936.502	.066	2	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>
47 01 49.42600	91 38 28.80300			.100	2	CLASSICAL SURVEY	1956	11100

<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>
47 01 49.79500	91 38 28.58000				3	CLASSICAL SURVEY		17389-67

**State Plane and UTM Coordinates (Feet)**

**NAD83(2007)**

<u>MN State Plane - North 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>
2988370.722	524951.967	1979065.741	17091272.923	.131	3	GPS - RTRN	2011	RTRN2011

**NAD83(1996)**

<u>MN State Plane - North 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>
2988370.724	524951.187	1979065.741	17091272.143	.066	2	ADJUSTMENT	1999	17648
2988370.862	524951.772	1979065.880	17091272.727	.066	2	ADJUSTMENT	1991	17497

**NAD83(1986)**

<u>MN State Plane - North 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>
2988370.949	524951.543	1979065.967	17091272.499	.066	2	ADJUSTMENT	1986	17289

**NAD27**

<u>MN State Plane - North 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>
2363760.003	196891.635			.100	2	CLASSICAL SURVEY	1956	11100

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BURLINGTON-SH0787-3NW-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BURLINGTON-SH0787-3NW-16AUG2011.jpg</a>	NW	Aug 16, 2011
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BURLINGTON-SH0787-2-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BURLINGTON-SH0787-2-16AUG2011.jpg</a>		Aug 16, 2011
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BURLINGTON-SH0787-1-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BURLINGTON-SH0787-1-16AUG2011.jpg</a>		Aug 16, 2011

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



Mn/DOT Name: BURLINGTON RM 1

NGS Name: BURLINGTON RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2299](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/1005  
 USGS Quad: TWO HARBORS

				<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	32	53 N	10 W	470149.44	913829.05		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>
1943	2011	GOOD	Horz=NO Vert=YES	YES			NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	AZIMUTH MARK DISK	NGS

**Description:** (2009)                      **Stamping:** BURLINGTON 2 NO 1 1943

1.5 MILES EAST-NORTHEAST OF TWO HARBORS, ON A HILL AT THE NORTHEAST SIDE OF BURLINGTON BAY, 0.85 MILE NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 TO MILEPOINT 27.0, THEN 0.75 MILE EAST AND SOUTH ON ROCKYPOINT ROAD TO THE TOP OF A STEEP GRADE, THEN 0.1 MILE NORTHWEST ON DRIVEWAY NUMBER 1573, THEN PACK 0.2 MILE NORTHWEST ON A TRAIL, 37.12 FEET NORTHEAST OF STATION BURLINGTON.

\* 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>			
741.554	.262		646.570	.197	2007	2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -95.098    12B = -95.075    09 = -94.983    03 = -94.901

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>							<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>			
47 01 49.43750	91 38 29.04549	562453.722	189960.436	.131	3	2011	RTRN2011	

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>		<u>Project Info</u>	
<u>MN State Plane - North Zone</u>				<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>
<u>X</u>	<u>Y</u>	<u>X</u>	<u>Y</u>				
2988398.636	524976.602	1979093.684	17091297.508	.131	3	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BURLINGTON_RM_1-CJ2299-3NE-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BURLINGTON_RM_1-CJ2299-3NE-16AUG2011.jpg</a>	NE	Aug 16, 2011
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BURLINGTON_RM_1-CJ2299-2-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BURLINGTON_RM_1-CJ2299-2-16AUG2011.jpg</a>		Aug 16, 2011
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BURLINGTON_RM_1-CJ2299-1-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BURLINGTON_RM_1-CJ2299-1-16AUG2011.jpg</a>		Aug 16, 2011

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



Mn/DOT Name: BURLINGTON RM 2

NGS Name: BURLINGTON RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2300](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/1005  
 USGS Quad: TWO HARBORS

				<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	32	53 N	10 W	470148.51	913829.02		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>
1943	2011	GOOD	Horz=NO Vert=YES	YES			NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	AZIMUTH MARK DISK	NGS

**Description:** (2009)                      **Stamping:** BURLINGTON 2 NO 2 1943

1.5 MILES EAST-NORTHEAST OF TWO HARBORS, ON A HILL AT THE NORTHEAST SIDE OF BURLINGTON BAY, 0.85 MILE NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 TO TRUNK HIGHWAY 61 MILEPOINT 27.0, THEN 0.75 MILE EAST AND SOUTH ON ROCKY POINT ROAD TO THE TOP OF A STEEP GRADE, THEN 0.1 MILE NORTHWEST ON DRIVEWAY NUMBER 1573, THEN PACK 300.0 FEET NORTHWEST ON A TRAIL, 76.26 FEET SOUTHEAST OF STATION BURLINGTON.

\* 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>
738.325	.262			643.339	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -95.102    12B = -95.079    09 = -94.987    03 = -94.905

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>Geodetic Position</u>					<u>Lake County - Lake (North Shore) Zone</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>			
47 01 48.51124	91 38 29.01728	562453.698	189866.568	.131	3	GPS - RTRN	2011	RTRN2011			

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>MN State Plane - North 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>		
2988402.360	524882.811	1979097.265	17091203.737	.131	3	GPS - RTRN	2011	RTRN2011		

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BURLINGTON_RM_2-CJ2300-3W-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BURLINGTON_RM_2-CJ2300-3W-16AUG2011.jpg</a>	W	Aug 16, 2011
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BURLINGTON_RM_2-CJ2300-2-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BURLINGTON_RM_2-CJ2300-2-16AUG2011.jpg</a>		Aug 16, 2011
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BURLINGTON_RM_2-CJ2300-1-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/BURLINGTON_RM_2-CJ2300-1-16AUG2011.jpg</a>		Aug 16, 2011

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





Mn/DOT Name: BURLINGTON USLS

NGS Name: BURLINGTON

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0786](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/1004  
 USGS Quad: TWO HARBORS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	53 N	10 W	470149.31	913829.37		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>
1871	2009	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	SEE DESCRIPTION	USLS

Description: (1943)

Stamping:

ON THE NORTH SHORE OF LAKE SUPERIOR, 1.5 MILES EAST-NORTHEAST OF TWO HARBORS, ON THE NORTHEAST SIDE OF BURLINGTON BAY, 14.3 FEET FROM STATION BURLINGTON.

Station Notes

5-18-2009 LOOKED IN THE VICINITY OF 14.3 FEET FROM STATION BURLINGTON, FOUND NOTHING. CONSIDERED DESTROYED.

\* 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>		
741.468	.131		646.590	.066	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>		
741.501						RECIPROCAL VERTICAL ANGLE	1871	HORZ	

Geoid Separations(ft): GEOID18 = -95.095 12B = -95.075 09 = -94.983 03 = -94.901

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Lake County - Lake (North Shore) Zone</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>		
47 01 49.30739	91 38 29.37233	562430.807	189947.734	.033	1	ADJUSTMENT	1999	17648	
47 01 49.30978	91 38 29.36992	562430.979	189947.972	.033	1	ADJUSTMENT	1991	17497	

<u>NAD83(1986)</u>		<u>Lake County - Lake (North Shore) Zone</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>		
47 01 49.30389	91 38 29.36436	562431.352	189947.367	.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>Latitude</u>	<u>Longitude</u>					<u>Year</u>	<u>Reference</u>	
47 01 49.54200	91 38 28.73300			.100	1	CLASSICAL SURVEY	1956	11100

<u>USSD</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>	
47 01 49.79500	91 38 28.58000				3	CLASSICAL SURVEY		17389-67

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>UTM - Zone 15</u>				<u>Determination Method</u>		<u>Project Info</u>	
<u>MN State Plane - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>		
2988376.247	524962.995	1979071.281	17091283.939	.033	1	ADJUSTMENT	1999	17648	
2988376.409	524963.240	1979071.443	17091284.184	.033	1	ADJUSTMENT	1991	17497	

<u>NAD83(1986)</u>		<u>UTM - Zone 15</u>				<u>Determination Method</u>		<u>Project Info</u>	
<u>MN State Plane - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>		
2988376.806	524962.651	1979071.839	17091283.594	.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 - North Zone</u>						<u>Year</u>	<u>Reference</u>	
2363764.630	196903.477			.100	1	CLASSICAL SURVEY	1956	11100



Mn/DOT Name: C 173

NGS Name: C 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0274](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091243/  
 USGS Quad: SILVER BAY SW

				<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	18	55 N	8 W	471510.60	912350.24	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>
1935	2007	NOT FOUND	Horz=NO Vert=YES	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: (1935) Stamping: C 173 1935

5.3 MILES WEST OF BEAVER BAY, 34.0 FEET EAST OF A FARM ENTRANCE, 30.0 FEET NORTH OF COUNTY ROAD 3, AT A FARMHOUSE FENCE.

**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>	
1067.888	.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>	
1067.682	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1067.682	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -95.079 12B = -95.023 09 = -94.980 03 = -94.918

\* No Horizontal Positions in the Database \*



Mn/DOT Name: C 336

NGS Name: C 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0534](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	24	53 N	11 W	470321.00	914003.00	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>
1978	2006	NOT FOUND	Horz=NO Vert=YES	NO		PROJECTS 1 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE) (DEPTH 27 FT)	VERTICAL CONTROL DISK	NGS

Description: (2006)                      Stamping: C 336 1978

2.1 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS, 0.1 MILE NORTH OF A PAVED ROAD EAST AND A FIELD ROAD WEST, ACROSS COUNTY ROAD 2 FROM THE SOUTH SIDE OF A HOUSE, 51.0 FEET WEST OF COUNTY ROAD 2, 1.0 FOOT EAST OF A WIRE FENCE, 1.0 FOOT SOUTH OF A WITNESS POST.

Station Notes

THE FENCE IS NOW MORE THAN 51.0 FEET, NO WOODEN GATE, AND THE GATE IS WIRE.

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>	
882.626	.007	1/2					VERTICAL ADJUSTMENT	1991	00000025	

Geoid Separations(ft): GEOID18 = -94.491    12B = -94.465    09 = -94.390    03 = -94.301

\* No Horizontal Positions in the Database \*



Mn/DOT Name: C 341

NGS Name: C 341

County: LAKE, MN (Sheet 1)

NGS ACRN: <a href="#">SH0588</a>	<a href="#">Get Map</a>
NGS Quad / Sta Num : 47091322/	
USGS Quad: CASTLE DANGER	

				<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	28	53 N	10 W	470306.13	913728.03	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	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	VERTICAL CONTROL DISK	NGS

Description: (2007)                      Stamping: C 341 1978

2.8 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 28.90, AT THE SOUTH END OF A HIGHWAY CURVE, 0.4 MILE NORTHEAST OF TRUNK HIGHWAY 61 BRIDGE OVER THE STEWART RIVER, 30.0 FEET NORTHWEST OF TRUNK HIGHWAY 61, 165.0 FEET NORTH OF DRIVEWAY NUMBERS 1690/1692/1696/1698 EXTENSION, 1.0 FOOT 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>	
640.068	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
640.068	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	
640.068	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
640.068	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3	
640.068	.007	1/2					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>	
639.979	.033	3					VERTICAL CONTROL SURVEY	1987	CS3806	

**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>	
640.317	.262			545.284	.197	2011	GPS - RTRN	2017	RTRN2017	
640.041	.262			545.107	.197	2007	GPS - RTRN	2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -95.062    12B = -95.033    09 = -94.934    03 = -94.859

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 03 06.12974	91 37 28.02950			566841.875	197640.555	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 03 06.13022	91 37 28.03147			566841.739	197640.607	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2992476.371	532825.497			1983182.227	17099138.130	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2992476.234	532825.543			1983182.089	17099138.177	.131	3	GPS - RTRN	2011	RTRN2011



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/C_341-SH0588-3NW-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/C_341-SH0588-3NW-04OCT2017.jpg</a>	NW	Oct 4, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/C_341-SH0588-2-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/C_341-SH0588-2-04OCT2017.jpg</a>		Oct 4, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/C_341-SH0588-1-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/C_341-SH0588-1-04OCT2017.jpg</a>		Oct 4, 2017

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



Mn/DOT Name: C 353

NGS Name: C 353

County: LAKE, MN (Sheet 1)

NGS ACRN: <a href="#">RM0375</a>	<a href="#">Get Map</a>
NGS Quad / Sta Num : 46091414/	
USGS Quad: TWO HARBORS OE S	

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
				<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
NE	16	52 N	11 W	465922.62	914403.00	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>
1979	2018	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER IS STEEL ROD

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STEEL ROD (NO SLEEVE) (DEPTH 10 FT)	VERTICAL CONTROL DISK	NGS

Description: (2009)                      Stamping: C 353 1979

2.8 MILES SOUTHWEST ON COUNTY ROAD 61 SCENIC DRIVE FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND SCENIC DRIVE IN TWO HARBORS, 41.7 FEET NORTHWEST OF THE NORTHWEST RAIL OF THE RAILROAD TRACKS, 40.5 FEET SOUTHEAST OF SCENIC DRIVE, 2.0 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</u>	<u>(/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>					
696.029	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963					
696.032	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE					
696.029	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691					
696.029	.016	2/1					VERTICAL CONTROL SURVEY	2010	VSHOR4					
696.029	.007	1/2					VERTICAL ADJUSTMENT	1991	00000025					

**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>Determination Method</u>	<u>Year</u>	<u>Reference</u>					
696.071	.262			601.757	.197	2007	GPS - RTRN	2011	RTRN2011					

Geoid Separations(ft): GEOID18 = -94.416    12B = -94.413    09 = -94.314    03 = -94.248

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>Geodetic Position</u>						<u>Lake County - Lake (North Shore) Zone</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>Determination Method</u>	<u>Year</u>	<u>Reference</u>							
46 59 22.61994	91 44 03.00118	538992.920	175589.466	.131	3	GPS - RTRN	2011	RTRN2011							

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>MN State Plane - North 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>Determination Method</u>	<u>Year</u>	<u>Reference</u>					
2965530.936	509681.403	1956209.319	17076041.307	.131	3	GPS - RTRN	2011	RTRN2011					

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/C_353-RM0375-3SE-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/C_353-RM0375-3SE-16AUG2011.jpg</a>	SE	Aug 16, 2011
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/C_353-RM0375-2-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/C_353-RM0375-2-16AUG2011.jpg</a>		Aug 16, 2011
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/C_353-RM0375-1-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/C_353-RM0375-1-16AUG2011.jpg</a>		Aug 16, 2011

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



Mn/DOT Name: CARS

NGS Name: CARS

County: LAKE, MN (Sheet 1)

NGS ACRN: [D08116](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				Reference	Reference	Vert	Horz
1/4	Sec	Twp	Rng	Latitude	Longitude	Order	Order
SW	2	52 N	11 W	470051.44	914221.38	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2011	2017	DESTROYED	Horz=NO Vert=NO	YES		RECESSED 1 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: (2011) Stamping: CARS 2011

1.6 MILES SOUTHWEST OF TWO HARBORS, 1.05 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 11 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 24.10, 22.5 FEET NORTHWEST OF NORTHBOUND TRUNK HIGHWAY 61, 20.7 FEET SOUTHEAST OF SOUTHBOUND TRUNK HIGHWAY 61, 1.5 FEET SOUTHEAST OF A WITNESS POST.

Station Pair: SONJU - LAKE, MN

Station Notes  
THE SURVEY MARK WAS DESTROYED BY CONSTRUCTION.

**Leveling-Derived Orthometric Heights (Feet)**

NAVD88							Project Info	
Orthometric Height			Ellipsoid (NAD83)			Determination Method	Year	Reference
Height	Acc	Order (/Class)	Height	Acc	Adj			
775.763	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963
775.773	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE

**Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)**

NAVD88							Project Info	
Orthometric Height			Ellipsoid (NAD83)			Determination Method	Year	Reference
Height	Acc	Order (/Class)	Height	Acc	Adj			
775.855	.262		681.360	.197	2011	GPS - RTRN	2017	RTRN2017
775.753			681.281	.030	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940
775.753			681.281	.030	2011	GPS - STATIC	2013	HBBAY
775.786	.131		681.373	.066	2007	GPS - STATIC	2012	HBBAY

Geoid Separations(ft): GEOID18 = -94.511 12B = -94.498 09 = -94.409 03 = -94.337

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)							Project Info		
Geodetic Position		Lake County - Lake (North Shore) Zone			Acc	Order	Determination Method	Year	Reference
Latitude	Longitude	X	Y						
47 00 51.44310	91 42 21.38444	546233.110	184431.508	.131	3	GPS - RTRN	2017	RTRN2017	
47 00 51.44324	91 42 21.38398	546233.142	184431.522	.020		ADJUSTMENT	2013	GPS2940	
47 00 51.44324	91 42 21.38398	546233.142	184431.522	.020	C	GPS - STATIC	2013	HBBAY	

NAD83(2007)							Project Info		
Geodetic Position		Lake County - Lake (North Shore) Zone			Acc	Order	Determination Method	Year	Reference
Latitude	Longitude	X	Y						
47 00 51.44363	91 42 21.38491	546233.079	184431.563	.033	C	GPS - STATIC	2012	HBBAY	

**State Plane and UTM Coordinates (Feet)**

NAD83(2011)							Project Info		
MN State Plane - North Zone		UTM - Zone 15			Acc	Order	Determination Method	Year	Reference
X	Y	X	Y						
2972412.335	518804.863	1963102.499	17085151.695	.131	3	GPS - RTRN	2017	RTRN2017	
2972412.367	518804.878	1963102.530	17085151.710	.020		ADJUSTMENT	2013	GPS2940	
2972412.367	518804.878	1963102.530	17085151.710	.020	C	GPS - STATIC	2013	HBBAY	

NAD83(2007)							Project Info		
MN State Plane - North Zone		UTM - Zone 15			Acc	Order	Determination Method	Year	Reference
X	Y	X	Y						
2972412.302	518804.916	1963102.465	17085151.749	.033	C	GPS - STATIC	2012	HBBAY	



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/CARS-DO8116-3NW-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/CARS-DO8116-3NW-04OCT2017.jpg</a>	NW	Oct 4, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/CARS-DO8116-2-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/CARS-DO8116-2-04OCT2017.jpg</a>		Oct 4, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/CARS-DO8116-1-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/CARS-DO8116-1-04OCT2017.jpg</a>		Oct 4, 2017

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





Mn/DOT Name: CARTER  
County: LAKE, MN (Sheet 1)

NGS Name: CARTER

NGS ACRN: [DR1375](#) [Get Map](#)  
NGS Quad / Sta Num : 47091323/  
USGS Quad: TWO HARBORS

				<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	31	53 N	10 W	470147.93	914001.66	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>
2017	2019	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:** (2017)                      **Stamping:** CARTER 2017

IN TWO HARBORS, 0.25 MILE NORTH ALONG COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 (4TH STREET) AND TRUNK HIGHWAY 61 IN TWO HARBORS, 34.1 FEET EAST OF COUNTY ROAD 2, 57.0 FEET SOUTH OF AN ENTRANCE TO AN URGENT CARE CENTER, 0.05 MILE SOUTH OF 12TH AVENUE, 1.5 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>	
699.956	.016	2/1						VERTICAL ADJUSTMENT	2021	00000963	
699.949	.016	2/1						VERTICAL CONTROL SURVEY	2019	VNSHORE	

**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>	
699.956				605.169	.023	2011		HORIZONTAL ADJUSTMENT	2019	GPS3328	
699.949	.131			605.366	.066	1996		GPS - STATIC	2019	Hlake2	
699.956				605.169	.023	2011		GPS - STATIC	2019	Hlake2	
700.008	.262			605.245	.197	2011		GPS - RTRN	2017	RTRN2017	

Geoid Separations(ft): GEOID18 = -94.783 12B = -94.764 09 = -94.678 03 = -94.590

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 01 47.93478	91 40 01.65938			556035.920	189944.447	.016		ADJUSTMENT	2019	GPS3328
47 01 47.93478	91 40 01.65938			556035.920	189944.447	.016	C	GPS - STATIC	2019	Hlake2
47 01 47.93454	91 40 01.65837			556035.990	189944.421	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(1996)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 01 47.93453	91 40 01.65986			556035.887	189944.422	.033	C	GPS - STATIC	2019	Hlake2

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>			<u>Project Info</u>			
<u>MN State Plane - North 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>									
2981986.864	524704.393			1972683.253	17091035.088	.016		ADJUSTMENT	2019	GPS3328
2981986.864	524704.393			1972683.253	17091035.088	.016	C	GPS - STATIC	2019	Hlake2
2981986.934	524704.370			1972683.323	17091035.065	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>			<u>Project Info</u>			
<u>MN State Plane - North 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>									
2981986.831	524704.367			1972683.220	17091035.062	.033	C	GPS - STATIC	2019	Hlake2

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/CARTER-DR1375-3E-16OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/CARTER-DR1375-3E-16OCT2017.jpg</a>	E	Oct 16, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/CARTER-DR1375-2-16OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/CARTER-DR1375-2-16OCT2017.jpg</a>		Oct 16, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/CARTER-DR1375-1-16OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/CARTER-DR1375-1-16OCT2017.jpg</a>		Oct 16, 2017

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



Mn/DOT Name: CAST

NGS Name: CAST

County: LAKE, MN (Sheet 1)

NGS ACRN: [DR1379](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091233/  
 USGS Quad: SPLIT ROCK POINT OE S

				<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	32	54 N	9 W	470722.88	912957.44	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>
2017	2019	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 22 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017) Stamping: CAST 2017

12.0 MILES NORTHEAST OF TWO HARBORS, 11.8 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 37.30, 64.0 FEET NORTHWEST OF TRUNK HIGHWAY 61, 15.9 FEET SOUTHWEST OF DRIVEWAY NUMBER 2855, 0.1 MILE NORTHEAST OF CEDAR WOLF TRAIL, 1.5 FEET NORTHEAST OF A WITNESS POST.

Station Pair: N 51 - LAKE, 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>	
648.480	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
648.480	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	

**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>	
648.444				552.771	.021	2011	HORIZONTAL ADJUSTMENT	2019	GPS3328	
648.480	.131			552.965	.066	1996	GPS - STATIC	2019	Hlake2	
648.444				552.771	.021	2011	GPS - STATIC	2019	Hlake2	
648.460	.262			552.811	.197	2011	GPS - RTRN	2017	RTRN2017	

Geoid Separations(ft): GEOID18 = -95.715 12B = -95.649 09 = -95.544 03 = -95.502

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Geodetic Position</u>					<u>Lake County - Lake (North Shore) Zone</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</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>	
47 07 22.87876	91 29 57.44348	47 07 22.87876	91 29 57.44348	598540.052	223022.822	.013		ADJUSTMENT	2019	GPS3328	
47 07 22.87876	91 29 57.44348	47 07 22.87876	91 29 57.44348	598540.052	223022.822	.013	C	GPS - STATIC	2019	Hlake2	
47 07 22.87824	91 29 57.44307	47 07 22.87824	91 29 57.44307	598540.079	223022.769	.131	3	GPS - RTRN	2017	RTRN2017	

<u>NAD83(1996)</u>		<u>Geodetic Position</u>					<u>Lake County - Lake (North Shore) Zone</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</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>	
47 07 22.87852	91 29 57.44398	47 07 22.87852	91 29 57.44398	598540.017	223022.798	.033	C	GPS - STATIC	2019	Hlake2	

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>MN State Plane - North Zone</u>					<u>UTM - Zone 15</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</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>	
3023132.787	559453.259	3023132.787	559453.259	2013871.506	17125713.067	.013		ADJUSTMENT	2019	GPS3328	
3023132.787	559453.259	3023132.787	559453.259	2013871.506	17125713.067	.013	C	GPS - STATIC	2019	Hlake2	
3023132.816	559453.207	3023132.816	559453.207	2013871.535	17125713.015	.131	3	GPS - RTRN	2017	RTRN2017	

<u>NAD83(1996)</u>		<u>MN State Plane - North Zone</u>					<u>UTM - Zone 15</u>			<u>Project Info</u>	
<u>X</u>	<u>Y</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>	
3023132.753	559453.234	3023132.753	559453.234	2013871.472	17125713.042	.033	C	GPS - STATIC	2019	Hlake2	



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/CAST-DR1379-3NW-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/CAST-DR1379-3NW-18OCT2017.jpg</a>	NW	Oct 18, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/CAST-DR1379-2-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/CAST-DR1379-2-18OCT2017.jpg</a>		Oct 18, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/CAST-DR1379-1-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/CAST-DR1379-1-18OCT2017.jpg</a>		Oct 18, 2017

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



Mn/DOT Name: COOKS

NGS Name: COOKS

County: LAKE, MN (Sheet 1)

NGS ACRN: [DR2018](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091331/  
 USGS Quad: KING 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	8	54 N	11 W	471057.85	914517.50		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>
2017	2017	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)	SURVEY DISK	MNDT

Description: (2017)                      Stamping: COOKS 2017

11.0 MILES NORTH OF TWO HARBORS, 3.0 MILES NORTH ALONG COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 IN TWO HARBORS, THEN 2.50 MILES WEST ON COUNTY ROAD 12, THEN 7.80 MILES NORTHERLY ON COUNTY ROAD 131, THEN 1.35 MILES NORTHEAST ON STEWART LAKE ROAD, 31.0 FEET EAST OF STEWART LAKE ROAD, 12.0 FEET SOUTH OF DRIVEWAY NUMBER 491, 497, 481 AND 482, 1.5 FEET 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>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>			
1633.737			1540.916	.021	2011	HORIZONTAL ADJUSTMENT	2019	GPS3302			
			1541.119	.066	1996	GPS - STATIC	2019	Hlake			
1633.737			1540.916	.021	2011	GPS - STATIC	2019	Hlake			

**Geoid Separations(ft): GEOID18 = -92.815    12B = -92.808    09 = -92.736    03 = -92.690**

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Lake 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>
47 10 57.85228	91 45 17.49667	414066.099	142536.554	.013	C	GPS - STATIC	2019	Hlake

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 10 57.85228	91 45 17.49667	535415.488	246131.298	.013		ADJUSTMENT	2019	GPS3302

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 10 57.85199	91 45 17.49721	535415.450	246131.270	.033	C	GPS - STATIC	2019	Hlake

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>MN State Plane - North 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>
2959141.492	580017.679	1949926.159	17146367.551	.013		ADJUSTMENT	2019	GPS3302
2959141.492	580017.679	1949926.159	17146367.551	.013	C	GPS - STATIC	2019	Hlake

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>
2959141.455	580017.649	1949926.122	17146367.522	.033	C	GPS - STATIC	2019	Hlake

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/COOKS-DR2018-3NE-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/COOKS-DR2018-3NE-27SEP2017.jpg</a>	NE	Sep 27, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/COOKS-DR2018-2-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/COOKS-DR2018-2-27SEP2017.jpg</a>		Sep 27, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/COOKS-DR2018-1-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/COOKS-DR2018-1-27SEP2017.jpg</a>		Sep 27, 2017

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



Mn/DOT Name: COVE

NGS Name: COVE

County: LAKE, MN (Sheet 1)

NGS ACRN: [DO8118](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	55 N	8 W	471501.35	911846.62	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>
2011	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

Description: (2011)                      Stamping: COVE 2011

IN BEAVER BAY, 1.0 MILE SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 (LAX LAKE ROAD) IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 50.15, 63.3 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 200.0 FEET SOUTHWEST OF THE COVE POINT LODGE, 39.4 FEET NORTHWEST OF A BIKE PATH, 1.4 FEET NORTHWEST OF A WITNESS POST.

Station Pair: POINT - LAKE, 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</u>	<u>(/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Year</u>	<u>Reference</u>			<u>Year</u>	<u>Reference</u>	
737.220	.016	2/1					2021	00000963	VERTICAL ADJUSTMENT				
737.203	.016	2/1					2019	VNSHORE	VERTICAL CONTROL SURVEY				

**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>			<u>Year</u>	<u>Reference</u>	
737.249	.262			640.908	.197	2011	2017	RTRN2017	GPS - RTRN				
737.177				640.878	.017	2011	2013	GPS2940	HORIZONTAL ADJUSTMENT				
737.177				640.878	.017	2011	2013	HBBAY	GPS - STATIC				
737.203	.131			640.937	.066	2007	2012	HBBAY	GPS - STATIC				

Geoid Separations(ft): GEOID18 = -96.374 12B = -96.345 09 = -96.250 03 = -96.148

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>			<u>Year</u>	<u>Reference</u>	
47 15 01.34670	91 18 46.62369	645712.187	268626.600	.131	3	GPS - RTRN	2017	RTRN2017					
47 15 01.34630	91 18 46.62417	645712.153	268626.560	.020		ADJUSTMENT	2013	GPS2940					
47 15 01.34630	91 18 46.62417	645712.153	268626.560	.020	C	GPS - STATIC	2013	HBBAY					

<u>NAD83(2007)</u>				<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>			<u>Year</u>	<u>Reference</u>	
47 15 01.34684	91 18 46.62498	645712.098	268626.615	.033	C	GPS - STATIC	2012	HBBAY					

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>MN State Plane - North 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>			<u>Year</u>	<u>Reference</u>	
3068436.685	606906.819	2059238.202	17173089.583	.131	3	GPS - RTRN	2017	RTRN2017					
3068436.652	606906.778	2059238.170	17173089.542	.020		ADJUSTMENT	2013	GPS2940					
3068436.652	606906.778	2059238.170	17173089.542	.020	C	GPS - STATIC	2013	HBBAY					

<u>NAD83(2007)</u>				<u>MN State Plane - North 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>			<u>Year</u>	<u>Reference</u>	
3068436.595	606906.831	2059238.113	17173089.595	.033	C	GPS - STATIC	2012	HBBAY					



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/COVE-DO8118-3SE-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/COVE-DO8118-3SE-20SEP2017.jpg</a>	SE	Sep 20, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/COVE-DO8118-2-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/COVE-DO8118-2-20SEP2017.jpg</a>		Sep 20, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/COVE-DO8118-1-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/COVE-DO8118-1-20SEP2017.jpg</a>		Sep 20, 2017

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



Mn/DOT Name: D 173

NGS Name: D 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0273](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091243/  
 USGS Quad: SILVER BAY SW

				<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	13	55 N	9 W	471511.02	912551.84	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>
1935	2007	NOT FOUND	Horz=NO Vert=YES	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: (1935) Stamping: D 173 1935

6.9 MILES WEST OF BEAVER BAY, AT THE NORTHEAST CORNER OF A ROAD JUNCTION, 35.0 FEET NORTH OF LONDON ROAD, 35.0 FEET EAST OF A FOREST ROAD, 6.0 FEET SOUTH OF A 10.0 INCH DIAMETER BALSAM TREE, AT THE EDGE OF A WOODED 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>	
1158.974	.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>	
1158.758	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1158.758	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -94.632 12B = -94.570 09 = -94.518 03 = -94.485

\* No Horizontal Positions in the Database \*



Mn/DOT Name: D 336

NGS Name: D 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0535](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	19	53 N	10 W	470409.10	914002.70	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>
1978	2007	GOOD	Horz=NO Vert=YES	YES		RECESSED 1 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STEEL ROD (NO SLEEVE) (DEPTH 32 FT)	METAL ROD (WITH REMOVABLE ID DISK)	NGS

Description: (2007)                      Stamping: D 336 1978

3.0 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS, AT THE JUNCTION OF COUNTY ROAD 2 AND COUNTY ROAD 12 WEST, 100.0 FEET SOUTHWEST OF THE CORNER OF A FARMHOUSE, 48.0 FEET EAST OF COUNTY ROAD 2, 39.9 FEET SOUTH OF DRIVEWAY NUMBER 1902, 3.0 FEET NORTH OF EXTENDED COUNTY ROAD 12, 3.0 FEET NORTH OF A FENCE CORNER, 2.0 FEET NORTH OF A WITNESS POST. THE DISK IS A PLASTIC CAP.

**Station Notes**

FOUND DISK OFF, THE ROD IS STILL IN GOOD CONDITION. 11-28-2006 THE DISK WAS TURNED IN TO THE CENTRAL OFFICE. STAMPED PLASTIC CAP AND SLIP OVER ROD.

**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>	
962.475	.016	2/1				VERTICAL ADJUSTMENT	2009	00000604	
962.475	.016	2/1				VERTICAL CONTROL SURVEY	2007	VTWOH	
962.475	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025	

Geoid Separations(ft): GEOID18 = -94.357    12B = -94.321    09 = -94.245    03 = -94.163

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/D_336-SH0535-3E-21JUN2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/D_336-SH0535-3E-21JUN2007.jpg</a>	E	Jun 21, 2007
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/D_336-SH0535-2-02JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/D_336-SH0535-2-02JUL2007.jpg</a>		Jul 2, 2007
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/D_336-SH0535-1-02JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/D_336-SH0535-1-02JUL2007.jpg</a>		Jul 2, 2007

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





Mn/DOT Name: D 341

NGS Name: D 341

County: LAKE, MN (Sheet 1)

NGS ACRN: <a href="#">SH0590</a>	<a href="#">Get Map</a>
NGS Quad / Sta Num : 47091322/	
USGS Quad: CASTLE DANGER	

				<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	22	53 N	10 W	470404.49	913534.75	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	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	VERTICAL CONTROL DISK	NGS

Description: (2007)                      Stamping: D 341 1978

4.5 MILES NORTHEAST OF TWO HARBORS, 4.2 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS TO TRUNK HIGHWAY 61 MILEPOINT 30.40, THEN 0.2 MILE NORTHEAST ON SILVER CLIFF TO THE START OF THE GITCHI GAMI STATE TRAIL, THEN WALK 0.24 MILE NORTHEAST TO STATION D 341 IN A ROCK ON YOUR LEFT (NORTHWEST), ON THE INSIDE EDGE OF A CURVE AT SILVER CLIFF ROAD, 32.0 FEET NORTHWEST OF THE SILVER CREEK CLIFF WALKING TRAIL.

**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>	
710.192	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
710.192	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	
710.192	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
710.192	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3	
710.192	.007	1/2					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>	
710.077	.033	3					VERTICAL CONTROL SURVEY	1987	CS3806	
709.999	.033	3					VERTICAL CONTROL SURVEY	1984	CS3806	

**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>	
710.215	.262			615.002	.197	2011	GPS - RTRN	2017	RTRN2017	
710.432	.262			615.317	.197	2007	GPS - RTRN	2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -95.252    12B = -95.216    09 = -95.111    03 = -95.046

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Lake County - Lake (North Shore) Zone</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>							
47 04 04.49125	91 35 34.74918	574805.806	203390.370	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>							
47 04 04.49062	91 35 34.74858	574805.846	203390.305	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>MN State Plane - North 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>	
3000203.837	538888.601	1990916.880	17105187.974	.131	3	GPS - RTRN	2017	RTRN2017	

<u>NAD83(2007)</u>		<u>MN State Plane - North 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>	
3000203.880	538888.538	1990916.923	17105187.911	.131	3	GPS - RTRN	2011	RTRN2011	



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/D_341-SH0590-3NW-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/D_341-SH0590-3NW-27SEP2017.jpg</a>	NW	Sep 27, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/D_341-SH0590-2-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/D_341-SH0590-2-27SEP2017.jpg</a>		Sep 27, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/D_341-SH0590-1-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/D_341-SH0590-1-27SEP2017.jpg</a>		Sep 27, 2017

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



Mn/DOT Name: D 353

NGS Name: D 353

County: LAKE, MN (Sheet 1)

NGS ACRN: <a href="#">RM0374</a>	<a href="#">Get Map</a>
NGS Quad / Sta Num : 46091441/	
USGS Quad: KNIFE RIVER	

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
				<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
SE	20	52 N	11 W	465814.62	914530.46	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>
1979	2018	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) (DEPTH 10 FT)	VERTICAL CONTROL DISK	NGS

Description: (2011)                      Stamping: D 353 1979

2.0 MILES NORTHEAST OF THE KNIFE RIVER. 2.0 MILES NORTHEAST ON COUNTY ROAD 61 FROM THE SCENIC DRIVE BRIDGE OVER THE KNIFE RIVER, AT THE SOUTH END OF A CURVE, 45.6 FEET EAST OF SCENIC DRIVE, 37.6 FEET WEST OF THE WEST RAIL OF A RAILROAD, 1.0 FOOT 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>	
655.589	.016	2/1						VERTICAL ADJUSTMENT	2021	00000963	
655.589	.016	2/1						VERTICAL CONTROL SURVEY	2019	VNSHORE	
655.599	.016	2/1						VERTICAL ADJUSTMENT	2011	00000691	
655.599	.016	2/1						VERTICAL CONTROL SURVEY	2010	VSHOR4	
655.599	.007	1/2						VERTICAL ADJUSTMENT	1991	00000025	

**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>	
655.619	.262			561.433	.197	2007		GPS - RTRN	2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -94.285 12B = -94.281 09 = -94.186 03 = -94.117

**Lat/Lon and County Coordinates (Feet)**

<u>NAVD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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 58 14.62135	91 45 30.46154	532775.616	168837.309	.131	3	GPS - RTRN	2011	RTRN2011	

**State Plane and UTM Coordinates (Feet)**

<u>NAVD83(2007)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
2959588.038	502686.937	1950257.638	17069057.950	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/D_353-RM0374-3E-06NOV2009.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/D_353-RM0374-3E-06NOV2009.jpg</a>	E	Nov 6, 2009
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/D_353-RM0374-2-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/D_353-RM0374-2-16AUG2011.jpg</a>		Aug 16, 2011
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/D_353-RM0374-1-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/D_353-RM0374-1-16AUG2011.jpg</a>		Aug 16, 2011

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



Mn/DOT Name: DAGO

NGS Name: DAGO

County: LAKE, MN (Sheet 1)

NGS ACRN: [DR2019](#) [Get Map](#)  
 NGS Quad / Sta Num : 48090331/  
 USGS Quad: CONNERS ISLAND

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	55 N	10 W	471210.90	913408.98		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>
2017	2017	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 14 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017) Stamping: DAGO 2017

12.0 MILES NORTH NORTHEAST OF TWO HARBORS, 2.30 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 TO TRUNK HIGHWAY MILEPOINT 28.50, THEN 12.60 MILES NORTHERLY ON COUNTY ROAD 3, 61.8 FEET EAST OF COUNTY ROAD 3, 20.2 FEET SOUTHEAST OF LONDON CROSSING ROAD, 1.5 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>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>			
1289.269			1195.591	.022	2011	HORIZONTAL ADJUSTMENT	2019	GPS3302			
			1195.788	.066	1996	GPS - STATIC	2019	Hlake			
1289.269			1195.591	.022	2011	GPS - STATIC	2019	Hlake			
1289.371	.262		1195.713	.197	2011	GPS - RTRN	2017	RTRN2017			

Geoid Separations(ft): GEOID18 = -93.694 12B = -93.658 09 = -93.566 03 = -93.546

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Geodetic Position</u>				<u>Lake 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>		
47 12 10.89688	91 34 08.97810	460263.582	149788.363	.013	C	GPS - STATIC	2019	Hlake		
47 12 10.89599	91 34 08.97690	460263.664	149788.273	.131	3	GPS - RTRN	2017	RTRN2017		

<u>NAD83(2011)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 12 10.89688	91 34 08.97810	581737.719	252543.748	.013		ADJUSTMENT	2019	GPS3302		

<u>NAD83(1996)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 12 10.89664	91 34 08.97863	581737.682	252543.724	.033	C	GPS - STATIC	2019	Hlake		

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>MN State Plane - North 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>		
3005164.280	588275.695	1995950.035	17154555.995	.013		ADJUSTMENT	2019	GPS3302		
3005164.280	588275.695	1995950.035	17154555.995	.013	C	GPS - STATIC	2019	Hlake		
3005164.365	588275.607	1995950.120	17154555.907	.131	3	GPS - RTRN	2017	RTRN2017		

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>		
3005164.244	588275.671	1995949.999	17154555.970	.033	C	GPS - STATIC	2019	Hlake		

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/DAGO-DR2019-3E-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/DAGO-DR2019-3E-27SEP2017.jpg</a>	E	Sep 27, 2017
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/DAGO-DR2019-2-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/DAGO-DR2019-2-27SEP2017.jpg</a>		Sep 27, 2017
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/DAGO-DR2019-1-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/DAGO-DR2019-1-27SEP2017.jpg</a>		Sep 27, 2017

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



Mn/DOT Name: DENTRA  
County: LAKE, MN (Sheet 1)

NGS Name: DENTRA

NGS ACRN: [DR1388](#) [Get Map](#)  
NGS Quad / Sta Num : 47091242/  
USGS Quad: SILVER BAY

				<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	36	56 N	8 W	471720.93	911713.25	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>
2017	2017	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 23 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017)                      Stamping: DENTRA 2017

IN SILVER BAY, AT THE JUNCTION OF COUNTY ROAD 5 (FOREST ROAD 11) AND EDISON BOULEVARD, 73.2 FEET WEST NORTHWEST OF EDISON BOULEVARD, 26.6 FEET NORTH-NORTHEAST OF COUNTY ROAD 5 (FOREST ROAD 11/PENN BOULEVARD), 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>	
973.686	.016	2/1						VERTICAL ADJUSTMENT	2021	00000963	
973.689	.016	2/1						VERTICAL CONTROL SURVEY	2019	VNSHORE	

**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>	
973.689				877.767	.023	2011		HORIZONTAL ADJUSTMENT	2019	GPS3302	
				877.961	.066	1996		GPS - STATIC	2019	Hlake	
973.689				877.767	.023	2011		GPS - STATIC	2019	Hlake	
973.741	.262			877.836	.197	2011		GPS - RTRN	2017	RTRN2017	

Geoid Separations(ft): GEOID18 = -95.951 12B = -95.905 09 = -95.873 03 = -95.787

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 17 20.93340	91 17 13.25487			652388.878	282659.571	.016		ADJUSTMENT	2019	GPS3302
47 17 20.93340	91 17 13.25487			652388.878	282659.571	.016	C	GPS - STATIC	2019	Hlake
47 17 20.93376	91 17 13.25403			652388.937	282659.607	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(1996)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 17 20.93317	91 17 13.25541			652388.841	282659.549	.033	C	GPS - STATIC	2019	Hlake

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>			<u>Project Info</u>			
<u>MN State Plane - North 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>									
3074544.370	621195.073			2065366.240	17187366.617	.016		ADJUSTMENT	2019	GPS3302
3074544.370	621195.073			2065366.240	17187366.617	.016	C	GPS - STATIC	2019	Hlake
3074544.427	621195.111			2065366.297	17187366.654	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>			<u>Project Info</u>			
<u>MN State Plane - North 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>									
3074544.334	621195.049			2065366.204	17187366.593	.033	C	GPS - STATIC	2019	Hlake

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/DENTRA-DR1388-3N-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/DENTRA-DR1388-3N-27SEP2017.jpg</a>	N	Sep 27, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/DENTRA-DR1388-2-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/DENTRA-DR1388-2-27SEP2017.jpg</a>		Sep 27, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/DENTRA-DR1388-1-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/DENTRA-DR1388-1-27SEP2017.jpg</a>		Sep 27, 2017

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



Mn/DOT Name: E 173

NGS Name: E 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0272](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	55 N	9 W	471432.02	912706.69	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>
1935	1978	NOT FOUND	Horz=NO Vert=YES	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: (1935)                      Stamping: E 173 1935

7.0 MILES NORTHEAST OF LONDON, 90.0 FEET EAST OF A WOOD BRIDGE OVER THE EAST SPLIT ROCK RIVER, 34.0 FEET NORTH OF A ROAD, AT A CLEARING.

**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>	
1132.117	.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>	
1131.901	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1131.901	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -94.537    12B = -94.481    09 = -94.413    03 = -94.386

\* No Horizontal Positions in the Database \*



Mn/DOT Name: E 336

NGS Name: E 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0536](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	13	53 N	11 W	470501.00	914003.00	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>
1978	2006	NOT FOUND	Horz=NO Vert=YES	NO		PROJECTS 4 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE) (DEPTH 14 FT)	VERTICAL CONTROL DISK	NGS

Description: (1978)                      Stamping: E 336 1978

4.0 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS, AT DRIVE L 243 WEST, 30.0 FEET WEST OF COUNTY ROAD 2, 24.0 FEET SOUTH OF A DRIVE, 45.0 FEET FROM ROW OF PINE TREES, 2.0 FEET SOUTH OF A POWER POLE WITH A GUY WIRE, 1.0 FOOT NORTH OF A WITNESS POST.

**Station Notes**

USED TIES AND GARMIN, COUNTY ROAD 2 TIES DO NOT FIT.

**Leveling-Derived Orthometric Heights (Feet)**

							<u>Project Info</u>	
<u>NAVD88</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</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>			
1006.750	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025

**Geoid Separations(ft): GEOID18 = -94.196    12B = -94.163    09 = -94.084    03 = -94.006**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: E 341  
County: LAKE, MN (Sheet 1)

NGS Name: E 341

NGS ACRN: <a href="#">SH0591</a>	<a href="#">Get Map</a>
NGS Quad / Sta Num : 47091322/	
USGS Quad: CASTLE DANGER	

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	53 N	10 W	470541.92	913413.19	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	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER IS STEEL ROD

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STEEL ROD (NO SLEEVE) (DEPTH 24 FT)	VERTICAL CONTROL DISK	NGS

**Description:** (2011)                      **Stamping:** E 341 1978

6.8 MILES NORTHEAST OF TWO HARBORS, 6.95 MILES NORTHEAST FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 33.15, 46.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 5.5 FEET NORTHEAST OF A POWER POLE, 0.2 MILE NORTHEAST OF A BRIDGE OVER THE ENCAMPMENT RIVER, 1.0 FOOT 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>		
671.295	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963		
671.295	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE		
671.295	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691		
671.295	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3		
671.295	.007	1/2				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>		
671.147	.033	3				VERTICAL CONTROL SURVEY	1987	CS3806		
671.121	.033	3				VERTICAL CONTROL SURVEY	1984	CS3806		

**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>		
671.265	.262		576.147	.197	2011	GPS - RTRN	2017	RTRN2017		
671.009	.262		575.990	.197	2007	GPS - RTRN	2011	RTRN2011		

Geoid Separations(ft): GEOID18 = -95.167 12B = -95.118 09 = -95.019 03 = -94.964

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 05 41.92166	91 34 13.18979	580650.184	213145.249	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 05 41.92028	91 34 13.19206	580650.024	213145.112	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>
3005653.339	548868.725	1996380.122	17115157.390	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>
3005653.185	548868.583	1996379.968	17115157.248	.131	3	GPS - RTRN	2011	RTRN2011





Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/E_341-SH0591-3SE-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/E_341-SH0591-3SE-27SEP2017.jpg</a>	SE	Sep 27, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/E_341-SH0591-2-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/E_341-SH0591-2-27SEP2017.jpg</a>		Sep 27, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/E_341-SH0591-1-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/E_341-SH0591-1-27SEP2017.jpg</a>		Sep 27, 2017

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



Mn/DOT Name: E 353

NGS Name: E 353

County: LAKE, MN (Sheet 1)

NGS ACRN: [RM0373](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	29	52 N	11 W	465742.31	914552.17	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>
1979	2018	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	VERTICAL CONTROL DISK	NGS

Description: (2002) Stamping: E 353 1979

1.2 MILES NORTHEAST OF A COUNTY ROAD 61 (SCENIC DRIVE) BRIDGE OVER THE KNIFE RIVER, AT THE SOUTHWEST END OF A CURVE, AT THE CENTER OF A CUTBACK, 24.0 FEET NORTHWEST OF SCENIC DRIVE, 3.0 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>
665.136	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963
665.136	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE
665.136	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691
665.136	.016	2/1					VERTICAL CONTROL SURVEY	2010	VSHOR4
665.136	.007	1/2					VERTICAL ADJUSTMENT	1991	00000025

**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>
665.136				570.881	.012	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940
665.136				570.881	.012	2011	GPS - STATIC	2013	HBBAY
665.123	.131			570.967	.066	2007	GPS - STATIC	2012	HBBAY
665.127	.262			570.957	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -94.275 12B = -94.271 09 = -94.170 03 = -94.101

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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 57 42.31363	91 45 52.16811			531196.587	165598.723	.016		ADJUSTMENT	2013	GPS2940
46 57 42.31363	91 45 52.16811			531196.587	165598.723	.016	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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 57 42.31367	91 45 52.16895			531196.529	165598.729	.033	C	GPS - STATIC	2012	HBBAY
46 57 42.31312	91 45 52.16939			531196.497	165598.674	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2958139.420	499388.075			1948804.472	17065762.301	.016		ADJUSTMENT	2013	GPS2940
2958139.420	499388.075			1948804.472	17065762.301	.016	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2958139.362	499388.078			1948804.414	17065762.304	.033	C	GPS - STATIC	2012	HBBAY
2958139.332	499388.022			1948804.384	17065762.248	.131	3	GPS - RTRN	2011	RTRN2011



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/E_353-RM0373-3NW-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/E_353-RM0373-3NW-16AUG2011.jpg</a>	NW	Aug 16, 2011
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/E_353-RM0373-2-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/E_353-RM0373-2-16AUG2011.jpg</a>		Aug 16, 2011
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/E_353-RM0373-1-16AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/E_353-RM0373-1-16AUG2011.jpg</a>		Aug 16, 2011

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



Mn/DOT Name: E 51

NGS Name: E 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0303](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	1	52 N	11 W	470111.00	914023.00	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	1956	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: E 51 1934

AT TWO HARBORS, 110.0 FEET SOUTH OF THE RAILROAD STATION, AT THE NORTHWEST CORNER OF THE TWP HARBORS RAILROAD PARKS, 1.0 BLOCK EAST OF MAIN STREET, 5.0 FEET EAST OF WALK TO THE WEST STATION ENTRANCE, 1.0 FOOT NORTH OF A WALK ON SIXTH STREET.

**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>	
636.390	.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>	
636.337	.007	1					VERTICAL CONTROL SURVEY	1934	L95 MINN	

Geoid Separations(ft): GEOID18 = -94.829    12B = -94.813    09 = -94.721    03 = -94.639

\* No Horizontal Positions in the Database \*



Mn/DOT Name: ENCAM MNDT

NGS Name: ENCAM

County: LAKE, MN (Sheet 1)

NGS ACRN: [AC5016](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

				<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	1	53 N	10 W	470607.80	913237.26	2	B

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1995	2019	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	STEEL SPIKE ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ALUMINUM ALLOY ROD (NO SLEEVE) (<10 FT) (DEPTH 6 FT)	METAL ROD	MNDT

Description: (1995)                      Stamping: ENCAM 1995

8.0 MILES NORTHEAST OF TWO HARBORS, 8.45 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 34.75, 69.5 FEET NORTH-NORTHWEST OF TRUNK HIGHWAY 61, 110.5 FEET EAST-NORTHEAST OF DRIVEWAY NUMBER 2467, 200.5 FEET NORTHEAST OF NORTHEAST CORNER OF A TRUNK HIGHWAY 61 BRIDGE OVER CROW CREEK, 48.6 FEET SOUTHEAST OF A POWER POLE, 3.4 FEET SOUTH-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>	
701.006	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963	
701.006	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE	
701.006	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
701.006	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3	

**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>	
701.006			605.586	.010	2011	HORIZONTAL ADJUSTMENT	2019	GPS3328	
701.006	.131		605.760	.066	1996	GPS - STATIC	2019	Hlake2	
701.006			605.586	.010	2011	GPS - STATIC	2019	Hlake2	
701.006			605.586	.010	2011	HORIZONTAL ADJUSTMENT	2019	GPS3302	
			605.760	.066	1996	GPS - STATIC	2019	Hlake	
701.006			605.586	.010	2011	GPS - STATIC	2019	Hlake	
701.006			605.586	.012	2011	HORIZONTAL ADJUSTMENT	2018	GPS3119	
701.006	.131		605.760	.066	1996	GPS - STATIC	2017	HMNCORS07	
701.006			605.586	.012	2011	GPS - STATIC	2017	HMNPH	
700.999	.262		605.645	.197	2011	GPS - RTRN	2017	RTRN2017	
700.894	.262		605.537	.197	2011	GPS - RTRN	2015	RTRN2015	
701.006			605.586	.014	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940	
701.006			605.579	.014	2011	GPS - STATIC	2013	HBBAY	
701.016	.131		605.753	.066	2007	GPS - STATIC	2012	HBBAY	
			605.586	.015	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800	
700.855	.262		605.602	.197	2007	GPS - RTRN	2011	RTRN2011	
			605.671	.015	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300	
701.016	.098		605.760	.049	1996	GPS - STATIC	2005	GPS2036	
700.983	.098		605.760	.049	1996	GPS - STATIC	2004	GPS1954	
700.976	.098		605.760	.049	1996	GPS - STATIC	1997	GPS805-B	
700.976	.131		605.760	.066	1996	GPS - STATIC	1997	GPS805-C	

Geoid Separations(ft): GEOID18 = -95.410    12B = -95.354    09 = -95.252    03 = -95.207

Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 06 07.79992	91 32 37.26311	587338.403	215633.781	.007		ADJUSTMENT	2019	GPS3328
47 06 07.79992	91 32 37.26311	587338.403	215633.781	.007	C	GPS - STATIC	2019	HLAKE2
47 06 07.79992	91 32 37.26311	587338.403	215633.781	.007		ADJUSTMENT	2019	GPS3302
47 06 07.79992	91 32 37.26311	587338.403	215633.781	.007	C	GPS - STATIC	2019	HLAKE
47 06 07.79992	91 32 37.26311	587338.403	215633.781	.010		ADJUSTMENT	2018	GPS3119
47 06 07.79992	91 32 37.26311	587338.403	215633.781	.010	C	GPS - STATIC	2017	HMNPH
47 06 07.79941	91 32 37.26264	587338.435	215633.729	.131	3	GPS - RTRN	2017	RTRN2017
47 06 07.79856	91 32 37.26297	587338.410	215633.644	.131	3	GPS - RTRN	2015	RTRN2015
47 06 07.79992	91 32 37.26311	587338.403	215633.781	.010		ADJUSTMENT	2013	GPS2940
47 06 07.79978	91 32 37.26317	587338.399	215633.767	.010	C	GPS - STATIC	2013	HBBAY
47 06 07.79992	91 32 37.26311	587338.403	215633.781	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 06 07.80006	91 32 37.26402	587338.340	215633.797	.033	C	GPS - STATIC	2012	HBBAY
47 06 07.79932	91 32 37.26532	587338.249	215633.724	.131	3	GPS - RTRN	2011	RTRN2011
47 06 07.80006	91 32 37.26402	587338.340	215633.797	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 06 07.79988	91 32 37.26371	587338.361	215633.778	.033	C	GPS - STATIC	2019	HLAKE2
47 06 07.79988	91 32 37.26371	587338.361	215633.778	.033	C	GPS - STATIC	2019	HLAKE
47 06 07.79988	91 32 37.26371	587338.361	215633.778	.033	C	GPS - STATIC	2017	HMNCORS07
47 06 07.79988	91 32 37.26371	587338.361	215633.778	.016	B	GPS - STATIC	2005	GPS2036
47 06 07.79988	91 32 37.26371	587338.361	215633.778	.016	B	GPS - STATIC	2004	GPS1954
47 06 07.79988	91 32 37.26371	587338.361	215633.778	.016	B	GPS - STATIC	1997	GPS805-B
47 06 07.79988	91 32 37.26371	587338.361	215633.778	.033	C	GPS - STATIC	1997	GPS805-C

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - North 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>	
3012236.319	551622.524	2002965.690	17117900.589	.007		ADJUSTMENT	2019	GPS3328	
3012236.319	551622.524	2002965.690	17117900.589	.007	C	GPS - STATIC	2019	HLAKE2	
3012236.319	551622.524	2002965.690	17117900.589	.007		ADJUSTMENT	2019	GPS3302	
3012236.319	551622.524	2002965.690	17117900.589	.007	C	GPS - STATIC	2019	HLAKE	
3012236.319	551622.524	2002965.690	17117900.589	.010		ADJUSTMENT	2018	GPS3119	
3012236.319	551622.524	2002965.690	17117900.589	.010	C	GPS - STATIC	2017	HMNPH	
3012236.352	551622.473	2002965.724	17117900.538	.131	3	GPS - RTRN	2017	RTRN2017	
3012236.331	551622.387	2002965.702	17117900.451	.131	3	GPS - RTRN	2015	RTRN2015	
3012236.319	551622.524	2002965.690	17117900.589	.010		ADJUSTMENT	2013	GPS2940	
3012236.315	551622.510	2002965.686	17117900.574	.010	C	GPS - STATIC	2013	HBBAY	
3012236.319	551622.524	2002965.690	17117900.589	.010		ADJUSTMENT	2012	GPS2800	

NAD83(2007)

MN State Plane - North 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>	
3012236.255	551622.537	2002965.627	17117900.602	.033	C	GPS - STATIC	2012	HBBAY	
3012236.167	551622.460	2002965.538	17117900.525	.131	3	GPS - RTRN	2011	RTRN2011	
3012236.255	551622.537	2002965.627	17117900.602	.010		ADJUSTMENT	2007	GPS2300	

NAD83(1996)

MN State Plane - North 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>	
3012236.277	551622.519	2002965.649	17117900.584	.033	C	GPS - STATIC	2019	HLAKE2	
3012236.277	551622.519	2002965.649	17117900.584	.033	C	GPS - STATIC	2019	HLAKE	
3012236.277	551622.519	2002965.649	17117900.584	.033	C	GPS - STATIC	2017	HMNCORS07	
3012236.277	551622.519	2002965.649	17117900.584	.016	B	GPS - STATIC	2005	GPS2036	
3012236.277	551622.519	2002965.649	17117900.584	.016	B	GPS - STATIC	2004	GPS1954	
3012236.277	551622.519	2002965.649	17117900.584	.016	B	GPS - STATIC	1997	GPS805-B	
3012236.277	551622.519	2002965.649	17117900.584	.033	C	GPS - STATIC	1997	GPS805-C	

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ENCAM-AC5016-3NW-11SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ENCAM-AC5016-3NW-11SEP2017.jpg</a>	NW	Sep 11, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ENCAM-AC5016-2-11SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ENCAM-AC5016-2-11SEP2017.jpg</a>		Sep 11, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ENCAM-AC5016-1-11SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ENCAM-AC5016-1-11SEP2017.jpg</a>		Sep 11, 2017

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



Mn/DOT Name: F 173

NGS Name: F 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0271](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	16	55 N	9 W	471431.32	912928.53	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>
1935	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: (2009)                      Stamping:

9.2 MILES WEST OF BEAVER BAY, 1.6 MILES NORTHWEST ON COUNTY ROAD 4 FROM THE JUNCTION WITH TRUNK HIGHWAY 61 IN BEAVER BAY, THEN 9.1 MILES WEST ON COUNTY ROAD 3, 0.5 MILE WEST OF A BRIDGE OVER THE WEST SPLIT ROCK RIVER, 28.0 FEET NORTH OF COUNTY ROAD 3.

Station Notes

5-18-2009 THE LOCATION IS ON THE EDGE OF A BACK SLOPE OF REBUILT COUNTY ROAD 3. CONSIDER DESTROYED.

**Leveling-Derived Orthometric Heights (Feet)**

<u>NAVD88</u>							<u>Project Info</u>	
<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</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>			
1252.179	.016	2/0				VERTICAL ADJUSTMENT	1991	00000025

  

<u>NGVD29</u>							<u>Project Info</u>	
<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</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>			
1251.953	.007	1				VERTICAL CONTROL SURVEY	1935	L49 MINN

Geoid Separations(ft): GEOID18 = -94.048    12B = -93.996    09 = -93.897    03 = -93.894

\* No Horizontal Positions in the Database \*





Mn/DOT Name: F 341  
County: LAKE, MN (Sheet 1)

NGS Name: F 341

NGS ACRN: [SH0592](#) [Get Map](#)  
NGS Quad / Sta Num : 47091322/  
USGS Quad: CASTLE DANGER

				<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	53 N	9 W	470611.04	913220.60	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>
1978	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	VERTICAL CONTROL DISK	NGS

Description: (2007) Stamping: F 341 1978

8.6 MILES NORTHEAST OF TWO HARBORS, 0.15 MILE NORTHEAST OF THE NORTHEAST END OF A BRIDGE OVER SILVER CREEK, AT TRUNK HIGHWAY 61 MILEPOINT 34.95, 42.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 132.50 FEET SOUTHWEST OF DRIVEWAY NUMBER 2510 SE, 1.0 FOOT NORTHEAST OF A WITNESS POST, 10.0 FEET SOUTHEAST OF ANOTHER 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>		
707.174	.016	2/1				VERTICAL ADJUSTMENT		2021	00000963		
707.174	.016	2/1				VERTICAL CONTROL SURVEY		2019	VNSHORE		
707.174	.016	2/1				VERTICAL ADJUSTMENT		2011	00000691		
707.174	.016	2/1				VERTICAL CONTROL SURVEY		2009	VSHOR3		
707.174	.007	1/2				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>		
706.997	.033	3				VERTICAL CONTROL SURVEY		1984	CS3806		

**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>		
706.944	.262		611.537	.197	2011	GPS - RTRN		2017	RTRN2017		
707.174	.262		611.875	.197	2007	GPS - RTRN		2011	RTRN2011		

Geoid Separations(ft): GEOID18 = -95.462 12B = -95.407 09 = -95.298 03 = -95.256

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>											
47 06 11.04064	91 32 20.60000			588497.496	215939.202	.131	3	GPS - RTRN	2017	RTRN2017		

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>											
47 06 11.04145	91 32 20.60280			588497.304	215939.288	.131	3	GPS - RTRN	2011	RTRN2011		

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>			<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>								
3013382.204	551974.033		2004111.838	17118250.282	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>			<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>								
3013382.009	551974.111		2004111.643	17118250.361	.131	3	GPS - RTRN	2011	RTRN2011



**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/F_341-SH0592-3SE-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/F_341-SH0592-3SE-27SEP2017.jpg</a>	SE	Sep 27, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/F_341-SH0592-2-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/F_341-SH0592-2-27SEP2017.jpg</a>		Sep 27, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/F_341-SH0592-1-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/F_341-SH0592-1-27SEP2017.jpg</a>		Sep 27, 2017

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



Mn/DOT Name: F 353

NGS Name: F 353

County: LAKE, MN (Sheet 1)

NGS ACRN: <a href="#">RM0372</a>	<a href="#">Get Map</a>
NGS Quad / Sta Num : 46091441/	
USGS Quad: KNIFE RIVER	

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SW	29	52 N	11 W	465734.71	914603.39	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1979	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
ROCK (1 TO 3 METERS)	VERTICAL CONTROL DISK	NGS

Description: (2012)                      Stamping: F 353 1979

1.0 MILE NORTHEAST OF KNIFE RIVER. 1.0 MILE NORTHEAST ALONG COUNTY ROAD 61 FROM THE BRIDGE OVER THE KNIFE RIVER (IN THE TOWN OF KNIFE RIVER), 30.3 FEET NORTHWEST OF THE CENTER OF SCENIC DRIVE, AT THE CENTER OF A CUT BANK, 128.2 FEET SOUTHWEST OF A NO PASSING SIGN, 3.0 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			
646.866	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963			
646.866	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE			
646.866	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691			
646.866	.016	2/1					VERTICAL CONTROL SURVEY	2010	VSHOR4			
646.866	.007	1/2					VERTICAL ADJUSTMENT	1991	00000025			

**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			
646.452	.262			552.204	.197	2011	GPS - RTRN	2017	RTRN2017			
646.879	.262			552.729	.197	2007	GPS - RTRN	2011	RTRN2011			

Geoid Separations(ft): GEOID18 = -94.255    12B = -94.252    09 = -94.150    03 = -94.081

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)				Geodetic Position				Lake County - Lake (North Shore) Zone			Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference				
46 57 34.71389	91 46 03.38751	530401.115	164846.524	.131	3	GPS - RTRN	2017	RTRN2017				

NAD83(2007)				Geodetic Position				Lake County - Lake (North Shore) Zone			Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference				
46 57 34.71304	91 46 03.38784	530401.091	164846.439	.131	3	GPS - RTRN	2011	RTRN2011				

**State Plane and UTM Coordinates (Feet)**

NAD83(2011)				MN State Plane - North Zone				UTM - Zone 15			Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference				
2957374.587	498604.786	1948038.691	17064980.414	.131	3	GPS - RTRN	2017	RTRN2017				

NAD83(2007)				MN State Plane - North Zone				UTM - Zone 15			Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference				
2957374.566	498604.700	1948038.669	17064980.327	.131	3	GPS - RTRN	2011	RTRN2011				

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/F_353-RM0372-3NW-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/F_353-RM0372-3NW-04OCT2017.jpg</a>	NW	Oct 4, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/F_353-RM0372-2-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/F_353-RM0372-2-04OCT2017.jpg</a>		Oct 4, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/F_353-RM0372-1-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/F_353-RM0372-1-04OCT2017.jpg</a>		Oct 4, 2017

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



Mn/DOT Name: F 51

NGS Name: F 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0304](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	1	52 N	11 W	470118.00	914014.00	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	1974	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: (1974)                      Stamping: F 51 1934

IN TWO HARBORS, 98.0 FEET EAST ALONG 3RD AVENUE FROM THE JUNCTION OF 3RD AVENUE AND 6TH STREET IN TWO HARBORS.

**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>	
661.042	.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>	
660.996	.007	1					VERTICAL CONTROL SURVEY	1934	L95 MINN	

Geoid Separations(ft): GEOID18 = -94.839    12B = -94.819    09 = -94.728    03 = -94.645

\* No Horizontal Positions in the Database \*





Mn/DOT Name: G 173

NGS Name: G 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0319](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091321/  
 USGS Quad: TWO HARBORS NE

				<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	19	55 N	9 W	471431.58	913137.79	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>
1935	1978	NOT FOUND	Horz=NO Vert=YES	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: (1935)                      Stamping: G 173 1935

3.7 MILES NORTHEAST OF LONDON, 0.5 MILE WEST OF A LOOKOUT TOWER, 575.0 FEET EAST OF A BRIDGE OVER A SMALL STREAM AT A FENCE LINE, NEAR A LARGE CLEARING, 25.0 FEET SOUTH OF A ROAD, 20.0 FEET EAST OF A FIELD ENTRANCE.

**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>	
1329.141	.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>	
1328.905	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1328.905	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -93.651 12B = -93.615 09 = -93.500 03 = -93.500

\* No Horizontal Positions in the Database \*



Mn/DOT Name: G 336

NGS Name: G 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0538](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	1	54 N	11 W	470631.00	914003.00	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>
1978	1978	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	VERTICAL CONTROL DISK	NGS

**Description:** (1978)                      **Stamping:** G 336 1978

5.7 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS, ON THE OUTSIDE EDGE OF A CURVE, 200.0 FEET NORTH OF A Y-JUNCTION OF COUNTY ROAD 2 AND UT 41, 27.6 FEET WEST FROM THE CENTERLINE OF COUNTY ROAD 2, 70.0 FEET EAST OF UT 41, 60.0 FEET SOUTH OF A POWER POLE, IN THE TOP OF A ROCK OUTCROP BETWEEN A Y-JUNCTION AND SILVER CREEK.

**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>	
1245.749	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025	

**Geoid Separations(ft): GEOID18 = -93.884    12B = -93.861    09 = -93.776    03 = -93.704**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: G 341

NGS Name: G 341

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0593](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	28	54 N	9 W	470748.00	912913.00	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>
1978	2000	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STEEL ROD (NO SLEEVE)	BENCH MARK DISK	NGS

**Description:** (2000)                      **Stamping:** G 341 1978

11.7 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, 124.0 FEET NORTHEAST OF TRUNK HIGHWAY 61 MILEPOST 338, 48.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 88.0 FEET SOUTHWEST OF THE SOUTHEAST END OF A METAL CULVERT, 1.0 FOOT 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>	
658.253	.007	1/2					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>	
658.089	.033	3					VERTICAL CONTROL SURVEY	1987	CS3806	

Geoid Separations(ft): GEOID18 = -95.784    12B = -95.722    09 = -95.613    03 = -95.574

\* No Horizontal Positions in the Database \*





Mn/DOT Name: G 353

NGS Name: G 353

County: LAKE, MN (Sheet 1)

NGS ACRN: [RM0371](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	31	52 N	11 W	465657.00	914658.00	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>
1979	2005	DESTROYED	Horz=NO Vert=NO	YES	3591		SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	BENCH MARK DISK	NGS

Description: (2002)                      Stamping: G 353 1979

IN KNIFE RIVER, IN THE NORTHWEST END OF A NORTHEAST ABUTMENT OF COUNTY ROAD 61 SCENIC DRIVE BRIDGE NUMBER 3591 OVER THE KNIFE RIVER, 20.0 FEET NORTHWEST OF SCENIC DRIVE.

**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>	
615.130	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025	

Geoid Separations(ft): GEOID18 = -94.157    12B = -94.153    09 = -94.045    03 = -93.979

\* No Horizontal Positions in the Database \*



Mn/DOT Name: G 355

NGS Name: G 355

County: LAKE, MN (Sheet 1)

NGS ACRN: <a href="#">SH0587</a>	<a href="#">Get Map</a>
NGS Quad / Sta Num : 47091323/	
USGS Quad: TWO HARBORS	

				<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	29	53 N	10 W	470235.56	913815.16	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>
1979	2017	GOOD	Horz=NO Vert=NO	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	VERTICAL CONTROL DISK	NGS

Description: (2000)                      Stamping: G 355 1979

1.9 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, 108.0 FEET WEST OF TRUNK HIGHWAY 61 MILEPOST 28.00, 73.6 FEET NORTHWEST OF TRUNK HIGHWAY 61, 83.5 FEET SOUTHEAST OF THE SOUTHWEST CORNER OF A HOUSE, 44.0 FEET SOUTHWEST OF DRIVEWAY NUMBER 1573, 92.3 FEET SOUTH OF THE SOUTHEAST CORNER OF A HOUSE.

Station Notes

THE SURVEY MARK IS ON PRIVATE PROPERTY AND HAS BEEN ABANDONED FOR MNDOT 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 (/Class)</u>	<u>Height</u>	<u>Acc</u>	<u>Adj</u>	<u>Year</u>	<u>Reference</u>					
631.560	.016	2/1				2021	00000963					
631.560	.016	2/1				2019	VNSHORE					
631.560	.016	2/1				2011	00000691					
631.560	.016	2/1				2009	VSHOR3					
631.560	.007	1/2				1991	00000025					

<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>					
631.482	.033	3				1987	CS3806					

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>					
631.675	.262		536.698	.197	2011	2017	RTRN2017					
631.560			536.574	.038	2011	2013	GPS2940					
631.560			536.574	.038	2011	2013	HBBAY					
631.560	.131		536.685	.066	2007	2012	HBBAY					
631.488	.262		536.610	.197	2007	2011	RTRN2011					

Geoid Separations(ft): GEOID18 = -950000 12B = -94.974 09 = -94.878 03 = -94.800

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>			<u>Geodetic Position</u>			<u>Lake County - Lake (North Shore) Zone</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>Order (/Class)</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>				
47 02 35.55649	91 38 15.16305		563513.484	194611.923	.131	3	2017	RTRN2017				
47 02 35.55663	91 38 15.16381		563513.432	194611.939	.026		2013	GPS2940				
47 02 35.55663	91 38 15.16381		563513.432	194611.939	.026	C	2013	HBBAY				

<u>NAD83(2007)</u>			<u>Geodetic Position</u>			<u>Lake County - Lake (North Shore) Zone</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</u>	<u>Order (/Class)</u>	<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>				
47 02 35.55681	91 38 15.16454		563513.382	194611.958	.033	C	2012	HBBAY				
47 02 35.55573	91 38 15.16581		563513.292	194611.851	.131	3	2011	RTRN2011				

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North 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>
2989271.757	529666.494	1979973.678	17095984.816	.131	3	GPS - RTRN	2017	RTRN2017
2989271.704	529666.507	1979973.625	17095984.829	.026		ADJUSTMENT	2013	GPS2940
2989271.704	529666.507	1979973.625	17095984.829	.026	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North 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>
2989271.653	529666.524	1979973.574	17095984.846	.033	C	GPS - STATIC	2012	HBBAY
2989271.567	529666.413	1979973.489	17095984.735	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/G_355-SH0587-3NW-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/G_355-SH0587-3NW-04OCT2017.jpg</a>	NW	Oct 4, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/G_355-SH0587-2-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/G_355-SH0587-2-04OCT2017.jpg</a>		Oct 4, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/G_355-SH0587-1-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/G_355-SH0587-1-04OCT2017.jpg</a>		Oct 4, 2017

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



Mn/DOT Name: G 51

NGS Name: G 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0305](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	31	53 N	10 W	470133.00	914001.00	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	1974	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: (1974)                      Stamping: G 51 1934

IN TWO HARBORS, 79.0 FEET WEST ALONG 7TH AVENUE FROM THE JUNCTION OF 7TH AVENUE AND WILLOW STREET IN TWO HARBORS.

**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>	
644.001	.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>	
643.952	.007	1					VERTICAL CONTROL SURVEY	1934	L95 MINN	

Geoid Separations(ft): GEOID18 = -94.832    12B = -94.816    09 = -94.728    03 = -94.642

\* No Horizontal Positions in the Database \*



Mn/DOT Name: GOOSEBERRY

NGS Name: GOOSEBERRY

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0755](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/1007  
 USGS Quad: SPLIT ROCK POINT

				<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	27	54 N	9 W	470818.94	912751.74		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>
1943	2000	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
OBJECT SURROUNDED BY A MASS OF CONCRETE	TRIANGULATION STATION DISK	NGS

**Description:** (2000)                      **Stamping:** GOOSEBERRY 1943

13.5 MILES NORTHEAST OF TWO HARBORS, IN GOOSEBERRY FALLS STATE PARK, 0.45 MILE SOUTHEAST ON A GRAVEL ROAD FROM AN ENTRANCE TO THE STATE PARK AT TRUNK HIGHWAY 61, 43.0 FEET NORTH OF A GRAVEL ROAD, 42.0 FEET EAST OF A 4.0 INCH DIAMETER PINE TREE, 27.0 FEET NORTHWEST OF A FENCE CORNER, 109.36 FEET SOUTHWEST OF GOOSEBERRY RM 1, 91.13 FEET EAST OF GOOSEBERRY 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>	
646.324	.197		550.563	.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>	
646.291						RECIPROCAL VERTICAL ANGLE	1943	HORZ	

Geoid Separations(ft): GEOID18 = -95.987 12B = -95.925 09 = -95.823 03 = -95.781

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 08 18.93935	91 27 51.73958	607338.905	228535.916	.066	2	ADJUSTMENT	1999	17648	
47 08 18.94608	91 27 51.73753	607339.059	228536.595	.066	2	ADJUSTMENT	1991	17497	

  

<u>NAD83(1986)</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 08 18.94425	91 27 51.73438	607339.274	228536.406	.066	2	ADJUSTMENT	1986	17289	

  

<u>NAD27</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 08 19.18800	91 27 51.13900			.100	2	CLASSICAL SURVEY	1956	11100	

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>UTM - Zone 15</u>				<u>Determination Method</u>		<u>Project Info</u>	
<u>MN State Plane - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>	
3031703.435	565313.714	2022449.160	17131559.302	.066	2	ADJUSTMENT	1999	17648	
3031703.562	565314.399	2022449.288	17131559.986	.066	2	ADJUSTMENT	1991	17497	

  

<u>NAD83(1986)</u>		<u>UTM - Zone 15</u>				<u>Determination Method</u>		<u>Project Info</u>	
<u>MN State Plane - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>	
3031703.784	565314.218	2022449.510	17131559.805	.066	2	ADJUSTMENT	1986	17289	

  

<u>NAD27</u>		<u>UTM - Zone 15</u>				<u>Determination Method</u>		<u>Project Info</u>	
<u>MN State Plane - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>	
2407090.327	237255.532			.100	2	CLASSICAL SURVEY	1956	11100	



Mn/DOT Name: GOOSEBERRY AZ MK

NGS Name: GOOSEBERRY AZ MK

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2569](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	22	54 N	9 W	470833.00	912802.00		

<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>
1943	2000	DESTROYED	Horz=NO Vert=NO	NO	3585		SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE WALKWAY	AZIMUTH MARK DISK	NGS

**Description:** (2000)                      **Stamping:** GOOSEBERRY 1943

12.7 MILES NORTHEAST OF TWO HARBORS, IN THE SOUTH SIDEWALK OF TRUNK HIGHWAY 61 BRIDGE NUMBER 3585 OVER THE GOOSEBERRY RIVER, 75.0 FEET SOUTHWEST OF THE NORTHEAST END OF A BRIDGE, 21.0 FEET LEFT OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 STATION 2137+00.

**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>		
755.133	.033	3							VERTICAL CONTROL SURVEY	1971	CS3805	

**Geoid Separations(ft):** GEOID18 = -95.879    12B = -95.820    09 = -95.718    03 = -95.676

\* No Horizontal Positions in the Database \*



Mn/DOT Name: GOOSEBERRY RM 1

NGS Name: GOOSEBERRY RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2570](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/1007  
 USGS Quad: SPLIT ROCK POINT

				<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	27	54 N	9 W	470819.96	912751.24		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1943	2011	NOT FOUND	Horz=NO Vert=YES	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:** **Stamping:** GOOSEBERRY NO 1 1943

13.5 MILES NORTHEAST OF TWO HARBORS, IN GOOSEBERRY FALLS STATE PARK, 0.45 MILE SOUTHEAST ON A GRAVEL ROAD FROM AN ENTRANCE TO THE STATE PARK AT TRUNK HIGHWAY 61, 1.0 FOOT WEST OF A WIRE FENCE, 109.36 FEET NORTHEAST OF STATION GOOSEBERRY.

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

**Geoid Separations(ft): GEOID18 = -95.984 12B = -95.925 09 = -95.820 03 = -95.781**



Mn/DOT Name: GOOSEBERRY RM 2

NGS Name: GOOSEBERRY RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2571](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/1007  
 USGS Quad: SPLIT ROCK POINT

				<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	27	54 N	9 W	470818.89	912753.06		

<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>
1943	2011	NOT FOUND	Horz=NO Vert=YES	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:** **Stamping:** GOOSEBERRY NO 2 1943

13.5 MILES NORTHEAST OF TWO HARBORS, IN GOOSEBERRY FALLS STATE PARK, 0.45 MILE SOUTHEAST ON A GRAVEL ROAD FROM AN ENTRANCE TO THE STATE PARK AT TRUNK HIGHWAY 61, 42.0 FEET NORTH OF THE CENTERLINE OF A GRAVEL ROAD, 39.0 FEET WEST OF A LONE PINE TREE, 21.0 FEET NORTH OF A WIRE FENCE.

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

**Geoid Separations(ft): GEOID18 = -95.984 12B = -95.925 09 = -95.820 03 = -95.781**





Mn/DOT Name: H 173

NGS Name: H 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0318](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091321/  
 USGS Quad: TWO HARBORS NE

				<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	26	55 N	10 W	471339.68	913336.85	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>
1935	2000	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)	BENCH MARK DISK	NGS

Description: (1935)                      Stamping: H 173 1935

1.7 MILES NORTHEAST OF LONDON, 0.66 MILE SOUTH OF A CREEK, 0.5 MILE SOUTH OF A SMALL HILL, 31.0 FEET EAST OF COUNTY ROAD 3, IN A CLEARING.

**Station Notes**

DUE TO TREE COVER, THIS SURVEY MARK HAS BEEN ABANDONED FOR MNDOT GEODETIC HORIZONTAL SURVEYS.

**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>	
1392.077	.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>	
1391.834	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1391.834	.007	1				VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -93.494 12B = -93.464 09 = -93.369 03 = -93.353

\* No Horizontal Positions in the Database \*



Mn/DOT Name: H 178

NGS Name: H 178

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0288](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	35	56 N	8 W	471709.39	911930.73	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>
1935	2007	NOT FOUND	Horz=NO Vert=YES	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: (1935)                      Stamping: H 178 1935

2.6 MILES NORTH ON COUNTY ROAD 4 FROM THE JUNCTION OF COUNTY ROAD 4 AND TRUNK HIGHWAY 61 AT BEAVER BAY, 1.0 MILE NORTHEAST OF THE JUNCTION OF COUNTY ROAD 4 AND COUNTY ROAD 3, AT THE TOP OF A HILL, 32.0 FEET SOUTH OF A ROAD, 5.0 FEET SOUTH OF A POPLAR TREE, 60.0 FEET EAST OF A ROAD SOUTHWEST.

**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>	
1125.483	.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>	
1125.277	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1125.277	.033	3					VERTICAL CONTROL SURVEY	1979	USGS-VERT	
1125.277	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -95.459    12B = -95.410    09 = -95.367    03 = -95.302

\* No Horizontal Positions in the Database \*



Mn/DOT Name: H 336

NGS Name: H 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0539](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	54 N	10 W	470724.00	913954.00	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>
1978	1978	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	VERTICAL CONTROL DISK	NGS

**Description:** (1978)                      **Stamping:** H 336 1978

6.7 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS, 60.0 FEET EAST OF COUNTY ROAD 2, 90.0 FEET NORTH OF A POINT IN LINE WITH THE NORTH EDGE OF A RED HOUSE, 1.0 POLE NORTH OF A POWER POLE WITH A TRANSFORMER, 0.05 MILE SOUTH OF A DRIVE SURROUNDED BY BLAZED PINE TREES, IN THE TOP OF A 6.0 FOOT BY 10.0 FOOT BOULDER.

**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>			
1311.986	.007	1/2							VERTICAL ADJUSTMENT	1991	00000025		

**Geoid Separations(ft): GEOID18 = -93.733    12B = -93.710    09 = -93.622    03 = -93.563**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: H 341

NGS Name: H 341

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0594](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	27	54 N	9 W	470829.00	912821.00	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>
1978	2000	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	BENCH MARK DISK	NGS

**Description:** (2000)                      **Stamping:** H 341 1978

12.7 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, 0.1 MILE NORTHEAST OF THE GOOSEBERRY FALLS STATE PARK ENTRANCE, 0.2 MILE SOUTHWEST OF TRUNK HIGHWAY 61 BRIDGE OVER THE GOOSEBERRY RIVER, 300.0 FEET NORTHEAST OF TRUNK HIGHWAY 61 MILEPOST 339, 34.0 FEET NORTHWEST OF TRUNK HIGHWAY 61, 4.0 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>	
726.383	.007	1/2					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>	
726.226	.033	3					VERTICAL CONTROL SURVEY	1987	CS3806	

Geoid Separations(ft): GEOID18 = -95.817    12B = -95.758    09 = -95.656    03 = -95.610

\* No Horizontal Positions in the Database \*



Mn/DOT Name: H 355

NGS Name: H 355

County: LAKE, MN (Sheet 1)

NGS ACRN: <a href="#">SH0589</a>	<a href="#">Get Map</a>
NGS Quad / Sta Num : 47091322/	
USGS Quad: CASTLE DANGER	

1/4	Sec	Twp	Rng	Reference	Reference	Vert	Horz
				Latitude	Longitude	Order	Order
SE	21	53 N	10 W	470341.52	913642.21	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1979	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
ROCK (1 TO 3 METERS)	VERTICAL CONTROL DISK	NGS

Description: (2007) Stamping: H 355 1979

3.6 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 29.80, 50.5 FEET NORTHWEST OF TRUNK HIGHWAY 61, 67.5 FEET NORTHEAST OF THE NORTHEAST CORNER OF A CONCRETE BLOCK HOUSE, 96.5 FEET SOUTHWEST OF A POWER POLE WITH A TRANSFORMER, 110.0 FEET NORTHEAST OF A DRIVEWAY NORTHWEST, 1.0 FOOT 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
665.366	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963
665.366	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE
665.366	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691
665.366	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3
665.366	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025

NGVD29				Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
665.264	.033	3				VERTICAL CONTROL SURVEY	1987	CS3806

**Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)**

NAVD88				Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
665.425	.262		570.363	.197	2011	GPS - RTRN	2017	RTRN2017
665.366			570.291	.040	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940
665.366			570.291	.040	2011	GPS - STATIC	2013	HBBAY
665.353	.131		570.402	.066	2007	GPS - STATIC	2012	HBBAY
665.297	.262		570.334	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -95.095 12B = -95.062 09 = -94.964 03 = -94.892

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)		Lake County - Lake (North Shore) Zone					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 03 41.51975	91 36 42.20638	570088.651	201159.550	.131	3	GPS - RTRN	2017	RTRN2017
47 03 41.52011	91 36 42.20731	570088.587	201159.588	.026		ADJUSTMENT	2013	GPS2940
47 03 41.52011	91 36 42.20731	570088.587	201159.588	.026	C	GPS - STATIC	2013	HBBAY

NAD83(2007)		Lake County - Lake (North Shore) Zone					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 03 41.52030	91 36 42.20804	570088.537	201159.609	.033	C	GPS - STATIC	2012	HBBAY
47 03 41.51793	91 36 42.20834	570088.511	201159.369	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North 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>
2995579.821	536471.204	1986290.385	17102778.192	.131	3	GPS - RTRN	2017	RTRN2017
2995579.756	536471.240	1986290.320	17102778.228	.026		ADJUSTMENT	2013	GPS2940
2995579.756	536471.240	1986290.320	17102778.228	.026	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North 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>
2995579.705	536471.258	1986290.270	17102778.246	.033	C	GPS - STATIC	2012	HBBAY
2995579.688	536471.018	1986290.253	17102778.006	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/H_355-SH0589-3NW-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/H_355-SH0589-3NW-04OCT2017.jpg</a>	NW	Oct 4, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/H_355-SH0589-2-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/H_355-SH0589-2-04OCT2017.jpg</a>		Oct 4, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/H_355-SH0589-1-04OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/H_355-SH0589-1-04OCT2017.jpg</a>		Oct 4, 2017

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



Mn/DOT Name: H 51

NGS Name: H 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0306](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	29	53 N	10 W	470239.00	913813.00	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>
1934	2007	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)	BENCH MARK DISK	NGS

**Description:** (2000)                      **Stamping:** H 51 1934

1.8 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, 0.1 MILE NORTHEAST OF TRUNK HIGHWAY 61 MILEPOST 328, AT A POWER LINE CROSSING BETWEEN 2 DRIVES SOUTHEAST, 0.45 MILE NORTHEAST OF FLOOD BAY PULL OFF, 46.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 160.0 FEET SOUTHWEST OF DRIVEWAY NUMBER L 452, 70.6 FEET WEST OF A POWER POLE.

**Station Notes**

THE DISK WAS REMOVED.

**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>	
638.992	.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>	
638.913	.033	3				VERTICAL CONTROL SURVEY	1987	CS3806	
638.864	.007	1				VERTICAL CONTROL SURVEY	1935	L95 MINN	

Geoid Separations(ft): GEOID18 = -95.013 12B = -94.987 09 = -94.888 03 = -94.813

\* No Horizontal Positions in the Database \*



Mn/DOT Name: HOUSEY MNDT

NGS Name: HOUSEY

County: LAKE, MN (Sheet 1)

NGS ACRN: [AC5019](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

		<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>
NE	36	55 N	11 W	471247.86	913954.05	2 B

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1995	2018	GOOD	Horz=YES Vert=YES	YES		RECESSED 4 IN.	STEEL SPIKE ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STEEL ROD (NO SLEEVE) (DEPTH 16 FT)	METAL ROD	MNDT

**Description:** (2007)                      **Stamping:** HOUSEY 1995

13.0 MILES NORTH OF TWO HARBORS, 12.9 MILES NORTH ALONG COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, 95.0 FEET WEST OF COUNTY ROAD 2, 71.0 FEET SOUTH OF COUNTY ROAD 14 (WALES ROAD), 99.6 FEET EAST OF A POWER POLE, 33.0 FEET SOUTH-SOUTHWEST OF THE SOUTH END OF A 24.0 INCH DIAMETER CONCRETE CULVERT, 2.8 FEET EAST OF A WITNESS POST.

**Station Notes**

THE STATION IS DRIVEN STAINLESS STEEL ROD WITH LOGO CAP.

**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>		
1536.877	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691		
1536.877	.016	2/1				VERTICAL CONTROL SURVEY	2011	VBCKY-R		
1536.877	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBCKY		

**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>		
1536.877			1443.937	.017	2011	HORIZONTAL ADJUSTMENT	2019	GPS3302		
			1444.144	.066	1996	GPS - STATIC	2019	HLAKE		
1536.877			1443.937	.017	2011	GPS - STATIC	2019	HLAKE		
1536.877			1443.931	.012	2011	HORIZONTAL ADJUSTMENT	2018	GPS3119		
1536.877	.131		1444.144	.066	1996	GPS - STATIC	2017	HMNCORS07		
1536.877			1443.931	.012	2011	GPS - STATIC	2017	HMNPH		
1536.913	.262		1443.987	.197	2011	GPS - RTRN	2017	RTRN2017		
1536.877			1443.931	.011	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940		
1536.877			1443.924	.011	2011	GPS - STATIC	2013	HBBAY		
1536.874	.131		1444.042	.066	2007	GPS - STATIC	2012	HBBAY		
			1443.931	.011	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800		
			1444.016	.011	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300		
1537.005	.098		1444.062	.049	1996	GPS - STATIC	2005	GPS2036		
1536.972	.098		1444.062	.049	1996	GPS - STATIC	2004	GPS1954		
1536.906	.098		1444.062	.049	1996	GPS - STATIC	2004	GPS1994		
1536.919	.098		1444.062	.049	1996	GPS - STATIC	1997	GPS805-B		
1536.919	.131		1444.062	.066	1996	GPS - STATIC	1997	GPS805-C		

Geoid Separations(ft): GEOID18 = -92.943    12B = -92.926    09 = -92.838    03 = -92.802





Lat/Lon and County Coordinates (Feet)

NAD83(2011)

Geodetic Position		Lake County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
47 12 47.86073	91 39 54.05493	436446.480	153597.216	.013		ADJUSTMENT	2019	GPS3302
47 12 47.86073	91 39 54.05493	436446.480	153597.216	.013	C	GPS - STATIC	2019	HLAKE
47 12 47.86001	91 39 54.05564	436446.431	153597.143	.010		ADJUSTMENT	2018	GPS3119
47 12 47.86001	91 39 54.05564	436446.431	153597.143	.010	C	GPS - STATIC	2017	HMNPH
47 12 47.85982	91 39 54.05504	436446.472	153597.124	.131	3	GPS - RTRN	2017	RTRN2017
47 12 47.86001	91 39 54.05564	436446.431	153597.143	.010		ADJUSTMENT	2013	GPS2940
47 12 47.86019	91 39 54.05554	436446.438	153597.162	.010	C	GPS - STATIC	2013	HBBAY
47 12 47.86001	91 39 54.05564	436446.431	153597.143	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

Geodetic Position		Lake County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
47 12 47.86014	91 39 54.05655	436446.368	153597.157	.033	C	GPS - STATIC	2012	HBBAY
47 12 47.86014	91 39 54.05655	436446.368	153597.157	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

Geodetic Position		Lake County		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
47 12 47.86027	91 39 54.05552	436446.439	153597.170	.033	C	GPS - STATIC	2017	HMNCORS07
47 12 47.85973	91 39 54.05652	436446.370	153597.115	.016	B	GPS - STATIC	2005	GPS2036
47 12 47.85973	91 39 54.05652	436446.370	153597.115	.016	B	GPS - STATIC	2004	GPS1954
47 12 47.85973	91 39 54.05652	436446.370	153597.115	.016	B	GPS - STATIC	2004	GPS1994
47 12 47.85973	91 39 54.05652	436446.370	153597.115	.016	B	GPS - STATIC	1997	GPS805-B
47 12 47.85973	91 39 54.05652	436446.370	153597.115	.033	C	GPS - STATIC	1997	GPS805-C

NAD83(1996)

Geodetic Position		Lake County - Lake (North Shore) Zone		Acc	Order	Determination Method	Project Info	
Latitude	Longitude	X	Y				Year	Reference
47 12 47.86027	91 39 54.05552	557993.368	256784.501	.033	C	GPS - STATIC	2019	HLAKE

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - North Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2981272.443	591562.964	1972068.492	17157877.638	.013		ADJUSTMENT	2019	GPS3302
2981272.443	591562.964	1972068.492	17157877.638	.013	C	GPS - STATIC	2019	HLAKE
2981272.395	591562.890	1972068.444	17157877.564	.010		ADJUSTMENT	2018	GPS3119
2981272.395	591562.890	1972068.444	17157877.564	.010	C	GPS - STATIC	2017	HMNPH
2981272.437	591562.872	1972068.486	17157877.546	.131	3	GPS - RTRN	2017	RTRN2017
2981272.395	591562.890	1972068.444	17157877.564	.010		ADJUSTMENT	2013	GPS2940
2981272.402	591562.909	1972068.451	17157877.582	.010	C	GPS - STATIC	2013	HBBAY
2981272.395	591562.890	1972068.444	17157877.564	.010		ADJUSTMENT	2012	GPS2800

NAD83(2007)

MN State Plane - North Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2981272.332	591562.902	1972068.381	17157877.576	.033	C	GPS - STATIC	2012	HBBAY
2981272.332	591562.902	1972068.381	17157877.576	.010		ADJUSTMENT	2007	GPS2300

NAD83(1996)

MN State Plane - North Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
2981272.403	591562.917	1972068.452	17157877.591	.033	C	GPS - STATIC	2019	HLAKE
2981272.403	591562.917	1972068.452	17157877.591	.033	C	GPS - STATIC	2017	HMNCORS07
2981272.335	591562.861	1972068.384	17157877.535	.016	B	GPS - STATIC	2005	GPS2036
2981272.335	591562.861	1972068.384	17157877.535	.016	B	GPS - STATIC	2004	GPS1954
2981272.335	591562.861	1972068.384	17157877.535	.016	B	GPS - STATIC	2004	GPS1994
2981272.335	591562.861	1972068.384	17157877.535	.016	B	GPS - STATIC	1997	GPS805-B
2981272.335	591562.861	1972068.384	17157877.535	.033	C	GPS - STATIC	1997	GPS805-C



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/HOUSEY-AC5019-3S-06SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/HOUSEY-AC5019-3S-06SEP2017.jpg</a>	S	Sep 6, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/HOUSEY-AC5019-2-06SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/HOUSEY-AC5019-2-06SEP2017.jpg</a>		Sep 6, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/HOUSEY-AC5019-1-06SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/HOUSEY-AC5019-1-06SEP2017.jpg</a>		Sep 6, 2017

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



Mn/DOT Name: ISACK

NGS Name: ISACK

County: LAKE, MN (Sheet 1)

NGS ACRN: [DO8121](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091414/  
 USGS Quad: TWO HARBORS OE S

		<u>Reference</u>		<u>Vert</u>	<u>Horz</u>
<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Order</u>	<u>Order</u>
NW	10	52 N	11 W	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>
2011	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	BENCH MARK DISK	MNDT

**Description:** (2011) **Stamping:** ISACK

3.3 MILES SOUTHWEST FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 11 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 22.3, 84.0 FEET NORTHWEST OF NORTHBOUND TRUNK HIGHWAY 61, 36.5 FEET SOUTHEAST OF SOUTHBOUND TRUNK HIGHWAY 61, 142.0 FEET SOUTHWEST OF THE ISACKSON ROAD CROSSOVER, 13.0 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>		
752.010	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963		
752.023	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE		

**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>		
752.033	.262		657.636	.197	2011	GPS - RTRN	2017	RTRN2017		
751.997			657.620	.013	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940		
751.997			657.620	.013	2011	GPS - STATIC	2013	HBBAY		
752.000	.131		657.709	.066	2007	GPS - STATIC	2012	HBBAY		

Geoid Separations(ft): GEOID18 = -94.399 12B = -94.396 09 = -94.301 03 = -94.235

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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 59 43.38451	91 43 52.55083			539763.944	177676.716	.131	3	GPS - RTRN	2017	RTRN2017
46 59 43.38470	91 43 52.55063			539763.959	177676.735	.016		ADJUSTMENT	2013	GPS2940
46 59 43.38470	91 43 52.55063			539763.959	177676.735	.016	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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 59 43.38498	91 43 52.55160			539763.892	177676.765	.033	C	GPS - STATIC	2012	HBBAY

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2966218.067	511797.663			1956899.446	17078155.899	.131	3	GPS - RTRN	2017	RTRN2017
2966218.081	511797.682			1956899.460	17078155.918	.016		ADJUSTMENT	2013	GPS2940
2966218.081	511797.682			1956899.460	17078155.918	.016	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2966218.013	511797.709			1956899.392	17078155.946	.033	C	GPS - STATIC	2012	HBBAY

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ISACK-DO8121-3SE-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ISACK-DO8121-3SE-02OCT2017.jpg</a>	SE	Oct 2, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ISACK-DO8121-2-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ISACK-DO8121-2-02OCT2017.jpg</a>		Oct 2, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ISACK-DO8121-1-08SEP2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ISACK-DO8121-1-08SEP2011.jpg</a>		Sep 8, 2011

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



Mn/DOT Name: J 173

NGS Name: J 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0317](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091321/  
 USGS Quad: TWO HARBORS NE

				<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	35	55 N	10 W	471209.23	913410.49	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>
1935	2000	NOT FOUND	Horz=NO Vert=YES	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: (1935)                      Stamping: J 173 1935

AT LONDON, 80.0 FEET SOUTH OF A V-JUNCTION ROAD, 42.0 FEET EAST OF A ROAD SOUTHWEST, 36.0 FEET WEST OF A ROAD NORTH, AT A FENCE.

**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>	
1290.827	.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>	
1290.581	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1290.581	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -93.697    12B = -93.658    09 = -93.569    03 = -93.546

\* No Horizontal Positions in the Database \*



Mn/DOT Name: J 178

NGS Name: J 178

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0289](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	27	56 N	8 W	471815.00	911945.00	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>
1935	1978	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: (1935)                      Stamping: J 178 1935

4.0 MILES NORTHEAST ON COUNTY ROAD 4 FROM THE JUNCTION OF COUNTY ROAD 4 AND TRUNK HIGHWAY 61 AT BEAVER BAY, AT THE TOP OF A HILL, 35.0 FEET WEST OF COUNTY ROAD 4, AT THE EDGE OF A WOODED AREA AT A SHARP CURVE, 57.0 FEET AND ACROSS A ROAD FROM A 10.0 INCH DIAMETER SPRUCE TREE.

**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>	
1165.175	.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>	
1164.942	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -95.069    12B = -95.010    09 = -94.983    03 = -94.928

\* No Horizontal Positions in the Database \*



Mn/DOT Name: J 336

NGS Name: J 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0540](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	25	54 N	11 W	470813.00	913955.00	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>
1978	2021	NOT FOUND	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (0 TO 1 METERS)	VERTICAL CONTROL DISK	NGS

**Description:** (1978)                      **Stamping:** J 336 1978

7.7 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS, NEAR THE NORTH EDGE OF A SWAMPY AREA, AT A T-JUNCTION OF COUNTY ROAD 2 AND A TRACK ROAD EAST, 150.0 FEET NORTH OF A TRACK ROAD, 51.0 FEET WEST OF COUNTY ROAD 2, 25.0 FEET NORTHWEST OF UNDERGROUND CABLE MARKER NUMBER 130.5, 15.0 FEET WEST OF A POINT UNDER A POWER LINE.

**Station Notes**  
 THE TIES FALL INTO THE DITCH BOTTOM.

**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>					
1299.876	.007	1/2				1991	00000025					

**Geoid Separations(ft): GEOID18 = -93.586    12B = -93.563    09 = -93.471    03 = -93.418**

\* No Horizontal Positions in the Database \*



**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North 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>
3034104.967	568262.729	2024854.646	17134504.073	.131	3	GPS - RTRN	2017	RTRN2017
3034104.977	568262.699	2024854.656	17134504.042	.033		ADJUSTMENT	2013	GPS2940
3034104.977	568262.699	2024854.656	17134504.042	.033	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North 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>
3034104.899	568262.733	2024854.578	17134504.076	.033	C	GPS - STATIC	2012	HBBAY
3034104.802	568262.654	2024854.480	17134503.997	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/J_341-SH0595-3NW-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/J_341-SH0595-3NW-26SEP2017.jpg</a>	NW	Sep 26, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/J_341-SH0595-2-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/J_341-SH0595-2-26SEP2017.jpg</a>		Sep 26, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/J_341-SH0595-1-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/J_341-SH0595-1-26SEP2017.jpg</a>		Sep 26, 2017

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





Mn/DOT Name: J 355

NGS Name: J 355

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0601](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	55 N	8 W	471234.55	912125.37	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>
1979	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	VERTICAL CONTROL DISK	NGS

Description: (2011) Stamping: J 355 1979

4.6 MILES SOUTHWEST ON TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY TO A DRIVEWAY NUMBER 4148 AT TRUNK HIGHWAY 61 MILEPOINT 46.30, THEN 0.2 MILE NORTHEAST ON A BIKE TRAIL TO STATION J 355 ON THE LEFT, 23.0 FEET WEST OF A BIKE TRAIL, ON THE INSIDE EDGE OF A HIGHWAY CURVE, ON THE TOP OF A ROCK CUT, 344.0 FEET SOUTH OF THE SOUTH END OF A GUARDRAIL, 1.8 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>	
656.370	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
656.370	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	
656.370	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
656.370	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3	
656.370	.007	1/2					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>	
656.232	.033	3					VERTICAL CONTROL SURVEY	1987	CS3806	

**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>	
656.449	.262			559.966	.197	2011	GPS - RTRN	2017	RTRN2017	
656.318	.262			559.937	.197	2007	GPS - RTRN	2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -96.522 12B = -96.483 09 = -96.378 03 = -96.263

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 12 34.55464	91 21 25.36747			634500.714	253944.744	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 12 34.55415	91 21 25.36925			634500.591	253944.697	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3057823.834	591788.397			2048604.448	17157989.540	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3057823.713	591788.344			2048604.327	17157989.488	.131	3	GPS - RTRN	2011	RTRN2011



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/J_355-SH0601-3W-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/J_355-SH0601-3W-25SEP2017.jpg</a>	W	Sep 25, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/J_355-SH0601-2-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/J_355-SH0601-2-25SEP2017.jpg</a>		Sep 25, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/J_355-SH0601-1-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/J_355-SH0601-1-25SEP2017.jpg</a>		Sep 25, 2017

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



Mn/DOT Name: J 51

NGS Name: J 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0307](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

				<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	21	53 N	10 W	470345.00	913637.00	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>
1934	2007	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)	BENCH MARK DISK	NGS

**Description:** (2000)                      **Stamping:** J 51 1934

3.6 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, 0.15 MILE SOUTHWEST OF TRUNK HIGHWAY 61 MILEPOST 330, 45.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 164.0 FEET SOUTHWEST OF DRIVEWAY NUMBER L654, 3.7 FEET NORTHEAST OF A POWER POLE NUMBER 5, 8.0 FEET NORTHWEST OF A ROW OF WHITE SPRUCE TREES.

**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>	
655.035	.007	1/2					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>	
654.933	.033	3					VERTICAL CONTROL SURVEY	1987	CS3806	
654.831	.007	1					VERTICAL CONTROL SURVEY	1935	L95 MINN	

Geoid Separations(ft): GEOID18 = -95.108    12B = -95.075    09 = -94.977    03 = -94.905

\* No Horizontal Positions in the Database \*



Mn/DOT Name: JERN MNDT  
County: LAKE, MN (Sheet 1)

NGS Name: JERN

NGS ACRN: [SH0752](#) [Get Map](#)  
NGS Quad / Sta Num : 47091231/  
USGS Quad: SPLIT ROCK POINT NE

				<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	55 N	8 W	471248.31	912123.48		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>
1977	2008	GOOD	Horz=YES Vert=YES	YES		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	HORIZONTAL CONTROL DISK	MNDT

Description: (2008)                      Stamping: JERN 1977

4.0 MILES SOUTHWEST ON TRUNK HIGHWAY 61 FROM BEAVER BAY, 0.95 MILE NORTHEAST ON TRUNK HIGHWAY 61 FROM AN ENTRANCE TO THE SPLIT ROCK STATE PARK, AT TRUNK HIGHWAY 61 MILEPOINT 146.6, 1000.0 FEET SOUTHWEST OF TRUNK HIGHWAY 61, 6.0 FEET WEST OF THE EDGE OF A ROCK CLIFF, 10.9 FEET NORTH-NORTHEAST OF A WITNESS POST, 32.62 FEET NORTH-NORTHEAST OF JERN MNDT RM 1, 19.01 FEET EAST OF JERN MNDT RM 2.

**Station Notes**

MNDOT DISTRICT 1 SURVEYS REPORTS A 1.2 FOOT DISCREPANCY WITH PUBLISHED COORDINATES AT THIS STATION - 9/18/2001.

\* 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>		
840.878	.197		744.690	.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>		
840.484						RECIPROCAL VERTICAL ANGLE	1977	HORZ	

Geoid Separations(ft): GEOID18 = -96.450    12B = -96.411    09 = -96.315    03 = -96.194

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 12 48.30727	91 21 23.48157	634655.350	255335.692	.066	2	ADJUSTMENT	1999	17648		
47 12 48.31544	91 21 23.47812	634655.603	255336.516	.066	2	ADJUSTMENT	1991	17497		

<u>NAD83(1986)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 12 48.31318	91 21 23.47561	634655.771	255336.284	3.281		CLASSICAL SURVEY	1988	HBEA1		
47 12 48.31271	91 21 23.47599	634655.745	255336.237	.066	2	ADJUSTMENT	1986	17289		

<u>NAD27</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 12 48.58319	91 21 22.87382			.100	2	CLASSICAL SURVEY	1979	15983		

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>		
3057922.578	593184.321	2048705.271	17159385.075	.066	2	ADJUSTMENT	1999	17648		
3057922.798	593185.154	2048705.491	17159385.907	.066	2	ADJUSTMENT	1991	17497		

<u>NAD83(1986)</u>		<u>MN State Plane - North 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>		
3057922.976	593184.929	2048705.670	17159385.682	3.281		CLASSICAL SURVEY	1988	HBEA1		
3057922.951	593184.880	2048705.644	17159385.634	.066	2	ADJUSTMENT	1986	17289		

<u>NAD27</u>		<u>MN State Plane - North 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>		
2433310.639	265128.883			.100	2	CLASSICAL SURVEY	1979	15983		



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/JERN-SH0752-3E-10SEP2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/JERN-SH0752-3E-10SEP2008.jpg</a>	E	Sep 10, 2008
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/JERN-SH0752-2-10SEP2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/JERN-SH0752-2-10SEP2008.jpg</a>		Sep 10, 2008
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/JERN-SH0752-1-10SEP2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/JERN-SH0752-1-10SEP2008.jpg</a>		Sep 10, 2008

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



Mn/DOT Name: JERN MNDT RM 1

NGS Name: JERN RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3143](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	55 N	8 W	471248.09	912123.83		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1977	2008	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	REFERENCE MARK DISK	MNDT

**Description:** (2008)                      **Stamping:** JERN 1977 NO 1

4.0 MILES SOUTHWEST ON TRUNK HIGHWAY 61 FROM BEAVER BAY, 0.95 MILE NORTHEAST ON TRUNK HIGHWAY 61 FROM AN ENTRANCE TO THE SPLIT ROCK STATE PARK, AT TRUNK HIGHWAY 61 MILEPOINT 146.6, 1000.0 FEET SOUTHWEST OF TRUNK HIGHWAY 61, 11.0 FEET WEST OF THE EDGE OF THE ROCK CLIFF, 22.3 FEET SOUTH-SOUTHWEST OF A STEEL WITNESS POST.

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

**Geoid Separations(ft):** GEOID18 = -96.447    12B = -96.411    09 = -96.315    03 = -96.194

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/JERN_RM_1-CJ3143-3E-10SEP2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/JERN_RM_1-CJ3143-3E-10SEP2008.jpg</a>	E	Sep 10, 2008
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/JERN_RM_1-CJ3143-2-10SEP2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/JERN_RM_1-CJ3143-2-10SEP2008.jpg</a>		Sep 10, 2008
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/JERN_RM_1-CJ3143-1-10SEP2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/JERN_RM_1-CJ3143-1-10SEP2008.jpg</a>		Sep 10, 2008

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



Mn/DOT Name: JERN MNDT RM 2

NGS Name: JERN RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3144](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	55 N	8 W	471248.34	912123.75		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1977	2008	GOOD	Horz=YES Vert=YES	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	REFERENCE MARK DISK	MNDT

Description: (1977) Stamping: JERN 1977 NO 2

4.0 MILES SOUTHWEST ON TRUNK HIGHWAY 61 FROM BEAVER BAY, 0.95 MILE NORTHEAST ON TRUNK HIGHWAY 61 FROM AN ENTRANCE TO THE SPLIT ROCK STATE PARK, AT TRUNK HIGHWAY 61 MILEPOINT 346.9, 1000.0 FEET SOUTHWEST OF TRUNK HIGHWAY 61, 25.0 FEET WEST OF THE EDGE OF THE ROCK CLIFF, 18.1 FEET NORTHWEST OF A STEEL WITNESS POST.

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

Geoid Separations(ft): GEOID18 = -96.447 12B = -96.411 09 = -96.315 03 = -96.194



Mn/DOT Name: JULIE

NGS Name: JULIE

County: LAKE, MN (Sheet 1)

NGS ACRN: [DQ6756](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	55 N	8 W	471532.94	911751.65	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>
2015	2017	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: (2015)                      Stamping: JULIE 2015

IN BEAVER BAY, AT THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 51.20, 68.4 FEET NORTHWEST OF TRUNK HIGHWAY 61, 115.0 FEET SOUTHWEST OF COUNTY ROAD 4, 9.4 FEET SOUTHEAST OF A BIKE PATH, 1.5 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>	
692.141	.016	2/1						VERTICAL ADJUSTMENT	2021	00000963	
692.125	.016	2/1						VERTICAL CONTROL SURVEY	2019	VNSHORE	

**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>	
692.125				595.727	.017	2011		HORIZONTAL ADJUSTMENT	2019	GPS3302	
				595.921	.066	1996		GPS - STATIC	2019	Hlake	
692.125				595.727	.017	2011		GPS - STATIC	2019	Hlake	
692.144				595.727	.026	2011		HORIZONTAL ADJUSTMENT	2018	GPS3119	
692.171	.131			595.921	.066	1996		GPS - STATIC	2017	HMNCORS07	
692.144				595.727	.026	2011		GPS - STATIC	2017	HMNPH	
692.200	.262			595.803	.197	2011		GPS - RTRN	2017	RTRN2017	
692.105	.262			595.707	.197	2011		GPS - RTRN	2015	RTRN2015	

Geoid Separations(ft): GEOID18 = -96.434    12B = -96.401    09 = -96.306    03 = -96.220

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Lake County - Lake (North Shore) Zone</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>								
47 15 32.94229	91 17 51.64679	649558.399	271763.375	.010		ADJUSTMENT	2019	GPS3302	
47 15 32.94229	91 17 51.64679	649558.399	271763.375	.010	C	GPS - STATIC	2019	Hlake	
47 15 32.94229	91 17 51.64679	649558.399	271763.375	.013		ADJUSTMENT	2018	GPS3119	
47 15 32.94229	91 17 51.64679	649558.399	271763.375	.013	C	GPS - STATIC	2017	HMNPH	
47 15 32.94211	91 17 51.64600	649558.453	271763.356	.131	3	GPS - RTRN	2017	RTRN2017	
47 15 32.94192	91 17 51.64664	649558.408	271763.337	.131	3	GPS - RTRN	2015	RTRN2015	

<u>NAD83(1996)</u>		<u>Lake County - Lake (North Shore) Zone</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>								
47 15 32.94217	91 17 51.64734	649558.361	271763.364	.033	C	GPS - STATIC	2019	Hlake	
47 15 32.94217	91 17 51.64734	649558.361	271763.364	.033	C	GPS - STATIC	2017	HMNCORS07	



**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North 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>
3072153.640	610195.089	2062959.498	17176371.802	.010		ADJUSTMENT	2019	GPS3302
3072153.640	610195.089	2062959.498	17176371.802	.010	C	GPS - STATIC	2019	HLAKE
3072153.640	610195.089	2062959.498	17176371.802	.013		ADJUSTMENT	2018	GPS3119
3072153.640	610195.089	2062959.498	17176371.802	.013	C	GPS - STATIC	2017	HMNPH
3072153.695	610195.072	2062959.553	17176371.785	.131	3	GPS - RTRN	2017	RTRN2017
3072153.651	610195.052	2062959.510	17176371.764	.131	3	GPS - RTRN	2015	RTRN2015

**NAD83(1996)**

MN State Plane - North 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>
3072153.602	610195.076	2062959.461	17176371.789	.033	C	GPS - STATIC	2019	HLAKE
3072153.602	610195.076	2062959.461	17176371.789	.033	C	GPS - STATIC	2017	HMNCORS07

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/JULIE-DQ6756-3NW-02JUN2015.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/JULIE-DQ6756-3NW-02JUN2015.jpg</a>	NW	Jun 2, 2015
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/JULIE-DQ6756-2-02JUN2015.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/JULIE-DQ6756-2-02JUN2015.jpg</a>		Jun 2, 2015
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/JULIE-DQ6756-1-02JUN2015.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/JULIE-DQ6756-1-02JUN2015.jpg</a>		Jun 2, 2015

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



Mn/DOT Name: K 173

NGS Name: K 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0316](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091321/  
 USGS Quad: TWO HARBORS NE

				<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	54 N	10 W	471101.00	913551.00	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>
1935	1935	GOOD	Horz=NO Vert=YES	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: (1935)                      Stamping: K 173 1935

1.9 MILES SOUTHWEST OF LONDON, 0.25 MILE NORTH OF A WOOD BRIDGE OVER THE GOOSEBERRY RIVER, 25.0 FEET WEST OF A ROAD, AT A CURVE, AT A FENCE.

**Station Notes**

DUE TO TREE COVER, THIS SURVEY MARK HAS BEEN ABANDONED FOR MNDOT GEODETIC HORIZONTAL SURVEYS.

**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>
1300.978	.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>
1300.732	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1300.732	.007	1				VERTICAL CONTROL SURVEY	1935	L49 MINN

Geoid Separations(ft): GEOID18 = -93.648 12B = -93.615 09 = -93.520 03 = -93.487

\* No Horizontal Positions in the Database \*



Mn/DOT Name: K 178

NGS Name: K 178

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0290](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	56 N	8 W	471936.92	911930.02	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>
1935	1978	NOT FOUND	Horz=YES Vert=YES	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: (1935)                      Stamping: K 178 1935

5.7 MILES NORTHEAST ON COUNTY ROAD 4 FROM THE JUNCTION OF COUNTY ROAD 4 AND TRUNK HIGHWAY 61 AT BEAVER BAY, 1.5 MILES SOUTH OF LAX LAKE, AT THE TOP OF A HILL, 40.0 FEET EAST OF COUNTY ROAD 4, 30.0 FEET NORTH OF A ROCK OUTCROP.

**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>	
1268.347	.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>	
1268.081	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1268.081	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -94.734    12B = -94.685    09 = -94.632    03 = -94.586

\* No Horizontal Positions in the Database \*



Mn/DOT Name: K 336

NGS Name: K 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0542](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	18	54 N	10 W	470939.00	913951.00	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>
1978	2008	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (0 TO 1 METERS)	VERTICAL CONTROL DISK	NGS

Description: (1978)                      Stamping: K 336 1978

9.35 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS, 30.0 FEET EAST OF COUNTY ROAD 2, 15.0 FEET SOUTHWEST OF A LARGE LONE BIRCH TREE, 1.0 FOOT NORTHWEST OF A WITNESS POST, IN THE TOP OF AN 8.0 FEET BY 8.0 FEET EMBEDDED BOULDER.

Station Notes  
 THE ROAD WAS RE-BUILT, NO BOULDER REMAINS.

**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>	
1401.710	.007	1/2							VERTICAL ADJUSTMENT	1991	00000025	

**Geoid Separations(ft): GEOID18 = -93.350    12B = -93.330    09 = -93.235    03 = -93.192**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: K 341

NGS Name: K 341

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0607](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	55 N	8 W	471535.74	911746.57	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>
1978	2017	NOT FOUND	Horz=NO Vert=NO	YES	9395		NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE WALKWAY	VERTICAL CONTROL DISK	NGS

**Description:** (2009)                      **Stamping:** K 341 1978

IN BEAVER BAY, IN THE SOUTHWEST END OF A CURB AT THE SOUTHWEST CORNER OF TRUNK HIGHWAY 61 BRIDGE NUMBER 9395 OVER THE BEAVER RIVER, AT TRUNK HIGHWAY 61 MILEPOINT 51.20, 32.0 FEET NORTHWEST OF THE CENTER CURB ON TRUNK HIGHWAY 61, 2.0 FEET NORTHEAST OF THE SOUTHWEST END OF A SIDEWALK.

**Station Notes**

THE BRIDGE WAS RE-DECKED, UNDER CONSTRUCTION.

**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>	
682.679	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
682.679	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3	
682.679	.007	1/2				VERTICAL ADJUSTMENT	2004	00000425-2	
682.679	.016	2/1				VERTICAL CONTROL SURVEY	2002	VBEBAY	
682.679	.007	1/2				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>	
682.512	.033	3				VERTICAL CONTROL SURVEY	1987	CS3806	

**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>	
682.679			586.285	.017	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940	
682.679			586.249	.017	2011	GPS - STATIC	2013	HBBAY	
682.676	.131		586.370	.066	2007	GPS - STATIC	2012	HBBAY	
			586.285	.043	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800	
682.650	.262		586.341	.197	2007	GPS - RTRN	2011	RTRN2011	
			586.370	.045	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300	
682.679	.131		586.442	.066	1996	GPS - STATIC	1997	GPS805-C	

Geoid Separations(ft): GEOID18 = -96.437    12B = -96.407    09 = -96.309    03 = -96.227

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Lake County - Lake (North Shore) Zone</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>							
47 15 35.73993	91 17 46.56862	649913.403	272040.914	.016		ADJUSTMENT	2013	GPS2940
47 15 35.73953	91 17 46.56914	649913.366	272040.874	.016	C	GPS - STATIC	2013	HBBAY
47 15 35.73993	91 17 46.56862	649913.403	272040.914	.026		ADJUSTMENT	2012	GPS2800

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>							
47 15 35.74004	91 17 46.56953	649913.340	272040.926	.033	C	GPS - STATIC	2012	HBBAY
47 15 35.73988	91 17 46.57089	649913.246	272040.912	.131	3	GPS - RTRN	2011	RTRN2011
47 15 35.74004	91 17 46.56953	649913.340	272040.926	.030		ADJUSTMENT	2007	GPS2300

<u>NAD83(1996)</u>		<u>Lake County - Lake (North Shore) Zone</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>							
47 15 35.73979	91 17 46.56926	649913.358	272040.901	.033	C	GPS - STATIC	1997	GPS805-C

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North 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>
3072497.193	610486.623	2063303.435	17176662.779	.016		ADJUSTMENT	2013	GPS2940
3072497.158	610486.582	2063303.400	17176662.738	.016	C	GPS - STATIC	2013	HBBAY
3072497.193	610486.623	2063303.435	17176662.779	.026		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

MN State Plane - North 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>
3072497.130	610486.632	2063303.372	17176662.789	.033	C	GPS - STATIC	2012	HBBAY
3072497.036	610486.614	2063303.278	17176662.771	.131	3	GPS - RTRN	2011	RTRN2011
3072497.130	610486.632	2063303.372	17176662.789	.030		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

MN State Plane - North 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>
3072497.149	610486.608	2063303.391	17176662.764	.033	C	GPS - STATIC	1997	GPS805-C

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/K_341-SH0607-3NW-30AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/K_341-SH0607-3NW-30AUG2011.jpg</a>	NW	Aug 30, 2011
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/K_341-SH0607-2-30AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/K_341-SH0607-2-30AUG2011.jpg</a>		Aug 30, 2011
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/K_341-SH0607-1-30AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/K_341-SH0607-1-30AUG2011.jpg</a>		Aug 30, 2011

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



Mn/DOT Name: K 355

NGS Name: K 355

County: LAKE, MN (Sheet 1)

NGS ACRN: <a href="#">SH0615</a>	<a href="#">Get Map</a>
NGS Quad / Sta Num : 47091213/	
USGS Quad: ILLGEN CITY	

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	56 N	7 W	471840.84	911404.11	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>
1979	2021	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	VERTICAL CONTROL DISK	NGS

**Description:** (2007)                      **Stamping:** K 355 1979

1.50 MILES NORTHEAST OF SILVER BAY, 1.65 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 AND COUNTY ROAD 5 IN SILVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 55.90, AT THE KOA CAMPGROUND, 116.0 FEET SOUTHWEST OF THE NORTHEAST CORNER OF THE KOA OFFICE, 74.5 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 67.0 FEET NORTHWEST OF THE SOUTHWEST CORNER OF AN OFFICE, 1.4 FEET SOUTHWEST 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>					
740.067	.016	2/1				2021	00000963					
740.067	.016	2/1				2019	VNSHORE					
740.067	.016	2/1				2011	00000691					
740.067	.016	2/1				2009	VSHOR3					
740.067	.007	1/2				1991	00000025					

<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>					
739.871	.033	3				1987	CS3809					

**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>					
740.097	.262		643.765	.197	2011	2021	GPSBM					
740.094	.262		643.765	.197	2011	2021	RTRN2021					
740.044	.262		643.762	.197	2011	2017	RTRN2017					
740.067			643.745	.020	2011	2013	GPS2940					
740.067			643.745	.020	2011	2013	HBBAY					
740.058	.131		643.827	.066	2007	2012	HBBAY					
740.048	.262		643.808	.197	2007	2011	RTRN2011					

Geoid Separations(ft): GEOID18 = -96.332 12B = -96.286 09 = -96.240 03 = -96.145

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Geodetic Position</u>						<u>Lake County - Lake (North Shore) Zone</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>			
47 18 40.83617	91 14 04.11014	665556.758	290541.282	.131	3	GPS - OPUS	2021	GPSBM			
47 18 40.83563	91 14 04.10932	665556.813	290541.226	.131	3	GPS - RTRN	2021	RTRN2021			
47 18 40.83542	91 14 04.10939	665556.808	290541.205	.131	3	GPS - RTRN	2017	RTRN2017			
47 18 40.83554	91 14 04.10981	665556.779	290541.218	.023		ADJUSTMENT	2013	GPS2940			
47 18 40.83554	91 14 04.10981	665556.779	290541.218	.023	C	GPS - STATIC	2013	HBBAY			

<u>NAD83(2007)</u>		<u>Geodetic Position</u>						<u>Lake County - Lake (North Shore) Zone</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>			
47 18 40.83593	91 14 04.11063	665556.724	290541.258	.033	C	GPS - STATIC	2012	HBBAY			
47 18 40.83478	91 14 04.10946	665556.802	290541.140	.131	3	GPS - RTRN	2011	RTRN2011			

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North 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>
3087383.955	629598.244	2078216.544	17195749.632	.131	3	GPS - OPUS	2021	GPSBM
3087384.013	629598.191	2078216.602	17195749.579	.131	3	GPS - RTRN	2021	RTRN2021
3087384.008	629598.169	2078216.598	17195749.558	.131	3	GPS - RTRN	2017	RTRN2017
3087383.979	629598.180	2078216.569	17195749.569	.023		ADJUSTMENT	2013	GPS2940
3087383.979	629598.180	2078216.569	17195749.569	.023	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North 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>
3087383.922	629598.218	2078216.511	17195749.607	.033	C	GPS - STATIC	2012	HBBAY
3087384.005	629598.104	2078216.595	17195749.493	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/K_355-SH0615-3SE-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/K_355-SH0615-3SE-17AUG2021.jpg</a>	SE	Aug 17, 2021
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/K_355-SH0615-2-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/K_355-SH0615-2-17AUG2021.jpg</a>		Aug 17, 2021
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/K_355-SH0615-1-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/K_355-SH0615-1-17AUG2021.jpg</a>		Aug 17, 2021

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





Mn/DOT Name: K 51

NGS Name: K 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0308](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

				<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	53 N	10 W	470452.46	913502.27	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>
1934	2007	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)	BENCH MARK DISK	NGS

Description: (1979)                      Stamping: K 51 1934

5.6 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM TWO HARBORS, AT THE NORTH END OF A CURVE, 0.15 MILE  
 SOUTHWEST OF TRUNK HIGHWAY 61 MILEPOST 332, 46.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 12.0 FEET  
 NORTHWEST OF A TRIPLE TRUNK BIRCH TREE, 1.0 FOOT 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>	
684.050	.007	1/2					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>	
683.765	.007	1/2					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
683.916	.033	3					VERTICAL CONTROL SURVEY	1987	CS3806	
683.863	.033	3					VERTICAL CONTROL SURVEY	1984	CS3806	
683.765	.007	1					VERTICAL CONTROL SURVEY	1935	L95 MINN	

Geoid Separations(ft): GEOID18 = -95.184    12B = -95.144    09 = -95.042    03 = -94.980

\* No Horizontal Positions in the Database \*



Mn/DOT Name: KANE

NGS Name: KANE

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0772](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091313/1006  
 USGS Quad: KANE 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	56 N	10 W	471747.41	913951.08	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>
1952	2017	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)	TRIANGULATION STATION DISK	CGS

Description: (2007) Stamping: KANE 1952

19.1 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, 0.55 MILE SOUTH OF COUNTY ROAD 203, 58.0 FEET EAST OF COUNTY ROAD 2, 1.0 FOOT WEST OF A WITNESS POST, 130.35 FEET NORTHEAST OF KANE RM 1, 94.91 FEET EAST OF KANE RM 2

Station Notes

IN 1995 KANE RM 1 AND KANE RM 2 WERE NOT SEARCHED FOR

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>	
1714.770	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
1714.777	.016	2/1				VERTICAL CONTROL SURVEY	2011	VBCKY-R	
1714.777	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBCKY	

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>	
1714.770			1621.972	.019	2011	HORIZONTAL ADJUSTMENT	2019	GPS3302	
			1622.172	.066	1996	GPS - STATIC	2019	Hlake	
1714.770			1621.972	.019	2011	GPS - STATIC	2019	Hlake	
1714.849	.262		1622.087	.197	2011	GPS - RTRN	2017	RTRN2017	
			1622.047	.040	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800	
			1622.133	.042	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300	
1714.892	.131		1622.238	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648	
1714.882	.131		1622.195	.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>
1715.909						RECIPROCAL VERTICAL ANGLE	1952	HORZ

Geoid Separations(ft): GEOID18 = -92.749 12B = -92.759 09 = -92.634 03 = -92.582



**Lat/Lon and County Coordinates (Feet)**

**NAD83(2011)**

Geodetic Position		Lake 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>
47 17 47.40797	91 39 51.08119	436751.006	183948.726	.013		ADJUSTMENT	2019	GPS3302
47 17 47.40797	91 39 51.08119	436751.006	183948.726	.013	C	GPS - STATIC	2019	Hlake
47 17 47.40689	91 39 51.08075	436751.036	183948.616	.131	3	GPS - RTRN	2017	RTRN2017
47 17 47.40904	91 39 51.08001	436751.087	183948.834	.026		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

Geodetic Position		Lake 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>
47 17 47.40917	91 39 51.08090	436751.026	183948.847	.026		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

Geodetic Position		Lake 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>
47 17 47.40886	91 39 51.08070	436751.040	183948.816	.033	C	ADJUSTMENT	1999	17648
47 17 47.40886	91 39 51.08070	436751.040	183948.816	.033	C	GPS - STATIC	1997	GPS805-C

**NAD83(1996)**

Geodetic Position		Lake County - Lake (North Shore) Zone					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>
47 17 47.40770	91 39 51.08173	558849.164	287126.662	.033	C	GPS - STATIC	2019	Hlake

**NAD83(1986)**

Geodetic Position		Lake 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>
47 17 47.40849	91 39 51.08046	436751.056	183948.778	.131	3	ADJUSTMENT	1986	17289

**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>
47 17 47.68400	91 39 50.46000			.100	3	CLASSICAL SURVEY	1956	11100

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North 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>
2980914.016	621910.044	1971754.189	17188218.273	.013		ADJUSTMENT	2019	GPS3302
2980914.016	621910.044	1971754.189	17188218.273	.013	C	GPS - STATIC	2019	Hlake
2980914.048	621909.935	1971754.221	17188218.165	.131	3	GPS - RTRN	2017	RTRN2017
2980914.095	621910.153	1971754.268	17188218.383	.026		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

MN State Plane - North 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>
2980914.033	621910.165	1971754.207	17188218.395	.026		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

MN State Plane - North 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>
2980913.979	621910.015	1971754.152	17188218.246	.033	C	GPS - STATIC	2019	Hlake
2980914.048	621910.134	1971754.221	17188218.364	.033	C	ADJUSTMENT	1999	17648
2980914.048	621910.134	1971754.221	17188218.364	.033	C	GPS - STATIC	1997	GPS805-C

**NAD83(1986)**

MN State Plane - North 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>
2980914.065	621910.097	1971754.239	17188218.327	.131	3	ADJUSTMENT	1986	17289

**NAD27**

MN State Plane - North 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>
2356300.687	293854.311			.100	3	CLASSICAL SURVEY	1956	11100



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KANE-SH0772-3E-06SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KANE-SH0772-3E-06SEP2017.jpg</a>	E	Sep 6, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KANE-SH0772-2-06SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KANE-SH0772-2-06SEP2017.jpg</a>		Sep 6, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KANE-SH0772-1-06SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KANE-SH0772-1-06SEP2017.jpg</a>		Sep 6, 2017

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



Mn/DOT Name: KANE AZ MK

NGS Name: KANE AZ MK

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3156](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091313/1006  
 USGS Quad: KANE 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	56 N	10 W	471740.00	913952.00		

<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>
1952	1952	GOOD	Horz=YES Vert=YES	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	AZIMUTH MARK DISK	MNDT

**Description:** **Stamping:** KANE 1952

18.95 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, 0.15 MILE SOUTH OF STATION KANE, 38.0 FEET WEST OF THE CENTERLINE OF COUNTY ROAD 2, 3.0 FEET NORTHWEST OF A WHITE WITNESS POST.

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

Geoid Separations(ft): GEOID18 = -92.749 12B = -92.759 09 = -92.634 03 = -92.582



Mn/DOT Name: KANE RM 1

NGS Name: KANE RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3157](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091313/1006  
 USGS Quad: KANE 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	56 N	10 W	471746.52	913952.44		

<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>
1952	2007	NOT FOUND	Horz=NO Vert=YES	NO		FLUSH	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:** KANE NO 1 1952

19.1 MILES NORTH OF TWO HARBORS, 19.1 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, 0.55 MILE SOUTH OF COUNTY ROAD 203, 34.0 FEET WEST OF THE CENTERLINE OF COUNTY HIGHWAY 2, 130.35 FEET SOUTHWEST OF STATION KANE

**Station Notes**

IN 1995 KANE RM 1 AND KANE RM 2 WERE NOT SEARCHED FOR.

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

Geoid Separations(ft): GEOID18 = -92.749 12B = -92.759 09 = -92.634 03 = -92.582



Mn/DOT Name: KANE RM 2  
 County: LAKE, MN (Sheet 1)

NGS Name: KANE RM 2

NGS ACRN: [CJ3158](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091313/1006  
 USGS Quad: KANE 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	31	56 N	10 W	471747.57	913952.44		

<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>
1952	2007	NOT FOUND	Horz=NO Vert=YES	NO		PROJECTS 4 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:** KANE NO 2 1952

19.1 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, 0.55 MILE SOUTH OF COUNTY ROAD 203, 35.0 FEET WEST OF THE CENTERLINE OF COUNTY HIGHWAY 2, 94.91 FEET WEST OF STATION KANE

**Station Notes**

IN 1995 KANE RM 1 AND KANE RM 2 WERE NOT SEARCHED FOR, THE TIES FALL IN NEW BED IN SLOPE (2007).

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

Geoid Separations(ft): GEOID18 = -92.749 12B = -92.759 09 = -92.634 03 = -92.582



Mn/DOT Name: KENN MNDT

NGS Name: KENN

County: LAKE, MN (Sheet 1)

NGS ACRN: [AH3143](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	56 N	7 W	472211.27	910957.68		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	2017	GOOD	Horz=YES Vert=NO	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	HORIZONTAL CONTROL DISK	MNDT

**Description:** (1992)                      **Stamping:** KENN 1992

2.0 MILES NORTHEAST OF ILLGEN CITY, 2.0 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 1 AND TRUNK HIGHWAY 61 IN ILLGEN CITY, ON THE TOP OF A ROCK CUT, AT TRUNK HIGHWAY 61 MILEPOINT 61.25, 65.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 3.7 FEET SOUTHEAST OF A WITNESS POST. STATION KENN MNDT IS FLUSH WITH THE GROUND.

**Station Notes**

DO NOT LEVEL TO STATION.

\* 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>	<u>Year</u>	<u>Reference</u>
783.830	.262		687.476	.197	2011	GPS - RTRN	2017	RTRN2017	
			687.335	.056	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800	
			687.417	.049	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300	
			687.561	.066	1996	GPS - STATIC	1999	GPS1147	
783.725	.131		687.561	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648	
783.791						GPS - STATIC	1992	HORZ	

Geoid Separations(ft): GEOID18 = -96.401    12B = -96.355    09 = -96.338    03 = -96.214

**Lat/Lon and County Coordinates (Feet)**

**NAD83(2011)**

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 22 11.26636	91 09 57.67979	682860.304	311595.610	.131	3	GPS - RTRN	2017	RTRN2017	
47 22 11.26662	91 09 57.68018	682860.277	311595.636	.026		ADJUSTMENT	2012	GPS2800	

**NAD83(2007)**

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 22 11.26673	91 09 57.68102	682860.220	311595.648	.023		ADJUSTMENT	2007	GPS2300	

**NAD83(1996)**

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 22 11.26699	91 09 57.67898	682860.361	311595.673	.033	C	GPS - STATIC	1999	GPS1147	
47 22 11.26699	91 09 57.67898	682860.361	311595.673	.033	C	ADJUSTMENT	1999	17648	

**NAD83(1986)**

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 22 11.26903	91 09 57.67331	682860.754	311595.874	.033	C	GPS - STATIC	1992	HMARA	



**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North 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>
3103825.902	651328.519	2094688.626	17217453.216	.131	3	GPS - RTRN	2017	RTRN2017
3103825.874	651328.544	2094688.598	17217453.242	.026		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

MN State Plane - North 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>
3103825.816	651328.554	2094688.540	17217453.252	.023		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

MN State Plane - North 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>
3103825.956	651328.584	2094688.680	17217453.282	.033	C	GPS - STATIC	1999	GPS1147
3103825.956	651328.584	2094688.680	17217453.282	.033	C	ADJUSTMENT	1999	17648

**NAD83(1986)**

MN State Plane - North 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>
3103826.341	651328.800	2094689.065	17217453.497	.033	C	GPS - STATIC	1992	HMARA

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KENN-AH3143-3NW-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KENN-AH3143-3NW-19SEP2017.jpg</a>	NW	Sep 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KENN-AH3143-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KENN-AH3143-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KENN-AH3143-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KENN-AH3143-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: KNILA  
 County: LAKE, MN (Sheet 1)

NGS Name: KNILA

NGS ACRN: [DR1373](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	52 N	11 W	465652.68	914736.60	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>
2017	2019	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 13 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017)                      Stamping: KNILA 2017

0.5 MILE SOUTHWEST OF KNIFE RIVER, 0.3 MILE SOUTH ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 103 IN KNIFE RIVER, AT TRUNK HIGHWAY 61 MILEPOINT 18.10, 73.0 FEET SOUTHEAST OF SOUTHBOUND TRUNK HIGHWAY 61, 128.5 FEET NORTHWEST OF NORTHBOUND TRUNK HIGHWAY 61, 1.5 FEET NORTHWEST OF A WITNESS POST.

Station Pair:    3804 S - LAKE, 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>					
662.187	.016	2/1				2021	00000963					
662.187	.016	2/1				2019	VNSHORE					

**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>					
662.151			568.070	.025	2011	2019	GPS3328					
662.187	.131		568.270	.066	1996	2019	Hlake2					
662.151			568.070	.025	2011	2019	Hlake2					
662.236	.262		568.175	.197	2011	2017	RTRN2017					

Geoid Separations(ft): GEOID18 = -94.061    12B = -94.061    09 = -93.950    03 = -93.884

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Geodetic Position</u>					<u>Lake County - Lake (North Shore) Zone</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 56 52.67856	91 47 36.60421	523838.707	160736.077	.016		ADJUSTMENT	2019	GPS3328			
46 56 52.67856	91 47 36.60421	523838.707	160736.077	.016	C	GPS - STATIC	2019	Hlake2			
46 56 52.67842	91 47 36.60414	523838.712	160736.063	.131	3	GPS - RTRN	2017	RTRN2017			

<u>NAD83(1996)</u>		<u>Geodetic Position</u>					<u>Lake County - Lake (North Shore) Zone</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 56 52.67831	91 47 36.60471	523838.672	160736.053	.033	C	GPS - STATIC	2019	Hlake2			

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>MN State Plane - North 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>		
2950981.388	494236.179	1941640.896	17060622.862	.016		ADJUSTMENT	2019	GPS3328		
2950981.388	494236.179	1941640.896	17060622.862	.016	C	GPS - STATIC	2019	Hlake2		
2950981.394	494236.164	1941640.901	17060622.848	.131	3	GPS - RTRN	2017	RTRN2017		

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>		
2950981.354	494236.153	1941640.862	17060622.836	.033	C	GPS - STATIC	2019	Hlake2		



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KNILA-DR1373-3SW-19OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KNILA-DR1373-3SW-19OCT2017.jpg</a>	SW	Oct 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KNILA-DR1373-2-19OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KNILA-DR1373-2-19OCT2017.jpg</a>		Oct 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KNILA-DR1373-1-19OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KNILA-DR1373-1-19OCT2017.jpg</a>		Oct 19, 2017

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



Mn/DOT Name: KR 106

NGS Name: KR 106

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5566](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	31	52 N	11 W	465643.19	914657.55	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>
1982	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

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

**Description:** (2009)                      **Stamping:** KR-106 1982

IN KNIFE RIVER, 0.15 MILE SOUTHEAST AND SOUTHWEST ON COUNTY ROAD 104 (MARINA ROAD), FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 104 IN KNIFE RIVER, THEN 0.05 MILE SOUTHEAST ON GRANITE POINT ROAD TO AN OFFICE, IN A CONCRETE SIDEWALK ON THE EAST SIDE OF THE MARINA OFFICE BUILDING.

**Station Notes**

THE MARK IS SET IN A 4.0 INCH SIDEWALK. THE MARK MAY NOT HOLD AN ELEVATION WELL.

**Leveling-Derived Orthometric Heights (Feet)**

<u>NAVD88</u>							<u>Project Info</u>	
<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</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>			
607.824	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963
607.827	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE
607.827	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691
607.827	.016	2/1				VERTICAL CONTROL SURVEY	2010	VSHOR4

**Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)**

<u>NAVD88</u>							<u>Project Info</u>	
<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</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>			
607.909	.262		513.739	.197	2011	GPS - RTRN	2017	RTRN2017
607.929	.262		513.867	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -94.176    12B = -94.173    09 = -94.061    03 = -93.996

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>								<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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 56 43.19071	91 46 57.54693	526525.995	159713.012	.131	3	GPS - RTRN	2017	RTRN2017	

  

<u>NAD83(2007)</u>								<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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 56 43.18981	91 46 57.54809	526525.912	159712.922	.131	3	GPS - RTRN	2011	RTRN2011	

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>							<u>Project Info</u>	
<u>MN State Plane - North 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>		
2953707.245	493321.037	1944364.499	17059703.884	.131	3	GPS - RTRN	2017	RTRN2017

  

<u>NAD83(2007)</u>							<u>Project Info</u>	
<u>MN State Plane - North 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>		
2953707.167	493320.944	1944364.420	17059703.792	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KR_106-DM5566-3NE-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KR_106-DM5566-3NE-02OCT2017.jpg</a>	NE	Oct 2, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KR_106-DM5566-2-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KR_106-DM5566-2-02OCT2017.jpg</a>		Oct 2, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KR_106-DM5566-1-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KR_106-DM5566-1-02OCT2017.jpg</a>		Oct 2, 2017

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



Mn/DOT Name: KR 108

NGS Name: KR 108

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5567](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	31	52 N	11 W	465641.57	914654.83	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>
1982	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

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

Description: (2009) Stamping: KR-108 1982

IN KNIFE RIVER, 0.15 MILE SOUTHEAST AND SOUTHWEST ON COUNTY ROAD 104 FROM THE JUNCTION OF COUNTY ROAD 61 AND COUNTY ROAD 104 (MARINA ROAD) IN KNIFE RIVER, THEN 0.05 MILE SOUTHEAST ON GRANITE POINT ROAD TO THE EAST END OF THE DOCK BY AN 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>	
604.920	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963	
604.923	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE	
604.933	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
604.933	.016	2/1				VERTICAL CONTROL SURVEY	2010	VSHOR4	

**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>	
604.933	.262		510.747	.197	2011	GPS - OPUS	2020	GPSBM	
605.140	.262		510.960	.197	2011	GPS - RTRN	2020	RTRN2020	
604.950	.262		510.770	.197	2011	GPS - RTRN	2017	RTRN2017	
604.933			510.714	.018	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940	
604.933			510.714	.018	2011	GPS - STATIC	2013	HBBAY	
604.920	.131		510.865	.066	2007	GPS - STATIC	2012	HBBAY	
604.881	.262		510.809	.197	2007	GPS - RTRN	2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -94.186 12B = -94.183 09 = -94.068 03 = -94.006

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>			<u>Lake County - Lake (North Shore) Zone</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 56 41.56879	91 46 54.83046		526710.685	159544.424	.131	3	GPS - OPUS	2020	GPSBM
46 56 41.56894	91 46 54.83105		526710.644	159544.440	.131	3	GPS - RTRN	2020	RTRN2020
46 56 41.56836	91 46 54.83020		526710.702	159544.380	.131	3	GPS - RTRN	2017	RTRN2017
46 56 41.56741	91 46 54.83210		526710.568	159544.287	.020		ADJUSTMENT	2013	GPS2940
46 56 41.56741	91 46 54.83210		526710.568	159544.287	.020	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>			<u>Lake County - Lake (North Shore) Zone</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 56 41.56762	91 46 54.83280		526710.520	159544.309	.033	C	GPS - STATIC	2012	HBBAY
46 56 41.56590	91 46 54.83193		526710.576	159544.134	.131	3	GPS - RTRN	2011	RTRN2011



**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North 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>
2953898.503	493159.947	1944555.451	17059542.556	.131	3	GPS - OPUS	2020	GPSBM
2953898.462	493159.961	1944555.410	17059542.571	.131	3	GPS - RTRN	2020	RTRN2020
2953898.522	493159.903	1944555.470	17059542.513	.131	3	GPS - RTRN	2017	RTRN2017
2953898.392	493159.805	1944555.340	17059542.415	.020		ADJUSTMENT	2013	GPS2940
2953898.392	493159.805	1944555.340	17059542.415	.020	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North 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>
2953898.343	493159.826	1944555.291	17059542.435	.033	C	GPS - STATIC	2012	HBBAY
2953898.406	493159.652	1944555.354	17059542.262	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KR_108-DM5567-3E-27JUL2020.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KR_108-DM5567-3E-27JUL2020.jpg</a>	E	Jul 27, 2020
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KR_108-DM5567-2-27JUL2020.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KR_108-DM5567-2-27JUL2020.jpg</a>		Jul 27, 2020
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KR_108-DM5567-1-27JUL2020.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/KR_108-DM5567-1-27JUL2020.jpg</a>		Jul 27, 2020

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



Mn/DOT Name: L 173

NGS Name: L 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0315](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091321/  
 USGS Quad: TWO HARBORS NE

				<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	16	54 N	10 W	470921.00	913706.00	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>
1935	1957	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: (1935)                      Stamping: L 173 1935

3.9 MILES SOUTHWEST OF LONDON, 33.0 FEET NORTH OF A CROSSROAD, 29.0 FEET EAST OF ALGER ROAD, 1.0 FOOT WEST OF A FENCE.

**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>		
1228.275	.016	2/0						VERTICAL ADJUSTMENT		1991	00000025		

<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>		
1228.042	.007	1						VERTICAL CONTROL SURVEY		1935	L49 MINN		

Geoid Separations(ft): GEOID18 = -93.776    12B = -93.750    09 = -93.648    03 = -93.612

\* No Horizontal Positions in the Database \*



Mn/DOT Name: L 178

NGS Name: L 178

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0291](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	14	56 N	8 W	472024.27	911904.12	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>
1935	1978	NOT FOUND	Horz=YES Vert=YES	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: (1935)                      Stamping: L 178 1935

6.8 MILES NORTHEAST ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT BEAVER BAY, 0.5 MILE SOUTH OF LAX LAKE, AT A LARGE CLEARING, 35.0 FEET WEST OF AN ABANDONED LOGGING TRACK, 31.0 FEET EAST OF A ROAD.

**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>	
1286.500	.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>	
1286.221	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1286.221	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -94.590    12B = -94.544    09 = -94.498    03 = -94.436

\* No Horizontal Positions in the Database \*





Mn/DOT Name: L 336

NGS Name: L 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0543](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	7	54 N	10 W	471029.00	913951.00	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>
1978	2008	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	VERTICAL CONTROL DISK	NGS

Description: (1978)                      Stamping: L 336 1978

10.35 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS, 32.0 FEET EAST OF COUNTY ROAD 2, 156.0 FEET SOUTH OF AN EXTENDED DRIVE SOUTH 123 WEST, IN THE TOP OF AN EXPOSED SECTION OF A ROCK OUTCROP, 1.0 FOOT SOUTH OF A WITNESS POST.

Station Notes  
 THE ROAD WAS RE-BUILT.

**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>		
1429.935	.007	1/2						VERTICAL ADJUSTMENT		1991	00000025		

**Geoid Separations(ft): GEOID18 = -93.225    12B = -93.205    09 = -93.110    03 = -93.074**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: L 341

NGS Name: L 341

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0606](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	14	55 N	8 W	471512.00	911839.00	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>
1978	2000	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	BENCH MARK DISK	NGS

Description: (2000)                      Stamping: L 341 1978

0.85 MILE SOUTHWEST ON TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY, 29.0 FEET NORTHWEST OF TRUNK HIGHWAY 61, 89.0 FEET NORTH OF DRIVEWAY B 101, 2.0 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>	
711.163	.007	1/2					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>	
711.003	.033	3					VERTICAL CONTROL SURVEY	1987	CS3806	

Geoid Separations(ft): GEOID18 = -96.345    12B = -96.315    09 = -96.224    03 = -96.125

\* No Horizontal Positions in the Database \*



Mn/DOT Name: L 355

NGS Name: L 355

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0618](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	15	56 N	7 W	471957.60	911219.71	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>
1979	2017	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 (IN SLEEVE) (DEPTH 13 FT)	VERTICAL CONTROL DISK	NGS

Description: (2009) Stamping: L 355 1979

6.6 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY, AT THE PALISADES MOTEL, 73.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 26.0 FEET SOUTHWEST OF THE NORTHEAST ENTRANCE, 6.5 FEET SOUTHWEST OF A POWER POLE, 72.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61 MILEPOST 58.0, 1.0 FOOT 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>	
668.142	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
668.142	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	
668.142	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
668.142	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3	
668.142	.016	2/1					VERTICAL CONTROL SURVEY	2008	VSHOR2	
668.142	.007	1/2					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>	
667.928	.033	3					VERTICAL CONTROL SURVEY	1987	CS3806	

**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>	
668.155	.262			571.790	.197	2011	GPS - RTRN	2017	RTRN2017	

Geoid Separations(ft): GEOID18 = -96.401 12B = -96.361 09 = -96.312 03 = -96.207

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 19 57.59583	91 12 19.70718			672872.370	298203.914	.131	3	GPS - RTRN	2017	RTRN2017

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3094385.189	637547.735			2085228.676	17203687.811	.131	3	GPS - RTRN	2017	RTRN2017

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<u>Location:</u>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/L_355-SH0618-3SE-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/L_355-SH0618-3SE-19SEP2017.jpg</a>	SE	Sep 19, 2017
<u>Monument:</u>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/L_355-SH0618-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/L_355-SH0618-2-19SEP2017.jpg</a>		Sep 19, 2017
<u>Disk:</u>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/L_355-SH0618-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/L_355-SH0618-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: L 51

NGS Name: L 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0309](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

				<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	12	53 N	10 W	470547.13	913259.57	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>
1934	2017	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)	BENCH MARK DISK	NGS

Description: (2000)                      Stamping: L 51 1934

7.9 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT THE NORTH END OF A HIGHWAY CURVE, 0.15 MILE NORTHEAST OF TRUNK HIGHWAY 61 MILEPOST 334, 33.0 FEET EAST OF TRUNK HIGHWAY 61, 75.0 FEET NORTH OF THE LAST POST AT THE NORTH END OF A GUARDRAIL, 1.0 FOOT 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>	
681.413	.007	1/2					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>	
681.255	.007	1					VERTICAL CONTROL SURVEY	1935	L95 MINN	

Geoid Separations(ft): GEOID18 = -95.420 12B = -95.367 09 = -95.262 03 = -95.216

\* No Horizontal Positions in the Database \*



Mn/DOT Name: LAKE HIGH  
County: LAKE, MN (Sheet 1)

NGS Name: LAKE HIGH

NGS ACRN: [SH0785](#) [Get Map](#)  
NGS Quad / Sta Num : 47091323/1008  
USGS Quad: TWO HARBORS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	52 N	11 W	470123.66	914007.03		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>
1952	1976	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)	TRIANGULATION STATION DISK	NGS

**Description:** (1976) **Stamping:** LAKE HIGH 1952

IN TWO HARBORS, 305.0 FEET NORTH ALONG 5TH STREET FROM THE JUNCTION OF 5TH STREET AND 4TH AVENUE IN TWO HARBORS, THEN 278.0 FEET WEST OF AN ALLEY ROAD.

\* 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>		
675.852	.197		581.216	.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>		
675.884						RECIPROCAL VERTICAL ANGLE	1952	HORZ	

Geoid Separations(ft): GEOID18 = -94.842 12B = -94.826 09 = -94.734 03 = -94.652

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 01 23.65708	91 40 07.03069	555611.223	187493.162	.066	2	ADJUSTMENT	1999	17648		
47 01 23.66297	91 40 07.02653	555611.524	187493.752	.066	2	ADJUSTMENT	1991	17497		

<u>NAD83(1986)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 01 23.66063	91 40 07.02565	555611.580	187493.514	.066	2	ADJUSTMENT	1986	17289		

<u>NAD27</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 01 23.88700	91 40 06.38400			.100	2	CLASSICAL SURVEY	1956	11100		

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>		
2981660.379	522238.217	1972353.125	17088570.089	.066	2	ADJUSTMENT	1999	17648		
2981660.656	522238.819	1972353.402	17088570.691	.066	2	ADJUSTMENT	1991	17497		

<u>NAD83(1986)</u>		<u>MN State Plane - North 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>		
2981660.721	522238.583	1972353.467	17088570.455	.066	2	ADJUSTMENT	1986	17289		

<u>NAD27</u>		<u>MN State Plane - North 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>		
2357049.086	194178.225			.100	2	CLASSICAL SURVEY	1956	11100		



Mn/DOT Name: LAKE HIGH RM 1

NGS Name: LAKE HIGH RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3192](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/1008  
 USGS Quad: TWO HARBORS

				<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	1	52 N	11 W	470123.98	914006.17		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1952	2008	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:** **Stamping:** LAKE HIGH NO 1 1952

LOCATED AT THE LAKE COUNTY HIGH SCHOOL IN TWO HARBORS, 12.0 FEET NORTH OF THE DRIVEWAY, 1.0 FOOT SOUTHEAST OF THE SOUTHEAST CORNER OF A SHED. 09-10-08 THE SCHOOL WAS FOUND REMOVED AND THE AREA REGRADED.

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

Geoid Separations(ft): GEOID18 = -94.846 12B = -94.829 09 = -94.737 03 = -94.652



Mn/DOT Name: LAKE HIGH RM 2

NGS Name: LAKE HIGH RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3193](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/1008  
 USGS Quad: TWO HARBORS

				<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	1	52 N	11 W	470123.99	914007.64		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1952	2008	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	NGS

**Description:** (2008)                      **Stamping:** LAKE HIGH NO 2 1952

LOCATED AT THE LAKE COUNTY HIGH SCHOOL IN TWO HARBORS, 10.0 FEET NORTH OF THE DRIVEWAY, 1.0 FOOT SOUTH OF A GAP BETWEEN TWO SHEDS. THE SCHOOL HAS BEEN REMOVED AND THE AREA REGRADED (09-10-2008).

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

**Geoid Separations(ft): GEOID18 = -94.842    12B = -94.826    09 = -94.734    03 = -94.649**



Mn/DOT Name: LAMBERT MNDT

NGS Name: LAMBERT

County: LAKE, MN (Sheet 1)

NGS ACRN: [AH9255](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	52 N	10 W	470053.05	913956.12	1	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>
1997	2003	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 15 FT)	SURVEY DISK	MNDT

Description: (2003)                      Stamping: LAMBERT 1997

IN TWO HARBORS, 0.4 MILE SOUTH ALONG WATERFRONT DRIVE FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND WATERFRONT DRIVE, THEN 0.3 MILE EAST ON SOUTH AVENUE, THEN 0.3 MILE SOUTH ON 3RD STREET TO A PARKING LOT DIRECTLY ABOVE A BOAT LAUNCHING RAMP, 73.0 FEET WEST OF A LIGHT POLE, 57.6 FEET NORTHWEST OF A 6.0 INCH DIAMETER MAPLE TREE, 51.0 FEET NORTH OF A 4.0 INCH DIAMETER ASH TREE, ABOUT 100.0 FEET SOUTH OF THE SOUTH BOAT RAMP.

**Station Notes**

REPLACED BY LAMBERT RESET (STAMPED--- LAMBERT RESET 1997 2003 ---),  
 WHICH WAS REPLACED BY LAMBERT RESET 2 (STAMPED---LAMBERT 2003 2011---)

**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>	
617.558	.007	1/2					VERTICAL ADJUSTMENT	2004	00000449	
617.558	.016	2/1					VERTICAL CONTROL SURVEY	2002	VH201	

**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>	
				522.624	.016	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800	
				522.712	.017	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300	

Geoid Separations(ft): GEOID18 = -94.974 12B = -94.957 09 = -94.862 03 = -94.780

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 00 53.04747	91 39 56.11915			556300.785	184376.349	.013		ADJUSTMENT	2012	GPS2800

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 00 53.04759	91 39 56.12007			556300.721	184376.363	.013		ADJUSTMENT	2007	GPS2300

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>			<u>Project Info</u>			
<u>MN State Plane - North 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>									
2982473.780	519151.538			1973161.619	17085483.037	.013		ADJUSTMENT	2012	GPS2800

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>			<u>Project Info</u>			
<u>MN State Plane - North 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>									
2982473.716	519151.549			1973161.556	17085483.048	.013		ADJUSTMENT	2007	GPS2300





Mn/DOT Name: LAMBERT RESET

NGS Name: LAMBERT RESET

County: LAKE, MN (Sheet 1)

NGS ACRN: [DG7027](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	6	52 N	10 W	470053.05	913956.12	2	B

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2003	2012	DESTROYED	Horz=NO Vert=NO	NO		RECESSED 2 IN.	MARKER W/BAR MAGNET

Monument Type	Disk Type	Mon. Agency
ALUMINUM ALLOY ROD (NO SLEEVE) (DEPTH 15 FT)	SURVEY DISK	MNDT

**Description:** (2004)                      **Stamping:** LAMBERT RESET 1997 2003

IN TWO HARBORS, 0.4 MILE SOUTH ALONG WATERFRONT DRIVE FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND WATERFRONT DRIVE, THEN 0.3 MILE WEST ON SOUTH AVENUE, THEN 0.3 MILE SOUTH ON 3RD STREET TO A PARKING LOT FOR A LIGHTHOUSE DIRECTLY ABOVE A BOAT LAUNCHING RAMP, 73.0 FEET WEST OF A LIGHT POLE, 57.6 FEET NORTHWEST OF A 6.0 INCH DIAMETER MAPLE TREE, 51.0 FEET NORTH OF A 4.0 INCH DIAMETER ASH TREE, ABOUT 100.0 FEET SOUTH OF THE SOUTH BOAT RAMP.

**Station Notes**

THE DISK WAS TURNED IN TO OFFICE.

**Leveling-Derived Orthometric Heights (Feet)**

**NAVD88**

Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj		Year	Reference	
617.568	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
617.564	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3	

**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	
			522.643	.021	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800	
			522.729	.022	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300	
617.650	.098		522.801	.049	1996	GPS - STATIC	2004	GPS1954	

Geoid Separations(ft): GEOID18 = -94.974 12B = -94.957 09 = -94.862 03 = -94.780

**Lat/Lon and County Coordinates (Feet)**

**NAD83(2011)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 00 53.04769	91 39 56.11964	556300.751	184376.372	.020		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 00 53.04780	91 39 56.12052	556300.691	184376.385	.023		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 00 53.04759	91 39 56.12028	556300.707	184376.363	.016	B	GPS - STATIC	2004	GPS1954

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2982473.745	519151.560	1973161.585	17085483.059	.020		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2982473.684	519151.570	1973161.524	17085483.069	.023		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2982473.701	519151.549	1973161.541	17085483.048	.016	B	GPS - STATIC	2004	GPS1954



Mn/DOT Name: LAMBERT RESET 2

NGS Name: LAMBERT RESET 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [DO8124](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	52 N	10 W	470053.05	913956.12	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>
2011	2018	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: (2015)                      Stamping: LAMBERT 2003 2011

IN TWO HARBORS, 0.4 MILE SOUTH ALONG WATERFRONT DRIVE FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND WATERFRONT DRIVE IN TWO HARBORS, THEN 0.3 MILE WEST ON SOUTH AVENUE, THEN 0.3 MILE SOUTH ON 3RD STREET TO A PARKING LOT FOR A LIGHTHOUSE DIRECTLY ABOVE A BOAT LAUNCHING RAMP, 73.0 FEET WEST OF A LIGHT POLE, 57.6 FEET NORTHWEST OF A MAPLE TREE, 51.0 FEET NORTH OF AN ASH TREE, 100.0 FEET SOUTH OF THE SOUTH BOAT RAMP, 17.0 FEET NORTHWEST OF THE NORTH LEG OF A PARK BENCH, 6.0 FEET NORTHWEST OF THE NORTHWEST EDGE OF A WALKING PATH.

**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>	
617.351	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
617.354	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	

**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>	
617.354				522.368	.014	2011	HORIZONTAL ADJUSTMENT	2019	GPS3302	
				522.620	.066	1996	GPS - STATIC	2019	HLAKE	
617.354				522.368	.014	2011	GPS - STATIC	2019	HLAKE	
617.354				522.368	.022	2011	HORIZONTAL ADJUSTMENT	2018	GPS3119	
617.430	.131			522.620	.066	1996	GPS - STATIC	2017	HMNCORS07	
617.354				522.368	.022	2011	GPS - STATIC	2017	HMNPH	
617.394	.262			522.440	.197	2011	GPS - RTRN	2017	RTRN2017	
617.335	.262			522.378	.197	2011	GPS - RTRN	2015	RTRN2015	
617.351				522.368	.038	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940	
617.351				522.368	.038	2011	GPS - STATIC	2013	HBBAY	
617.322	.131			522.469	.066	2007	GPS - STATIC	2012	HBBAY	

Geoid Separations(ft): GEOID18 = -94.974    12B = -94.957    09 = -94.862    03 = -94.780

**Lat/Lon and County Coordinates (Feet)**

**NAD83(2011)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 00 53.04823	91 39 56.12042	556300.698	184376.428	.010		ADJUSTMENT	2019	GPS3302
47 00 53.04823	91 39 56.12042	556300.698	184376.428	.010	C	GPS - STATIC	2019	HLAKE
47 00 53.04823	91 39 56.12042	556300.698	184376.428	.013		ADJUSTMENT	2018	GPS3119
47 00 53.04823	91 39 56.12042	556300.698	184376.428	.013	C	GPS - STATIC	2017	HMNPH
47 00 53.04770	91 39 56.12011	556300.719	184376.374	.131	3	GPS - RTRN	2017	RTRN2017
47 00 53.04709	91 39 56.12081	556300.669	184376.313	.131	3	GPS - RTRN	2015	RTRN2015
47 00 53.04823	91 39 56.12042	556300.698	184376.428	.026		ADJUSTMENT	2013	GPS2940
47 00 53.04823	91 39 56.12042	556300.698	184376.428	.026	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 00 53.04811	91 39 56.12136	556300.633	184376.417	.033	C	GPS - STATIC	2012	HBBAY

**NAD83(1996)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 00 53.04773	91 39 56.12110	556300.650	184376.379	.033	C	GPS - STATIC	2019	HLAKE
47 00 53.04773	91 39 56.12110	556300.650	184376.379	.033	C	GPS - STATIC	2017	HMNCORS07

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2982473.690	519151.614	1973161.530	17085483.113	.010		ADJUSTMENT	2019	GPS3302
2982473.690	519151.614	1973161.530	17085483.113	.010	C	GPS - STATIC	2019	HLAKE
2982473.690	519151.614	1973161.530	17085483.113	.013		ADJUSTMENT	2018	GPS3119
2982473.690	519151.614	1973161.530	17085483.113	.013	C	GPS - STATIC	2017	HMNPH
2982473.713	519151.560	1973161.552	17085483.060	.131	3	GPS - RTRN	2017	RTRN2017
2982473.665	519151.498	1973161.505	17085482.997	.131	3	GPS - RTRN	2015	RTRN2015
2982473.690	519151.614	1973161.530	17085483.113	.026		ADJUSTMENT	2013	GPS2940
2982473.690	519151.614	1973161.530	17085483.113	.026	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2982473.626	519151.600	1973161.465	17085483.100	.033	C	GPS - STATIC	2012	HBBAY

**NAD83(1996)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2982473.644	519151.562	1973161.484	17085483.061	.033	C	GPS - STATIC	2019	HLAKE
2982473.644	519151.562	1973161.484	17085483.061	.033	C	GPS - STATIC	2017	HMNCORS07

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LAMBERT_RESET_2-DO8124-3NW-07SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LAMBERT_RESET_2-DO8124-3NW-07SEP2017.jpg</a>	NW	Sep 7, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LAMBERT_RESET_2-DO8124-2-07SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LAMBERT_RESET_2-DO8124-2-07SEP2017.jpg</a>		Sep 7, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LAMBERT_RESET_2-DO8124-1-07SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LAMBERT_RESET_2-DO8124-1-07SEP2017.jpg</a>		Sep 7, 2017

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



Mn/DOT Name: LAUREN  
County: LAKE, MN (Sheet 1)

NGS Name: LAUREN

NGS ACRN: [SH0789](#) [Get Map](#)  
NGS Quad / Sta Num : 47091324/1009  
USGS Quad: HIGHLAND

				<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	25	55 N	11 W	471318.45	913953.86	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>
1952	2007	GOOD	Horz=NO 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)	TRIANGULATION STATION DISK	NGS

**Description:** (2007)                      **Stamping:** LAUREN 1952

4.0 MILES EAST OF WALES, 2.5 MILES NORTHEAST OF THE LAUREN RAILROAD STATION, 13.45 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, 0.5 MILE NORTH OF COUNTY ROAD 14, 140.5 FEET NORTH OF DRIVEWAY NUMBER 4021, 80.0 FEET WEST OF TRUNK HIGHWAY 2, 1.0 FOOT EAST OF A WITNESS POST, 77.19 FEET SOUTH-SOUTHWEST OF LAUREN1, 91.50 FEET NORTH OF LAUREN RM 2.

**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>	
1653.724	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
1653.730	.016	2/1					VERTICAL CONTROL SURVEY	2011	VBCKY-R	
1653.730	.016	2/1					VERTICAL CONTROL SURVEY	2009	VBCKY	

**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>	
1653.540	.262			1560.732	.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>	
1653.507							RECIPROCAL VERTICAL ANGLE	1952	HORZ	

Geoid Separations(ft): GEOID18 = -92.897    12B = -92.880    09 = -92.792    03 = -92.759

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(1996)</u>				<u>Lake 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>
<u>Latitude</u>	<u>Longitude</u>									
47 13 18.44853	91 39 53.85762			436470.258	156696.517	.131	3	ADJUSTMENT	1999	17648
47 13 18.44847	91 39 53.85681			436470.314	156696.511	.131	3	ADJUSTMENT	1991	17497

<u>NAD83(1986)</u>				<u>Lake 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>
<u>Latitude</u>	<u>Longitude</u>									
47 13 18.44849	91 39 53.85670			436470.322	156696.513	.131	3	ADJUSTMENT	1986	17289

<u>NAD27</u>				<u>Lake 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>
<u>Latitude</u>	<u>Longitude</u>									
47 13 18.72000	91 39 53.22900					.100	3	CLASSICAL SURVEY	1956	11100



State Plane and UTM Coordinates (Feet)

NAD83(1996)

MN State Plane - North 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>
2981228.533	594661.674	1972029.121	17160975.680	.131	3	ADJUSTMENT	1999	17648
2981228.589	594661.668	1972029.177	17160975.675	.131	3	ADJUSTMENT	1991	17497

NAD83(1986)

MN State Plane - North 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>
2981228.597	594661.671	1972029.185	17160975.677	.131	3	ADJUSTMENT	1986	17289

NAD27

MN State Plane - North 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>
2356615.779	266605.587			.100	3	CLASSICAL SURVEY	1956	11100

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LAUREN-SH0789-3W-30JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LAUREN-SH0789-3W-30JUL2007.jpg</a>	W	Jul 30, 2007
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LAUREN-SH0789-2-30JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LAUREN-SH0789-2-30JUL2007.jpg</a>		Jul 30, 2007
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LAUREN-SH0789-1-30JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LAUREN-SH0789-1-30JUL2007.jpg</a>		Jul 30, 2007

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



Mn/DOT Name: LAUREN AZ MK

NGS Name: LAUREN AZ MK

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3204](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/1009  
 USGS Quad: HIGHLAND

				<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	25	55 N	11 W	471326.00	913953.00		

<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>
1952	1952	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	AZIMUTH MARK DISK	NGS

**Description:** (1952)                      **Stamping:** LAUREN 1952

4.0 MILES EAST OF WALES, 2.5 MILES NORTHEAST OF THE LAUREN RAILROAD STATION, 13.35 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, 28.0 FEET EAST OF THE APPROXIMATE CENTERLINE OF HIGHWAY 2, 2.0 FEET SOUTHEAST OF A WITNESS POST.

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

**Geoid Separations(ft): GEOID18 = -92.887    12B = -92.871    09 = -92.782    03 = -92.749**





Mn/DOT Name: LAUREN RM 2

NGS Name: LAUREN RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3206](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/1009  
 USGS Quad: HIGHLAND

				<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	25	55 N	11 W	471317.55	913953.68	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>
1952	2007	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>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

**Description:** (2007)                      **Stamping:** LAUREN NO 2 1952

4.0 MILES EAST OF WALES, 2.5 MILES NORTHEAST OF THE LAUREN RAILROAD STATION, 13.50 MILES NORTH OF TWO HARBORS, 13.45 MILES NORTH ALONG COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 IN TWO HARBORS, 91.50 FEET SOUTH OF STATION LAUREN, 57.0 FEET NORTH OF DRIVEWAY NUMBER 4021, 67.3 FEET WEST OF COUNTY ROAD 2, 1.0 FOOT 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>	
1647.428	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
1647.434	.016	2/1					VERTICAL CONTROL SURVEY	2011	VBCKY-R	
1647.434	.016	2/1					VERTICAL CONTROL SURVEY	2009	VBCKY	

Geoid Separations(ft): GEOID18 = -92.897    12B = -92.880    09 = -92.792    03 = -92.759

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LAUREN_RM_2-CJ3206-3W-30JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LAUREN_RM_2-CJ3206-3W-30JUL2007.jpg</a>	W	Jul 30, 2007
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LAUREN_RM_2-CJ3206-2-30JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LAUREN_RM_2-CJ3206-2-30JUL2007.jpg</a>		Jul 30, 2007
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LAUREN_RM_2-CJ3206-1-30JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LAUREN_RM_2-CJ3206-1-30JUL2007.jpg</a>		Jul 30, 2007

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





Mn/DOT Name: LIGHT

NGS Name: LIGHT

County: LAKE, MN (Sheet 1)

NGS ACRN: [DO8125](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	33	55 N	8 W	471233.40	912134.23	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>
2011	2019	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 18 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2011)                      Stamping: LIGHT 2011

4.2 MILES SOUTHWEST OF BEAVER BAY, 4.6 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 (LAX LAKE ROAD) IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 46.4, 68.3 FEET NORTHWEST OF TRUNK HIGHWAY 61, 9.5 FEET SOUTHWEST OF AN ENTRANCE, 1.5 FEET SOUTHEAST OF A WITNESS POST.

Station Pair:    SRLH - LAKE, 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>	
678.270	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
678.270	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	

**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>	
678.279				581.780	.021	2011	HORIZONTAL ADJUSTMENT	2019	GPS3328	
678.270	.131			581.964	.066	1996	GPS - STATIC	2019	Hlake2	
678.279				581.780	.021	2011	GPS - STATIC	2019	Hlake2	
678.279	.262			581.833	.197	2011	GPS - RTRN	2017	RTRN2017	
678.270				581.780	.035	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940	
678.270				581.780	.035	2011	GPS - STATIC	2013	HBBAY	
678.279	.131			581.915	.066	2007	GPS - STATIC	2012	HBBAY	

Geoid Separations(ft): GEOID18 = -96.486    12B = -96.447    09 = -96.348    03 = -96.230

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Lake County - Lake (North Shore) Zone</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>							
47 12 33.39786	91 21 34.22512	633887.180	253838.296	.016		ADJUSTMENT	2019	GPS3328
47 12 33.39786	91 21 34.22512	633887.180	253838.296	.016	C	GPS - STATIC	2019	Hlake2
47 12 33.39804	91 21 34.22493	633887.194	253838.315	.131	3	GPS - RTRN	2017	RTRN2017
47 12 33.39786	91 21 34.22512	633887.180	253838.296	.033		ADJUSTMENT	2013	GPS2940
47 12 33.39786	91 21 34.22512	633887.180	253838.296	.033	C	GPS - STATIC	2013	HBBAY
<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>							
47 12 33.39824	91 21 34.22597	633887.122	253838.336	.033	C	GPS - STATIC	2012	HBBAY
<u>NAD83(1996)</u>		<u>Lake County - Lake (North Shore) Zone</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>							
47 12 33.39804	91 21 34.22585	633887.130	253838.316	.033	C	GPS - STATIC	2019	Hlake2

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
3057215.106	591657.450	2047995.628	17157859.530	.016		ADJUSTMENT	2019	GPS3328
3057215.106	591657.450	2047995.628	17157859.530	.016	C	GPS - STATIC	2019	HLAKE2
3057215.118	591657.469	2047995.641	17157859.549	.131	3	GPS - RTRN	2017	RTRN2017
3057215.106	591657.450	2047995.628	17157859.530	.033		ADJUSTMENT	2013	GPS2940
3057215.106	591657.450	2047995.628	17157859.530	.033	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
3057215.046	591657.487	2047995.569	17157859.568	.033	C	GPS - STATIC	2012	HBBAY

**NAD83(1996)**

MN State Plane - North Zone		UTM - Zone 15		Acc	Order	Determination Method	Project Info	
X	Y	X	Y				Year	Reference
3057215.055	591657.467	2047995.578	17157859.547	.033	C	GPS - STATIC	2019	HLAKE2

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIGHT-DO8125-3NW-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIGHT-DO8125-3NW-25SEP2017.jpg</a>	NW	Sep 25, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIGHT-DO8125-2-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIGHT-DO8125-2-25SEP2017.jpg</a>		Sep 25, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIGHT-DO8125-1-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIGHT-DO8125-1-25SEP2017.jpg</a>		Sep 25, 2017

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



Mn/DOT Name: LIND MNDT

NGS Name: LIND

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0759](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	13	54 N	9 W	470954.87	912522.57	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>
1977	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	HORIZONTAL CONTROL DISK	MNDT

Description: (2009) Stamping: LIND 1977

5.0 MILES NORTHEAST OF CASTLE DANGER, 2.7 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND A BRIDGE OVER GOOSEBERRY FALLS AT CASTLE DANGER TO TRUNK HIGHWAY 61 MILEPOST 42.0, THEN 0.1 MILE SOUTHEAST ON TWIN POINT ACCESS ROAD TO A PARKING LOT, THEN 0.1 MILE SOUTHEAST ON A WALK PATH, 41.85 FEET WEST OF LIND MNDT RM 1, 43.45 FEET WEST-NORTHWEST OF LIND MNDT RM 2, IN 1995 DEPARTMENT OF NATURAL RESOURCES (DNR) SURVEYS FOUND STATION LIND MNDT AND LIND MNDT RM 1.

**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>					
626.065	.016	2/1				2021	00000963					
626.065	.016	2/1				2019	VNSHORE					
626.065	.016	2/1				2011	00000691					
626.068	.016	2/1				2009	VSHOR3					

**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>					
626.163	.262		529.914	.197	2011	2020	GPSBM					
626.321	.262		530.130	.197	2011	2020	RTRN2020					
626.065			529.832	.031	2011	2013	GPS2940					
626.065			529.832	.031	2011	2013	HBBAY					
626.081	.131		529.983	.066	2007	2012	HBBAY					
626.006	.262		529.920	.197	2007	2011	RTRN2011					
624.014	.197		528.004	.131	1996	1999	17648					

<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>					
624.014						1977	HORZ					

Geoid Separations(ft): GEOID18 = -96.250 12B = -96.191 09 = -96.086 03 = -96.040

**Lat/Lon and County Coordinates (Feet)**

**NAD83(2011)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 09 54.87318	91 25 22.57000	617828.567	238062.359	.131	3	GPS - OPUS	2020	GPSBM
47 09 54.87113	91 25 22.57011	617828.556	238062.151	.131	3	GPS - RTRN	2020	RTRN2020
47 09 54.87320	91 25 22.56966	617828.590	238062.360	.033		ADJUSTMENT	2013	GPS2940
47 09 54.87320	91 25 22.56966	617828.590	238062.360	.033	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 09 54.87347	91 25 22.57071	617828.518	238062.389	.033	C	GPS - STATIC	2012	HBBAY
47 09 54.87257	91 25 22.57301	617828.358	238062.300	.131	3	GPS - RTRN	2011	RTRN2011

**NAD83(1996)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 09 54.86085	91 25 22.56729	617828.731	238061.106	.066	2	ADJUSTMENT	1999	17648
47 09 54.86804	91 25 22.56489	617828.910	238061.831	.066	2	ADJUSTMENT	1991	17497

**NAD83(1986)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 09 54.86560	91 25 22.56276	617829.053	238061.581	.066	2	ADJUSTMENT	1986	17289

**NAD27**

Geodetic Position						Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 09 55.12878	91 25 21.94958			.100	2	CLASSICAL SURVEY	1979	15983

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3041802.602	575251.891	2032561.278	17141480.206	.131	3	GPS - OPUS	2020	GPSBM
3041802.599	575251.683	2032561.275	17141479.998	.131	3	GPS - RTRN	2020	RTRN2020
3041802.625	575251.893	2032561.302	17141480.209	.033		ADJUSTMENT	2013	GPS2940
3041802.625	575251.893	2032561.302	17141480.209	.033	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3041802.552	575251.919	2032561.229	17141480.235	.033	C	GPS - STATIC	2012	HBBAY
3041802.395	575251.825	2032561.072	17141480.140	.131	3	GPS - RTRN	2011	RTRN2011

**NAD83(1996)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3041802.816	575250.646	2032561.491	17141478.961	.066	2	ADJUSTMENT	1999	17648
3041802.966	575251.378	2032561.642	17141479.693	.066	2	ADJUSTMENT	1991	17497

**NAD83(1986)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3041803.119	575251.134	2032561.794	17141479.449	.066	2	ADJUSTMENT	1986	17289

**NAD27**

MN State Plane - North Zone						Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2417191.134	247194.434			.100	2	CLASSICAL SURVEY	1979	15983

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIND-SH0759-3NE-27JUL2020.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIND-SH0759-3NE-27JUL2020.jpg</a>	NE	Jul 27, 2020
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIND-SH0759-2-27JUL2020.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIND-SH0759-2-27JUL2020.jpg</a>		Jul 27, 2020
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIND-SH0759-1-27JUL2020.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIND-SH0759-1-27JUL2020.jpg</a>		Jul 27, 2020

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



Mn/DOT Name: LIND MNDT RM 1

NGS Name: LIND RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3218](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	13	54 N	9 W	470954.84	912521.97	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>
1977	2011	GOOD	Horz=NO Vert=YES	YES			NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	REFERENCE MARK DISK	MNDT

**Description:** (2009)                      **Stamping:** LIND NO 1 1977

5.0 MILES NORTHEAST OF CASTLE DANGER, 2.7 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND A BRIDGE OVER GOOSEBERRY FALLS AT CASTLE DANGER, TO TRUNK HIGHWAY 61 MILEPOST 42.0, THEN 0.1 MILE SOUTHEAST ON TWIN POINT ACCESS ROAD TO A PARKING LOT, THEN 0.1 MILE SOUTHEAST ON A WALKING PATH TO STATION LIND MNDT RM 1, 41.85 FEET EAST OF STATION LIND, 21.65 FEET NORTH OF LIND MNDT RM 2.

**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>	
622.259	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
622.259	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3	

**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>	
622.482	.262			526.393	.197	2007	GPS - RTRN	2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -96.253    12B = -96.194    09 = -96.089    03 = -96.043

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 09 54.83941	91 25 21.96806	617870.092	238058.173	.131	3	GPS - RTRN	2011	RTRN2011	

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
3041844.258	575249.372	2032602.923	17141477.626	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIND_RM_1-CJ3218-3SE-03JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIND_RM_1-CJ3218-3SE-03JUL2007.jpg</a>	SE	Jul 3, 2007
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIND_RM_1-CJ3218-2-03JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIND_RM_1-CJ3218-2-03JUL2007.jpg</a>		Jul 3, 2007
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIND_RM_1-CJ3218-1-03JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIND_RM_1-CJ3218-1-03JUL2007.jpg</a>		Jul 3, 2007

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



Mn/DOT Name: LIND MNDT RM 2

NGS Name: LIND RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3219](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	13	54 N	9 W	470954.64	912522.05	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>
1977	2018	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	REFERENCE MARK DISK	MNDT

**Description:** (2009)                      **Stamping:** LIND NO 2 1977

5.0 MILES NORTHEAST OF CASTLE DANGER, 2.7 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND A BRIDGE OVER GOOSEBERRY FALLS AT CASTLE DANGER TO TRUNK HIGHWAY 61 MILEPOST 42.0, THEN 0.1 MILE SOUTHEAST ON TWIN POINT ACCESS ROAD TO A PARKING LOT, THEN 0.1 MILE SOUTHEAST ON A WALKING PATH TO STATION LIND MNDT RM 2, 43.45 FEET EAST-SOUTHEAST OF STATION LIND, 21.65 FEET SOUTH OF LIND MNDT RM 1.

**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>		
619.946	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963		
619.946	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE		
619.946	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691		
619.946	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3		

**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>		
619.936	.262		523.742	.197	2011	GPS - RTRN	2020	RTRN2020		
619.936	.262		523.847	.197	2007	GPS - RTRN	2011	RTRN2011		

Geoid Separations(ft): GEOID18 = -96.253    12B = -96.194    09 = -96.089    03 = -96.043

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>
<u>Latitude</u>	<u>Longitude</u>									
47 09 54.63567	91 25 22.04848			617864.157	238037.636	.131	3	GPS - RTRN	2020	RTRN2020

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>
<u>Latitude</u>	<u>Longitude</u>									
47 09 54.63547	91 25 22.04935			617864.096	238037.617	.131	3	GPS - RTRN	2011	RTRN2011

**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 - North Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
<u>X</u>	<u>Y</u>									
3041839.151	575228.615			2032597.785	17141456.880	.131	3	GPS - RTRN	2020	RTRN2020

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>MN State Plane - North Zone</u>				<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
<u>X</u>	<u>Y</u>									
3041839.092	575228.593			2032597.725	17141456.858	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIND_RM_2-CJ3219-3E-27JUL2020.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIND_RM_2-CJ3219-3E-27JUL2020.jpg</a>	E	Jul 27, 2020
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIND_RM_2-CJ3219-2-27JUL2020.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIND_RM_2-CJ3219-2-27JUL2020.jpg</a>		Jul 27, 2020
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIND_RM_2-CJ3219-1-27JUL2020.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LIND_RM_2-CJ3219-1-27JUL2020.jpg</a>		Jul 27, 2020

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



Mn/DOT Name: LITE

NGS Name: LITE

County: LAKE, MN (Sheet 1)

NGS ACRN: [DO8134](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	55 N	8 W	471200.64	912158.38	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>
1984	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	SURVEY DISK	NOS

**Description:** (2013)                      **Stamping:** LITE 1984

5.5 MILES SOUTHWEST OF BEAVER BAY, 5.2 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY TO TRUNK HIGHWAY 61 MILEPOINT 45.85, THENCE 0.4 MILE SOUTHEAST ON THE SPLIT ROAD LIGHT HOUSE ROAD THROUGH A PARK ENTRANCE TO A MAIN BUILDING, THENCE 0.05 MILE SOUTHWEST ON THE WALK TO A LIGHT HOUSE, 187.0 FEET EAST OF THE CENTER OF A SIDEWALK, AT THE STEPS AS YOU BEGIN TO CLIMB STAIRS, 125.0 FEET EAST OF THE NORTHEAST CORNER OF A SQUARE BUILDING NEXT TO A LIGHT HOUSE, 26.4 FEET WEST OF THE CORNER POST OF A CHAIN LINK FENCE, 9.7 FEET NORTH OF A CHAIN LINK FENCE.

**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>	
713.286	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
713.286	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	

**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>	
713.247	.262			616.728	.197	2011	GPS - RTRN	2017	RTRN2017	
713.253				616.695	.035	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940	
713.253				616.695	.035	2011	GPS - STATIC	2013	HBBAY	
713.253	.131			616.839	.066	2007	GPS - STATIC	2012	HBBAY	

Geoid Separations(ft): GEOID18 = -96.561 12B = -96.519 09 = -96.407 03 = -96.306

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 12 00.64322	91 21 58.37827			632161.175	250549.432	.131	3	GPS - RTRN	2017	RTRN2017
47 12 00.64323	91 21 58.37849			632161.160	250549.433	.033		ADJUSTMENT	2013	GPS2940
47 12 00.64323	91 21 58.37849			632161.160	250549.433	.033	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 12 00.64360	91 21 58.37942			632161.096	250549.472	.033	C	GPS - STATIC	2012	HBBAY

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>			<u>Project Info</u>			
<u>MN State Plane - North 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>									
3055622.436	588302.291			2046398.194	17154507.353	.131	3	GPS - RTRN	2017	RTRN2017
3055622.421	588302.291			2046398.179	17154507.353	.033		ADJUSTMENT	2013	GPS2940
3055622.421	588302.291			2046398.179	17154507.353	.033	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>			<u>Project Info</u>			
<u>MN State Plane - North 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>									
3055622.356	588302.327			2046398.114	17154507.389	.033	C	GPS - STATIC	2012	HBBAY



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LITE-DO8134-3SW-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LITE-DO8134-3SW-25SEP2017.jpg</a>	SW	Sep 25, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LITE-DO8134-2-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LITE-DO8134-2-25SEP2017.jpg</a>		Sep 25, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LITE-DO8134-1-25SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LITE-DO8134-1-25SEP2017.jpg</a>		Sep 25, 2017

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





Mn/DOT Name: LOOP

NGS Name: LOOP

County: LAKE, MN (Sheet 1)

NGS ACRN: [DR1376](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

				<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	21	53 N	10 W	470353.11	913613.31	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>
2017	2019	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 27 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017)                      Stamping: LOOP 2017

4.0 MILES NORTHEAST OF TWO HARBORS, 4.0 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 30.25, 44.7 FEET NORTH NORTHWEST OF TRUNK HIGHWAY 61, 24.2 FEET EAST OF COUNTY ROAD 113 (LOOP ROAD), 5.0 FEET EAST OF A WITNESS POST.

Station Pair:    SICRCF - LAKE, 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>			<u>Year</u>	<u>Reference</u>	
636.131	.016	2/1				2021	00000963	VERTICAL ADJUSTMENT				
636.131	.016	2/1				2019	VNSHORE	VERTICAL CONTROL SURVEY				

**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>			<u>Year</u>	<u>Reference</u>	
636.127			540.986	.024	2011	2019	GPS3328	HORIZONTAL ADJUSTMENT				
636.131	.131		541.183	.066	1996	2019	Hlake2	GPS - STATIC				
636.127			540.986	.024	2011	2019	Hlake2	GPS - STATIC				
636.140	.262		541.019	.197	2011	2017	RTRN2017	GPS - RTRN				

Geoid Separations(ft): GEOID18 = -95.154    12B = -95.118    09 = -95.019    03 = -94.951

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 03 53.11258	91 36 13.30888	572113.190	202292.558	.016		ADJUSTMENT	2019	GPS3328	
47 03 53.11258	91 36 13.30888	572113.190	202292.558	.016	C	GPS - STATIC	2019	Hlake2	
47 03 53.11256	91 36 13.30853	572113.215	202292.556	.131	3	GPS - RTRN	2017	RTRN2017	

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 03 53.11234	91 36 13.30937	572113.156	202292.535	.033	C	GPS - STATIC	2019	Hlake2	

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>MN State Plane - North 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>
2997557.374	537684.135	1988269.267	17103987.819	.016		ADJUSTMENT	2019	GPS3328
2997557.374	537684.135	1988269.267	17103987.819	.016	C	GPS - STATIC	2019	Hlake2
2997557.398	537684.133	1988269.291	17103987.817	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>
2997557.341	537684.110	1988269.233	17103987.794	.033	C	GPS - STATIC	2019	Hlake2



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LOOP-DR1376-3N-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LOOP-DR1376-3N-18OCT2017.jpg</a>	N	Oct 18, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LOOP-DR1376-2-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LOOP-DR1376-2-18OCT2017.jpg</a>		Oct 18, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LOOP-DR1376-1-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LOOP-DR1376-1-18OCT2017.jpg</a>		Oct 18, 2017

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



Mn/DOT Name: LOST

NGS Name: LOST

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0769](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091312/1010  
 USGS Quad: LEGLER 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	20	56 N	9 W	471922.26	913041.38		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>
1952	1952	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

**Description:** (1952)                      **Stamping:** LOST 1952

8.5 MILES WEST-NORTHWEST OF BEAVER BAY, 19.5 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS THEN 8.1 MILES EAST ON COUNTY ROAD 203 (1.9 MILES EAST OF RAILROAD) THEN 0.15 MILE SOUTH ON A DIM WOODS ROAD, 23.0 FEET SOUTHEAST OF THE SOUTHEAST END OF A LARGE BOULDER, 11.0 FEET SOUTH-SOUTHEAST OF AN 8.0 INCH DIAMETER BALSAM TREE, 6.0 FEET NORTH OF A WITNESS POST, 66.34 FEET SOUTHWEST OF LOST RM 1, 67.23 FEET SOUTH OF LOST RM 2.

\* 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>		
1692.910	.197		1600.128	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648		

<u>NGVD29</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>		
1692.910						RECIPROCAL VERTICAL ANGLE	1952	HORZ		

Geoid Separations(ft): GEOID18 = -92.834    12B = -92.831    09 = -92.710    03 = -92.710

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Lake 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>
47 19 22.26295	91 30 41.38197	474656.529	193473.342	.066	2	ADJUSTMENT	1999	17648
47 19 22.26397	91 30 41.37979	474656.679	193473.446	.066	2	ADJUSTMENT	1991	17497

<u>NAD83(1986)</u>		<u>Geodetic Position</u>		<u>Lake 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>
47 19 22.26366	91 30 41.38005	474656.661	193473.414	.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>
47 19 22.55100	91 30 40.77500			.100	2	CLASSICAL SURVEY	1956	11100

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>
3018597.314	632259.343	2009444.687	17198511.024	.066	2	ADJUSTMENT	1999	17648
3018597.462	632259.449	2009444.835	17198511.130	.066	2	ADJUSTMENT	1991	17497

<u>NAD83(1986)</u>		<u>MN State Plane - North 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>
3018597.444	632259.417	2009444.818	17198511.099	.066	2	ADJUSTMENT	1986	17289

<u>NAD27</u>		<u>MN State Plane - North 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>
2393984.078	304204.880			.100	2	CLASSICAL SURVEY	1956	11100



Mn/DOT Name: LOST RM 1

NGS Name: LOST RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3239](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091312/1010  
 USGS Quad: LEGLER 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	20	56 N	9 W	471922.52	913040.50		

<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>
1952	1952	GOOD	Horz=YES Vert=YES	NO		PROJECTS 8 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

**Description:** (1952)                      **Stamping:** LOST NO 1 1952

8.5 MILES WEST-NORTHWEST OF BEAVER BAY, 19.5 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, THEN 8.1 MILES EAST ON COUNTY ROAD 203 (1.9 MILES EAST OF A RAILROAD) THEN 0.15 MILE SOUTH ON A DIM WOODS ROAD, 66.34 FEET NORTHEAST OF STATION LOST.

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

**Geoid Separations(ft): GEOID18 = -92.834   12B = -92.834   09 = -92.710   03 = -92.713**



Mn/DOT Name: LOST RM 2

NGS Name: LOST RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3240](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091312/1010  
 USGS Quad: LEGLER 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	20	56 N	9 W	471922.92	913041.24		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1952	1952	GOOD	Horz=YES Vert=YES	NO		PROJECTS 7 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

**Description:** (1952)                      **Stamping:** LOST NO 2 1952

8.5 MILES WEST-NORTHWEST OF BEAVER BAY, 19.5 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS THEN 8.1 MILES EAST ON COUNTY ROAD 203 (1.9 MILES EAST OF A RAILROAD) THEN 0.15 MILE SOUTH ON A DIM WOODS ROAD, 45.0 FEET EAST-NORTHEAST OF THE NORTHEAST END OF A LARGE BOULDER, 67.23 FEET NORTH OF STATION LOST.

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

**Geoid Separations(ft): GEOID18 = -92.834   12B = -92.834   09 = -92.710   03 = -92.713**



Mn/DOT Name: LUPIN

NGS Name: LUPIN

County: LAKE, MN (Sheet 1)

NGS ACRN: [DR1390](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	11	56 N	7 W	472123.90	911047.20	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2017	2019	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 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017)                      Stamping: LUPIN 2017

0.75 MILE NORTHEAST OF ILLGEN CITY, 0.75 MILE NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND TRUNK HIGHWAY 1 IN ILLGEN CITY, AT TRUNK HIGHWAY 61 MILEPOINT 60.10, 38.9 FEET NORTHWEST OF TRUNK HIGHWAY 61, 0.2 MILE SOUTHWEST OF LUPIN DRIVE, 1.5 FEET SOUTHEAST OF A WITNESS POST.

Station Pair: SANDERS - LAKE, MN

**Leveling-Derived Orthometric Heights (Feet)**

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj				Year	Reference		
679.851	.016	2/1				VERTICAL ADJUSTMENT			2021	00000963		
679.858	.016	2/1				VERTICAL CONTROL SURVEY			2019	VNSHORE		

**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		
679.838			583.473	.024	2011	HORIZONTAL ADJUSTMENT			2019	GPS3328		
679.858	.131		583.670	.066	1996	GPS - STATIC			2019	Hlake2		
679.838			583.473	.024	2011	GPS - STATIC			2019	Hlake2		
679.831	.262		583.480	.197	2011	GPS - RTRN			2017	RTRN2017		

Geoid Separations(ft): GEOID18 = -96.394    12B = -96.352    09 = -96.315    03 = -96.204

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)		Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
47 21 23.89782	91 10 47.19687	679378.390	306848.580	.016		ADJUSTMENT	2019	GPS3328	
47 21 23.89782	91 10 47.19687	679378.390	306848.580	.016	C	GPS - STATIC	2019	Hlake2	
47 21 23.89746	91 10 47.19685	679378.390	306848.543	.131	3	GPS - RTRN	2017	RTRN2017	

NAD83(1996)		Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
47 21 23.89755	91 10 47.19734	679378.357	306848.553	.033	C	GPS - STATIC	2019	Hlake2	

**State Plane and UTM Coordinates (Feet)**

NAD83(2011)		MN State Plane - North Zone		UTM - Zone 15		Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3100537.957	646445.909	2091393.859	17212575.936	.016		ADJUSTMENT	2019	GPS3328
3100537.957	646445.909	2091393.859	17212575.936	.016	C	GPS - STATIC	2019	Hlake2
3100537.959	646445.872	2091393.861	17212575.900	.131	3	GPS - RTRN	2017	RTRN2017

NAD83(1996)		MN State Plane - North Zone		UTM - Zone 15		Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3100537.925	646445.880	2091393.827	17212575.908	.033	C	GPS - STATIC	2019	Hlake2

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LUPIN-DR1390-3NW-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LUPIN-DR1390-3NW-18OCT2017.jpg</a>	NW	Oct 18, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LUPIN-DR1390-1-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/LUPIN-DR1390-1-18OCT2017.jpg</a>		Oct 18, 2017
Disk:			

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



Mn/DOT Name: M 173

NGS Name: M 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0314](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	29	54 N	10 W	470815.00	913740.00	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>
1935	2021	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)	BENCH MARK DISK	NGS

Description: (1935)                      Stamping: M 173 1935

5.4 MILES SOUTHWEST OF LONDON, 8.4 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS THEN 2.0 MILES SOUTHEAST ON A GRAVEL ROAD, 85.0 FEET SOUTHWEST OF A HOUSE, 35.0 FEET NORTH OF A ROAD, 4.0 FEET SOUTHEAST OF A 10.0 INCH DIAMETER BASSWOOD TREE.

**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>	
1278.255	.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>	
1278.022	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1278.022	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -93.901    12B = -93.878    09 = -93.786    03 = -93.737

\* No Horizontal Positions in the Database \*



Mn/DOT Name: M 178

NGS Name: M 178

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0292](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	56 N	8 W	472051.72	911757.46	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>
1935	1978	NOT FOUND	Horz=YES Vert=YES	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: (1935)                      Stamping: M 178 1935

6.0 MILES SOUTH OF FINLAND, 0.5 MILE NORTH OF THE LAX LAKE STORE, 29.0 FEET EAST OF A ROAD, 18.0 FEET NORTH OF A PRIVATE GARAGE, 3.0 FEET WEST 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>	
1281.503	.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>	
1281.205	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1281.205	.007	1				VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -94.705    12B = -94.662    09 = -94.616    03 = -94.537

\* No Horizontal Positions in the Database \*





Mn/DOT Name: M 336

NGS Name: M 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0544](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	54 N	10 W	471108.00	913951.00	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>
1978	2008	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	VERTICAL CONTROL DISK	NGS

**Description:** (1978)                      **Stamping:** M 336 1978

11.2 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS, 33.0 FEET EAST OF COUNTY ROAD 2, 1.0 FOOT NORTH OF A WITNESS POST, IN THE TOP OF AN EMBEDDED BOULDER ACROSS FROM A DO NOT PASS SIGN.

**Station Notes**  
 THE ROAD WAS RE-BUILT, NO ROCK BOULDER REMAINS.

**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>		
1452.353	.007	1/2						VERTICAL ADJUSTMENT		1991	00000025		

**Geoid Separations(ft): GEOID18 = -93.140    12B = -93.120    09 = -93.021    03 = -92.989**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: M 341

NGS Name: M 341

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0605](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	14	55 N	8 W	471438.00	911916.00	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>
1978	2000	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	BENCH MARK DISK	NGS

Description: (2000)                      Stamping: M 341 1978

1.6 MILES SOUTHWEST ON TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY, BETWEEN 2 HIGHWAY CURVES, 22.0 FEET EAST OF TRUNK HIGHWAY 61, OPPOSITE A PULL OFF AREA, 78.0 FEET NORTH OF THE NORTH END OF A GUARDRAIL, 4.0 FEET SOUTH 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>	
731.777	.007	1/2						VERTICAL ADJUSTMENT		1991	00000025	

<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>	
731.623	.033	3						VERTICAL CONTROL SURVEY		1987	CS3806	

Geoid Separations(ft): GEOID18 = -96.378    12B = -96.348    09 = -96.256    03 = -96.145

\* No Horizontal Positions in the Database \*



Mn/DOT Name: M 51

NGS Name: M 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0311](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

				<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	53 N	9 W	470640.73	913105.82	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	2017	GOOD	Horz=NO Vert=YES	YES		PROJECTS 5 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: (2007)                      Stamping: M 51 1934

9.7 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 36.10, 85.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 79.0 FEET NORTHEAST OF DRIVEWAY NUMBER 2676, 43.0 FEET NORTHEAST OF A POWER POLE, 1.0 FOOT 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>	
665.110	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963	
665.110	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE	
665.084	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
665.084	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3	
665.084	.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>	
664.874	.007	1/2				UNKNOWN/APPROXIMATE	1992	UNCHECKD	
664.874	.007	1				VERTICAL CONTROL SURVEY	1935	L95 MINN	

**Geoid Separations(ft): GEOID18 = -95.626    12B = -95.564    09 = -95.459    03 = -95.416**

**\* No Horizontal Positions in the Database \***

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/M_51-SH0311-3SE-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/M_51-SH0311-3SE-27SEP2017.jpg</a>	SE	Sep 27, 2017
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/M_51-SH0311-2-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/M_51-SH0311-2-27SEP2017.jpg</a>		Sep 27, 2017
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/M_51-SH0311-1-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/M_51-SH0311-1-27SEP2017.jpg</a>		Sep 27, 2017

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



Mn/DOT Name: MAKI

NGS Name: MAKI

County: LAKE, MN (Sheet 1)

NGS ACRN: [DR2030](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	6	53 N	10 W	470623.32	914002.39		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>
2017	2017	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 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017)                      Stamping: MAKI 2017

6.0 MILES NORTH OF TWO HARBORS, 5.65 MILES NORTH ALONG COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 IN TWO HARBORS, 44.3 FEET EAST OF COUNTY ROAD 2, 23.0 FEET NORTH OF AN ENTRANCE, 1.5 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>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>			
1261.605			1167.708	.018	2011	HORIZONTAL ADJUSTMENT	2019	GPS3302			
			1167.908	.066	1996	GPS - STATIC	2019	Hlake			
1261.605			1167.708	.018	2011	GPS - STATIC	2019	Hlake			
1261.638	.262		1167.750	.197	2011	GPS - RTRN	2017	RTRN2017			

Geoid Separations(ft): GEOID18 = -93.911    12B = -93.884    09 = -93.799    03 = -93.727

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Geodetic Position</u>				<u>Lake 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>		
47 06 23.31829	91 40 02.38608	435742.548	114635.281	.013		ADJUSTMENT	2019	GPS3302		
47 06 23.31829	91 40 02.38608	435742.548	114635.281	.013	C	GPS - STATIC	2019	Hlake		
47 06 23.31833	91 40 02.38509	435742.617	114635.284	.131	3	GPS - RTRN	2017	RTRN2017		

<u>NAD83(1996)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 06 23.31801	91 40 02.38661	556582.929	217841.476	.033	C	GPS - STATIC	2019	Hlake		

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>MN State Plane - North 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>		
2981419.451	552599.177	1972157.902	17118923.275	.013		ADJUSTMENT	2019	GPS3302		
2981419.451	552599.177	1972157.902	17118923.275	.013	C	GPS - STATIC	2019	Hlake		
2981419.519	552599.183	1972157.970	17118923.280	.131	3	GPS - RTRN	2017	RTRN2017		

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>		
2981419.415	552599.148	1972157.866	17118923.246	.033	C	GPS - STATIC	2019	Hlake		

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/MAKI-DR2030-3E-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/MAKI-DR2030-3E-27SEP2017.jpg</a>	E	Sep 27, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/MAKI-DR2030-2-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/MAKI-DR2030-2-27SEP2017.jpg</a>		Sep 27, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/MAKI-DR2030-1-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/MAKI-DR2030-1-27SEP2017.jpg</a>		Sep 27, 2017

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



Mn/DOT Name: MAPLE

NGS Name: MAPLE

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0779](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/1011  
 USGS Quad: TWO HARBORS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	54 N	10 W	470711.98	913822.33		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>
1952	1976	GOOD	Horz=? Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

**Description:** (1976)                      **Stamping:** MAPLE 1952

7.0 MILES NORTH-NORTHEAST OF TWO HARBORS, 2.7 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND 7TH STREET AT TWO HARBORS, THEN 5.8 MILES NORTHERLY ON COUNTY ROAD 3, THEN 0.55 LEFT ON A SIDE ROAD TO THE HOME OF JOHN HEDIN, THEN CONTINUE THROUGH A GATE AND ALONG THE NORTH SIDE OF A FENCE TO A FENCE CORNER, THEN 1.0 MILE LEFT ON OLD WOODS ROAD TO AN OLD LOG CABIN AT THE EDGE OF A SMALL CLEARING, THEN LEFT 225.0 FEET TO A DIM FORK, THEN ON THE RIGHT FORK TO THE END OF A ROAD, THEN ON A BLAZED TRAIL TO THE TOP OF A WOODED RIDGE, 17.0 FEET WEST-SOUTHWEST OF A TREE, 8.0 FEET EAST OF A WITNESS POST, 65.34 FEET WEST-NORTHWEST OF MAPLE RM 1, 79.10 FEET SOUTH OF MAPLE 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>	<u>Year</u>	<u>Reference</u>
1420.601	.131		1326.756	.066	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>	<u>Year</u>	<u>Reference</u>
1420.601						RECIPROCAL VERTICAL ANGLE	1952	HORZ	

Geoid Separations(ft): GEOID18 = -93.993    12B = -93.966    09 = -93.891    03 = -93.825

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Lake 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>	<u>Year</u>	<u>Reference</u>	
47 07 11.98178	91 38 22.33134	442678.907	119544.458	.033	1	ADJUSTMENT	1999	17648		
47 07 11.98237	91 38 22.33069	442678.952	119544.518	.033	1	ADJUSTMENT	1991	17497		

  

<u>NAD83(1986)</u>		<u>Geodetic Position</u>		<u>Lake 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>	<u>Year</u>	<u>Reference</u>	
47 07 11.98104	91 38 22.32953	442679.032	119544.383	.033	1	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>	
47 07 12.24500	91 38 21.69000			.100	1	CLASSICAL SURVEY	1956	11100

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>	
2988246.288	557658.147	1978990.549	17123970.771	.033	1	ADJUSTMENT	1999	17648		
2988246.331	557658.208	1978990.593	17123970.832	.033	1	ADJUSTMENT	1991	17497		

  

<u>NAD83(1986)</u>		<u>MN State Plane - North 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>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Year</u>	<u>Reference</u>	
2988246.414	557658.075	1978990.676	17123970.699	.033	1	ADJUSTMENT	1986	17289		

  

<u>NAD27</u>		<u>MN State Plane - North 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>	
2363634.696	229601.401			.100	1	CLASSICAL SURVEY	1956	11100



Mn/DOT Name: MAPLE RM 1

NGS Name: MAPLE RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3268](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/1011  
 USGS Quad: TWO HARBORS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<u>Reference</u>	<u>Reference</u>	<u>Vert</u>	<u>Horz</u>
				<u>Latitude</u>	<u>Longitude</u>	<u>Order</u>	<u>Order</u>
NW	32	54 N	10 W	470711.76	913821.44		

<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>
1952	1976	GOOD	Horz=YES Vert=YES	NO		PROJECTS 3 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	REFERENCE MARK DISK	NGS

**Description:** **Stamping:** MAPLE NO 1 1952

7.0 MILES NORTH-NORTHEAST OF TWO HARBORS, 2.7 MILES NORTHEAST ON TRUNK HIGHWAY 61, FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND 7TH STREET IN TWO HARBORS, THEN 5.8 MILES NORTHERLY ON COUNTY ROAD 3, THEN 0.55 LEFT ON A SIDE ROAD TO THE HOME OF JOHN HEDIN, THEN CONTINUE THROUGH A GATE AND ALONG THE NORTH SIDE OF A FENCE TO A FENCE CORNER, THEN 1.0 MILE LEFT ON OLD WOODS ROAD TO AN OLD LOG CABIN AT THE EDGE OF A SMALL CLEARING, THEN LEFT 225.0 FEET TO A DIM FORK, THEN ON THE RIGHT FORK TO THE END OF A ROAD, THEN ON A BLAZED TRAIL TO THE TOP OF A WOODED RIDGE, 9.0 FEET WEST-SOUTHWEST OF A TWIN MAPLE TREE, 65.34 FEET EAST-SOUTHEAST OF STATION MAPLE.

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

Geoid Separations(ft): GEOID18 = -93.993 12B = -93.970 09 = -93.894 03 = -93.829



Mn/DOT Name: MAPLE RM 2

NGS Name: MAPLE RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3269](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/1011  
 USGS Quad: TWO HARBORS

				<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	32	54 N	10 W	470712.76	913822.28		

<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>
1952	1976	GOOD	Horz=YES Vert=YES	NO		PROJECTS 3 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	REFERENCE MARK DISK	NGS

**Description:** **Stamping:** MAPLE NO 2 1952

7.0 MILES NORTH-NORTHEAST OF TWO HARBORS, 2.7 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND 7TH STREET IN TWO HARBORS, THEN 5.8 MILES NORTHERLY ON COUNTY ROAD 3, THEN 0.55 LEFT ON A SIDE ROAD TO THE HOME OF JOHN HEDIN, THEN CONTINUE THROUGH A GATE AND NORTH ALONG THE SIDE OF A FENCE TO A FENCE CORNER, THEN 1.0 MILE LEFT ON OLD WOODS ROAD TO AN OLD LOG CABIN AT THE EDGE OF A SMALL CLEARING, THEN LEFT 225.0 FEET TO A DIM FORK, THEN ON THE RIGHT FORK TO THE END OF A ROAD, THEN ON A BLAZED TRAIL TO THE TOP OF A WOODED RIDGE, 79.10 FEET NORTH OF STATION MAPLE.

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

Geoid Separations(ft): GEOID18 = -93.993 12B = -93.970 09 = -93.894 03 = -93.829



Mn/DOT Name: MARBLE  
County: LAKE, MN (Sheet 1)

NGS Name: MARBLE

NGS ACRN: [SH0770](#) [Get Map](#)  
NGS Quad / Sta Num : 47091313/1013  
USGS Quad: KANE 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	32	56 N	10 W	471722.78	913741.39		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>
1952	1952	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

**Description:** (1952)                      **Stamping:** MARBLE 1952

19.0 MILES NORTH-NORTHEAST OF TWO HARBORS, 19.6 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS, THEN 1.65 MILES EAST ON COUNTY ROAD 203 THEN 1.35 MILES SOUTH ON A GRAVEL ROAD TO A SIDE ROAD LEFT AND STATION MARBLE NEAR THE MARBLE LAKE LOOKOUT TOWER, 70.0 FEET SOUTH OF THE SOUTHEAST LEG OF A TOWER, 14.0 FEET NORTHEAST OF A TREE, 10.0 FEET SOUTHEAST OF A DRIVEWAY, 7.0 FEET NORTHWEST OF A WITNESS POST, 85.48 FEET SOUTH-SOUTHWEST OF MARBLE RM 1, 95.64 FEET NORTHEAST OF MARBLE 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>	
1765.088	.197		1672.454	.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>	
1765.088						RECIPROCAL VERTICAL ANGLE	1952	HORZ	

Geoid Separations(ft): GEOID18 = -92.716    12B = -92.729    09 = -92.598    03 = -92.565

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>Geodetic Position</u>				<u>Lake 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>			
47 17 22.77539	91 37 41.38711	445684.310	181425.589	.066	2	ADJUSTMENT	1999	17648			

<u>NAD83(1986)</u>		<u>Geodetic Position</u>				<u>Lake 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>			
47 17 22.77522	91 37 41.38663	445684.344	181425.572	.066	2	ADJUSTMENT	1986	17289			

<u>NAD27</u>		<u>Geodetic Position</u>				<u>Lake 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>			
47 17 23.05300	91 37 40.76900			.100	2	CLASSICAL SURVEY	1956	11100			

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>			
2989899.118	619582.971	1980733.960	17185878.749	.066	2	ADJUSTMENT	1999	17648			

<u>NAD83(1986)</u>		<u>MN State Plane - North 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>			
2989899.151	619582.955	1980733.994	17185878.733	.066	2	ADJUSTMENT	1986	17289			

<u>NAD27</u>		<u>MN State Plane - North 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>			
2365285.843	291527.429			.100	2	CLASSICAL SURVEY	1956	11100			





Mn/DOT Name: MARBLE LAKE LOOKOUT TOWER

NGS Name: MARBLE LAKE LOOKOUT TOWER

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0771](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091313/1026  
 USGS Quad: KANE 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	32	56 N	10 W	471723.53	913741.18		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>
1952	1952	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	LOOKOUT TOWER	NGS

Description: (1952)

Stamping:

19.0 MILES NORTH-NORTHEAST OF TWO HARBORS, 19.6 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS THEN 1.65 MILES EAST ON COUNTY ROAD 203 THEN SOUTH 1.35 MILES TO A SIDE ROAD LEFT AT THE TOP OF A WOODED HILL.

\* No Vertical Positions in the Database \*

Geoid Separations(ft): GEOID18 = -92.716 12B = -92.729 09 = -92.595 03 = -92.565

Lat/Lon and County Coordinates (Feet)

<u>NAD83(1996)</u>		<u>Geodetic Position</u>				<u>Lake 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>	
47 17 23.52741	91 37 41.18108	445698.729	181501.749	.328	4	ADJUSTMENT	1999	17648	

<u>NAD83(1986)</u>		<u>Geodetic Position</u>				<u>Lake 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>	
47 17 23.52717	91 37 41.18038	445698.777	181501.725	.328	4	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>
47 17 23.80800	91 37 40.56600			.100	4	CLASSICAL SURVEY	1956	11100

State Plane and UTM Coordinates (Feet)

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>	
2989911.867	619659.419	1980746.817	17185955.161	.328	4	ADJUSTMENT	1999	17648	

<u>NAD83(1986)</u>		<u>MN State Plane - North 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>	
2989911.916	619659.395	1980746.866	17185955.138	.328	4	ADJUSTMENT	1986	17289	

<u>NAD27</u>		<u>MN State Plane - North 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>
2365298.378	291604.173			.100	4	CLASSICAL SURVEY	1956	11100



Mn/DOT Name: MARBLE RM 1

NGS Name: MARBLE RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3273](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091313/1013  
 USGS Quad: KANE 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	32	56 N	10 W	471723.55	913740.88		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1952	1952	GOOD	Horz=YES Vert=YES	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:** (1952)                      **Stamping:** MARBLE NO 1 1952

19.0 MILES NORTH-NORTHEAST OF TWO HARBORS, 19.6 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS THEN 1.65 MILES EAST ON COUNTY ROAD 203 THEN 1.35 MILES SOUTH ON A GRAVEL ROAD TO A SIDE ROAD LEFT AND STATION MARBLE RM 1 NEAR THE MARBLE LAKE LOOKOUT TOWER, 16.0 FEET NORTHEAST OF THE SOUTHEAST LEG OF A LOOKOUT TOWER.

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

**Geoid Separations(ft): GEOID18 = -92.716    12B = -92.729    09 = -92.598    03 = -92.565**



Mn/DOT Name: MARBLE RM 2

NGS Name: MARBLE RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3274](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091313/1013  
 USGS Quad: KANE 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	32	56 N	10 W	471722.25	913742.54		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1952	1952	GOOD	Horz=? Vert=YES	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:** (1952)                      **Stamping:** MARBLE NO 2 1952

19.0 MILES NORTH-NORTHEAST OF TWO HARBORS, 19.6 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS THEN 1.65 MILES EAST ON COUNTY ROAD 203 THEN 1.35 MILES SOUTH ON A GRAVEL ROAD TO A SIDE ROAD LEFT AND STATION MARBLE RM 2 NEAR THE MARBLE LAKE LOOKOUT TOWER, 12.0 FEET SOUTHWEST OF THE APPROXIMATE CENTERLINE OF A ROAD.

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

**Geoid Separations(ft): GEOID18 = -92.716    12B = -92.729    09 = -92.598    03 = -92.565**



Mn/DOT Name: MARK  
County: LAKE, MN (Sheet 1)

NGS Name: MARK

NGS ACRN: [DR1387](#) [Get Map](#)  
NGS Quad / Sta Num : 47091242/  
USGS Quad: SILVER BAY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	6	55 N	7 W	471627.86	911632.48	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2017	2019	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 12 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

**Description:** (2017)      **Stamping:** MARK 2017

IN SILVER BAY, 1.6 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN SILVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 52.65, 30.6 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 1.5 FEET NORTHEAST OF A WITNESS POST.

**Station Pair:** 3807 B - LAKE, MN

**Leveling-Derived Orthometric Heights (Feet)**

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Year	Reference					
671.088	.016	2/1				2021	00000963	VERTICAL ADJUSTMENT				
671.085	.016	2/1				2019	VNSHORE	VERTICAL CONTROL SURVEY				

**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					
671.062			574.631	.022	2011	2019	GPS3328	HORIZONTAL ADJUSTMENT				
671.085	.131		574.828	.066	1996	2019	Hlake2	GPS - STATIC				
671.062			574.631	.022	2011	2019	Hlake2	GPS - STATIC				
671.085	.262		574.674	.197	2011	2017	RTRN2017	GPS - RTRN				

Geoid Separations(ft): GEOID18 = -96.453 12B = -96.411 09 = -96.332 03 = -96.256

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)		Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
47 16 27.85907	91 16 32.48339	655110.351	277235.893	.016		ADJUSTMENT	2019	GPS3328	
47 16 27.85907	91 16 32.48339	655110.351	277235.893	.016	C	GPS - STATIC	2019	Hlake2	
47 16 27.85883	91 16 32.48254	655110.410	277235.867	.131	3	GPS - RTRN	2017	RTRN2017	

NAD83(1996)		Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
47 16 27.85882	91 16 32.48388	655110.317	277235.868	.033	C	GPS - STATIC	2019	Hlake2	

**State Plane and UTM Coordinates (Feet)**

NAD83(2011)		MN State Plane - North Zone		UTM - Zone 15		Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3077481.054	615885.486	2068294.615	17182053.424	.016		ADJUSTMENT	2019	GPS3328
3077481.054	615885.486	2068294.615	17182053.424	.016	C	GPS - STATIC	2019	Hlake2
3077481.113	615885.463	2068294.674	17182053.401	.131	3	GPS - RTRN	2017	RTRN2017

NAD83(1996)		MN State Plane - North Zone		UTM - Zone 15		Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3077481.021	615885.459	2068294.582	17182053.397	.033	C	GPS - STATIC	2019	Hlake2

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/MARK-DR1387-3SE-17OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/MARK-DR1387-3SE-17OCT2017.jpg</a>	SE	Oct 17, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/MARK-DR1387-2-17OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/MARK-DR1387-2-17OCT2017.jpg</a>		Oct 17, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/MARK-DR1387-1-17OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/MARK-DR1387-1-17OCT2017.jpg</a>		Oct 17, 2017

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



Mn/DOT Name: MHD UNSTAMPED

NGS Name: MHD UNSTAMPED

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	52 N	11 W	470132.00	914041.00		

<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	2000	DESTROYED	Horz=NO Vert=NO	YES	38001		SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	SURVEY DISK	MNDT

Description: (2002)                      Stamping:

AT TWO HARBORS, IN THE SOUTHWEST CORNER OF RAILROAD BRIDGE NUMBER 38001 OVER TRUNK HIGHWAY 61, 61.0 FEET RIGHT OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 STATION NORTHBOUND 896+57.

**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>	
782.410	.033	3				VERTICAL CONTROL SURVEY	1963	CS3804	

Geoid Separations(ft): GEOID18 = -94.705    12B = -94.688    09 = -94.600    03 = -94.518

\* No Horizontal Positions in the Database \*

Mn/DOT Name: MNCORS SLVB SILVER BAY ARP

NGS Name: SILVER BAY CORS ARP

County: LAKE, MN (Sheet 1)

NGS ACRN: [I95780](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				Reference	Reference	Vert	Horz
1/4	Sec	Twp	Rng	Latitude	Longitude	Order	Order
SE	19	56 N	7 W	471809.37	911504.35	3	A

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2011	2011	GOOD	Horz=YES Vert=YES	YES			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	SEE DESCRIPTION	MNDT

**Description:** (2012)

**Stamping:**

0.65 MILE NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 5 IN SILVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 54.95, THEN 0.1 MILE NORTHWEST ALONG DRIVEWAY NUMBER 5163 (AN ENTRANCE TO SILVER BAY TRUCK STATION). THE GPS REFERENCE MARK CONSISTS OF A 4.0 CM BRASS PLUG IN A SECO ADJUSTABLE MONUMENT MOUNT. THE MOUNT IS THREADED ONTO A 2.4 INCH DIAMETER BY 4.9 FEET STEEL PIPE WHICH IS BOLTED INTO A STEEL BUILDING WITH A WOOD SHINGLED ROOF.

**Leveling-Derived Orthometric Heights (Feet)**

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
780.418	.033	3					NON-RECIPROCAL VERTICAL ANGLE	2015	VTRIG1

**Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)**

NAVD88				Ellipsoid (NAD83)				Project Info	
Height	Acc	Order (/Class)		Height	Acc	Adj	Determination Method	Year	Reference
780.491	.131			684.388	.066	1996	GPS - STATIC	2017	HMNCORS07
				684.241	.008	2011	GPS - STATIC	2015	HMNCORS15
780.445	.098			684.251	.049	2011	GPS - STATIC	2012	HMNCORS05

Geoid Separations(ft): GEOID18 = -96.243 12B = -96.194 09 = -96.155 03 = -96.060

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)				Lake County - Lake (North Shore) Zone				Project Info		
Geodetic Position				X	Y	Acc	Order	Determination Method	Year	Reference
Latitude	Longitude									
47 18 09.36808	91 15 04.35308			661354.017	287420.213	.003	A	GPS - STATIC	2015	HMNCORS15
47 18 09.36820	91 15 04.35308			661354.017	287420.225	.016	B	GPS - STATIC	2012	HMNCORS05

NAD83(1996)				Lake County - Lake (North Shore) Zone				Project Info		
Geodetic Position				X	Y	Acc	Order	Determination Method	Year	Reference
Latitude	Longitude									
47 18 09.36803	91 15 04.35359			661353.982	287420.208	.033	C	GPS - STATIC	2017	HMNCORS07

**State Plane and UTM Coordinates (Feet)**

NAD83(2011)				UTM - Zone 15				Project Info		
MN State Plane - North Zone				X	Y	Acc	Order	Determination Method	Year	Reference
X	Y									
3083310.324	626311.256			2074138.573	17192469.103	.003	A	GPS - STATIC	2015	HMNCORS15
3083310.324	626311.268			2074138.572	17192469.115	.016	B	GPS - STATIC	2012	HMNCORS05

NAD83(1996)				UTM - Zone 15				Project Info		
MN State Plane - North Zone				X	Y	Acc	Order	Determination Method	Year	Reference
X	Y									
3083310.289	626311.250			2074138.537	17192469.097	.033	C	GPS - STATIC	2017	HMNCORS07

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_CORS_ARP-I95780-3NW-04MAY2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_CORS_ARP-I95780-3NW-04MAY2011.jpg</a>	NW	May 4, 2011
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_CORS_ARP-I95780-2-04MAY2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_CORS_ARP-I95780-2-04MAY2011.jpg</a>		May 4, 2011
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_CORS_ARP-I95780-1-14JUN2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_CORS_ARP-I95780-1-14JUN2011.jpg</a>		Jun 14, 2011

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



Mn/DOT Name: MNCORS SLVB SILVER BAY L1PC1

NGS Name: SILVER BAY CORS L1 PHASE CENTE

County: LAKE, MN (Sheet 1)

NGS ACRN: [!95782](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	19	56 N	7 W	471909.36	911504.35		

<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>
2011	2011	GOOD	Horz=YES Vert=YES	YES			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	SEE DESCRIPTION	MNDT

**Description:** (2012)

**Stamping:**

0.65 MILE NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 5 IN SILVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 54.95, THEN 0.1 MILE NORTHWEST ALONG DRIVEWAY NUMBER 5163 (AN ENTRANCE TO SILVER BAY TRUCK STATION). STATION MNCORS SLVB SILVER BAY L1PC1 IS IN ZEPHYR GEODETIC LF MODEL 2 ANTENNA SERIAL NUMBER 1441028103.

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

Geoid Separations(ft): GEOID18 = -95.892 12B = -95.850 09 = -95.833 03 = -95.725

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_CORS_L1_PHASE_CENTE-!95782-3E-04MAY2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_CORS_L1_PHASE_CENTE-!95782-3E-04MAY2011.jpg</a>	E	May 4, 2011
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_CORS_L1_PHASE_CENTE-!95782-2-04MAY2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_CORS_L1_PHASE_CENTE-!95782-2-04MAY2011.jpg</a>		May 4, 2011
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_CORS_L1_PHASE_CENTE-!95782-1-04MAY2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_CORS_L1_PHASE_CENTE-!95782-1-04MAY2011.jpg</a>		May 4, 2011

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



Mn/DOT Name: MNCORS TWOH TWO HARBORS ARP

NGS Name: TWO HARBORS CORS ARP

County: LAKE, MN (Sheet 1)

NGS ACRN: [I62780](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SE	25	53 N	11 W	470241.96	914006.97	3	A

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2005	2006	GOOD	Horz=YES Vert=YES	YES			SEE DESCRIPTION

Monument Type	Disk Type	Mon. Agency
SEE DESCRIPTIVE TEXT	SEE DESCRIPTION	MNDT

**Description:** (2006)

**Stamping:**

IN THE NORTH END OF TWO HARBORS, 1.2 MILES NORTH ALONG COUNTY ROAD 2 (4TH STREET) FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 IN TWO HARBORS, ATTACHED TO THE SOUTH SIDE OF THE TWO HARBORS MINNESOTA DEPARTMENT OF TRANSPORTATION TRUCK STATION.

**Station Notes**

THE NATIONAL GEODETIC SURVEY (NGS) SITE ID IS MNTH.

**Leveling-Derived Orthometric Heights (Feet)**

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method		Year	Reference	
840.313	.033	3				NON-RECIPROCAL VERTICAL ANGLE		2005	VTRIG1	

**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	
840.376	.131		745.940	.066	1996	GPS - STATIC		2017	HMNCORS07	
			745.789	.008	2011	GPS - STATIC		2015	HMNCORS15	
840.385	.098		745.806	.049	2011	GPS - STATIC		2012	HMNCORS05	
840.353	.098		745.779	.049	1996	GPS - STATIC		2006	HMNCORS02	

Geoid Separations(ft): GEOID18 = -94.596 12B = -94.577 09 = -94.498 03 = -94.403

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)		Geodetic Position				Lake County - Lake (North Shore) Zone			Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method		Year	Reference	
47 02 41.95986	91 40 06.96699	555785.534	195424.904	.003	A	GPS - STATIC		2015	HMNCORS15	
47 02 41.95983	91 40 06.96696	555785.536	195424.900	.016	B	GPS - STATIC		2012	HMNCORS05	

NAD83(1996)		Geodetic Position				Lake County - Lake (North Shore) Zone			Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method		Year	Reference	
47 02 41.95983	91 40 06.96744	555785.503	195424.901	.033	C	GPS - STATIC		2017	HMNCORS07	
47 02 41.96023	91 40 06.96797	555785.467	195424.942	.016	B	GPS - STATIC		2006	HMNCORS02	

**State Plane and UTM Coordinates (Feet)**

NAD83(2011)		MN State Plane - North Zone				UTM - Zone 15			Project Info	
X	Y	X	Y	Acc	Order	Determination Method		Year	Reference	
2981517.895	530170.209	1972222.670	17096500.114	.003	A	GPS - STATIC		2015	HMNCORS15	
2981517.897	530170.206	1972222.672	17096500.111	.016	B	GPS - STATIC		2012	HMNCORS05	

NAD83(1996)		MN State Plane - North Zone				UTM - Zone 15			Project Info	
X	Y	X	Y	Acc	Order	Determination Method		Year	Reference	
2981517.863	530170.205	1972222.639	17096500.110	.033	C	GPS - STATIC		2017	HMNCORS07	
2981517.826	530170.245	1972222.601	17096500.150	.016	B	GPS - STATIC		2006	HMNCORS02	

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS_CORS_ARP-I62780-3N-13SEP2006.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS_CORS_ARP-I62780-3N-13SEP2006.jpg</a>	N	Sep 13, 2006
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS_CORS_ARP-I62780-2-13SEP2006.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS_CORS_ARP-I62780-2-13SEP2006.jpg</a>		Sep 13, 2006
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS_CORS_ARP-I62780-1-13SEP2006.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS_CORS_ARP-I62780-1-13SEP2006.jpg</a>		Sep 13, 2006

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





Mn/DOT Name: MNCORS TWOH TWO HARBORS L1PC1

NGS Name: TWO HARBORS CORS L1 PHASE CENT

County: LAKE, MN (Sheet 1)

NGS ACRN: [!95685](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	25	53 N	11 W	470241.96	914006.97		

<u>Year Set</u>	<u>Last Recovery</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	2008	DESTROYED	Horz=NO Vert=NO	YES			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	SEE DESCRIPTION	MNDT

Description: (2012)                      Stamping:

IN THE NORTH END OF TWO HARBORS, 1.2 MILES NORTH ALONG COUNTY ROAD 2 (4TH STREET) FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 IN TWO HARBORS, ATTACHED TO THE SOUTH SIDE OF THE TWO HARBORS MINNESOTA DEPARTMENT OF TRANSPORTATION TRUCK STATION. THE STATION IS IN ZEPHYR GEODETIC ANTENNA SERIAL NUMBER 12694128.

**Station Notes**

THE NATIONAL GEODETIC SURVEY (NGS) SITE ID IS MNTH.

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

Geoid Separations(ft): GEOID18 = -94.596    12B = -94.577    09 = -94.498    03 = -94.403

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS_CORS_L1_PHASE_CENT-!95685-3N-13SEP2006.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS_CORS_L1_PHASE_CENT-!95685-3N-13SEP2006.jpg</a>	N	Sep 13, 2006
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS_CORS_L1_PHASE_CENT-!95685-2-13SEP2006.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS_CORS_L1_PHASE_CENT-!95685-2-13SEP2006.jpg</a>		Sep 13, 2006
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS_CORS_L1_PHASE_CENT-!95685-1-13SEP2006.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS_CORS_L1_PHASE_CENT-!95685-1-13SEP2006.jpg</a>		Sep 13, 2006

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



Mn/DOT Name: MNCORS TWOH TWO HARBORS L1PC2

NGS Name: TWO HARBORS CORS L1 PHASE CENT

County: LAKE, MN (Sheet 1)

NGS ACRN: [!95686](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	25	53 N	11 W	470241.96	914006.97		

<u>Year Set</u>	<u>Last Recovery</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	YES			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	SEE DESCRIPTION	MNDT

Description: (2012)                      Stamping:

IN THE NORTH END OF TWO HARBORS, 1.2 MILES NORTH ALONG COUNTY ROAD 2 (4TH STREET) FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 IN TWO HARBORS, ATTACHED TO THE SOUTH SIDE OF THE TWO HARBORS MINNESOTA DEPARTMENT OF TRANSPORTATION TRUCK STATION. STATION MNCORS TWOH TWO HARBORS L1PC2 IS IN ZEPHYR GEODETIC LF MODEL 2 ANTENNA SERIAL NUMBER 30895737.

Station Notes  
 THE NATIONAL GEODETIC SURVEY (NGS) SITE ID IS MNTH.

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

Geoid Separations(ft): GEOID18 = -94.596    12B = -94.577    09 = -94.498    03 = -94.403

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS_CORS_L1_PHASE_CENT-!95686-3N-04JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS_CORS_L1_PHASE_CENT-!95686-3N-04JUN2008.jpg</a>	N	Jun 4, 2008
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS_CORS_L1_PHASE_CENT-2-04JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS_CORS_L1_PHASE_CENT-2-04JUN2008.jpg</a>		Jun 4, 2008
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS_CORS_L1_PHASE_CENT-!95686-1-28APR2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS_CORS_L1_PHASE_CENT-!95686-1-28APR2008.jpg</a>		Apr 28, 2008

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



Mn/DOT Name: MOCHA

NGS Name: MOCHA

County: LAKE, MN (Sheet 1)

NGS ACRN: [DO8126](#) [Get Map](#)  
 NGS Quad / Sta Num : 46092112/  
 USGS Quad: DULUTH

				<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	20	52 N	11 W	465811.47	914544.02	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>
2011	2019	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (0 TO 1 METERS)	SURVEY DISK	MNDT

Description: (2011)                      Stamping: MOCHA 2011

5.1 MILES SOUTHWEST OF TWO HARBORS, 5.1 MILES SOUTHWEST OF TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 11 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 19.95, 43.5 FEET SOUTHEAST OF SOUTHBOUND TRUNK HIGHWAY 61, 87.0 FEET NORTHWEST OF NORTHBOUND TRUNK HIGHWAY 61, 1.6 FEET NORTHWEST OF A WITNESS POST.

Station Pair: BENNA MNDT - LAKE, 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>		
714.086	.016	2/1						VERTICAL ADJUSTMENT		2021	00000963		
714.106	.016	2/1						VERTICAL CONTROL SURVEY		2019	VNSHORE		

**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>		
714.073				619.822	.008	2011		HORIZONTAL ADJUSTMENT		2019	GPS3328		
714.106	.131			620.005	.066	1996		GPS - STATIC		2019	HLAKE2		
714.073				619.822	.008	2011		GPS - STATIC		2019	HLAKE2		
714.116	.262			619.868	.197	2011		GPS - RTRN		2017	RTRN2017		
714.086				619.822	.008	2011		HORIZONTAL ADJUSTMENT		2013	GPS2940		
714.086				619.822	.008	2011		GPS - STATIC		2013	HBBAY		
714.106	.131			619.936	.066	2007		GPS - STATIC		2012	HBBAY		

Geoid Separations(ft): GEOID18 = -94.248    12B = -94.248    09 = -94.153    03 = -94.084

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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 58 11.46730	91 45 44.02132	531828.215	168539.028	.010		ADJUSTMENT	2019	GPS3328					
46 58 11.46730	91 45 44.02132	531828.215	168539.028	.010	C	GPS - STATIC	2019	HLAKE2					
46 58 11.46695	91 45 44.02082	531828.249	168538.992	.131	3	GPS - RTRN	2017	RTRN2017					
46 58 11.46730	91 45 44.02132	531828.215	168539.028	.010		ADJUSTMENT	2013	GPS2940					
46 58 11.46730	91 45 44.02132	531828.215	168539.028	.010	C	GPS - STATIC	2013	HBBAY					

  

<u>NAD83(2007)</u>				<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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 58 11.46759	91 45 44.02224	531828.152	168539.059	.033	C	GPS - STATIC	2012	HBBAY					

  

<u>NAD83(1996)</u>				<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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 58 11.46721	91 45 44.02186	531828.177	168539.020	.033	C	GPS - STATIC	2019	HLAKE2					

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North 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>
2958653.312	502351.132	1949322.690	17068723.663	.010		ADJUSTMENT	2019	GPS3328
2958653.312	502351.132	1949322.690	17068723.663	.010	C	GPS - STATIC	2019	HLAKE2
2958653.347	502351.097	1949322.725	17068723.628	.131	3	GPS - RTRN	2017	RTRN2017
2958653.312	502351.132	1949322.690	17068723.663	.010		ADJUSTMENT	2013	GPS2940
2958653.312	502351.132	1949322.690	17068723.663	.010	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North 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>
2958653.248	502351.161	1949322.626	17068723.692	.033	C	GPS - STATIC	2012	HBBAY

**NAD83(1996)**

MN State Plane - North 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>
2958653.275	502351.123	1949322.653	17068723.653	.033	C	GPS - STATIC	2019	HLAKE2

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/MOCHA-DO8126-3SE-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/MOCHA-DO8126-3SE-02OCT2017.jpg</a>	SE	Oct 2, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/MOCHA-DO8126-2-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/MOCHA-DO8126-2-02OCT2017.jpg</a>		Oct 2, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/MOCHA-DO8126-1-02OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/MOCHA-DO8126-1-02OCT2017.jpg</a>		Oct 2, 2017

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



Mn/DOT Name: N 173

NGS Name: N 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0313](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	19	54 N	10 W	470855.00	913951.00	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>
1935	2021	GOOD	Horz=NO Vert=YES	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1979) Stamping: N 173 1935

1.6 MILES EAST OF ALGER, AT THE NORTHEAST CORNER OF LONDON ROAD AND COUNTY ROAD 2, 58.0 FEET EAST OF COUNTY ROAD 2, 37.0 FEET NORTH OF LONDON ROAD.

**Station Notes**

DUE TO TREE COVER, THIS SURVEY MARK HAS BEEN ABANDONED FOR MNDOT GEODETIC HORIZONTAL SURVEYS.

**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>	
1356.566	.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>	
1356.310	.007	1/2				UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1356.310	.007	1				VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -93.468 12B = -93.448 09 = -93.356 03 = -93.307

\* No Horizontal Positions in the Database \*



Mn/DOT Name: N 178

NGS Name: N 178

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0293](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	12	56 N	7 W	472125.00	911703.00	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>
1935	1935	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	BENCH MARK DISK	NGS

Description: (1935)                      Stamping: N 178 1935

5.0 MILES SOUTH ON COUNTY ROAD 4 FROM FINLAND, 33.0 FEET WEST OF A ROAD, 12.0 FEET WEST OF A LARGE TREE STUMP.

**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>	
1306.671	.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>	
1306.349	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1306.349	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -94.754    12B = -94.718    09 = -94.675    03 = -94.586

\* No Horizontal Positions in the Database \*



Mn/DOT Name: N 19

NGS Name: N 19

County: LAKE, MN (Sheet 1)

NGS ACRN: [RM0344](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	31	52 N	11 W	465631.47	914734.49	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>
1933	2009	DESTROYED	Horz=NO Vert=NO	NO	RR	FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	BENCH MARK DISK	NGS

Description: (2009) Stamping: N 19 1933

0.7 MILE SOUTHWEST OF SCENIC DRIVE OVER THE KNIFE RIVER (COUNTY ROAD 61 BRIDGE IN KNIFE RIVER), IN THE SOUTH END OF AN EAST ABUTMENT OF A RAILROAD BRIDGE.

Station Notes

8/16/2011 NEW BRIDGE IN PLACE.

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>	
643.998	.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>	
643.978	.007	1/2				UNKNOWN/APPROXIMATE	1992	UNCHECKD	
643.978	.007	1				VERTICAL CONTROL SURVEY	1933	L29 MINN	

Geoid Separations(ft): GEOID18 = -94.091 12B = -94.094 09 = -93.976 03 = -93.914

\* No Horizontal Positions in the Database \*



Mn/DOT Name: N 336

NGS Name: N 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0545](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	31	55 N	10 W	471154.00	913951.00	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>
1978	2008	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	VERTICAL CONTROL DISK	NGS

**Description:** (1978)                      **Stamping:** N 336 1978

12.0 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS, 24.0 FEET EAST OF COUNTY ROAD 2, 120.0 FEET NORTHEAST AND ACROSS A ROAD FROM BURIED CABLE MARKER NUMBER 140.5, 1.0 FOOT SOUTH OF A WITNESS POST, IN THE TOP OF AN 8.0 FEET BY 10.0 FEET EMBEDDED BOULDER.

**Station Notes**  
 THE ROAD WAS RE-BUILT, NO ROCK BOULDER REMAINS.

**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>	
1460.263	.007	1/2					VERTICAL ADJUSTMENT	1991	00000025	

**Geoid Separations(ft): GEOID18 = -93.048    12B = -93.031    09 = -92.930    03 = -92.897**

\* No Horizontal Positions in the Database \*





Mn/DOT Name: N 341

NGS Name: N 341

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0603](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	27	55 N	8 W	471334.00	912042.00	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>
1978	2000	DESTROYED	Horz=NO Vert=NO	YES			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	BENCH MARK DISK	NGS

Description: (2000)                      Stamping: N 341 1978

3.2 MILES SOUTHWEST ON TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY, 0.1 MILE SOUTHWEST OF TRUNK HIGHWAY 61 MILEPOST 348, 37.0 FEET NORTHWEST OF TRUNK HIGHWAY 61, OPPOSITE DRIVEWAY B 147, AT THE SOUTHWEST END OF A MASSIVE ROCK OUTCROP, 1.0 FOOT 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>	
676.754	.007	1/2					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>	
676.606	.033	3					VERTICAL CONTROL SURVEY	1987	CS3806	

Geoid Separations(ft): GEOID18 = -96.368    12B = -96.338    09 = -96.250    03 = -96.122

\* No Horizontal Positions in the Database \*



Mn/DOT Name: N 51

NGS Name: N 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0312](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

				<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	32	54 N	9 W	470715.35	913011.54	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>
1934	2019	GOOD	Horz=YES Vert=YES	YES		PROJECTS 7 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: (2007) Stamping: N 51 1934

10.7 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 37.10, 66.5 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 51.0 FEET SOUTHWEST OF A DRIVEWAY, 39.5 FEET NORTH OF A POWER POLE, 1.0 FOOT NORTHWEST OF A WITNESS POST.

Station Pair: CAST - LAKE, 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>
634.950	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963
634.950	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE
634.904	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691
634.904	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3
634.822	.007	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>
634.349	.007	1/2				UNKNOWN/APPROXIMATE	1992	UNCHECKD
634.628	.033	3				VERTICAL CONTROL SURVEY	1987	CS3806
634.349	.007	1				VERTICAL CONTROL SURVEY	1935	L95 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>
634.904			539.251	.018	2011	HORIZONTAL ADJUSTMENT	2019	GPS3328
634.950	.131		539.444	.066	1996	GPS - STATIC	2019	Hlake2
634.904			539.251	.018	2011	GPS - STATIC	2019	Hlake2
634.923	.262		539.294	.197	2011	GPS - RTRN	2017	RTRN2017
634.904			539.212	.024	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940
634.904			539.212	.024	2011	GPS - STATIC	2013	HBBAY
634.907	.131		539.382	.066	2007	GPS - STATIC	2012	HBBAY
634.749	.262		539.228	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -95.689 12B = -95.626 09 = -95.521 03 = -95.479

**Lat/Lon and County Coordinates (Feet)**

**NAD83(2011)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 07 15.34578	91 30 11.54102	597550.518	222278.570	.013		ADJUSTMENT	2019	GPS3328
47 07 15.34578	91 30 11.54102	597550.518	222278.570	.013	C	GPS - STATIC	2019	HLAKE2
47 07 15.34549	91 30 11.54066	597550.542	222278.540	.131	3	GPS - RTRN	2017	RTRN2017
47 07 15.34522	91 30 11.54043	597550.558	222278.512	.033		ADJUSTMENT	2013	GPS2940
47 07 15.34522	91 30 11.54043	597550.558	222278.512	.033	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 07 15.34536	91 30 11.54134	597550.495	222278.528	.033	C	GPS - STATIC	2012	HBBAY
47 07 15.34518	91 30 11.54159	597550.477	222278.510	.131	3	GPS - RTRN	2011	RTRN2011

**NAD83(1996)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 07 15.34554	91 30 11.54151	597550.483	222278.546	.033	C	GPS - STATIC	2019	HLAKE2

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3022173.881	558670.058	2012911.629	17124931.489	.013		ADJUSTMENT	2019	GPS3328
3022173.881	558670.058	2012911.629	17124931.489	.013	C	GPS - STATIC	2019	HLAKE2
3022173.906	558670.029	2012911.655	17124931.460	.131	3	GPS - RTRN	2017	RTRN2017
3022173.923	558670.002	2012911.671	17124931.433	.033		ADJUSTMENT	2013	GPS2940
3022173.923	558670.002	2012911.671	17124931.433	.033	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3022173.860	558670.015	2012911.608	17124931.446	.033	C	GPS - STATIC	2012	HBBAY
3022173.843	558669.996	2012911.591	17124931.428	.131	3	GPS - RTRN	2011	RTRN2011

**NAD83(1996)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3022173.848	558670.033	2012911.596	17124931.464	.033	C	GPS - STATIC	2019	HLAKE2

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/N_51-SH0312-3SE-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/N_51-SH0312-3SE-27SEP2017.jpg</a>	SE	Sep 27, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/N_51-SH0312-2-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/N_51-SH0312-2-27SEP2017.jpg</a>		Sep 27, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/N_51-SH0312-1-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/N_51-SH0312-1-27SEP2017.jpg</a>		Sep 27, 2017

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



Mn/DOT Name: NICADO  
 County: LAKE, MN (Sheet 1)

NGS Name: NICADO

NGS ACRN: [DR2033](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	1	56 N	8 W	472128.64	911658.08		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>
2017	2017	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 12 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017)                      Stamping: NICADO 2017

4.0 MILES SOUTHWEST OF FINLAND, 1.75 MILES SOUTH ALONG TRUNK HIGHWAY 1 FROM THE JUNCTION OF TRUNK HIGHWAY 1 AND COUNTY ROAD 6 IN FINLAND, TO TRUNK HIGHWAY 1 MILEPOST 343.0, THEN 3.25 MILES SOUTHWEST ON COUNTY ROAD 31 (LAX LAKE ROAD), 29.4 FEET SOUTHEAST OF COUNTY ROAD 31, 2.60 MILES SOUTHWEST OF A PIT ROAD, 1.5 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>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>			
1288.426			1193.702	.023	2011	HORIZONTAL ADJUSTMENT	2019	GPS3302			
			1193.899	.066	1996	GPS - STATIC	2019	Hlake			
1288.426			1193.702	.023	2011	GPS - STATIC	2019	Hlake			
1288.429	.262		1193.712	.197	2011	GPS - RTRN	2017	RTRN2017			

Geoid Separations(ft): GEOID18 = -94.750 12B = -94.714 09 = -94.675 03 = -94.583

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Geodetic Position</u>				<u>Lake 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>		
47 21 28.64399	91 16 58.07965	531361.011	206288.084	.016		ADJUSTMENT	2019	GPS3302		
47 21 28.64399	91 16 58.07965	531361.011	206288.084	.016	C	GPS - STATIC	2019	Hlake		
47 21 28.64386	91 16 58.07892	531361.062	206288.071	.131	3	GPS - RTRN	2017	RTRN2017		

<u>NAD83(1996)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 21 28.64372	91 16 58.08018	653852.765	307738.200	.033	C	GPS - STATIC	2019	Hlake		

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>MN State Plane - North 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>		
3075000.246	646309.411	2065858.992	17212476.839	.016		ADJUSTMENT	2019	GPS3302		
3075000.246	646309.411	2065858.992	17212476.839	.016	C	GPS - STATIC	2019	Hlake		
3075000.296	646309.399	2065859.042	17212476.827	.131	3	GPS - RTRN	2017	RTRN2017		

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>		
3075000.210	646309.383	2065858.956	17212476.811	.033	C	GPS - STATIC	2019	Hlake		

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/NICADO-DR2033-3SE-04DEC2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/NICADO-DR2033-3SE-04DEC2017.jpg</a>	SE	Dec 4, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/NICADO-DR2033-2-04DEC2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/NICADO-DR2033-2-04DEC2017.jpg</a>		Dec 4, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/NICADO-DR2033-1-04DEC2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/NICADO-DR2033-1-04DEC2017.jpg</a>		Dec 4, 2017

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



Mn/DOT Name: OOSE

NGS Name: OOSE

County: LAKE, MN (Sheet 1)

NGS ACRN: [DR1380](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	54 N	9 W	470909.47	912648.96	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>
2017	2019	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 12 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017) Stamping: OOSE 2017

14.0 MILES NORTHEAST OF TWO HARBORS, 14.0 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 40.70, 49.9 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 14.9 FEET NORTHEAST OF EAGLE LANE, 13.5 FEET NORTHWEST OF A BIKE PATH, 1.5 FEET SOUTHWEST OF A WITNESS POST.

Station Pair: Q 51 - LAKE, 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>			<u>Year</u>	<u>Reference</u>	
683.526	.016	2/1				2021	00000963	VERTICAL ADJUSTMENT				
683.522	.016	2/1				2019	VNSHORE	VERTICAL CONTROL SURVEY				

**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>			<u>Year</u>	<u>Reference</u>	
683.427			587.414	.024	2011	2019	GPS3328	HORIZONTAL ADJUSTMENT				
683.522	.131		587.610	.066	1996	2019	Hlake2	GPS - STATIC				
683.427			587.414	.024	2011	2019	Hlake2	GPS - STATIC				
683.378	.262		587.391	.197	2011	2017	RTRN2017	GPS - RTRN				

Geoid Separations(ft): GEOID18 = -96.046 12B = -95.987 09 = -95.889 03 = -95.836

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>			<u>Year</u>	<u>Reference</u>		
47 09 09.47206	91 26 48.95955	611774.054	233573.582	.016		2019	GPS3328	ADJUSTMENT					
47 09 09.47206	91 26 48.95955	611774.054	233573.582	.016	C	2019	Hlake2	GPS - STATIC					
47 09 09.47138	91 26 48.95948	611774.057	233573.513	.131	3	2017	RTRN2017	GPS - RTRN					

<u>NAD83(1996)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>			<u>Year</u>	<u>Reference</u>		
47 09 09.47182	91 26 48.96006	611774.018	233573.559	.033	C	2019	Hlake2	GPS - STATIC					

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>MN State Plane - North 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>			<u>Year</u>	<u>Reference</u>		
3035933.083	570524.570	2026685.802	17136762.689	.016		2019	GPS3328	ADJUSTMENT					
3035933.083	570524.570	2026685.802	17136762.689	.016	C	2019	Hlake2	GPS - STATIC					
3035933.090	570524.501	2026685.808	17136762.620	.131	3	2017	RTRN2017	GPS - RTRN					

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>			<u>Year</u>	<u>Reference</u>		
3035933.049	570524.545	2026685.767	17136762.664	.033	C	2019	Hlake2	GPS - STATIC					



**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/OOSE-DR1380-3SE-16OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/OOSE-DR1380-3SE-16OCT2017.jpg</a>	SE	Oct 16, 2017
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/OOSE-DR1380-2-16OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/OOSE-DR1380-2-16OCT2017.jpg</a>		Oct 16, 2017
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/OOSE-DR1380-1-16OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/OOSE-DR1380-1-16OCT2017.jpg</a>		Oct 16, 2017

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



Mn/DOT Name: P 173  
 County: LAKE, MN (Sheet 1)

NGS Name: P 173

NGS ACRN: [SH0385](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	12	54 N	11 W	471032.00	913953.00	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>
1935	2008	DESTROYED	Horz=NO Vert=NO	YES			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	BENCH MARK DISK	NGS

Description: (1935)                      Stamping: P 173 1935

10.4 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, 3.5 MILES NORTH OF ALGER, AT THE EDGE OF A WOODED AREA, 52.0 FEET NORTHWEST OF A COVERED SPRING, 45.0 FEET NORTHWEST OF A LARGE BOULDER, 35.0 FEET WEST OF TRUNK HIGHWAY 2.

Station Notes  
 THE ROAD WAS RE-BUILT.

**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>	
1427.930	.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>	
1427.648	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -93.212    12B = -93.195    09 = -93.097    03 = -93.061

\* No Horizontal Positions in the Database \*



Mn/DOT Name: P 178

NGS Name: P 178

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0294](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	6	56 N	7 W	472205.88	911623.93	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>
1935	2007	NOT FOUND	Horz=NO Vert=YES	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: (1935)                      Stamping: P 178 1935

4.0 MILES SOUTH ON COUNTY ROAD 4 FROM FINLAND, 150.0 FEET NORTH OF A LARGE ROCK OUTCROP WEST OF A ROAD, 62.0 FEET SOUTH OF A POLE, 34.0 FEET EAST OF A ROAD, AT A SMALL CLEARING.

**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>	
1343.137	.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>	
1342.806	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1342.806	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -94.721 12B = -94.685 09 = -94.649 03 = -94.563

\* No Horizontal Positions in the Database \*





Mn/DOT Name: P 19

NGS Name: P 19

County: LAKE, MN (Sheet 1)

NGS ACRN: <a href="#">RM0346</a>	<a href="#">Get Map</a>
NGS Quad / Sta Num : 46091414/	
USGS Quad: TWO HARBORS OE S	

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	52 N	11 W	465844.75	914444.70	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>
1933	2012	GOOD	Horz=YES Vert=YES	YES		PROJECTS 4 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: (2013)                      Stamping: P 19 1933

2.85 MILES NORTHEAST ON TRUNK HIGHWAY 61 (SCENIC DRIVE) FROM A BRIDGE OVER THE KNIFE RIVER, 64.4 FEET NORTHEAST OF A TAR CROSSOVER ROAD SOUTHEAST, 40.7 FEET SOUTHEAST OF COUNTY ROAD 61 (SCENIC DRIVE), 39.8 FEET NORTHWEST OF THE NORTHWEST RAIL OF A RAILROAD, 1.0 FOOT 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>		
668.453	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691		
668.453	.016	2/1				VERTICAL CONTROL SURVEY	2010	VSHOR4		
668.453	.007	1/2				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>		
668.339	.007	1				VERTICAL CONTROL SURVEY	1933	L29 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>		
668.453			574.083	.008	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940		
668.453			574.074	.008	2011	GPS - STATIC	2013	HBBAY		
668.470	.131		574.188	.066	2007	GPS - STATIC	2012	HBBAY		
			574.083	.009	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800		
668.293	.262		574.024	.197	2007	GPS - RTRN	2011	RTRN2011		
			574.182	.010	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300		
668.437	.131		574.267	.066	1996	HORIZONTAL ADJUSTMENT	2003	GPS1931		
668.437	.131		574.267	.066	1996	GPS - STATIC	2003	HSTLO		

Geoid Separations(ft): GEOID18 = -94.363    12B = -94.363    09 = -94.265    03 = -94.199

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Geodetic Position</u>					<u>Lake County - Lake (North Shore) Zone</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 58 44.74735	91 44 44.69732	536017.019	171817.649	.007		ADJUSTMENT	2013	GPS2940			
46 58 44.74738	91 44 44.69737	536017.015	171817.652	.007	C	GPS - STATIC	2013	HBBAY			
46 58 44.74735	91 44 44.69732	536017.019	171817.649	.010		ADJUSTMENT	2012	GPS2800			

  

<u>NAD83(2007)</u>		<u>Geodetic Position</u>					<u>Lake County - Lake (North Shore) Zone</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 58 44.74752	91 44 44.69823	536016.956	171817.668	.033	C	GPS - STATIC	2012	HBBAY			
46 58 44.74599	91 44 44.69766	536016.992	171817.512	.131	3	GPS - RTRN	2011	RTRN2011			
46 58 44.74752	91 44 44.69823	536016.956	171817.668	.010		ADJUSTMENT	2007	GPS2300			

  

<u>NAD83(1996)</u>		<u>Geodetic Position</u>					<u>Lake County - Lake (North Shore) Zone</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 58 44.74729	91 44 44.69802	536016.970	171817.644	.033	C	ADJUSTMENT	2003	GPS1931			
46 58 44.74729	91 44 44.69802	536016.970	171817.644	.033	C	GPS - STATIC	2003	HSTLO			

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North 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>
2962707.925	505794.047	1953381.275	17072159.391	.007		ADJUSTMENT	2013	GPS2940
2962707.922	505794.050	1953381.271	17072159.394	.007	C	GPS - STATIC	2013	HBBAY
2962707.925	505794.047	1953381.275	17072159.391	.010		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

MN State Plane - North 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>
2962707.862	505794.063	1953381.212	17072159.407	.033	C	GPS - STATIC	2012	HBBAY
2962707.904	505793.909	1953381.254	17072159.253	.131	3	GPS - RTRN	2011	RTRN2011
2962707.862	505794.063	1953381.212	17072159.407	.010		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

MN State Plane - North 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>
2962707.877	505794.040	1953381.226	17072159.384	.033	C	ADJUSTMENT	2003	GPS1931
2962707.877	505794.040	1953381.226	17072159.384	.033	C	GPS - STATIC	2003	HSTLO

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/P_19-RM0346-3SE-10NOV2009.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/P_19-RM0346-3SE-10NOV2009.jpg</a>	SE	Nov 10, 2009
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/P_19-RM0346-2-10NOV2009.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/P_19-RM0346-2-10NOV2009.jpg</a>		Nov 10, 2009
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/P_19-RM0346-1-10NOV2009.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/P_19-RM0346-1-10NOV2009.jpg</a>		Nov 10, 2009

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



Mn/DOT Name: P 336

NGS Name: P 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0546](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	25	55 N	11 W	471250.00	914009.00	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>
1978	2008	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (0 TO 1 METERS)	VERTICAL CONTROL DISK	NGS

Description: (2008)                      Stamping: P 336 1978

13.0 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS TO THE BIG NOISE INN THEN 0.2 MILE WEST ON COUNTY ROAD 14, 46.0 FEET NORTH OF COUNTY ROAD 14, ACROSS THE ROAD FROM A LONE OAK TREE, 33.0 FEET EAST OF A POWER POLE WITH A TRANSFORMER, 12.0 FEET NORTH OF THE POWER LINES, 1.0 FOOT SOUTH OF A WITNESS POST, IN THE TOP OF 8.0 FEET BY 10.0 FEET BOULDER. A ROAD WAS REBUILT, AND THE BOULDER GONE.

**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>	
1541.654	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025	

Geoid Separations(ft): GEOID18 = -92.923    12B = -92.910    09 = -92.818    03 = -92.782

\* No Horizontal Positions in the Database \*



Mn/DOT Name: P 341

NGS Name: P 341

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0602](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	28	55 N	8 W	471300.00	912116.00	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>
1978	2000	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	BENCH MARK DISK	NGS

Description: (2000)                      Stamping: P 341 1978

4.0 MILES SOUTHWEST ON TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY, 0.05 MILE NORTHEAST OF TRUNK HIGHWAY 61 MILEPOST 347, AT THE SOUTH END OF A CURVE, 21.0 FEET WEST OF TRUNK HIGHWAY 61, AT THE SOUTH END OF A CUT BANK, 144.0 FEET SOUTH OF THE WEST END OF A METAL CULVERT, 2.0 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>	
711.367	.007	1/2					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>	
711.226	.033	3					VERTICAL CONTROL SURVEY	1987	CS3806	

Geoid Separations(ft): GEOID18 = -96.414    12B = -96.381    09 = -96.286    03 = -96.161

\* No Horizontal Positions in the Database \*



Mn/DOT Name: P 51

NGS Name: P 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0248](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	27	55 N	9 W	470822.00	912824.00	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	2017	NOT FOUND	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:** (1979)                      **Stamping:** P 51 1934

12.4 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM TWO HARBORS, 120.0 FEET SOUTHEAST OF A SIGN AT THE SOUTH ENTRANCE TO THE GOOSEBERRY FALLS STATE PARK, 28.0 FEET EAST OF A CONCRETE CULVERT, 12.0 FEET SOUTH OF AN ENTRANCE TO A CONSERVATION CAMP, 4.0 FEET SOUTH OF A FLAGPOLE. STATION P 51 IS CONSIDERED LOST.

**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>	
715.701	.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>	
715.481	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
715.481	.007	1					VERTICAL CONTROL SURVEY	1935	L95 MINN	

Geoid Separations(ft): GEOID18 = -95.840    12B = -95.777    09 = -95.676    03 = -95.633

\* No Horizontal Positions in the Database \*



Mn/DOT Name: PALISADES

NGS Name: PALISADES

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0744](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	56 N	7 W	471913.79	911241.78		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>
1952	1987	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	TRIANGULATION STATION DISK	CGS

**Description:** (1952)                      **Stamping:** PALISADES 1952

6.0 MILES NORTHEAST OF BEAVER BAY AND 2.0 MILES SOUTHWEST OF ILLGEN CITY AT THE PALISADES HEAD STATE PARK, 6.15 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE TRADING POST CAFE IN BEAVER BAY, THEN 0.35 MILE EAST ON A ROAD AT PALISADES HEAD SIGN TO A FORK IN A ROAD, KEEP RIGHT AT THE FORK AND CONTINUE 0.1 MILE, 61.0 FEET SOUTH OF MACADAM ROAD, IN THE CENTER OF A CIRCULAR DRIVE.

**Station Notes**

THE STATION DISK WAS FOUND BROKEN OFF AND THE STEM IS FLUSH WITH THE ROCK (MNDOT 1977). THE NATIONAL GEODETIC SURVEY (NGS) SET NEW MARK "PALISADES RESET" DE8054 IN 1987.

\* 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>		
840.221	.197		743.929	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648		

Geoid Separations(ft): GEOID18 = -96.525    12B = -96.486    09 = -96.430    03 = -96.332

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 19 13.78924	91 12 41.77705	671282.369	293789.659	.066	2	ADJUSTMENT	1999	17648	
47 19 13.79937	91 12 41.77153	671282.766	293790.679	.066	2	ADJUSTMENT	1997	17627	
47 19 13.79889	91 12 41.77174	671282.750	293790.631	.066	2	ADJUSTMENT	1991	17497	

<u>NAD83(1986)</u>		<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 19 13.79607	91 12 41.76964	671282.890	293790.343	.066	2	ADJUSTMENT	1986	17289	

<u>NAD27</u>		<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>
47 19 14.08034	91 12 41.20180					.100	2	CLASSICAL SURVEY	1979	15983

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>
3092973.937	633073.617	2083810.982	17199216.306	.066	2	ADJUSTMENT	1999	17648
3092974.293	633074.652	2083811.338	17199217.341	.066	2	ADJUSTMENT	1997	17627
3092974.279	633074.604	2083811.325	17199217.291	.066	2	ADJUSTMENT	1991	17497

<u>NAD83(1986)</u>		<u>MN State Plane - North 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>
3092974.431	633074.321	2083811.476	17199217.009	.066	2	ADJUSTMENT	1986	17289

<u>NAD27</u>		<u>MN State Plane - North 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>
2468360.701	305019.625					.100	2	CLASSICAL SURVEY	1979	15983



Mn/DOT Name: PALISADES MN ST PATROL MAST

NGS Name: PALISADES MN ST PATROL MAST

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0747](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	56 N	7 W	471912.65	911242.61		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>
1977	2012	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: (1987)

Stamping:

3.0 MILES NORTHEAST OF SILVER BAY, ON THE HIGHEST HILL IN PALISADES HEAD STATE PARK.

\* No Vertical Positions in the Database \*

Geoid Separations(ft): GEOID18 = -96.529 12B = -96.486 09 = -96.430 03 = -96.332

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 19 12.65038	91 12 42.61205	671223.027	293675.185	.328	4	ADJUSTMENT	1999	17648
47 19 12.65949	91 12 42.60690	671223.396	293676.102	.328	4	ADJUSTMENT	1997	17627
47 19 12.66251	91 12 42.60619	671223.450	293676.407	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 19 12.65913	91 12 42.60273	671223.683	293676.061	.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>
47 19 12.93739	91 12 42.03772			.100	4	CLASSICAL SURVEY	1979	15983

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - North 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>
3092919.247	632956.863	2083756.124	17199099.647	.328	4	ADJUSTMENT	1999	17648
3092919.579	632957.795	2083756.458	17199100.578	.328	4	ADJUSTMENT	1997	17627
3092919.620	632958.102	2083756.500	17199100.885	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

<u>MN State Plane - North 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>
3092919.867	632957.765	2083756.746	17199100.548	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - North 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>
2468305.956	304902.455			.100	4	CLASSICAL SURVEY	1979	15983



Mn/DOT Name: PALISADES RESET

NGS Name: PALISADES RESET

County: LAKE, MN (Sheet 1)

NGS ACRN: [DE8054](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/1008  
 USGS Quad: ILLGEN CITY

				<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	22	56 N	7 W	471913.79	911241.78	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>
1987	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	HORIZONTAL CONTROL DISK	NGS

**Description:** (2009)                      **Stamping:** PALISADES 1953 1987

2.0 MILES SOUTHWEST OF ILLGEN CITY, 2.25 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND TRUNK HIGHWAY 1 IN ILLGEN CITY TO TRUNK HIGHWAY 61 MILEPOINT 57.10, THEN 0.35 MILE SOUTHEAST ON A ROAD TO PALISADES PARK, THEN 0.1 MILE ON THE RIGHT FORK, 62.0 FEET SOUTHEAST OF A ROAD, 94.1 FEET NORTHEAST OF THE NORTHEAST CORNER OF A FENCE AROUND A TOWER, 18.56 FEET NORTHEAST OF PALISADES RESET RM 2, 17.96 FEET SOUTHEAST OF PALISADES RESET RM 3.

**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>	
835.953	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
835.953	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	
835.953	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
835.960	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3	

**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>	
835.946	.262			739.460	.197	2011	GPS - RTRN	2017	RTRN2017	
835.953				739.359	.022	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940	
835.953				739.411	.022	2011	GPS - STATIC	2013	HBBAY	
835.956	.131			739.533	.066	2007	GPS - STATIC	2012	HBBAY	
				739.359	.055	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800	
835.901	.262			739.470	.197	2007	GPS - RTRN	2011	RTRN2011	
				739.444	.048	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300	
835.924	.131			739.588	.066	1996	HORIZONTAL ADJUSTMENT	2002	GPS1736	
835.924	.131			739.588	.066	1996	GPS - STATIC	2002	HISAB	

<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>	
835.858							LEVELING	1987	HORZ	

Geoid Separations(ft): GEOID18 = -96.525    12B = -96.486    09 = -96.430    03 = -96.332



**Lat/Lon and County Coordinates (Feet)**

**NAD83(2011)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 19 13.79060	91 12 41.77929	671282.217	293789.799	.131	3	GPS - RTRN	2017	RTRN2017
47 19 13.79064	91 12 41.78005	671282.165	293789.804	.020		ADJUSTMENT	2013	GPS2940
47 19 13.79070	91 12 41.77995	671282.172	293789.810	.020	C	GPS - STATIC	2013	HBBAY
47 19 13.79064	91 12 41.78005	671282.165	293789.804	.026		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 19 13.79074	91 12 41.78089	671282.107	293789.815	.033	C	GPS - STATIC	2012	HBBAY
47 19 13.79064	91 12 41.78003	671282.166	293789.804	.131	3	GPS - RTRN	2011	RTRN2011
47 19 13.79074	91 12 41.78089	671282.107	293789.815	.023		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 19 13.79123	91 12 41.77861	671282.265	293789.862	.033	C	ADJUSTMENT	2002	GPS1736
47 19 13.79123	91 12 41.77861	671282.266	293789.862	.033	C	GPS - STATIC	2002	HISAB

**NAD83(1986)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 19 13.79425	91 12 41.77168	671282.749	293790.160	.033	C	GPS - STATIC	1988	HBEA1

**NAD27**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 19 14.11100	91 12 41.18800			.100	C	CLASSICAL SURVEY	1950	UNK

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3092973.780	633073.751	2083810.824	17199216.440	.131	3	GPS - RTRN	2017	RTRN2017
3092973.727	633073.754	2083810.772	17199216.443	.020		ADJUSTMENT	2013	GPS2940
3092973.734	633073.760	2083810.779	17199216.449	.020	C	GPS - STATIC	2013	HBBAY
3092973.727	633073.754	2083810.772	17199216.443	.026		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3092973.669	633073.763	2083810.714	17199216.452	.033	C	GPS - STATIC	2012	HBBAY
3092973.729	633073.754	2083810.773	17199216.443	.131	3	GPS - RTRN	2011	RTRN2011
3092973.669	633073.763	2083810.714	17199216.452	.023		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3092973.825	633073.816	2083810.869	17199216.505	.033	C	ADJUSTMENT	2002	GPS1736
3092973.825	633073.816	2083810.870	17199216.505	.033	C	GPS - STATIC	2002	HISAB

**NAD83(1986)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3092974.295	633074.134	2083811.340	17199216.822	.033	C	GPS - STATIC	1988	HBEA1

**NAD27**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2468361.570	305022.750			.100	C	CLASSICAL SURVEY	1950	UNK

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RESET-DE8054-3SE-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RESET-DE8054-3SE-19SEP2017.jpg</a>	SE	Sep 19, 2017
Moment:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RESET-DE8054-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RESET-DE8054-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RESET-DE8054-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RESET-DE8054-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: PALISADES RESET RM 3

NGS Name: PALISADES RESET RM 3

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4458](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
SW	22	56 N	7 W	471913.93	911241.94	2	3

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
1987	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

Monument Type	Disk Type	Mon. Agency
ROCK (1 TO 3 METERS)	REFERENCE MARK DISK	NGS

**Description:** (2007) **Stamping:** PALISADES N0 3 1953 1987

2.0 MILES SOUTHWEST OF ILLGEN CITY, 2.25 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND TRUNK HIGHWAY 1 IN ILLGEN CITY TO TRUNK HIGHWAY 61 MILEPOINT 57.10, THEN 0.35 MILE SOUTHEAST ON A ROAD TO PALISADES PARK, THEN 0.1 MILE ON THE RIGHT FORK, 62.0 FEET SOUTHEAST OF A ROAD, 17.96 FEET NORTHWEST OF STATION PALISADES RESET.

**Leveling-Derived Orthometric Heights (Feet)**

NAVD88				Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
835.864	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963
835.864	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE
835.864	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691
835.871	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3

**Non Leveling-Derived Orthometric and Ellipsoid Heights (Feet)**

NAVD88				Ellipsoid (NAD83)			Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj	Determination Method	Year	Reference
835.950	.262		739.467	.197	2011	GPS - RTRN	2017	RTRN2017
835.855	.262		739.428	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -96.525 12B = -96.483 09 = -96.427 03 = -96.329

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)		Lake County - Lake (North Shore) Zone					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 19 13.93026	91 12 41.94107	671271.295	293804.124	.131	3	GPS - RTRN	2017	RTRN2017

NAD83(2007)		Lake County - Lake (North Shore) Zone					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 19 13.93035	91 12 41.94127	671271.281	293804.133	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

NAD83(2011)		MN State Plane - North Zone				UTM - Zone 15		Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference	
3092962.292	633087.624	2083799.358	17199230.329	.131	3	GPS - RTRN	2017	RTRN2017	

NAD83(2007)		MN State Plane - North Zone				UTM - Zone 15		Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference	
3092962.278	633087.633	2083799.344	17199230.337	.131	3	GPS - RTRN	2011	RTRN2011	

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RESET_RM_3-DM4458-3SE-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RESET_RM_3-DM4458-3SE-19SEP2017.jpg</a>	SE	Sep 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RESET_RM_3-DM4458-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RESET_RM_3-DM4458-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RESET_RM_3-DM4458-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RESET_RM_3-DM4458-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: PALISADES RM 1

NGS Name: PALISADES RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3434](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	22	56 N	7 W	471913.93	911241.72		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1952	2017	NOT FOUND	Horz=NO Vert=NO	YES		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	REFERENCE MARK DISK	CGS

**Description:** (1952)                      **Stamping:** PALISADES NO 1 1952

2.0 MILES SOUTHWEST OF ILLGEN CITY, 2.25 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND TRUNK HIGHWAY 1 IN ILLGEN CITY TO TRUNK HIGHWAY 61 MILEPOST 57.10, THEN 0.35 MILE SOUTHEAST ON A ROAD TO PALISADES PARK, THEN 0.10 MILE ON A RIGHT FORK, 62.0 FEET SOUTH OF THE APPROXIMATE CENTERLINE OF A ROAD.

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

Geoid Separations(ft): GEOID18 = -96.522    12B = -96.483    09 = -96.427    03 = -96.329

<u>Type</u>	<u>Station Photos</u>		<u>Dir</u>	<u>Date</u>
	<u>Location:</u>	<u>File Name</u>		
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RM_1-CJ3434-3NW-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RM_1-CJ3434-3NW-19SEP2017.jpg</a>		NW	Sep 19, 2017

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



Mn/DOT Name: PALISADES RM 2

NGS Name: PALISADES RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3435](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	22	56 N	7 W	471913.65	911241.94	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>
1952	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	REFERENCE MARK DISK	CGS

Description: (2009)

Stamping: PALISADES NO 2 1952

2.0 MILES SOUTHWEST OF ILLGEN CITY, 2.25 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND TRUNK HIGHWAY 1 IN ILLGEN CITY TO TRUNK HIGHWAY 61 MILEPOINT 57.10, THEN 0.35 MILE SOUTHEAST ON A ROAD TO PALISADES PARK, THEN 0.1 MILE ON THE RIGHT FORK, 92.10 FEET NORTHEAST OF THE NORTHEAST CORNER OF A FENCE AROUND A TOWER, 18.56 FEET SOUTHWEST OF STATION PALISADES RESET.

**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>
836.727	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963
836.727	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE
836.727	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691
836.731	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3

**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>
836.695	.262			740.208	.197	2011	GPS - RTRN	2017	RTRN2017
836.668	.262			740.241	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -96.525 12B = -96.486 09 = -96.430 03 = -96.332

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 19 13.64582	91 12 41.94427	671270.620	293775.310	.131	3	GPS - RTRN	2017	RTRN2017	

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 19 13.64561	91 12 41.94402	671270.637	293775.288	.131	3	GPS - RTRN	2011	RTRN2011	

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>MN State Plane - North 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>			
3092962.775	633058.810	2083799.799	17199201.517	.131	3	GPS - RTRN	2017	RTRN2017			

<u>NAD83(2007)</u>		<u>MN State Plane - North 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>			
3092962.793	633058.789	2083799.817	17199201.496	.131	3	GPS - RTRN	2011	RTRN2011			

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RM_2-CJ3435-3SE-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RM_2-CJ3435-3SE-19SEP2017.jpg</a>	SE	Sep 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RM_2-CJ3435-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RM_2-CJ3435-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RM_2-CJ3435-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/PALISADES_RM_2-CJ3435-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: PION MNDT  
County: LAKE, MN (Sheet 1)

NGS Name: PION

NGS ACRN: [SH0778](#) [Get Map](#)  
NGS Quad / Sta Num : 47091322/  
USGS Quad: CASTLE DANGER

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	53 N	10 W	470400.19	913538.68		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>
1977	1982	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	HORIZONTAL CONTROL DISK	MNDT

**Description:** (2007) **Stamping:** PION 1977

4.3 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS TO A POWER POLE LINE LEFT (TRUNK HIGHWAY 61 MILEPOINT 30.6) THEN PACK UP A POWER POLE LINE (NORTHWEST) TO THE TOP OF A HILL THEN 600.0 FEET NORTHEAST ALONG THE EDGE OF A CLIFF, ON SILVER CLIFF, 5.2 FEET NORTHWEST OF THE EDGE OF A ROCK CLIFF, 20.3 FEET SOUTH OF A WITNESS POST, 32.98 FEET SOUTH OF PION MNDT RM 1, 28.38 FEET NORTH-NORTHEAST OF PION MNDT RM 2.

**Station Notes**

8/17/2011 NO ACCESS, PRIVATE ROAD/STEEP CLIFF.

\* 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>Determination Method</u>	<u>Year</u>	<u>Reference</u>				
813.975	.197		HORIZONTAL ADJUSTMENT	1999	17648				

  

<u>NGVD29</u>				<u>Ellipsoid (NAD83)</u>				<u>Project Info</u>	
<u>Height</u>	<u>Acc</u>	<u>Order</u> (/Class)	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>				
813.614			RECIPROCAL VERTICAL ANGLE	1977	HORZ				

Geoid Separations(ft): GEOID18 = -95.256 12B = -95.216 09 = -95.115 03 = -95.049

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(1996)</u>								<u>Project Info</u>		
<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>							
47 04 00.19253	91 35 38.67659	574525.052	202960.483	.066	2	ADJUSTMENT		1999	17648	
47 04 00.19871	91 35 38.67462	574525.201	202961.106	.066	2	ADJUSTMENT		1991	17497	

  

<u>NAD83(1986)</u>								<u>Project Info</u>		
<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>							
47 04 00.19644	91 35 38.67322	574525.293	202960.874	.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>								
47 04 00.43310	91 35 38.03081			.100	2	CLASSICAL SURVEY		1979	15983

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - North 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>						
2999940.499	538447.860	1990652.942	17104747.743	.066	2	ADJUSTMENT	1999	17648	
2999940.623	538448.489	1990653.067	17104748.371	.066	2	ADJUSTMENT	1991	17497	

  

<u>NAD83(1986)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>	
<u>MN State Plane - North 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>						
2999940.725	538448.261	1990653.168	17104748.143	.066	2	ADJUSTMENT	1986	17289	

  

<u>NAD27</u>								<u>Project Info</u>	
<u>MN State Plane - North 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>								
2375329.637	210388.936			.100	2	CLASSICAL SURVEY	1979	15983	



Mn/DOT Name: PION MNDT RM 1

NGS Name: PION RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3490](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

				<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	22	53 N	10 W	470400.51	913538.60		

<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>
1977	1977	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	REFERENCE MARK DISK	MNDT

**Description:** (1977)                      **Stamping:** PION NO 1 1977

4.3 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS, TO A POLE LINE LEFT (TRUNK HIGHWAY 61 MILEPOINT 30.6) THEN PACK UP POLE LINE (NORTHWEST) TO THE TOP OF A HILL, THEN 600.0 FEET NORTHEAST ALONG THE EDGE OF A CLIFF, ON SILVER CLIFF, 11.0 FEET NORTHWEST OF THE EDGE OF THE ROCK CLIFF, 18.9 FEET NORTHEAST OF A STEEL WITNESS POST.

**Station Notes**

8/17/2011 NO ACCESS. PRIVATE ROAD/ STEEP CLIFF

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

Geoid Separations(ft): GEOID18 = -95.256    12B = -95.216    09 = -95.115    03 = -95.049



Mn/DOT Name: PION MNDT RM 2

NGS Name: PION RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ3491](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

				<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	22	53 N	10 W	470400.08	913539.05		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1977	1977	GOOD	Horz=YES Vert=YES	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	REFERENCE MARK DISK	MNDT

**Description:** (1977)                      **Stamping:** PION NO 2 1977

4.3 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS, TO A POLE LINE LEFT (TRUNK HIGHWAY 61 MILEPOINT 30.6) THEN PACK UP A POLE LINE (NORTHWEST) TO THE TOP OF A HILL, THEN 600.0 FEET NORTHEAST ALONG THE EDGE OF A CLIFF, ON SILVER CLIFF, 8.0 FEET NORTHWEST OF THE EDGE OF THE ROCK CLIFF, 35.5 FEET SOUTHWEST OF A STEEL WITNESS POST.

**Station Notes**

8/17/2011 NO ACCESS. PRIVATE ROAD/STEEP CLIFF.

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

Geoid Separations(ft): GEOID18 = -95.256    12B = -95.216    09 = -95.115    03 = -95.049



Mn/DOT Name: POINT

NGS Name: POINT

County: LAKE, MN (Sheet 1)

NGS ACRN: [DO8130](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	35 N	8 W	471511.87	911830.46	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>
2011	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

**Description:** (2011)                      **Stamping:** POINT 2011

IN BEAVER BAY, 0.7 MILE SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 (LAX LAKE ROAD) IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 50.45, 43.5 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 10.4 FEET NORTHWEST OF A BIKE PATH, 2.7 FEET NORTHWEST OF A WITNESS POST.

**Station Pair:** COVE - LAKE, MN

**Leveling-Derived Orthometric 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>
703.089	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963
703.073	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE

**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>
703.234	.262		606.879	.197	2011	GPS - RTRN	2017	RTRN2017
703.060			606.738	.016	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940
703.060			606.738	.016	2011	GPS - STATIC	2013	HBBAY
703.083	.131		606.810	.066	2007	GPS - STATIC	2012	HBBAY

**Geoid Separations(ft):** GEOID18 = -96.384    12B = -96.355    09 = -96.260    03 = -96.165

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u> <u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 15 11.86839	91 18 30.45522	646845.580	269673.600	.131	3	GPS - RTRN	2017	RTRN2017	
47 15 11.86816	91 18 30.45519	646845.582	269673.576	.016		ADJUSTMENT	2013	GPS2940	
47 15 11.86816	91 18 30.45519	646845.582	269673.576	.016	C	GPS - STATIC	2013	HBBAY	

<u>NAD83(2007)</u> <u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 15 11.86876	91 18 30.45596	646845.529	269673.638	.033	C	GPS - STATIC	2012	HBBAY	

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u> <u>MN State Plane - North 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>
3069527.071	607998.350	2060330.051	17174179.317	.131	3	GPS - RTRN	2017	RTRN2017
3069527.074	607998.326	2060330.053	17174179.294	.016		ADJUSTMENT	2013	GPS2940
3069527.074	607998.326	2060330.053	17174179.294	.016	C	GPS - STATIC	2013	HBBAY

<u>NAD83(2007)</u> <u>MN State Plane - North 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>
3069527.019	607998.386	2060329.999	17174179.353	.033	C	GPS - STATIC	2012	HBBAY

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/POINT-DO8130-3SE-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/POINT-DO8130-3SE-20SEP2017.jpg</a>	SE	Sep 20, 2017
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/POINT-DO8130-2-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/POINT-DO8130-2-20SEP2017.jpg</a>		Sep 20, 2017
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/POINT-DO8130-1-21SEP2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/POINT-DO8130-1-21SEP2011.jpg</a>		Sep 21, 2011

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





Mn/DOT Name: Q 173

NGS Name: Q 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0386](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	1	54 N	11 W	471132.00	913952.00	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>
1935	1978	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: (1935)                      Stamping: Q 173 1935

4.6 MILES NORTH OF ALGER, 1.4 MILES SOUTH OF A ROAD TO ROLLINGS, 11.5 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, 150.0 FEET SOUTH OF A WOODEN BRIDGE, 47.0 FEET WEST OF COUNTY ROAD 2, 30.0 FEET NORTH OF A ROAD WEST.

**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>		
1444.033	.016	2/0						VERTICAL ADJUSTMENT		1991	00000025		

<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>		
1443.737	.007	1						VERTICAL CONTROL SURVEY		1935	L49 MINN		

Geoid Separations(ft): GEOID18 = -93.090    12B = -93.071    09 = -92.972    03 = -92.936

\* No Horizontal Positions in the Database \*



Mn/DOT Name: Q 19

NGS Name: Q 19

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0336](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	52 N	11 W	470054.00	914202.00	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>
1934	1962	DESTROYED	Horz=NO Vert=NO	YES			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STRUCTURE (MASSIVE)	BENCH MARK DISK	NGS

Description: (2002)                      Stamping: Q 19 1933

2.0 MILES SOUTHWEST ALONG A RAILROAD FROM TWO HARBORS, 0.4 MILE SOUTH OF RAILROAD MILEPOST 26, IN THE SOUTHWEST CORNER OF THE FOUNDATION OF A RAILROAD BRIDGE COLUMN (1ST COLUMN WEST OF THE EAST END OF A BRIDGE), 9.5 FEET EAST OF THE EAST RAIL OF A RAILROAD, 1.0 FOOT NORTH OF THE SOUTH EDGE AND 1.0 FOOT EAST OF THE WEST EDGE OF A FOUNDATION.

**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>	
741.957	.007	1/2					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>	
741.898	.007	1					VERTICAL CONTROL SURVEY	1933	L29 MINN	

Geoid Separations(ft): GEOID18 = -94.567    12B = -94.554    09 = -94.462    03 = -94.393

\* No Horizontal Positions in the Database \*



Mn/DOT Name: Q 336

NGS Name: Q 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0547](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	25	55 N	11 W	471246.00	914107.00	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>
1978	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	VERTICAL CONTROL DISK	NGS

**Description:** (1978)                      **Stamping:** Q 336 1978

13.0 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS THEN 0.95 MILE WEST ON COUNTY ROAD 14 AT THE BIG NOISE INN, 22.0 FEET NORTH OF COUNTY ROAD 14, AT THE CREST OF A HILL, 25.0 FEET WEST OF AN EXTENDED DRIVE NORTH, 2.0 FEET NORTH OF A WITNESS POST, IN THE TOP OF A 6.0 FEET BY 8.0 FEET ROCK OUTCROP.

**Station Notes**

THE ROAD WAS REBUILT, AND THE ROCK REMOVED.

**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>	
1622.241	.007	1/2					VERTICAL ADJUSTMENT	1991	00000025	

Geoid Separations(ft): GEOID18 = -92.867    12B = -92.857    09 = -92.759    03 = -92.726

\* No Horizontal Positions in the Database \*



Mn/DOT Name: Q 341

NGS Name: Q 341

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0600](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	55 N	8 W	471220.90	912206.50	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>
1978	2012	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	VERTICAL CONTROL DISK	NGS

Description: (2009) Stamping: Q 341 1978

5.2 MILES SOUTHWEST ON TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY, 0.15 MILE SOUTHWEST OF TRUNK HIGHWAY 61 MILEPOINT 45.85, 48.0 FEET NORTHWEST OF TRUNK HIGHWAY 61, OPPOSITE THE SPLIT ROCK LIGHTHOUSE STATE PARK ENTRANCE, IN THE NORTHWEST END OF A LARGE BOULDER, 2.3 FEET 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>	
713.368	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
713.368	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3	
713.368	.007	1/2					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>	
713.230	.033	3					VERTICAL CONTROL SURVEY	1987	CS3806	

Geoid Separations(ft): GEOID18 = -96.407 12B = -96.368 09 = -96.269 03 = -96.165

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Q_341-SH0600-3NW-21JUN2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Q_341-SH0600-3NW-21JUN2007.jpg</a>	NW	Jun 21, 2007
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Q_341-SH0600-2-21JUN2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Q_341-SH0600-2-21JUN2007.jpg</a>		Jun 21, 2007
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Q_341-SH0600-1-21JUN2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Q_341-SH0600-1-21JUN2007.jpg</a>		Jun 21, 2007

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



Mn/DOT Name: Q 51

NGS Name: Q 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0249](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	23	54 N	9 W	470922.05	912634.47	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>
1934	2019	GOOD	Horz=YES Vert=YES	YES		RECESSED 8 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:** (2007)                      **Stamping:** Q 51 1934

10.1 MILES SOUTHWEST ON TRUNK HIGHWAY 61 FROM THE TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 40.95, 48.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 26.0 FEET SOUTHWEST OF DRIVEWAY NUMBER 3396, 7.3 FEET NORTHWEST OF A WITNESS POST.

**Station Pair:** OOSE - LAKE, 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>
691.206	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963
691.206	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE
691.222	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691
691.222	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3
691.222	.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>
691.098	.007	1/2				UNKNOWN/APPROXIMATE	1992	UNCHECKD
691.098	.007	1				VERTICAL CONTROL SURVEY	1933	L95 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>
691.226			595.074	.030	2011	HORIZONTAL ADJUSTMENT	2019	GPS3328
691.206	.131		595.271	.066	1996	GPS - STATIC	2019	Hlake2
691.226			595.074	.030	2011	GPS - STATIC	2019	Hlake2
691.104	.262		595.104	.197	2011	GPS - RTRN	2017	RTRN2017
691.222			595.084	.029	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940
691.222			595.084	.029	2011	GPS - STATIC	2013	HBBAY
691.239	.131		595.324	.066	2007	GPS - STATIC	2012	HBBAY
691.003	.262		595.104	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -96.056    12B = -960000    09 = -95.902    03 = -95.850

**Lat/Lon and County Coordinates (Feet)**

**NAD83(2011)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 09 22.05158	91 26 34.47115	612799.014	234829.270	.020		ADJUSTMENT	2019	GPS3328
47 09 22.05158	91 26 34.47115	612799.014	234829.270	.020	C	GPS - STATIC	2019	HLAKE2
47 09 22.05119	91 26 34.47092	612799.029	234829.230	.131	3	GPS - RTRN	2017	RTRN2017
47 09 22.05073	91 26 34.47042	612799.063	234829.183	.033		ADJUSTMENT	2013	GPS2940
47 09 22.05073	91 26 34.47042	612799.063	234829.183	.033	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 09 22.05102	91 26 34.47150	612798.989	234829.214	.033	C	GPS - STATIC	2012	HBBAY
47 09 22.05012	91 26 34.47034	612799.067	234829.122	.131	3	GPS - RTRN	2011	RTRN2011

**NAD83(1996)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 09 22.05134	91 26 34.47165	612798.979	234829.247	.033	C	GPS - STATIC	2019	HLAKE2

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3036906.880	571820.206	2027661.355	17138056.592	.020		ADJUSTMENT	2019	GPS3328
3036906.880	571820.206	2027661.355	17138056.592	.020	C	GPS - STATIC	2019	HLAKE2
3036906.896	571820.167	2027661.372	17138056.553	.131	3	GPS - RTRN	2017	RTRN2017
3036906.932	571820.121	2027661.407	17138056.507	.033		ADJUSTMENT	2013	GPS2940
3036906.932	571820.121	2027661.407	17138056.507	.033	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3036906.857	571820.149	2027661.332	17138056.535	.033	C	GPS - STATIC	2012	HBBAY
3036906.939	571820.060	2027661.414	17138056.445	.131	3	GPS - RTRN	2011	RTRN2011

**NAD83(1996)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3036906.845	571820.181	2027661.321	17138056.567	.033	C	GPS - STATIC	2019	HLAKE2

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Q_51-SH0249-3SE-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Q_51-SH0249-3SE-26SEP2017.jpg</a>	SE	Sep 26, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Q_51-SH0249-2-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Q_51-SH0249-2-26SEP2017.jpg</a>		Sep 26, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Q_51-SH0249-1-26SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Q_51-SH0249-1-26SEP2017.jpg</a>		Sep 26, 2017

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



Mn/DOT Name: R 173

NGS Name: R 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0387](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	25	55 N	11 W	471250.00	913953.00	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>
1935	2007	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)	BENCH MARK DISK	NGS

Description: (1978)                      Stamping: R 173 1935

13.0 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS, AT THE JUNCTION OF COUNTY ROAD 2 AND COUNTY ROAD 14, 350.0 FEET NORTH OF THE NORTH CORNER OF THE BIG NOISE INN, 180.0 FEET NORTH OF COUNTY ROAD 14, 1.0 FOOT 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>	
1549.764	.007	1/2					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>	
1549.439	.007	1/2					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1549.439	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -92.943    12B = -92.926    09 = -92.834    03 = -92.798

\* No Horizontal Positions in the Database \*



Mn/DOT Name: R 19

NGS Name: R 19

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0339](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	36	53 N	11 W	470133.00	914042.00	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>
1933	2007	DESTROYED	Horz=NO Vert=NO	NO	38006		NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	BENCH MARK DISK	NGS

Description: (1979)                      Stamping: R 19 1933

IN TWO HARBORS, IN THE NORTHEAST ABUTMENT OF A RAILROAD BRIDGE OVER TRUNK HIGHWAY 61, 17.0 FEET NORTH OF TRUNK HIGHWAY 61, 200.0 FEET NORTH OF RAILROAD MILEPOST 200, 6.5 FEET EAST OF THE EAST RAIL OF A RAILROAD.

Station Notes

NEW BRIDGE 1999.

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>
698.926	.007	1/2				VERTICAL ADJUSTMENT	2004	00000449
698.926	.016	2/1				VERTICAL CONTROL SURVEY	2002	VH2O1
698.926	.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>
698.860	.007	1				VERTICAL CONTROL SURVEY	1933	L29 MINN

Geoid Separations(ft): GEOID18 = -94.701 12B = -94.685 09 = -94.600 03 = -94.514

\* No Horizontal Positions in the Database \*





Mn/DOT Name: R 336

NGS Name: R 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0548](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	25	55 N	11 W	471249.00	914155.70	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>
1978	2007	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (0 TO 1 METERS)	VERTICAL CONTROL DISK	NGS

**Description:** (2007)                      **Stamping:** R 336 1978

13.0 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS, THEN 1.6 MILES WEST ON COUNTY ROAD 14, 98.0 FEET NORTH OF COUNTY ROAD 14, 2.0 FEET SOUTH OF A WITNESS POST, IN THE TOP OF A 5.0 FEET BY 6.0 FEET ROCK OUTCROP.

**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>	
1657.946	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
1657.946	.016	2/1					VERTICAL CONTROL SURVEY	2011	VBCKY-R	
1657.946	.016	2/1					VERTICAL CONTROL SURVEY	2009	VBCKY	
1657.946	.007	1/2					VERTICAL ADJUSTMENT	1991	00000025	

**Geoid Separations(ft): GEOID18 = -92.828    12B = -92.818    09 = -92.729    03 = -92.690**

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/R_336-SH0548-3E-30JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/R_336-SH0548-3E-30JUL2007.jpg</a>	E	Jul 30, 2007
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/R_336-SH0548-2-30JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/R_336-SH0548-2-30JUL2007.jpg</a>		Jul 30, 2007
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/R_336-SH0548-1-30JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/R_336-SH0548-1-30JUL2007.jpg</a>		Jul 30, 2007

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



Mn/DOT Name: R 341

NGS Name: R 341

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0597](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	54 N	8 W	471117.40	912355.60	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	2007	DESTROYED	Horz=NO Vert=NO	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	VERTICAL CONTROL DISK	NGS

**Description:** (2009) **Stamping:** R 341 1978

7.0 MILES SOUTHWEST ON TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY, 0.5 MILE NORTHEAST OF THE SPLIT ROCK RIVER, 111.0 FEET WEST OF TRUNK HIGHWAY 61 MILEPOST 44, 37.0 FEET NORTHWEST OF TRUNK HIGHWAY 61, 1.0 FOOT 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>	
687.814	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
687.814	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3	
687.814	.007	1/2					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>	
687.695	.033	3					VERTICAL CONTROL SURVEY	1987	CS3806	

Geoid Separations(ft): GEOID18 = -96.256 12B = -96.207 09 = -96.102 03 = -96.037

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/R_341-SH0597-3NW-02JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/R_341-SH0597-3NW-02JUL2007.jpg</a>	NW	Jul 2, 2007
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/R_341-SH0597-2-02JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/R_341-SH0597-2-02JUL2007.jpg</a>		Jul 2, 2007
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/R_341-SH0597-1-02JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/R_341-SH0597-1-02JUL2007.jpg</a>		Jul 2, 2007

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



Mn/DOT Name: R 366 A

NGS Name: R 366 A

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5559](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	25	55 N	11 W	471248.68	914103.86	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>
2007	2021	GOOD	Horz=YES Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	SURVEY DISK	MNDT

**Description:** (2007)                      **Stamping:** R 366 A 2007

13.0 MILES NORTH OF TWO HARBORS, 12.9 MILES NORTH ALONG COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 IN TWO HARBORS, THEN 0.9 MILE WEST ON COUNTY ROAD 14, 53.8 FEET NORTH OF COUNTY ROAD 14, 93.5 FEET EAST OF DRIVEWAY NUMBER 1097, 33.8 FEET WEST OF DRIVEWAY NUMBER 1105, 5.9 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>
1613.389	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691
1613.389	.016	2/1					VERTICAL CONTROL SURVEY	2011	VBCKY-R
1613.389	.016	2/1					VERTICAL CONTROL SURVEY	2009	VBCKY

**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>
1613.415	.262			1520.545	.197	2011	GPS - OPUS	2021	GPSBM
1613.422	.262			1520.551	.197	2011	GPS - OPUS	2021	GPSBM
1613.442	.262			1520.571	.197	2011	GPS - RTRN	2021	RTRN2021

Geoid Separations(ft): GEOID18 = -92.871    12B = -92.861    09 = -92.762    03 = -92.726

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>			<u>Lake 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>
47 12 48.67747	91 41 03.86376		431627.036	153696.367	.131	3	GPS - OPUS	2021	GPSBM
47 12 48.67711	91 41 03.86423		431627.003	153696.330	.131	3	GPS - OPUS	2021	GPSBM
47 12 48.67719	91 41 03.86295		431627.091	153696.338	.131	3	GPS - RTRN	2021	RTRN2021

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>							
2976452.559	591556.844	1967249.749	17157878.563	.131	3	GPS - OPUS	2021	GPSBM
2976452.527	591556.807	1967249.717	17157878.526	.131	3	GPS - OPUS	2021	GPSBM
2976452.615	591556.817	1967249.805	17157878.536	.131	3	GPS - RTRN	2021	RTRN2021

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/R_366_A-DM5559-3N-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/R_366_A-DM5559-3N-17AUG2021.jpg</a>	N	Aug 17, 2021
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/R_366_A-DM5559-2-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/R_366_A-DM5559-2-17AUG2021.jpg</a>		Aug 17, 2021
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/R_366_A-DM5559-1-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/R_366_A-DM5559-1-17AUG2021.jpg</a>		Aug 17, 2021

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



Mn/DOT Name: R 366 B

NGS Name: R 366 B

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5558](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	18	55 N	10 W	471452.90	913940.60	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>
2007	2007	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) (DEPTH 12 FT)	SURVEY DISK	MNDT

Description: (2007)                      Stamping: R 366 B 2007

15.5 MILES NORTH OF TWO HARBORS, 15.3 MILES NORTH ALONG COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 IN TWO HARBORS, 62.8 FEET EAST-SOUTHEAST OF COUNTY ROAD 2, 38.1 FEET SOUTH-SOUTHWEST OF DRIVEWAY NUMBER 4382, 1.7 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>	
1696.332	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
1696.335	.016	2/1				VERTICAL CONTROL SURVEY	2011	VBCKY-R	
1696.335	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBCKY	

Geoid Separations(ft): GEOID18 = -92.798    12B = -92.785    09 = -92.697    03 = -92.667

\* No Horizontal Positions in the Database \*



Mn/DOT Name: R 366 C

NGS Name: R 366 C

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5557](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091313/  
 USGS Quad: KANE 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>
SW	6	55 N	10 W	471623.00	913915.90	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>
2007	2007	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) (DEPTH 12 FT)	SURVEY DISK	MNDT

Description: (2007)                      Stamping: R 366 C 2007

17.0 MILES NORTH OF TWO HARBORS, 17.15 MILES NORTH ALONG COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 IN TWO HARBORS, 50.3 FEET NORTHEAST OF COUNTY ROAD 2, 237.7 FEET NORTHWEST OF BAILEY ROAD, 1.2 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>	
1709.757	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
1709.764	.016	2/1				VERTICAL CONTROL SURVEY	2011	VBCKY-R	
1709.764	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBCKY	

Geoid Separations(ft): GEOID18 = -92.743    12B = -92.746    09 = -92.638    03 = -92.602

\* No Horizontal Positions in the Database \*



Mn/DOT Name: R 366 D

NGS Name: R 366 D

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5556](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091313/  
 USGS Quad: KANE 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	25	56 N	10 W	471815.50	913951.10	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>
2007	2007	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) (DEPTH 19 FT)	SURVEY DISK	MNDT

Description: (2007)                      Stamping: R 366 D 2007

20.0 MILES NORTH OF TWO HARBORS, 19.45 MILES NORTH ALONG COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 IN TWO HARBORS, 76.4 FEET NORTH OF COUNTY ROAD 203, (KANE LAKE ROAD), 55.8 FEET EAST OF COUNTY ROAD 2, 1.5 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>	
1687.707	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
1687.710	.016	2/1				VERTICAL CONTROL SURVEY	2011	VBCKY-R	
1687.710	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBCKY	

Geoid Separations(ft): GEOID18 = -92.752    12B = -92.772    09 = -92.641    03 = -92.582

\* No Horizontal Positions in the Database \*



Mn/DOT Name: R 366 E

NGS Name: R 366 E

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5555](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091313/  
 USGS Quad: KANE 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	13	56 N	11 W	471947.20	913952.20	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>
2007	2007	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) (DEPTH 13 FT)	SURVEY DISK	MNDT

Description: (2007)                      Stamping: R 366 E 2007

21.0 MILES NORTH OF TWO HARBORS, 21.1 MILES NORTH ALONG COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 IN TWO HARBORS, 67.2 FEET WEST OF COUNTY ROAD 2, 1.0 FOOT 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>	
1675.613	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
1675.613	.016	2/1				VERTICAL CONTROL SURVEY	2011	VBCKY-R	
1675.613	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBCKY	

Geoid Separations(ft): GEOID18 = -92.798    12B = -92.821    09 = -92.687    03 = -92.608

\* No Horizontal Positions in the Database \*



Mn/DOT Name: R 366 F

NGS Name: R 366 F

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM5554](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091313/  
 USGS Quad: KANE 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	7	56 N	10 W	472108.33	913927.88	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>
2007	2007	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) (DEPTH 23 FT)	SURVEY DISK	MNDT

Description: (2007)                      Stamping: R 366 F 2007

23.0 MILES NORTH OF TWO HARBORS, 22.8 MILES NORTH ALONG COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 IN TWO HARBORS, 66.7 FEET WEST-NORTHWEST OF COUNTY ROAD 2, 26.0 FEET NORTH-NORTHWEST OF A TRACK ROAD WEST, 1.5 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>	
1690.715	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
1690.715	.016	2/1				VERTICAL CONTROL SURVEY	2011	VBCKY-R	
1690.715	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBCKY	

Geoid Separations(ft): GEOID18 = -92.841    12B = -92.854    09 = -92.713    03 = -92.624

\* No Horizontal Positions in the Database \*





Mn/DOT Name: R 51

NGS Name: R 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0250](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	12	54 N	9 W	471035.68	912447.88	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>
1934	2017	NOT FOUND	Horz=NO Vert=NO	NO		PROJECTS 4 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	BENCH MARK DISK	NGS

**Description:** (2000)                      **Stamping:** R-51 1934

8.1 MILES SOUTHWEST ON TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY, 0.1 MILE SOUTHWEST OF TRUNK HIGHWAY 61 MILEPOST 343, IN THE WEST CORNER OF A LARGE LAWN, 47.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 70.0 FEET NORTHEAST OF DRIVEWAY NUMBER V 432, 24.0 FEET SOUTHEAST OF THE SOUTHWEST END OF A GUARDRAIL, 1.0 FOOT SOUTHEAST OF A WITNESS POST.

**Station Notes**

NEW BIKE PATH IN THE AREA.

**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>
644.028	.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>
643.919	.007	1/2				UNKNOWN/APPROXIMATE	1992	UNCHECKD
643.919	.007	1				VERTICAL CONTROL SURVEY	1934	L95 MINN

Geoid Separations(ft): GEOID18 = -96.217 12B = -96.165 09 = -96.063 03 = -96.007

\* No Horizontal Positions in the Database \*



Mn/DOT Name: RADIO RADIATING SYSTEM CENTER

NGS Name: RADIO RADIATING SYSTEM CENTER

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0754](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/1015  
 USGS Quad: SPLIT ROCK POINT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	54 N	9 W	470820.37	912753.65		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>
1943	1971	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	NGS

Description: (1943)

Stamping:

IN GOOSEBERRY FALLS STATE PARK, 0.2 MILES SOUTHEAST ALONG COUNTY HIGHWAY 1 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY HIGHWAY 1, THEN 0.3 MILES SOUTHEAST ON COUNTY HIGHWAY 1, 101.80 FEET NORTHWEST FROM THE CENTERLINE OF COUNTY HIGHWAY 1.

\* 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>		
646.324	.197		550.576	.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>		
646.291						RECIPROCAL VERTICAL ANGLE	1943	HORZ	

Geoid Separations(ft): GEOID18 = -95.971 12B = -95.912 09 = -95.807 03 = -95.768

**Lat/Lon and County Coordinates (Feet)**

**NAD83(1996)**

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>		
47 08 20.37035	91 27 53.65253	607209.413	228683.378	.066	2	ADJUSTMENT	1999	17648	
47 08 20.37708	91 27 53.65048	607209.567	228684.057	.066	2	ADJUSTMENT	1991	17497	

**NAD83(1986)**

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>		
47 08 20.37525	91 27 53.64732	607209.782	228683.868	.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>	
47 08 20.61900	91 27 53.05200			.100	2	CLASSICAL SURVEY	1956	11100

**State Plane and UTM Coordinates (Feet)**

**NAD83(1996)**

<u>MN State Plane - North 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>		
3031568.152	565455.865	2022314.120	17131701.628	.066	2	ADJUSTMENT	1999	17648	
3031568.279	565456.550	2022314.249	17131702.312	.066	2	ADJUSTMENT	1991	17497	

**NAD83(1986)**

<u>MN State Plane - North 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>		
3031568.502	565456.369	2022314.470	17131702.131	.066	2	ADJUSTMENT	1986	17289	

**NAD27**

<u>MN State Plane - North 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>	
2406955.037	237397.682			.100	2	CLASSICAL SURVEY	1956	11100



Mn/DOT Name: ROCK POINT

NGS Name: ROCK POINT

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4472](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	5	54 N	8 W	471114.51	912311.20	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>
1984	2011	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	HYDROGRAPHIC SURVEY DISK NOS	NOS

**Description:** (2007)                      **Stamping:** ROCK POINT 1984

7.0 MILES SOUTHWEST OF BEAVER BAY, 7.5 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY, TO TRUNK HIGHWAY 61 MILEPOINT 43.70, THEN 0.8 MILE NORTHEAST ALONG A BIKE TRAIL TO A BRIDGE, THEN 0.3 MILE SOUTHEAST ALONG A HIKING TRAIL TO THE HIGH POINT ON A HILL (CORUNDUM POINT), 90.3 FEET SOUTH OF STATION SPLIT ROCK RM 1.

**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>
758.742	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691
758.745	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3

**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>
758.607	.262			662.299	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -96.473    12B = -96.427    09 = -96.309    03 = -96.247

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 11 14.50647	91 23 11.20022	627049.406	245964.971	.131	3	GPS - RTRN	2011	RTRN2011	

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>				
<u>MN State Plane - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>		
		3050698.849	583516.993	2041468.292	17149730.328	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ROCK_POINT-DM4472-3E-02JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ROCK_POINT-DM4472-3E-02JUL2007.jpg</a>	E	Jul 2, 2007
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ROCK_POINT-DM4472-2-01SEP2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ROCK_POINT-DM4472-2-01SEP2011.jpg</a>		Sep 1, 2011
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ROCK_POINT-DM4472-1-01SEP2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/ROCK_POINT-DM4472-1-01SEP2011.jpg</a>		Sep 1, 2011

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



Mn/DOT Name: RR 20 A

NGS Name: RR 20 A

County: LAKE, MN (Sheet 1)

NGS ACRN: [RM0345](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	31	52 N	11 W	465656.00	914654.00		

<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	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STRUCTURE (MASSIVE)	CHISELED SQUARE	DMIRRR

**Description:**

**Stamping:**

0.1 MILE NORTHEAST FROM KNIFE RIVER, 0.1 MILE NORTHEAST BY A RAIL FROM A DEPOT ALONG THE IRON RANGE DIVISION OF THE DULUTH, MISSABE AND NORTHERN RAILWAY, ON RAILROAD BRIDGE NUMBER 20A, 0.5 MILE NORTHEAST OF MILEPOST 19, 7.0 FEET NORTHWEST OF THE CENTERLINE OF A TRACK, RAILROAD STATION 1032 + 64, THE RAILROAD ELEVATION IS 123.77 FEET.

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

Geoid Separations(ft): GEOID18 = -94.170 12B = -94.166 09 = -94.058 03 = -93.989



Mn/DOT Name: RR 30 A

NGS Name: RR 30 A

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0341](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	24	53 N	11 W	470336.00	914115.00		

<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	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STRUCTURE (MASSIVE)	CHISELED SQUARE	DMIRRR

**Description:**

**Stamping:**

3.0 MILES NORTHWEST FROM TWO HARBORS, ALONG THE IRON RANGE DIVISION OF THE DULUTH, MISSABE AND NORTHERN RAILWAY, ON RAILROAD BRIDGE NUMBER 30A, 0.5 MILE NORTHWEST OF MILEPOST 29, ON THE NORTHEAST SIDE OF THE TRACK, RAILROAD STATION 1558 + 49, THE RAILROAD ELEVATION IS 530.89 FEET.

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

Geoid Separations(ft): GEOID18 = -94.235 12B = -94.212 09 = -94.140 03 = -94.048



Mn/DOT Name: RR 30.6

NGS Name: RR 30.6

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0342](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	53 N	11 W	470408.00	914227.00		

<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	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	SEE DESCRIPTION	DMIRRR

**Description:**

**Stamping:**

4.1 MILES NORTHWEST FROM TWO HARBORS, ALONG THE IRON RANGE DIVISION OF THE DULUTH, MISSABE AND NORTHERN RAILWAY, 0.6 MILE NORTHWEST OF MILEPOST 30, A VERTICAL RAIL 31.0 FEET NORTHEAST OF THE CENTERLINE OF THE 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 = -93.970 12B = -93.947 09 = -93.871 03 = -93.786



Mn/DOT Name: RR 31.9

NGS Name: RR 31.9

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0343](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	14	53 N	11 W	470500.00	914248.00		

<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	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	CHISELED SQUARE	DMIRRR

**Description:**

**Stamping:**

5.4 MILES NORTHWEST FROM TWO HARBORS, ALONG THE IRON RANGE DIVISION OF THE DULUTH, MISSABE AND NORTHERN RAILWAY, 0.9 MILE NORTHWEST OF MILEPOST 31, IN AN OLD SIGNAL PEDESTAL.

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

Geoid Separations(ft): GEOID18 = -93.779 12B = -93.756 09 = -93.681 03 = -93.602



Mn/DOT Name: RR 33 A

NGS Name: RR 33 A

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0345](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	11	53 N	11 W	470531.00	914232.00		

<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	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STRUCTURE (MASSIVE)	CHISELED SQUARE	DMIRRR

**Description:**

**Stamping:**

6.1 MILES NORTHWEST FROM TWO HARBORS, ALONG THE IRON RANGE DIVISION OF THE DULUTH, MISSABE AND NORTHERN RAILWAY, ON RAILROAD BRIDGE NUMBER 33A, 0.6 MILE NORTHWEST OF MILEPOST 32, RAILROAD STATION 1722 + 13, THE RAILROAD ELEVATION IS 704.56 FEET.

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

Geoid Separations(ft): GEOID18 = -93.730 12B = -93.701 09 = -93.628 03 = -93.550





Mn/DOT Name: RR 34.3

NGS Name: RR 34.3

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0346](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	34	54 N	11 W	470700.00	914235.00		

<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	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	SEE DESCRIPTION	DMIRRR

**Description:** **Stamping:**  
 7.0 MILES SOUTHEAST FROM HIGHLAND, ALONG THE IRON RANGE DIVISION OF THE DULUTH, MISSABE AND NORTHERN RAILWAY, 0.3 MILE NORTHWEST OF MILEPOST 34, 17.0 FEET NORTHEAST OF THE CENTERLINE OF THE TRACK, RAILROAD STATION 1809+00 THE RAILROAD ELEVATION IS 820.49 FEET.

**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 = -93.468 12B = -93.445 09 = -93.366 03 = -93.297





Mn/DOT Name: RR 35.9

NGS Name: RR 35.9

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0349](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	26	54 N	11 W	470816.00	914155.00	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>
1933	1933	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	SEE DESCRIPTION	DMIRRR

Description: (1933)

Stamping:

5.4 MILES SOUTHEAST OF HIGHLAND, ALONG THE IRON RANGE DIVISION OF THE DULUTH, MISSABE AND NORTHERN RAILWAY, 0.1 MILE SOUTHEAST OF MILEPOST 36, 19.0 FEET NORTHEAST OF THE CENTERLINE OF A RAILROAD.

Station Notes

APPEARS TO BE SET IN A RAIL. THE YEAR SET 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>
1427.025	.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>
1426.756	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD

Geoid Separations(ft): GEOID18 = -93.330 12B = -93.310 09 = -93.225 03 = -93.172

\* No Horizontal Positions in the Database \*



Mn/DOT Name: RR 37 A

NGS Name: RR 37 A

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0351](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	23	54 N	11 W	470836.00	914133.00	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>
1933	1933	GOOD	Horz=YES Vert=YES	NO	37 A	FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	CHISELED SQUARE	DMIRRR

Description: (1933)                      Stamping:

5.0 MILES SOUTHEAST OF HIGHLAND, 5.0 MILES SOUTHEAST ALONG THE IRON RANGE DIVISION OF THE DULUTH, MISSABE AND NORTHERN RAILWAY, ON THE ABUTMENT OF BRIDGE NUMBER 37A.

Station Notes

THE YEAR SET 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>
1435.263	.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>
1434.987	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD

Geoid Separations(ft): GEOID18 = -93.317 12B = -93.300 09 = -93.212 03 = -93.163

\* No Horizontal Positions in the Database \*



Mn/DOT Name: RR 37.9

NGS Name: RR 37.9

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0352](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	14	54 N	11 W	470951.00	914141.00		

<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	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	SEE DESCRIPTION	DMIRRR

**Description:**

**Stamping:**

3.4 MILES SOUTHEAST FROM HIGHLAND, ALONG THE IRON RANGE DIVISION OF THE DULUTH, MISSABE AND NORTHERN RAILWAY, 0.1 MILE SOUTHEAST OF MILEPOST 38, 33.0 FEET NORTHEAST OF THE CENTERLINE OF THE TRACK, AT RAILROAD STATION 1997 + 97, THE RAILROAD ELEVATION IS 1027.73 FEET.

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

Geoid Separations(ft): GEOID18 = -93.120 12B = -93.103 09 = -93.018 03 = -92.976



Mn/DOT Name: RR 39.0

NGS Name: RR 39.0

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0353](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	11	54 N	11 W	471050.00	914153.00		

<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	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	CHISELED SQUARE	DMIRRR

**Description:** **Stamping:**  
 2.3 MILES SOUTHEAST FROM HIGHLAND, ALONG THE IRON RANGE DIVISION OF THE DULUTH, MISSABE AND NORTHERN RAILWAY, NEAR MILEPOST 39, IN AN OLD SIGNAL PEDESTAL.

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

Geoid Separations(ft): GEOID18 = -92.995 12B = -92.979 09 = -92.887 03 = -92.848



Mn/DOT Name: RR 40.3

NGS Name: RR 40.3

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0355](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	2	54 N	11 W	471149.00	914215.00		

<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	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	SEE DESCRIPTION	DMIRRR

**Description:**

**Stamping:**

1.0 MILE SOUTHEAST FROM HIGHLAND, ALONG THE IRON RANGE DIVISION OF THE DULUTH, MISSABE AND NORTHERN RAILWAY, 0.3 MILE NORTHWEST OF MILEPOST 40, 33.0 FEET NORTHEAST OF THE CENTERLINE OF THE TRACK, AT RAILROAD STATION 2126 + 24, THE RAILROAD ELEVATION IS 1108.73 FEET.

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

Geoid Separations(ft): GEOID18 = -92.880 12B = -92.874 09 = -92.782 03 = -92.743



Mn/DOT Name: RR 42.3

NGS Name: RR 42.3

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0357](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	28	55 N	11 W	471254.00	914413.00		

<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	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	SEE DESCRIPTION	DMIRRR

**Description:** **Stamping:**  
 1.0 MILE NORTHWEST FROM HIGHLAND, ALONG THE IRON RANGE DIVISION OF THE DULUTH, MISSABE AND NORTHERN RAILWAY, 0.3 MILE NORTHWEST OF MILEPOST 42, 20.0 FEET NORTHEAST OF THE CENTERLINE OF THE TRACKS, AT RAILROAD STATION 2234 + 95, THE RAILROAD ELEVATION 1160.04 FEET.

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

Geoid Separations(ft): GEOID18 = -92.782 12B = -92.782 09 = -92.703 03 = -92.661





Mn/DOT Name: RR 43.0

NGS Name: RR 43.0

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0358](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	28	55 N	11 W	471327.00	914414.00		

<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	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE FOOTING - SMALL	SEE DESCRIPTION	DMIRRR

**Description:** **Stamping:**  
 1.7 MILES NORTHWEST FROM HIGHLAND, ALONG THE IRON RANGE DIVISION OF THE DULUTH, MISSABE AND NORTHERN RAILWAY, NEAR MILEPOST 43, 35.0 FEET NORTH OF THE RAILROAD CENTERLINE, AT RAILROAD STATION 2271 + 52, THE RAILROAD ELEVATION IS 1158.06 FEET.

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

Geoid Separations(ft): GEOID18 = -92.785 12B = -92.782 09 = -92.707 03 = -92.657



Mn/DOT Name: RR 43.8

NGS Name: RR 43.8

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0359](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	21	55 N	11 W	471411.00	914439.00		

<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	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CULVERT - ANY SIZE, ANY TYPE	CHISELED SQUARE	DMIRRR

**Description:** **Stamping:**  
 2.5 MILES NORTHWEST FROM HIGHLAND, ALONG THE IRON RANGE DIVISION OF THE DULUTH, MISSABE AND  
 NORTHERN RAILWAY, 0.2 MILE SOUTHEAST OF MILEPOST 44, STATION RR 43.8 IS ON A CONCRETE CULVERT HEADWALL.

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

Geoid Separations(ft): GEOID18 = -92.811 12B = -92.811 09 = -92.729 03 = -92.674





Mn/DOT Name: RR 46 A

NGS Name: RR 46 A

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0362](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091331/  
 USGS Quad: KING 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	20	55 N	11 W	471406.00	914612.00	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>
1933	1933	GOOD	Horz=NO Vert=NO	NO	46A	FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	CHISELED SQUARE	DMIRRR

**Description:** (1933)                      **Stamping:**

3.8 MILES NORTHWEST OF HIGHLAND, 3.8 MILES NORTHWEST ALONG THE IRON RANGE DIVISION OF THE DULUTH, MISSABE AND NORTHERN RAILWAY, IN THE NORTHEAST ABUTMENT OF A RAILROAD BRIDGE NUMBER 46A.

**Station Notes**

THE YEAR SET IS UNKNOWN. THE SURVEY MARK IS ON RAILROAD PROPERTY AND HAS BEEN ABANDONED FOR MNDOT GEODETIC USE.

**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>	
1622.162	.007	1/2					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>	
1621.788	.007	1/2					UNKNOWN/APPROXIMATE	1992	UNCHECKD	

Geoid Separations(ft): GEOID18 = -92.867    12B = -92.874    09 = -92.798    03 = -92.736

\* No Horizontal Positions in the Database \*



Mn/DOT Name: S 173

NGS Name: S 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0388](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	18	55 N	10 W	471433.00	913944.00	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>
1935	2007	NOT FOUND	Horz=NO Vert=YES	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: (1935) Stamping: S 173 1935

8.0 MILES NORTH OF ALGER, 15.0 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, 600.0 FEET NORTHEAST OF A FIRST CURVE NORTH OF 1.0 MILE STRAIGHT STRETCH OF A ROAD, AT THE EDGE OF A WOODED AREA, 35.0 FEET EAST OF COUNTY ROAD 2.

**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>	
1667.736	.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>	
1667.385	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1667.385	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -92.815 12B = -92.802 09 = -92.716 03 = -92.684

\* No Horizontal Positions in the Database \*



Mn/DOT Name: S 19

NGS Name: S 19

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0340](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	24	53 N	11 W	470337.00	914113.00	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>
1933	1979	GOOD	Horz=NO Vert=NO	NO	RR		SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	BENCH MARK DISK	NGS

**Description:** (1979)                      **Stamping:** S 19 1933

IN THE NORTHEAST ABUTMENT OF A RAILROAD BRIDGE OVER THE LITTLE STEWART RIVER, 0.5 MILE WEST OF A RAILROAD OVERPASS ALONG TRUNK HIGHWAY 61 IN TWO HARBORS, THEN 2.45 MILES NORTH ON COUNTY ROAD 15, AT A RAILROAD CROSSING, 400.0 FEET SOUTHEAST OF A RAILROAD CROSSING, 7.6 FEET NORTH OF THE NORTH RAIL OF A RAILROAD.

**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>	
1032.705	.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>	
1032.626	.007	1/2				UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1032.626	.007	1				VERTICAL CONTROL SURVEY	1933	L29 MINN	

Geoid Separations(ft): GEOID18 = -94.242 12B = -94.219 09 = -94.147 03 = -94.055

\* No Horizontal Positions in the Database \*



Mn/DOT Name: S 336

NGS Name: S 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0550](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	27	55 N	11 W	471320.60	914228.70	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>
1978	2007	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	VERTICAL CONTROL DISK	NGS

Description: (1978) Stamping: S 336 1978

13.0 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS, THEN 2.5 MILES WEST ON COUNTY ROAD 14, AT DRIVE Y 453 TO A MICROWAVE TOWER, 190.0 FEET SOUTH OF A DRIVE, 148.0 FEET WEST OF COUNTY ROAD 14, 2.0 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>	
1746.735	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
1746.735	.016	2/1					VERTICAL CONTROL SURVEY	2011	VBCKY-R	
1746.735	.016	2/1					VERTICAL CONTROL SURVEY	2009	VBCKY	
1746.735	.007	1/2					VERTICAL ADJUSTMENT	1991	00000025	

Geoid Separations(ft): GEOID18 = -92.785 12B = -92.779 09 = -92.697 03 = -92.657

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/S_336-SH0550-3W-30JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/S_336-SH0550-3W-30JUL2007.jpg</a>	W	Jul 30, 2007
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/S_336-SH0550-2-30JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/S_336-SH0550-2-30JUL2007.jpg</a>		Jul 30, 2007
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/S_336-SH0550-1-30JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/S_336-SH0550-1-30JUL2007.jpg</a>		Jul 30, 2007

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



Mn/DOT Name: S 341  
County: LAKE, MN (Sheet 1)

NGS Name: S 341

NGS ACRN: <a href="#">SH0608</a>	<a href="#">Get Map</a>
NGS Quad / Sta Num : 47091242/	
USGS Quad: SILVER BAY	

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	55 N	7 W	471612.52	911651.97	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	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	VERTICAL CONTROL DISK	NGS

**Description:** (2009)                      **Stamping:** S 341 1978

IN EAST BEAVER BAY, 1.0 MILE NORTHEAST ON TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 52.2, AT THE NORTHEAST END OF A CUT BANK, ON THE INSIDE EDGE OF A SLIGHT HIGHWAY CURVE, 30.0 FEET NORTHWEST OF TRUNK HIGHWAY 61, 3.8 FEET 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>			
685.711	.016	2/1				2021	00000963	VERTICAL ADJUSTMENT		
685.704	.016	2/1				2019	VNSHORE	VERTICAL CONTROL SURVEY		
685.688	.016	2/1				2011	00000691	VERTICAL ADJUSTMENT		
685.688	.016	2/1				2009	VSHOR3	VERTICAL CONTROL SURVEY		
685.688	.007	1/2				2004	00000425-2	VERTICAL ADJUSTMENT		
685.688	.016	2/1				2002	VBEBAY	VERTICAL CONTROL SURVEY		
685.688	.007	1/2				1991	00000025	VERTICAL ADJUSTMENT		

<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>			
685.510	.033	3				1987	CS3806	VERTICAL CONTROL SURVEY		

**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>			
685.665	.262		589.244	.197	2011	2017	RTRN2017	GPS - RTRN		
685.766	.262		589.431	.197	2007	2011	RTRN2011	GPS - RTRN		

Geoid Separations(ft): GEOID18 = -96.460 12B = -96.420 09 = -96.335 03 = -96.260

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 16 12.51907	91 16 51.97199	653740.781	275704.081	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 16 12.51904	91 16 51.97175	653740.797	275704.078	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>
3076174.177	614300.085	2066985.564	17180470.198	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(2007)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>
3076174.194	614300.083	2066985.581	17180470.195	.131	3	GPS - RTRN	2011	RTRN2011





Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/S_341-SH0608-3NW-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/S_341-SH0608-3NW-19SEP2017.jpg</a>	NW	Sep 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/S_341-SH0608-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/S_341-SH0608-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/S_341-SH0608-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/S_341-SH0608-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: S 51

NGS Name: S 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0251](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	54 N	8 W	471142.88	912314.96	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	2007	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: (1979) Stamping: S-51 1934

6.2 MILES SOUTHWEST ON TRUNK HIGHWAY 61 FROM BEAVER BAY, ON THE TOP OF A SMALL HILL, 25.0 FEET NORTH OF A DRIVEWAY TO A HOUSE, 25.0 FEET NORTHWEST OF TRUNK HIGHWAY 61, 9.0 FEET WEST OF A LARGE ROCK, THE STATION IS CONSIDERED LOST.

**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>	
738.588	.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>	
738.460	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
738.598	.007	1					VERTICAL CONTROL SURVEY	1934	L95 MINN	

Geoid Separations(ft): GEOID18 = -96.315 12B = -96.269 09 = -96.161 03 = -96.086

\* No Horizontal Positions in the Database \*



Mn/DOT Name: SANDERS  
County: LAKE, MN (Sheet 1)

NGS Name: SANDERS

NGS ACRN: [DR1391](#) [Get Map](#)  
NGS Quad / Sta Num : 47091213/  
USGS Quad: ILLGEN CITY

				<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	1	56 N	7 W	472139.98	911031.22	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>
2017	2019	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 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017)                      Stamping: SANDERS 2017

1.0 MILE NORTHEAST OF ILLGEN CITY, 1.05 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND TRUNK HIGHWAY 1 IN ILLGEN CITY, AT TRUNK HIGHWAY 61 MILEPOINT 60.40, 30.7 FEET NORTHWEST OF TRUNK HIGHWAY 61, 14.6 FEET SOUTHWEST OF AN ENTRANCE, 0.15 MILE NORTHEAST OF LUPIN DRIVE, 19.5 FEET EAST SOUTHEAST OF A WITNESS POST.

Station Pair: LUPIN - LAKE, 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>	
677.344	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
677.344	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	

**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>	
677.348				580.983	.023	2011	HORIZONTAL ADJUSTMENT	2019	GPS3328	
677.344	.131			581.180	.066	1996	GPS - STATIC	2019	Hlake2	
677.348				580.983	.023	2011	GPS - STATIC	2019	Hlake2	
677.341	.262			580.996	.197	2011	GPS - RTRN	2017	RTRN2017	

Geoid Separations(ft): GEOID18 = -96.391    12B = -96.348    09 = -96.319    03 = -96.204

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 21 39.97886	91 10 31.21827			680503.378	308460.945	.016		ADJUSTMENT	2019	GPS3328
47 21 39.97886	91 10 31.21827			680503.378	308460.945	.016	C	GPS - STATIC	2019	Hlake2
47 21 39.97785	91 10 31.21771			680503.415	308460.842	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(1996)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 21 39.97859	91 10 31.21875			680503.344	308460.919	.033	C	GPS - STATIC	2019	Hlake2

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3101597.120	648102.006			2092455.342	17214230.304	.016		ADJUSTMENT	2019	GPS3328
3101597.120	648102.006			2092455.342	17214230.304	.016	C	GPS - STATIC	2019	Hlake2
3101597.161	648101.904			2092455.383	17214230.202	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3101597.088	648101.977			2092455.310	17214230.276	.033	C	GPS - STATIC	2019	Hlake2



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SANDERS-DR1391-3NW-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SANDERS-DR1391-3NW-18OCT2017.jpg</a>	NW	Oct 18, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SANDERS-DR1391-2-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SANDERS-DR1391-2-18OCT2017.jpg</a>		Oct 18, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SANDERS-DR1391-1-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SANDERS-DR1391-1-18OCT2017.jpg</a>		Oct 18, 2017

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



Mn/DOT Name: SHTR

NGS Name: SHTR

County: LAKE, MN (Sheet 1)

NGS ACRN: [DR1382](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	54 N	8 W	471108.80	912415.34	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>
2017	2019	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 12 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017) Stamping: SHTR 2017

8.0 MILES SOUTHWEST OF BEAVER BAY, 8.2 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 43.40, 38.5 FEET NORTHWEST OF TRUNK HIGHWAY 61, 21.9 FEET SOUTHWEST OF AN ENTRANCE, 1.3 MILES NORTHEAST OF TWIN POINTS TRAIL, 1.5 FEET SOUTHEAST OF A WITNESS POST.

Station Pair: 3806 AD - LAKE, 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>	
660.888	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
660.888	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	

**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>	
660.789				564.602	.025	2011	HORIZONTAL ADJUSTMENT	2019	GPS3328	
660.888	.131			564.799	.066	1996	GPS - STATIC	2019	Hlake2	
660.789				564.602	.025	2011	GPS - STATIC	2019	Hlake2	
660.891	.262			564.730	.197	2011	GPS - RTRN	2017	RTRN2017	

Geoid Separations(ft): GEOID18 = -96.210 12B = -96.161 09 = -96.056 03 = -95.994

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 11 08.79910	91 24 15.33845			622609.420	245466.637	.016		ADJUSTMENT	2019	GPS3328
47 11 08.79910	91 24 15.33845			622609.420	245466.637	.016	C	GPS - STATIC	2019	Hlake2
47 11 08.79880	91 24 15.33842			622609.421	245466.607	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(1996)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 11 08.79887	91 24 15.33896			622609.384	245466.614	.033	C	GPS - STATIC	2019	Hlake2

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3046282.706	582841.209			2037051.954	17149061.317	.016		ADJUSTMENT	2019	GPS3328
3046282.706	582841.209			2037051.954	17149061.317	.016	C	GPS - STATIC	2019	Hlake2
3046282.709	582841.179			2037051.957	17149061.287	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3046282.672	582841.185			2037051.919	17149061.293	.033	C	GPS - STATIC	2019	Hlake2



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SHTR-DR1382-3NW-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SHTR-DR1382-3NW-18OCT2017.jpg</a>	NW	Oct 18, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SHTR-DR1382-2-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SHTR-DR1382-2-18OCT2017.jpg</a>		Oct 18, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SHTR-DR1382-1-18OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SHTR-DR1382-1-18OCT2017.jpg</a>		Oct 18, 2017

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



Mn/DOT Name: SICRCF

NGS Name: SICRCF

County: LAKE, MN (Sheet 1)

NGS ACRN: [DR1377](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

				<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	22	53 N	10 W	470356.93	913551.28	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>
2017	2019	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 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017)                      Stamping: SICRCF 2017

5.0 MILES NORTHEAST OF TWO HARBORS, 4.3 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 30.50, 50.9 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 320.8 FEET SOUTHWEST OF THE SOUTHEAST EDGE OF THE SILVER CLIFF TUNNEL ENTRANCE, 0.2 MILE NORTHEAST OF (LOOP ROAD) COUNTY ROAD 113, 1.5 FEET NORTHWEST OF A WITNESS POST.

Station Pair: LOOP - LAKE, 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>	
662.236	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
662.236	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	

**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>	
662.243				567.036	.023	2011	HORIZONTAL ADJUSTMENT	2019	GPS3328	
662.236	.131			567.233	.066	1996	GPS - STATIC	2019	Hlake2	
662.243				567.036	.023	2011	GPS - STATIC	2019	Hlake2	
662.299	.262			567.118	.197	2011	GPS - RTRN	2017	RTRN2017	

Geoid Separations(ft): GEOID18 = -95.223    12B = -95.184    09 = -95.082    03 = -95.013

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 03 56.93183	91 35 51.28238			573645.757	202648.076	.016		ADJUSTMENT	2019	GPS3328
47 03 56.93183	91 35 51.28238			573645.757	202648.076	.016	C	GPS - STATIC	2019	Hlake2
47 03 56.93143	91 35 51.28199			573645.783	202648.035	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(1996)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 03 56.93158	91 35 51.28287			573645.723	202648.051	.033	C	GPS - STATIC	2019	Hlake2

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2999074.434	538100.585			1989786.571	17104401.867	.016		ADJUSTMENT	2019	GPS3328
2999074.434	538100.585			1989786.571	17104401.867	.016	C	GPS - STATIC	2019	Hlake2
2999074.462	538100.545			1989786.598	17104401.827	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2999074.401	538100.559			1989786.537	17104401.841	.033	C	GPS - STATIC	2019	Hlake2



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SICRCF-DR1377-3SE-16OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SICRCF-DR1377-3SE-16OCT2017.jpg</a>	SE	Oct 16, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SICRCF-DR1377-2-16OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SICRCF-DR1377-2-16OCT2017.jpg</a>		Oct 16, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SICRCF-DR1377-1-16OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SICRCF-DR1377-1-16OCT2017.jpg</a>		Oct 16, 2017

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





Mn/DOT Name: SILVER BAY MNDT

NGS Name: SILVER BAY

County: LAKE, MN (Sheet 1)

NGS ACRN: [DE8048](#) [Get Map](#)  
NGS Quad / Sta Num : 47091242/  
USGS Quad: SILVER BAY

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	56 N	7 W	471730.89	911557.93		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>
1987	2012	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	HORIZONTAL CONTROL DISK	MNDT

Description: (2011) Stamping: SILVER BAY 1987

IN SILVER BAY, 0.60 MILE WEST-SOUTHWEST ALONG COUNTY ROAD 5 FROM THE JUNCTION OF COUNTY ROAD 5 AND TRUNK HIGHWAY 61 IN SILVER BAY, THEN 0.05 MILE SOUTHEAST ALONG A ROAD TO A TOWER, THEN 0.25 MILE SOUTHERLY ALONG A RIGHT FORK-IN-ROAD TOWARD A SCENIC OVERLOOK, THEN 0.10 MILE NORTHWEST, THEN SOUTH ALONG A GRAVEL ACCESS ROAD TO TOWER, 100.0 FEET SOUTH OF A TV TOWER, 99.3 FEET SOUTH OF THE SOUTHWEST CORNER OF A FENCE AROUND A TV TOWER, 6.0 FEET SOUTHEAST OF A WITNESS POST, 24.12 FEET EAST-SOUTHEAST OF SILVER BAY MNDT RM 1, 20.80 FEET SOUTH-SOUTHEAST OF SILVER BAY MNDT 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>
999.998	.262		903.820	.197	2011	GPS - RTRN	2017	RTRN2017
999.998			903.742	.018	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940
999.998			903.774	.018	2011	GPS - STATIC	2013	HBBAY
999.998	.131		903.873	.066	2007	GPS - STATIC	2012	HBBAY
			903.742	.060	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800
999.923	.262		903.791	.197	2007	GPS - RTRN	2011	RTRN2011
			903.824	.052	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300
1000.031	.131		903.971	.066	1996	HORIZONTAL ADJUSTMENT	2002	GPS1736
1000.031	.131		903.971	.066	1996	GPS - STATIC	2002	HISAB

**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>
999.801						RECIPROCAL VERTICAL ANGLE	1987	HORZ

Geoid Separations(ft): GEOID18 = -96.224 12B = -96.181 09 = -96.135 03 = -96.050

**Lat/Lon and County Coordinates (Feet)**

**NAD83(2011)**

<u>Geodetic Position</u>		<u>Lake 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>
47 17 30.88940	91 15 57.92897	535546.856	182204.013	.131	3	GPS - RTRN	2017	RTRN2017
47 17 30.88937	91 15 57.92924	535546.837	182204.010	.016		ADJUSTMENT	2013	GPS2940
47 17 30.88941	91 15 57.92926	535546.836	182204.014	.016	C	GPS - STATIC	2013	HBBAY
47 17 30.88937	91 15 57.92924	535546.837	182204.010	.030		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

<u>Geodetic Position</u>		<u>Lake 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>
47 17 30.88947	91 15 57.93009	535546.779	182204.020	.033	C	GPS - STATIC	2012	HBBAY
47 17 30.88856	91 15 57.92905	535546.850	182203.928	.131	3	GPS - RTRN	2011	RTRN2011
47 17 30.88947	91 15 57.93009	535546.778	182204.020	.023		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

<u>Geodetic Position</u>		<u>Lake 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>
47 17 30.88996	91 15 57.92780	535546.936	182204.070	.033	C	ADJUSTMENT	2002	GPS1736
47 17 30.88996	91 15 57.92780	535546.936	182204.070	.033	C	GPS - STATIC	2002	HISAB

**NAD83(1986)**

<u>Geodetic Position</u>		<u>Lake 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>
47 17 30.89048	91 15 57.92073	535547.424	182204.124	.033	C	GPS - STATIC	1988	HBEA1

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North 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>
3079711.562	622325.955	2070534.385	17188489.676	.131	3	GPS - RTRN	2017	RTRN2017
3079711.543	622325.952	2070534.367	17188489.672	.016		ADJUSTMENT	2013	GPS2940
3079711.542	622325.956	2070534.365	17188489.676	.016	C	GPS - STATIC	2013	HBBAY
3079711.543	622325.952	2070534.367	17188489.672	.030		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

MN State Plane - North 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>
3079711.485	622325.960	2070534.308	17188489.681	.033	C	GPS - STATIC	2012	HBBAY
3079711.558	622325.870	2070534.382	17188489.590	.131	3	GPS - RTRN	2011	RTRN2011
3079711.485	622325.961	2070534.308	17188489.681	.023		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

MN State Plane - North 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>
3079711.641	622326.014	2070534.465	17188489.735	.033	C	ADJUSTMENT	2002	GPS1736
3079711.641	622326.014	2070534.465	17188489.735	.033	C	GPS - STATIC	2002	HISAB

**NAD83(1986)**

MN State Plane - North 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>
3079712.127	622326.078	2070534.951	17188489.798	.033	C	GPS - STATIC	1988	HBEA1

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY-DE8048-3SE-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY-DE8048-3SE-19SEP2017.jpg</a>	SE	Sep 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY-DE8048-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY-DE8048-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY-DE8048-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY-DE8048-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: SILVER BAY MNDT RM 1

NGS Name: SILVER BAY RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	31	56 N	7 W	471730.90	911558.28		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	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	REFERENCE MARK DISK	MNDT

**Description:** (2011)                      **Stamping:** SILVER BAY NO 1 1987

IN SILVER BAY, 0.60 MILE WEST-SOUTHWEST ALONG COUNTY ROAD 5 FROM THE JUNCTION OF COUNTY ROAD 5 AND TRUNK HIGHWAY 61 IN SILVER BAY, THEN 0.05 MILE SOUTHEAST ALONG A ROAD TO A TOWER, THEN 0.25 MILE SOUTHERLY ALONG A RIGHT FORK-IN-ROAD TOWARD A SCENIC OVERLOOK, THEN 0.10 MILE NORTHWEST, THEN SOUTH ALONG A GRAVEL ACCESS ROAD TO A TOWER, 24.12 FEET WEST-SOUTHWEST OF STATION SILVER BAY MNDT, 19.7 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>Project Info</u>	
<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</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>			
996.980	.262		900.802	.197	2011	GPS - RTRN	2017	RTRN2017
996.921	.262		900.789	.197	2007	GPS - RTRN	2011	RTRN2011

**Geoid Separations(ft):** GEOID18 = -96.224    12B = -96.178    09 = -96.132    03 = -96.050

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>							<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Lake 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>					
47 17 30.89760	91 15 58.27823	535522.776	182204.800	.131	3	GPS - RTRN	2017	RTRN2017

  

<u>NAD83(2007)</u>							<u>Project Info</u>	
<u>Geodetic Position</u>		<u>Lake 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>					
47 17 30.89802	91 15 58.27983	535522.666	182204.842	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>							<u>Project Info</u>	
<u>MN State Plane - North 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>					
3079687.474	622326.215	2070510.301	17188489.971	.131	3	GPS - RTRN	2017	RTRN2017

  

<u>NAD83(2007)</u>							<u>Project Info</u>	
<u>MN State Plane - North 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>					
3079687.363	622326.255	2070510.190	17188490.011	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_RM_1-3N-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_RM_1-3N-19SEP2017.jpg</a>	N	Sep 19, 2017
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_RM_1-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_RM_1-2-19SEP2017.jpg</a>		Sep 19, 2017
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_RM_1-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_RM_1-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: SILVER BAY MNDT RM 2

NGS Name: SILVER BAY RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN:  
NGS Quad / Sta Num : 47091242/  
USGS Quad: SILVER BAY

[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	56 N	7 W	471731.08	911558.04		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>
1987	2017	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	REFERENCE MARK DISK	MNDT

**Description:** (2007)                      **Stamping:** SILVER BAY NO 2 1987

IN SILVER BAY, 0.60 MILE WEST-SOUTHWEST ALONG COUNTY ROAD 5 FROM THE JUNCTION OF COUNTY ROAD 5 AND TRUNK HIGHWAY 61 IN SILVER BAY, THEN 0.05 MILE SOUTHEAST ALONG A ROAD TO A TOWER, THEN 0.25 MILE SOUTHERLY ALONG A RIGHT FORK-IN-ROAD TOWARD A SCENIC OVERLOOK, THEN 0.10 MILE NORTHWEST, THEN SOUTH ALONG A GRAVEL ACCESS ROAD TO A TOWER, 24.12 FEET EAST-NORTHEAST OF STATION SILVER BAY MNDT RM 1, 20.80 FEET NORTH-NORTHWEST OF STATION SILVER BAY MNDT, 15.8 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>
999.306	.262		903.131	.197	2011	GPS - RTRN	2017	RTRN2017
999.273	.262		903.141	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -96.224    12B = -96.178    09 = -96.132    03 = -96.050

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Lake 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>
47 17 31.08126	91 15 58.03697	535539.374	182223.440	.131	3	GPS - RTRN	2017	RTRN2017

  

<u>NAD83(2007)</u>		<u>Lake 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>
47 17 31.08096	91 15 58.03761	535539.330	182223.410	.131	3	GPS - RTRN	2011	RTRN2011

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>MN State Plane - North 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>
3079703.658	622345.211	2070526.511	17188508.941	.131	3	GPS - RTRN	2017	RTRN2017

  

<u>NAD83(2007)</u>		<u>UTM - Zone 15</u>					<u>Project Info</u>	
<u>MN State Plane - North 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>
3079703.615	622345.180	2070526.468	17188508.910	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_RM_2-3SE-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_RM_2-3SE-19SEP2017.jpg</a>	SE	Sep 19, 2017
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_RM_2-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_RM_2-2-19SEP2017.jpg</a>		Sep 19, 2017
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_RM_2-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SILVER_BAY_RM_2-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: SILVER BAY RADIO MAST

NGS Name: SILVER BAY RADIO MAST

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	36	56 N	8 W	471723.07	911753.00		

<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	1987	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	SURVEY DISK	MNDT

Description: (1987)                      Stamping:  
 0.5 MILE WEST-NORTHWEST OF SILVER BAY.

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

Geoid Separations(ft): GEOID18 = -95.777    12B = -95.728    09 = -95.695    03 = -95.613



Mn/DOT Name: SILVER BAY TV TOWER

NGS Name: SILVER BAY TV TOWER

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	56 N	7 W	471731.96	911558.21		

<u>Year Set</u>	<u>Last Recovery</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	1987	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	SURVEY DISK	MNDT

Description: (1987)                      Stamping:  
 IN SILVER BAY, 100.0 FEET NORTH OF STATION SILVER BAY MNDT.

\* No Vertical Positions in the Database \*

Geoid Separations(ft): GEOID18 = -96.217    12B = -96.171    09 = -96.125    03 = -96.043

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(1986)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 17 31.96882	91 15 58.21368	657579.974	283691.910	3.281		CLASSICAL SURVEY	1991	H1991		

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(1986)</u>		<u>MN State Plane - North 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>
3079689.348	622434.820	2070512.336	17188598.558	3.281		CLASSICAL SURVEY	1991	H1991



Mn/DOT Name: SILVER BAY WATER TANK

NGS Name: SILVER BAY WATER TANK

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2776](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	31	56 N	7 W	471529.99	911720.10		

<u>Year Set</u>	<u>Last Recovery</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	1987	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	ELEVATED TANK	MNDT

Description: (1987)                      Stamping:  
 IN THE NORTH CENTRAL PART OF SILVER BAY.

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

Geoid Separations(ft): GEOID18 = -96.089    12B = -96.046    09 = -96.010    03 = -95.925



Mn/DOT Name: SILVER CLIFF

NGS Name: SILVER CLIFF

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0777](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/1021  
 USGS Quad: CASTLE DANGER

				<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	22	53 N	10 W	470405.44	913539.92		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>
1952	1977	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	TRIANGULATION STATION DISK	NGS

**Description:** (1977) **Stamping:** SILVER CLIFF 1952

5.0 MILES EAST OF TWO HARBORS, ON A HIGH HILL CALLED SILVER CLIFF, 4.7 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61, 150.0 FEET NORTHWEST OF A TELEPHONE POLE, 24.0 FEET SOUTHEAST OF A TREE, 19.0 FEET EAST OF THE EDGE OF A ROCK CLIFF, 18.95 FEET WEST OF SILVER CLIFF RM 1, 16.25 FEET EAST-NORTHEAST OF SILVER CLIFF RM 2.

**Station Notes**

8/17/2011 PRIVATE ROAD/STEEP CLIFF.

\* 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>
879.591	.197		784.572	.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>
879.296						RECIPROCAL VERTICAL ANGLE	1952	HORZ

Geoid Separations(ft): GEOID18 = -95.229 12B = -95.193 09 = -95.092 03 = -95.023

**Lat/Lon and County Coordinates (Feet)**

**NAD83(1996)**

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 04 05.44462	91 35 39.91878	574449.979	203494.276	.066	2	ADJUSTMENT	1999	17648
47 04 05.45039	91 35 39.91778	574450.060	203494.859	.066	2	ADJUSTMENT	1991	17497

**NAD83(1986)**

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 04 05.44818	91 35 39.91654	574450.141	203494.633	.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>
47 04 05.68325	91 35 39.27729			.100	2	CLASSICAL SURVEY	1979	15983
47 04 05.69900	91 35 39.25400			.100	3	CLASSICAL SURVEY	1958	USGS-HORZ

**State Plane and UTM Coordinates (Feet)**

**NAD83(1996)**

<u>MN State Plane - North 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>
2999844.160	538978.201	1990557.430	17105278.095	.066	2	ADJUSTMENT	1999	17648
2999844.218	538978.787	1990557.488	17105278.680	.066	2	ADJUSTMENT	1991	17497

**NAD83(1986)**

<u>MN State Plane - North 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>
2999844.308	538978.564	1990557.578	17105278.458	.066	2	ADJUSTMENT	1986	17289

**NAD27**

<u>MN State Plane - North 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>
2375233.001	210919.071			.100	2	CLASSICAL SURVEY	1979	15983
2375234.582	210920.698			.100	3	CLASSICAL SURVEY	1958	USGS-HORZ





Mn/DOT Name: SILVER CLIFF RM 1

NGS Name: SILVER CLIFF RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2777](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/1021  
 USGS Quad: CASTLE DANGER

				<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	22	53 N	10 W	470405.45	913539.65		

<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>
1952	1977	GOOD	Horz=YES Vert=YES	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	REFERENCE MARK DISK	NGS

**Description:** **Stamping:** SILVER CLIFF NO 1 1952

5.0 MILES EAST OF TWO HARBORS, ON A HIGH HILL CALLED SILVER CLIFF, 4.7 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61, 40.6 FEET SOUTHEAST OF A TRIANGLE BLAZED TREE.

**Station Notes**

8/17/2011 PRIVATE ROAD/STEP CLIFF.

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

Geoid Separations(ft): GEOID18 = -95.233 12B = -95.193 09 = -95.092 03 = -95.026



Mn/DOT Name: SILVER CLIFF RM 2

NGS Name: SILVER CLIFF RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2778](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/1021  
 USGS Quad: CASTLE DANGER

				<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	22	53 N	10 W	470405.40	913540.14		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1952	1977	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	REFERENCE MARK DISK	NGS

**Description:** **Stamping:** SILVER CLIFF NO 2 1952

5.0 MILES EAST OF TWO HARBORS, ON A HIGH HILL CALLED SILVER CLIFF, 4.7 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61, 8.0 FEET SOUTHWEST OF A TRIANGLE BLAZED TREE, 4.0 FEET SOUTHWEST OF THE EDGE OF A ROCK CLIFF.

**Station Notes**

8/17/2011 PRIVATE ROAD/STEEP CLIFF.

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

Geoid Separations(ft): GEOID18 = -95.229 12B = -95.190 09 = -95.092 03 = -95.023



Mn/DOT Name: SONJU

NGS Name: SONJU

County: LAKE, MN (Sheet 1)

NGS ACRN: [DO8131](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NE	10	52 N	11 W	470037.52	914241.49	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2011	2021	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 20 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2011)                      Stamping: SON JU 2011

2.0 MILES SOUTHWEST OF TWO HARBORS, 1.45 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 11 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 23.70, 58.5 FEET NORTHWEST OF SOUTHBOUND TRUNK HIGHWAY 61, 226.3 FEET SOUTHWEST OF COUNTY ROAD 9, 1.5 FEET SOUTHEAST OF A WITNESS POST.

Station Pair: CARS - LAKE, MN

**Leveling-Derived Orthometric Heights (Feet)**

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj				Year	Reference		
756.265	.016	2/1				VERTICAL ADJUSTMENT			2021	00000963		
756.271	.016	2/1				VERTICAL CONTROL SURVEY			2019	VNSHORE		

**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		
756.317	.262		661.829	.197	2011	GPS - OPUS			2021	GPSBM		
756.327	.262		661.839	.197	2011	GPS - RTRN			2021	RTRN2021		
756.360	.262		661.885	.197	2011	GPS - RTRN			2017	RTRN2017		
756.255			661.806	.030	2011	HORIZONTAL ADJUSTMENT			2013	GPS2940		
756.255			661.806	.030	2011	GPS - STATIC			2013	HBBAY		
756.265	.131		661.888	.066	2007	GPS - STATIC			2012	HBBAY		

Geoid Separations(ft): GEOID18 = -94.488 12B = -94.475 09 = -94.386 03 = -94.314

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)								Project Info	
Geodetic Position		Lake County - Lake (North Shore) Zone				Determination Method		Year	Reference
Latitude	Longitude	X	Y	Acc	Order				
47 00 37.52215	91 42 41.49479	544808.881	183051.913	.131	3	GPS - OPUS		2021	GPSBM
47 00 37.52171	91 42 41.49480	544808.879	183051.869	.131	3	GPS - RTRN		2021	RTRN2021
47 00 37.52195	91 42 41.49466	544808.889	183051.893	.131	3	GPS - RTRN		2017	RTRN2017
47 00 37.52212	91 42 41.49481	544808.880	183051.910	.020		ADJUSTMENT		2013	GPS2940
47 00 37.52212	91 42 41.49481	544808.880	183051.910	.020	C	GPS - STATIC		2013	HBBAY

  

NAD83(2007)								Project Info	
Geodetic Position		Lake County - Lake (North Shore) Zone				Determination Method		Year	Reference
Latitude	Longitude	X	Y	Acc	Order				
47 00 37.52242	91 42 41.49570	544808.819	183051.942	.033	C	GPS - STATIC		2012	HBBAY

**State Plane and UTM Coordinates (Feet)**

NAD83(2011)				Project Info					
MN State Plane - North Zone		UTM - Zone 15		Year	Reference				
X	Y	X	Y						
2971044.349	517369.603	1961732.737	17083718.915	.131	3	GPS - OPUS		2021	GPSBM
2971044.349	517369.558	1961732.737	17083718.871	.131	3	GPS - RTRN		2021	RTRN2021
2971044.358	517369.583	1961732.747	17083718.895	.131	3	GPS - RTRN		2017	RTRN2017
2971044.348	517369.600	1961732.736	17083718.912	.020		ADJUSTMENT		2013	GPS2940
2971044.348	517369.600	1961732.736	17083718.912	.020	C	GPS - STATIC		2013	HBBAY

  

NAD83(2007)				Project Info					
MN State Plane - North Zone		UTM - Zone 15		Year	Reference				
X	Y	X	Y						
2971044.285	517369.629	1961732.674	17083718.942	.033	C	GPS - STATIC		2012	HBBAY



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SONJU-DO8131-3NW-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SONJU-DO8131-3NW-17AUG2021.jpg</a>	NW	Aug 17, 2021
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SONJU-DO8131-2-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SONJU-DO8131-2-17AUG2021.jpg</a>		Aug 17, 2021
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SONJU-DO8131-1-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SONJU-DO8131-1-17AUG2021.jpg</a>		Aug 17, 2021

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



Mn/DOT Name: SPLIT MNDT

NGS Name: SPLIT

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0753](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	55 N	8 W	471200.04	912201.27		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>
1977	2008	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STRUCTURE (MASSIVE)	CHISELED CROSS	MNMT

Description: (2008)

Stamping:

5.0 MILES SOUTHWEST OF BEAVER BAY, IN A STATE PARK, ON THE CATWALK ON THE NORTHWEST SIDE OF THE SPLIT ROCK LIGHTHOUSE, 5.36 FEET NORTH OF THE BOTTOM HINGE PIN OF THE CATWALK DOOR, 1.80 FEET EAST OF THE WEST RAILING OF A SUPPORT BOLT, 1.35 FEET NORTHWEST OF A LIGHTHOUSE, THE STATION IS A FILED "X" IN THE JOINT OF CATWALK. THE CATWALK HAS CHANGED.

\* 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>		
766.731	.197		670.451	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648		

<u>NGVD29</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>		
766.403						RECIPROCAL VERTICAL ANGLE	1977	HORZ		

Geoid Separations(ft): GEOID18 = -96.552 12B = -96.509 09 = -96.397 03 = -96.299

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>			
47 12 00.04392	91 22 01.27387	631960.174	250492.252	.066	2	ADJUSTMENT	1999	17648			
47 12 00.05194	91 22 01.27030	631960.435	250493.060	.066	2	ADJUSTMENT	1991	17497			

<u>NAD83(1986)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>			
47 12 00.04959	91 22 01.26789	631960.596	250492.819	3.281		CLASSICAL SURVEY	1988	HBEA1			
47 12 00.04918	91 22 01.26827	631960.570	250492.778	.066	2	ADJUSTMENT	1986	17289			

<u>NAD27</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>			
47 12 00.31880	91 22 00.66282			.100	2	CLASSICAL SURVEY	1979	15983			

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>			
3055423.902	588237.105	2046199.598	17154442.477	.066	2	ADJUSTMENT	1999	17648			
3055424.131	588237.923	2046199.827	17154443.294	.066	2	ADJUSTMENT	1991	17497			

<u>NAD83(1986)</u>		<u>MN State Plane - North 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>			
3055424.302	588237.688	2046199.998	17154443.060	3.281		CLASSICAL SURVEY	1988	HBEA1			
3055424.277	588237.646	2046199.973	17154443.018	.066	2	ADJUSTMENT	1986	17289			

<u>NAD27</u>		<u>MN State Plane - North 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>			
2430812.127	260181.578			.100	2	CLASSICAL SURVEY	1979	15983			



Mn/DOT Name: SPLIT ROCK

NGS Name: SPLIT ROCK 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0757](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/1010  
 USGS Quad: SPLIT ROCK POINT

				<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	5	54 N	8 W	471115.84	912311.02	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>
1943	2011	GOOD	Horz=NO Vert=YES	YES			STEEL SPIKE ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	TRIANGULATION STATION DISK	NGS

**Description:** (2011)                      **Stamping:** SPLIT ROCK 1943

18.5 MILES NORTHEAST OF TWO HARBORS, 7.5 MILES SOUTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY, TO TRUNK HIGHWAY 61 MILEPOINT 43.70, THEN 0.8 MILE NORTHEAST ALONG A BIKE PATH TO A BRIDGE, THEN 0.3 MILE SOUTHEAST ALONG A HIKING TRAIL TO A HIGH POINT ON A HILL (CORUNDUM POINT), 0.75 MILE SOUTHWEST OF THE SPLIT ROCK LIGHTHOUSE, 125.0 FEET NORTH OF A POINT, 100.0 FEET EAST OF THE BAY SIDE OF A BLUFF, 47.01 FEET NORTH OF SPLIT ROCK RM 1, 38.84 FEET EAST OF SPLIT ROCK RM 2.

**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>	
764.487	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
764.490	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3	

**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>	
764.287	.262			667.981	.197	2007	GPS - RTRN	2011	RTRN2011	
764.434	.197			668.227	.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>	
764.401							RECIPROCAL VERTICAL ANGLE	1943	HORZ	

Geoid Separations(ft): GEOID18 = -96.466    12B = -96.420    09 = -96.302    03 = -96.240

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 11 15.84955	91 23 11.02370	627064.035	246100.814	.131	3	GPS - RTRN	2011	RTRN2011

<u>NAD83(1996)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 11 15.83802	91 23 11.01956	627064.300	246099.641	.066	2	ADJUSTMENT	1999	17648
47 11 15.84565	91 23 11.01631	627064.538	246100.410	.066	2	ADJUSTMENT	1991	17497

<u>NAD83(1986)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 11 15.84292	91 23 11.01436	627064.668	246100.131	.066	2	ADJUSTMENT	1986	17289

<u>NAD27</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 11 16.11100	91 23 10.40500			.100	2	CLASSICAL SURVEY	1956	11100

<u>USSD</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 11 16.36800	91 23 10.21500				3	CLASSICAL SURVEY		17389-67

**State Plane and UTM Coordinates (Feet)**

**NAD83(2007)**

MN State Plane - North 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>
3050708.021	583653.303	2041477.668	17149866.600	.131	3	GPS - RTRN	2011	RTRN2011

**NAD83(1996)**

MN State Plane - North 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>
3050708.333	583652.142	2041477.978	17149865.438	.066	2	ADJUSTMENT	1999	17648
3050708.541	583652.920	2041478.187	17149866.216	.066	2	ADJUSTMENT	1991	17497

**NAD83(1986)**

MN State Plane - North 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>
3050708.681	583652.646	2041478.327	17149865.942	.066	2	ADJUSTMENT	1986	17289

**NAD27**

MN State Plane - North 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>
2426096.673	255596.431			.100	2	CLASSICAL SURVEY	1956	11100

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SPLIT_ROCK_2-SH0757-3W-01SEP2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SPLIT_ROCK_2-SH0757-3W-01SEP2011.jpg</a>	W	Sep 1, 2011
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SPLIT_ROCK_2-SH0757-2-01SEP2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SPLIT_ROCK_2-SH0757-2-01SEP2011.jpg</a>		Sep 1, 2011
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SPLIT_ROCK_2-SH0757-1-01SEP2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SPLIT_ROCK_2-SH0757-1-01SEP2011.jpg</a>		Sep 1, 2011

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



Mn/DOT Name: SPLIT ROCK LIGHTHOUSE

NGS Name: SPLIT ROCK LIGHTHOUSE

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0751](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/1014  
 USGS Quad: SPLIT ROCK POINT NE

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	55 N	8 W	471159.98	912201.22		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>
1943	2012	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	LIGHTHOUSE	NGS

Description: (1987)

Stamping:

19.0 MILES NORTHEAST OF TWO HARBORS, IN A STATE PARK, 0.4 MILE SOUTHEAST OF TRUNK HIGHWAY 61.

\* No Vertical Positions in the Database \*

Geoid Separations(ft): GEOID18 = -96.552 12B = -96.509 09 = -96.397 03 = -96.299

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 11 59.97965	91 22 01.21773	631963.935	250485.672	.328	4	ADJUSTMENT	1999	17648
47 11 59.98706	91 22 01.21515	631964.126	250486.420	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 11 59.98427	91 22 01.21205	631964.335	250486.134	.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>
47 12 00.25442	91 22 00.60547			.100	4	CLASSICAL SURVEY	1979	15983
47 12 00.25000	91 22 00.62000			.100	4	CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - North 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>
3055427.924	588230.682	2046203.609	17154436.049	.328	4	ADJUSTMENT	1999	17648
3055428.085	588231.436	2046203.771	17154436.803	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

<u>MN State Plane - North 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>
3055428.305	588231.159	2046203.991	17154436.525	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - North 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>
2430816.233	260175.146			.100	4	CLASSICAL SURVEY	1979	15983
2430815.000	260175.000			.100	4	CLASSICAL SURVEY	1950	UNK





Mn/DOT Name: SPLIT ROCK RM 1

NGS Name: SPLIT ROCK 2 RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2810](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	5	54 N	8 W	471115.37	912311.03	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>
1943	2011	GOOD	Horz=NO Vert=YES	YES			NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	REFERENCE MARK DISK	NGS

**Description:** (2011)                      **Stamping:** SPLIT ROCK NO 1 1943

18.5 MILES NORTHEAST OF TWO HARBORS, 7.5 MILES SOUTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY TO TRUNK HIGHWAY 61 MILEPOINT 43.70, THEN 0.8 MILE NORTHEAST ON A BIKE PATH TO A BRIDGE, THEN 0.3 MILE SOUTHEAST ON A HIKING TRAIL TO A HIGH POINT ON A HILL (CORUNDUM POINT), 0.75 MILE SOUTHWEST OF THE SPLIT ROCK LIGHTHOUSE, 125.0 FEET NORTH OF A POINT, 100.0 FEET EAST OF THE BAY SIDE OF A BLUFF, 47.01 FEET SOUTH OF STATION SPLIT ROCK.

**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>	
769.608	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
769.611	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3	

**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>	
769.405	.262			673.096	.197	2007	GPS - RTRN	2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -96.470 12B = -96.420 09 = -96.306 03 = -96.243

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>		
47 11 15.38577	91 23 11.03586	627062.353	246053.845	.131	3	GPS - RTRN	2011	RTRN2011		

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>UTM - Zone 15</u>			<u>Determination Method</u>		<u>Project Info</u>	
<u>MN State Plane - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
3050708.223	583606.309	2041477.800	17149819.614	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SPLIT_ROCK_2_RM_1-CJ2810-3S-01SEP2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SPLIT_ROCK_2_RM_1-CJ2810-3S-01SEP2011.jpg</a>	S	Sep 1, 2011
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SPLIT_ROCK_2_RM_1-CJ2810-2-02JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SPLIT_ROCK_2_RM_1-CJ2810-2-02JUL2007.jpg</a>		Jul 2, 2007
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SPLIT_ROCK_2_RM_1-CJ2810-1-01SEP2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SPLIT_ROCK_2_RM_1-CJ2810-1-01SEP2011.jpg</a>		Sep 1, 2011

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



Mn/DOT Name: SPLIT ROCK RM 2

NGS Name: SPLIT ROCK 2 RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2811](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	5	54 N	8 W	471115.83	912311.58	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>
1943	2011	GOOD	Horz=NO Vert=YES	YES			NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	REFERENCE MARK DISK	NGS

**Description:** (2011)                      **Stamping:** SPLIT ROCK NO 2 1943

18.5 MILES NORTHEAST OF TWO HARBORS, 7.5 MILES SOUTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY TO TRUNK HIGHWAY 61 MILEPOINT 43.70, THEN 0.8 MILE NORTHEAST ON A BIKE PATH TO A BRIDGE, THEN 0.3 MILE SOUTHEAST ON A HIKING TRAIL TO A HIGH POINT ON A HILL (CORUNDUM POINT), 0.75 MILE SOUTHWEST OF THE SPLIT ROCK LIGHTHOUSE, 125.0 FEET NORTH OF A POINT, 100.0 FEET EAST OF THE BAY SIDE OF A BLUFF, 38.84 FEET WEST OF STATION SPLIT ROCK.

**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>		
770.835	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691		
770.838	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3		

**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>		
770.494	.262		674.195	.197	2007	GPS - RTRN	2011	RTRN2011		

Geoid Separations(ft): GEOID18 = -96.466    12B = -96.417    09 = -96.302    03 = -96.237

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>		
47 11 15.83427	91 23 11.58346	627025.349	246099.959	.131	3	GPS - RTRN	2011	RTRN2011		

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2007)</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>
3050669.404	583650.899	2041439.055	17149864.254	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SPLIT_ROCK_2_RM_2-CJ2811-3E-02JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SPLIT_ROCK_2_RM_2-CJ2811-3E-02JUL2007.jpg</a>	E	Jul 2, 2007
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SPLIT_ROCK_2_RM_2-CJ2811-2-02JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SPLIT_ROCK_2_RM_2-CJ2811-2-02JUL2007.jpg</a>		Jul 2, 2007
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SPLIT_ROCK_2_RM_2-CJ2811-1-01SEP2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SPLIT_ROCK_2_RM_2-CJ2811-1-01SEP2011.jpg</a>		Sep 1, 2011

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



Mn/DOT Name: SPLIT ROCK USLS

NGS Name: SPLIT ROCK

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0756](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/1009  
 USGS Quad: SPLIT ROCK POINT

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	54 N	8 W	471115.86	912310.99		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>
1870	2007	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	USLS

Description: (1943)

Stamping:

18.5 MILES NORTHEAST OF TWO HARBORS, 0.75 MILE SOUTHWEST OF THE SPLIT ROCK LIGHTHOUSE.

\* 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>
764.434	.131		668.227	.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>
764.401						RECIPROCAL VERTICAL ANGLE	1870	HORZ

Geoid Separations(ft): GEOID18 = -96.470 12B = -96.420 09 = -96.302 03 = -96.240

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 11 15.85981	91 23 10.98582	627066.669	246101.806	.033	1	ADJUSTMENT	1999	17648
47 11 15.86219	91 23 10.98190	627066.944	246102.043	.033	1	ADJUSTMENT	1991	17497

<u>NAD83(1986)</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 11 15.85585	91 23 10.97662	627067.298	246101.394	.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>Latitude</u>	<u>Longitude</u>						<u>Year</u>	<u>Reference</u>
47 11 16.12500	91 23 10.36700			.100	1	CLASSICAL SURVEY	1956	11100

<u>USSD</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>
47 11 16.36800	91 23 10.21500				3	CLASSICAL SURVEY		17389-67

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
3050710.614	583654.401	2041480.262	17149867.693	.033	1	ADJUSTMENT	1999	17648
3050710.879	583654.648	2041480.528	17149867.940	.033	1	ADJUSTMENT	1991	17497

<u>NAD83(1986)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>	<u>Determination Method</u>	<u>Year</u>	<u>Reference</u>
3050711.258	583654.014	2041480.906	17149867.306	.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 - North Zone</u>							<u>Year</u>	<u>Reference</u>
2426099.265	255597.908			.100	1	CLASSICAL SURVEY	1956	11100



Mn/DOT Name: SRLH

NGS Name: SRLH

County: LAKE, MN (Sheet 1)

NGS ACRN: [DR1384](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	33	55 N	8 W	471241.95	912124.20	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>
2017	2019	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 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017) Stamping: SRLH 2017

4.5 MILES SOUTHWEST OF BEAVER BAY, 4.35 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY, AT TRUNK HIGHWAY 61 MILEPOINT 46.60, 38.6 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 6.0 FEET NORTHWEST OF A GUARDRAIL CABLE, 0.9 MILE SOUTHWEST OF GULL ROCKS ROAD, 1.5 FEET NORTHWEST OF A WITNESS POST.

Station Pair: LIGHT - LAKE, 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>	
697.072	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
697.069	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	

**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>	
697.066				600.593	.024	2011	HORIZONTAL ADJUSTMENT	2019	GPS3328	
697.069	.131			600.789	.066	1996	GPS - STATIC	2019	Hlake2	
697.066				600.593	.024	2011	GPS - STATIC	2019	Hlake2	
697.062	.262			600.616	.197	2011	GPS - RTRN	2017	RTRN2017	

Geoid Separations(ft): GEOID18 = -96.483 12B = -96.447 09 = -96.345 03 = -96.227

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 12 41.94914	91 21 24.19674			634594.680	254692.437	.016		ADJUSTMENT	2019	GPS3328
47 12 41.94914	91 21 24.19674			634594.680	254692.437	.016	C	GPS - STATIC	2019	Hlake2
47 12 41.94904	91 21 24.19650			634594.696	254692.427	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(1996)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 12 41.94889	91 21 24.19723			634594.645	254692.413	.033	C	GPS - STATIC	2019	Hlake2

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3057887.746	592539.200			2048669.476	17158740.117	.016		ADJUSTMENT	2019	GPS3328
3057887.746	592539.200			2048669.476	17158740.117	.016	C	GPS - STATIC	2019	Hlake2
3057887.763	592539.190			2048669.493	17158740.107	.131	3	GPS - RTRN	2017	RTRN2017

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
3057887.713	592539.174			2048669.443	17158740.091	.033	C	GPS - STATIC	2019	Hlake2



**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SRLH-DR1384-3SE-16OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SRLH-DR1384-3SE-16OCT2017.jpg</a>	SE	Oct 16, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SRLH-DR1384-2-16OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SRLH-DR1384-2-16OCT2017.jpg</a>		Oct 16, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SRLH-DR1384-1-16OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/SRLH-DR1384-1-16OCT2017.jpg</a>		Oct 16, 2017

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



Mn/DOT Name: STEWART

NGS Name: STEWART

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0537](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/1022  
 USGS Quad: TWO HARBORS

				<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	1	53 N	11 W	470601.45	914003.92	1	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>
1952	2012	GOOD	Horz=YES Vert=YES	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)	TRIANGULATION STATION DISK	NGS

**Description:** (1995)                      **Stamping:** STEWART 1952

5.25 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 IN TWO HARBORS, 64.0 FEET (SLOPE) WEST OF COUNTY ROAD 2, 14.1 FEET NORTH-NORTHEAST OF A POWER POLE, 1.2 FEET EAST OF A WITNESS POST, 61.06 FEET SOUTHWEST OF STEWART RM 1. IN 1995 STEWART RM 1 AND STEWART RM 2 WERE NOT SEARCHED FOR.

**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>	
1260.322	.007	1/2					VERTICAL ADJUSTMENT	1991	00000025	

**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>	
1260.326				1166.422	.040	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940	
1260.326				1166.346	.040	2011	GPS - STATIC	2013	HBBAY	
1260.299	.131			1166.418	.066	2007	GPS - STATIC	2012	HBBAY	
				1166.422	.078	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800	
1260.368	.262			1166.497	.197	2007	GPS - RTRN	2011	RTRN2011	
				1166.510	.081	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300	
1260.332	.131			1166.507	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648	
1260.326	.131			1166.576	.066	1996	GPS - STATIC	1997	GPS805-C	

Geoid Separations(ft): GEOID18 = -93.983    12B = -93.957    09 = -93.871    03 = -93.796

**Lat/Lon and County Coordinates (Feet)**

**NAD83(2011)**

Geodetic Position		Lake County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 06 01.44612	91 40 03.91840	435629.214	112419.451	.023		ADJUSTMENT	2013	GPS2940
47 06 01.44595	91 40 03.91844	435629.212	112419.434	.023	C	GPS - STATIC	2013	HBBAY
47 06 01.44612	91 40 03.91840	435629.214	112419.451	.046		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

Geodetic Position		Lake County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 06 01.44626	91 40 03.91931	435629.151	112419.465	.033	C	GPS - STATIC	2012	HBBAY
47 06 01.44545	91 40 03.91982	435629.116	112419.383	.131	3	GPS - RTRN	2011	RTRN2011
47 06 01.44626	91 40 03.91931	435629.151	112419.465	.046		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

Geodetic Position		Lake County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 06 01.44595	91 40 03.91909	435629.167	112419.434	.033	C	ADJUSTMENT	1999	17648
47 06 01.44595	91 40 03.91909	435629.167	112419.434	.033	C	GPS - STATIC	1997	GPS805-C
47 06 01.44547	91 40 03.91883	435629.185	112419.385	.066	2	ADJUSTMENT	1991	17497

**NAD83(1986)**

Geodetic Position		Lake County					Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 06 01.44404	91 40 03.91785	435629.252	112419.240	.066	2	ADJUSTMENT	1986	17289

**NAD27**

Geodetic Position							Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 06 01.69900	91 40 03.28400			.100	2	CLASSICAL SURVEY	1956	11100

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2981354.529	550381.616	1972089.686	17116706.386	.023		ADJUSTMENT	2013	GPS2940
2981354.526	550381.599	1972089.684	17116706.368	.023	C	GPS - STATIC	2013	HBBAY
2981354.529	550381.616	1972089.686	17116706.386	.046		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

MN State Plane - North Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2981354.465	550381.629	1972089.623	17116706.399	.033	C	GPS - STATIC	2012	HBBAY
2981354.432	550381.547	1972089.589	17116706.316	.131	3	GPS - RTRN	2011	RTRN2011
2981354.465	550381.629	1972089.623	17116706.399	.046		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

MN State Plane - North Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2981354.481	550381.598	1972089.639	17116706.368	.033	C	ADJUSTMENT	1999	17648
2981354.481	550381.598	1972089.639	17116706.368	.033	C	GPS - STATIC	1997	GPS805-C
2981354.500	550381.550	1972089.658	17116706.319	.066	2	ADJUSTMENT	1991	17497

**NAD83(1986)**

MN State Plane - North Zone		UTM - Zone 15					Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2981354.571	550381.406	1972089.728	17116706.176	.066	2	ADJUSTMENT	1986	17289

**NAD27**

MN State Plane - North Zone							Project Info	
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
2356742.286	222323.822			.100	2	CLASSICAL SURVEY	1956	11100

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/STEWART-SH0537-3S-18AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/STEWART-SH0537-3S-18AUG2011.jpg</a>	S	Aug 18, 2011
Moment:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/STEWART-SH0537-2-18AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/STEWART-SH0537-2-18AUG2011.jpg</a>		Aug 18, 2011
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/STEWART-SH0537-1-18AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/STEWART-SH0537-1-18AUG2011.jpg</a>		Aug 18, 2011

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



Mn/DOT Name: STEWART AZ MK

NGS Name: STEWART AZ MK

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2828](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/1022  
 USGS Quad: TWO HARBORS

				<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	1	53 N	11 W	470612.00	914002.00		

<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>
1952	1977	GOOD	Horz=YES Vert=YES	NO		PROJECTS 6 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	AZIMUTH MARK DISK	MNDT

**Description:** **Stamping:** STEWART 1952

5.25 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, 26.0 FEET EAST OF THE APPROXIMATE CENTERLINE OF COUNTY ROAD 2, 2.0 FEET SOUTHWEST OF A WITNESS POST.

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

Geoid Separations(ft): GEOID18 = -93.950 12B = -93.924 09 = -93.838 03 = -93.766





Mn/DOT Name: STEWART RM 1

NGS Name: STEWART RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2829](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/1022  
 USGS Quad: TWO HARBORS

				<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	1	53 N	11 W	470601.95	914003.43		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1952	1977	GOOD	Horz=YES Vert=YES	NO		PROJECTS 6 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	REFERENCE MARK DISK	MNDT

**Description:** **Stamping:** STEWART NO 1 1952

5.25 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, 7.0 FEET WEST OF A CUT BANK, 61.06 FEET NORTHEAST OF STATION STEWART.

**Station Notes**

IN 1995 STEWART RM 1 AND STEWART RM 2 WERE NOT SEARCHED FOR.

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

Geoid Separations(ft): GEOID18 = -93.986 12B = -93.957 09 = -93.871 03 = -93.799



Mn/DOT Name: STEWART RM 2

NGS Name: STEWART RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2830](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/1022  
 USGS Quad: TWO HARBORS

				<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	1	53 N	11 W	470600.95	914003.74		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1952	1977	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	MNDT

**Description:** **Stamping:** STEWART NO 2 1952

5.25 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, 32.0 FEET SOUTH-SOUTHWEST OF A POWER POLE, 27.0 FEET WEST OF A CUT BANK.

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

**Geoid Separations(ft): GEOID18 = -93.986 12B = -93.957 09 = -93.871 03 = -93.799**



Mn/DOT Name: STUFFY

NGS Name: STUFFY

County: LAKE, MN (Sheet 1)

NGS ACRN: [DR2042](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091243/  
 USGS Quad: SILVER BAY SW

				<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	14	55 N	9 W	471509.50	912551.34		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>
2017	2017	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 11 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017)                      Stamping: STUFFY 2017

15.0 MILES NORTH NORTHEAST OF TWO HARBORS, 2.30 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2, TO TRUNK HIGHWAY MILEPOST 28.50, THEN 121.90 MILES NORTHERLY ON COUNTY ROAD 3, 84.3 FEET NORTHWEST OF COUNTY ROAD 3, 24.8 FEET SOUTHWEST OF TONY'S ROAD, 26.9 FEET SOUTH OF DRIVEWAY NUMBER 4451/4453, 1.5 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>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>			
1150.109			1055.523	.019	2011	HORIZONTAL ADJUSTMENT	2019	GPS3302			
			1055.716	.066	1996	GPS - STATIC	2019	Hlake			
1150.109			1055.523	.019	2011	GPS - STATIC	2019	Hlake			
1150.126	.262		1055.549	.197	2011	GPS - RTRN	2017	RTRN2017			

Geoid Separations(ft): GEOID18 = -94.639    12B = -94.577    09 = -94.524    03 = -94.491

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Geodetic Position</u>				<u>Lake 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>		
47 15 09.50357	91 25 51.33556	494633.482	167845.952	.013		ADJUSTMENT	2019	GPS3302		
47 15 09.50357	91 25 51.33556	494633.482	167845.952	.013	C	GPS - STATIC	2019	Hlake		
47 15 09.50350	91 25 51.33573	494633.470	167845.944	.131	3	GPS - RTRN	2017	RTRN2017		

<u>NAD83(1996)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 15 09.50332	91 25 51.33608	616430.254	269973.014	.033	C	GPS - STATIC	2019	Hlake		

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>MN State Plane - North 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>		
3039127.214	607078.100	2029933.937	17173304.397	.013		ADJUSTMENT	2019	GPS3302		
3039127.214	607078.100	2029933.937	17173304.397	.013	C	GPS - STATIC	2019	Hlake		
3039127.202	607078.092	2029933.925	17173304.390	.131	3	GPS - RTRN	2017	RTRN2017		

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>		
3039127.178	607078.074	2029933.901	17173304.371	.033	C	GPS - STATIC	2019	Hlake		

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/STUFFY-DR2042-3NW-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/STUFFY-DR2042-3NW-27SEP2017.jpg</a>	NW	Sep 27, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/STUFFY-DR2042-2-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/STUFFY-DR2042-2-27SEP2017.jpg</a>		Sep 27, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/STUFFY-DR2042-1-27SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/STUFFY-DR2042-1-27SEP2017.jpg</a>		Sep 27, 2017

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



Mn/DOT Name: T 173

NGS Name: T 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0389](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091313/  
 USGS Quad: KANE 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	7	55 N	10 W	471552.00	913907.00	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>
1935	2007	NOT FOUND	Horz=NO Vert=YES	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: (1935)                      Stamping: T 173 1935

16.5 MILES NORTH OF TWO HARBORS, 16.5 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, 300.0 FEET NORTH OF A CURVE NORTHWEST, 38.0 FEET EAST OF COUNTY ROAD 2, 25.0 FEET NORTH OF A PRIVATE ROAD, AT THE EDGE OF A WOODED AREA.

Station Notes  
 THE SET DATE 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>	
1741.302	.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>	
1740.932	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1740.932	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -92.759    12B = -92.759    09 = -92.657    03 = -92.624

\* No Horizontal Positions in the Database \*



Mn/DOT Name: T 178

NGS Name: T 178

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0384](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091321/  
 USGS Quad: TWO HARBORS NE

				<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	54 N	10 W	471038.00	913536.00	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>
1935	1957	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: (1935)                      Stamping: T 178 1935

3.1 MILES SOUTH OF LONDON, 9.8 MILES NORTH ON COUNTY ROAD 3 FROM THE JUNCTION OF COUNTY ROAD 3 AND TRUNK HIGHWAY 61 AT SILVER CLIFF, 0.9 MILE SOUTH OF ALGER-LONDON ROAD, 30.0 FEET NORTHWEST OF A ROCK OUTCROP, 8.0 FEET NORTH OF A ROAD, AT THE EDGE OF A WOODED 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>	
1320.726	.007	1					VERTICAL CONTROL SURVEY	1993	POSTED	

  

<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>	
1320.476	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -93.760    12B = -93.724    09 = -93.628    03 = -93.596

\* No Horizontal Positions in the Database \*



Mn/DOT Name: T 19

NGS Name: T 19

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0344](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	11	53 N	11 W	470531.00	914232.00	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>
1933	1962	GOOD	Horz=NO Vert=NO	NO	RR		SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	BENCH MARK DISK	NGS

**Description:** (1979)                      **Stamping:** T 19 1933

0.7 MILE SOUTH OF THE RAILROAD STATION AT STEWART, IN THE EAST SIDE OF THE NORTH ABUTMENT OF A RAILROAD BRIDGE OVER THE STEWART RIVER, 1.4 FEET SOUTH OF THE NORTH SIDE OF AN ABUTMENT, 3.2 FEET EAST OF THE EAST RAIL OF THE RAILROAD TRACKS.

**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>
1206.894	.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>
1206.730	.007	1/2				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1206.730	.007	1				VERTICAL CONTROL SURVEY	1933	L29 MINN

Geoid Separations(ft): GEOID18 = -93.730 12B = -93.704 09 = -93.632 03 = -93.553

\* No Horizontal Positions in the Database \*



Mn/DOT Name: T 341  
County: LAKE, MN (Sheet 1)

NGS Name: T 341

NGS ACRN: [SH0613](#) [Get Map](#)  
NGS Quad / Sta Num : 47091242/  
USGS Quad: SILVER BAY

				<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	32	56 N	7 W	471738.00	911539.00	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>
1978	2007	DESTROYED	Horz=NO Vert=NO	YES			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	BENCH MARK DISK	NGS

Description: (2000)                      Stamping: T 341 1978

2.9 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY, 0.1 MILE NORTHEAST OF TRUNK HIGHWAY 61 MILEPOST 354 AND RAILROAD CROSSING, AT THE NORTHEAST END OF A MASSIVE ROCK OUTCROP, 34.0 FEET NORTHWEST OF TRUNK HIGHWAY 61, OPPOSITE THE NORTHEAST END OF A LARGE ELEVATOR, 2.0 FEET NORTHEAST OF A WITNESS POST.

Station Notes  
THE ROCK WAS REMOVED.

**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>	
738.529	.007	1/2					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>	
738.338	.033	3					VERTICAL CONTROL SURVEY	1987	CS3806	

Geoid Separations(ft): GEOID18 = -96.269 12B = -96.224 09 = -96.174 03 = -96.089

\* No Horizontal Positions in the Database \*



Mn/DOT Name: T 355

NGS Name: T 355

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0599](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	55 N	8 W	471213.00	912213.00	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>
1979	2011	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	BENCH MARK DISK	NGS

Description: (2002)                      Stamping: T 355 1979

5.30 MILES SOUTHWEST ON TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY, 0.10 MILE SOUTHWEST OF TRUNK HIGHWAY 61, AT THE SPLIT ROCK LIGHTHOUSE, 72.0 FEET SOUTHWEST OF THE SOUTHWEST END OF A ROCK CUT, 29.0 FEET SOUTHEAST OF A ROAD, 11.0 FEET SOUTH OF A NO PARKING SIGN, 2.0 FEET SOUTHWEST OF A WITNESS POST, THE STATION IS BURIED UNDER A DEPARTMENT OF NATURAL RESOURCES (DNR) BIKE PATH AND WAS DEEMED UNUSABLE.

Station Notes

8/31/2011 TIES FALL UNDER BAKER PATH.

**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>	
742.338	.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>	
742.203	.033	3				VERTICAL CONTROL SURVEY	1987	CS3806	

Geoid Separations(ft): GEOID18 = -96.430 12B = -96.388 09 = -96.283 03 = -96.184

\* No Horizontal Positions in the Database \*





Mn/DOT Name: T 51

NGS Name: T 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0252](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	55 N	8 W	471238.81	912124.80	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>
1934	2007	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 7 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:** (2000)                      **Stamping:** T-51 1934

4.55 MILES SOUTHWEST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY, 0.9 MILE NORTHEAST OF THE SPLIT ROCK LIGHTHOUSE ENTRANCE, 55.0 FEET EAST OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 MILEPOINT 46.6, 25.0 FEET NORTHEAST OF AN EAST GATE POST, 1.0 FOOT NORTHWEST OF A WITNESS POST.

**Station Notes**  
 THE DISK WAS REMOVED.

**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>	
645.137	.007	1/2					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>	
644.999	.033	3					VERTICAL CONTROL SURVEY	1987	CS3806	
644.930	.007	1					VERTICAL CONTROL SURVEY	1934	L95 MINN	

Geoid Separations(ft): GEOID18 = -96.499    12B = -96.460    09 = -96.358    03 = -96.240

\* No Horizontal Positions in the Database \*



Mn/DOT Name: TBM 1 L3626

NGS Name: TBM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [B17639](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

				<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	12	53 N	10 W	470544.00	913314.00		

<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: (2011)

Stamping:

7.4 MILES NORTHEAST OF TWO HARBORS, 7.6 MILES ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS.

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

Geoid Separations(ft): GEOID18 = -95.377 12B = -95.325 09 = -95.223 03 = -95.174



Mn/DOT Name: TBM 1 L7032-5

NGS Name: TBM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [BC4980](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	21	55 N	9 W	471431.00	912852.00		

<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	1935	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:** (2011)

**Stamping:**

8.6 MILES WEST-SOUTHWEST OF BEAVER CREEK, 1.6 MILES NORTHWEST ALONG COUNTY ROAD 4 (LAX LAKE ROAD)  
 FROM THE JUNCTION OF COUNTY ROAD 4 AND TRUNK HIGHWAY 61 (MAIN STREET) IN BEAVER BAY, SOUTH AND WEST  
 ALONG COUNTY ROAD 3 (AIRPORT ROAD).

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

Geoid Separations(ft): GEOID18 = -94.170 12B = -94.117 09 = -94.025 03 = -94.016



Mn/DOT Name: TBM 1 L7032-7

NGS Name: TBM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [BC7432](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091313/  
 USGS Quad: KANE 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>
SW	6	55 N	10 W	471639.00	913929.00		

<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	1935	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: (2010)

Stamping:

2.8 MILES SOUTH OF MCNAIR, THEN 2.8 MILES SOUTH ALONG HIGHWAY 2 FROM THE JUNCTION OF HIGHWAY 2 AND LANGLEY RIVER ROAD.

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

Geoid Separations(ft): GEOID18 = -92.743 12B = -92.743 09 = -92.634 03 = -92.592



Mn/DOT Name: TBM 2 L3626

NGS Name: TBM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [B17640](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091322/  
 USGS Quad: CASTLE DANGER

				<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	1	53 N	10 W	470605.00	913229.00		

<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: (2010)

Stamping:

1.9 MILES SOUTHWEST OF CASTLE DANGER, THEN 1.9 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 106.

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

Geoid Separations(ft): GEOID18 = -95.456 12B = -95.400 09 = -95.295 03 = -95.252



Mn/DOT Name: TBM 2 L7032-5

NGS Name: TBM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [BC4981](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	55 N	8 W	471555.00	912042.00		

<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	1935	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:** (2010)

**Stamping:**

1.8 MILES SOUTHEAST OF BEAVER BAY, THEN 1.8 MILES NORTH ALONG COUNTY HIGHWAY 4 FROM THE JUNCTION OF COUNTY HIGHWAY 4 AND TRUNK HIGHWAY 61, THEN 0.2 MILE WEST ALONG COUNTY HIGHWAY 3.

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

Geoid Separations(ft): GEOID18 = -95.564 12B = -95.528 09 = -95.482 03 = -95.394



Mn/DOT Name: TBM 2 L7032-7

NGS Name: TBM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [BC7433](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091313/  
 USGS Quad: KANE 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>
SW	30	56 N	10 W	471815.00	913950.00		

<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	1935	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:** (2010)

**Stamping:**

1.0 MILE SOUTH OF MCNAIR, THEN 0.9 MILE SOUTH ALONG COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND FOREST ROUTE 122, THEN 148.0 FEET EAST ALONG KANE LAKE ROAD.

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

Geoid Separations(ft): GEOID18 = -92.752 12B = -92.769 09 = -92.641 03 = -92.582



Mn/DOT Name: TBM 3 L3626

NGS Name: TBM 3

County: LAKE, MN (Sheet 1)

NGS ACRN: [B17641](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	54 N	8 W	471111.00	912359.00		

<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: (2010)

Stamping:

6.8 MILES NORTHEAST OF CASTLE DANGER, THEN 6.8 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 106.

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

Geoid Separations(ft): GEOID18 = -96.273 12B = -96.227 09 = -96.119 03 = -96.056





Mn/DOT Name: TBM 41 L799

NGS Name: TBM 41

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9102](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	52 N	11 W	465650.00	914711.00		

<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	1933	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: (2011)

Stamping:

IN KNIFE RIVER, 0.02 MILE SOUTH-SOUTHWEST ALONG SCENIC DRIVE/OLD HIGHWAY 61 FROM THE JUNCTION OF SCENIC DRIVE/OLD HIGHWAY 61 AND CENTRAL AVENUE, THEN 279.0 FEET NORTH-NORTHWEST ALONG COUNTY ROAD 102 (CHURCH ROAD), THEN 387.0 FEET SOUTHWEST ALONG COUNTY ROAD 103 (ALGER SMITH ROAD).

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

Geoid Separations(ft): GEOID18 = -94.130 12B = -94.130 09 = -94.019 03 = -93.953



Mn/DOT Name: TBM 42 L799

NGS Name: TBM 42

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9103](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	31	52 N	11 W	465704.00	914652.00		

<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	1933	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: (2011)

Stamping:

IN KNIFE RIVER, 0.1 MILE NORTH-NORTHEAST ALONG COUNTY ROAD 103 (RIVERVIEW STREET) FROM THE JUNCTION OF COUNTY ROAD 103 AND CENTRAL AVENUE IN KNIFE RIVER.

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

Geoid Separations(ft): GEOID18 = -94.163 12B = -94.160 09 = -94.055 03 = -93.986



Mn/DOT Name: TBM 43 L799

NGS Name: TBM 43

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9104](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	30	52 N	11 W	465722.00	914630.00		

<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	1933	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: (2011)

Stamping:

0.5 MILE NORTH-NORTHEAST OF KNIFE RIVER, 0.5 MILE NORTHEAST ALONG SCENIC DRIVE/OLD HIGHWAY 61 FROM THE JUNCTION OF SCENIC DRIVE/OLD HIGHWAY 61 AND SKIFF LANDING ROAD IN KNIFE RIVER, THEN 194.0 FEET NORTH ALONG SALAKKA ROAD.

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

Geoid Separations(ft): GEOID18 = -94.196 12B = -94.193 09 = -94.091 03 = -94.022



Mn/DOT Name: TBM 44 L799

NGS Name: TBM 44

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9105](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	29	52 N	11 W	465744.00	914602.00		

<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	1933	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:** (2011)

**Stamping:**

1.1 MILES NORTHEAST OF KNIFE RIVER, 1.1 MILES NORTHEAST ALONG SCENIC DRIVE/OLD HIGHWAY 61 FROM THE JUNCTION OF SCENIC DRIVE/OLD HIGHWAY 61 AND SKIFF LANDING ROAD IN KNIFE RIVER.

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

Geoid Separations(ft): GEOID18 = -94.242 12B = -94.242 09 = -94.140 03 = -94.071



Mn/DOT Name: TBM 45 L799

NGS Name: TBM 45

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9106](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	20	52 N	11 W	465806.00	914533.00		

<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	1933	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: (2011)

Stamping:

1.0 MILE SOUTHWEST OF LARSMONT, 1.0 MILE SOUTHWEST ALONG COUNTY ROAD 101 (OLD NORTH SHORE ROAD FROM THE JUNCTION OF COUNTY ROAD 101 AND SCENIC DRIVE/OLD HIGHWAY 61 IN LARSMONT.

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

Geoid Separations(ft): GEOID18 = -94.294 12B = -94.288 09 = -94.193 03 = -94.124



Mn/DOT Name: TBM 46 L799

NGS Name: TBM 46

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9107](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091441/  
 USGS Quad: KNIFE RIVER

				<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	21	52 N	11 W	465830.00	914503.00		

<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	1933	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: (2011)

Stamping:

0.4 MILE SOUTHWEST OF LARSMONT, 0.4 MILE SOUTHWEST ALONG COUNTY ROAD 101 (OLD NORTH SHORE ROAD) FROM THE JUNCTION OF COUNTY ROAD 101 AND SCENIC DRIVE/OLD HIGHWAY 61 IN LARSMONT0.

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

Geoid Separations(ft): GEOID18 = -94.337 12B = -94.334 09 = -94.239 03 = -94.173



Mn/DOT Name: TBM 47 L799

NGS Name: TBM 47

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9108](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091414/  
 USGS Quad: TWO HARBORS OE S

				<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	52 N	11 W	465908.00	914414.00		

<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	1933	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: (2011)

Stamping:

0.6 MILE NORTHEAST OF LARSMONT, 0.6 MILE NORTHEAST ALONG COUNTY ROAD 101 (OLD NORTH SHORE ROAD) FROM THE JUNCTION OF COUNTY ROAD 101 AND SCENIC DRIVE/OLD HIGHWAY 61 IN LARSMONT.

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

Geoid Separations(ft): GEOID18 = -94.413 12B = -94.413 09 = -94.311 03 = -94.248



Mn/DOT Name: TBM 48 L799

NGS Name: TBM 48

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9109](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091414/  
 USGS Quad: TWO HARBORS OE S

				<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	52 N	11 W	465919.00	914401.00		

<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	1933	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:** (2011)

**Stamping:**

0.9 MILE NORTHEAST OF LARSMONT, 0.9 MILE NORTHEAST ALONG COUNTY ROAD 101 90LD NORTH SHORE ROAD) FROM THE JUNCTION OF COUNTY ROAD 101 AND SCENIC DRIVE/OLD HIGHWAY 61 IN LARSMONT0.

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

Geoid Separations(ft): GEOID18 = -94.429 12B = -94.426 09 = -94.327 03 = -94.265





Mn/DOT Name: TBM 49 L799

NGS Name: TBM 49

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9110](#) [Get Map](#)  
 NGS Quad / Sta Num : 46091414/  
 USGS Quad: TWO HARBORS OE S

				<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	52 N	11 W	465943.00	914330.00		

<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	1933	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: (2011)

Stamping:

1.5 MILES NORTHEAST OF LARSMONT, 1.5 MILES NORTHEAST ALONG COUNTY ROAD 101 (OLD NORTH SHORE ROAD)  
 FROM THE JUNCTION OF COUNTY ROAD 101 AND SCENIC DRIVE/OLD HIGHWAY 61 IN LARSMONT, THEN 190.0 FEET  
 SOUTHEAST ALONG OLD NORTH SHORE LANE.

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

Geoid Separations(ft): GEOID18 = -94.475 12B = -94.468 09 = -94.370 03 = -94.304



Mn/DOT Name: TBM 50 L799

NGS Name: TBM 50

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9111](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	10	52 N	11 W	470009.00	914258.00		

<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	1933	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:** (2011)

**Stamping:**

2.6 MILES SOUTHWEST OF TWO HARBORS, 1.4 MILES WEST ALONG TRUNK HIGHWAY 61 (7TH AVENUE) FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND WATERFRONT DRIVE/POPLER STREET IN TWO HARBORS, THEN 2.3 MILES SOUTHWEST ALONG SCENIC DRIVE/OLD HIGHWAY 61, THEN 0.8 MILE NORTHWEST ALONG COUNTY ROAD 101 (OLD NORTH SHORE ROAD).

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

Geoid Separations(ft): GEOID18 = -94.514 12B = -94.501 09 = -94.406 03 = -94.337



Mn/DOT Name: TBM 51 L799

NGS Name: TBM 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9112](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	11	52 N	11 W	470038.00	914222.00		

<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	1933	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:** (2011)

**Stamping:**

1.9 MILES SOUTHWEST OF TWO HARBORS, 1.4 MILES WEST ALONG TRUNK HIGHWAY 61 (7TH AVENUE) FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND WATERFRONT DRIVE/POPLER STREET IN TWO HARBORS, THEN 2.3 SOUTHWEST ALONG SCENIC DRIVE/OLD HIGHWAY 61, THEN 1.5 MILES SOUTHEAST AND NORTHWEST ALONG COUNTY ROAD 101 (OLD NORTH SHORE ROAD).

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

**Geoid Separations(ft): GEOID18 = -94.550 12B = -94.534 09 = -94.442 03 = -94.373**



Mn/DOT Name: TBM 52 L799

NGS Name: TBM 52

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9113](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	2	52 N	11 W	470100.00	914126.00		

<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	1933	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: (2011)

Stamping:

1.0 MILE SOUTHWEST OF TWO HARBORS, 1.4 MILES ALONG TRUNK HIGHWAY 61 (7TH AVENUE) FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND WATERFRONT DRIVE/POPLER STREET IN TWO HARBORS, THEN 0.1 MILE ALONG SCENIC DRIVE.

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

Geoid Separations(ft): GEOID18 = -94.662 12B = -94.642 09 = -94.550 03 = -94.481



Mn/DOT Name: TBM 53 L799

NGS Name: TBM 53

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9114](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	1	52 N	11 W	470102.00	914111.00		

<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	1933	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: (2011)

Stamping:

0.8 MILE SOUTHWEST OF TWO HARBORS, 0.2 MILE SOUTH ALONG 7TH STREET/CEDAR STREET FROM THE JUNCTION OF 7TH STREET/CEDAR STREET AND 4TH AVENUE IN TWO HARBORS, THEN 0.4 MILE ALONG 1ST AVENUE.

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

Geoid Separations(ft): GEOID18 = -94.701 12B = -94.682 09 = -94.593 03 = -94.518



Mn/DOT Name: TBM 54 L799

NGS Name: TBM 54

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9115](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	1	52 N	11 W	470106.00	914046.00		

<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	1933	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: (2011)

Stamping:

0.5 MILE SOUTHWEST OF TWO HARBORS, 0.2 MILE SOUTH ALONG 7TH STREET /CEDAR STREET FROM THE JUNCTION OF 7TH STREET/CEDAR STREET AND 4TH AVENUE IN TWO HARBORS, THEN 0.4 MILE WEST AND NORTHWEST ALONG 1ST AVENUE.

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

Geoid Separations(ft): GEOID18 = -94.770 12B = -94.750 09 = -94.659 03 = -94.583



Mn/DOT Name: TBM 55 L799

NGS Name: TBM 55

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9116](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	1	52 N	11 W	470109.00	914030.00		

<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	1933	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: (2011)

Stamping:

IN TWO HARBORS, 0.2 MILE SOUTH ALONG 7TH STREET/CEDAR STREET FROM THE JUNCTION OF 7TH STREET/CEDAR STREET IN TWO HARBORS, THEN 0.1 MILE WEST ALONG 1ST AVENUE.

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

Geoid Separations(ft): GEOID18 = -94.813 12B = -94.796 09 = -94.705 03 = -94.623



Mn/DOT Name: TBM 56 L799

NGS Name: TBM 56

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9117](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	1	52 N	11 W	470122.00	914029.00		

<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	1933	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: (2011)

Stamping:

IN TWO HARBORS, 0.2 MILE WEST ALONG 4TH AVENUE FROM THE JUNCTION OF 4TH AVENUE AND COUNTY ROAD 20 IN TWO HARBORS.

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

Geoid Separations(ft): GEOID18 = -94.777 12B = -94.757 09 = -94.668 03 = -94.586





Mn/DOT Name: TBM 57 L799

NGS Name: TBM 57

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9118](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	36	53 N	11 W	470149.00	914046.00		

<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	1933	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: (2011)

Stamping:

IN TWO HARBORS, 0.3 MILE NORTH ALONG 8TH STREET/PINE STREET FROM THE JUNCTION OF 8TH STREET/PINE STREET AND TRUNK HIGHWAY 61 (7TH AVENUE) IN TWO HARBORS, THEN 0.2 MILE ALONG 12TH AVENUE.

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

Geoid Separations(ft): GEOID18 = -94.636 12B = -94.619 09 = -94.537 03 = -94.449



Mn/DOT Name: TBM 58 L799

NGS Name: TBM 58

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9119](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	36	53 N	11 W	470201.00	914049.00		

<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	1933	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: (2011)

Stamping:

0.89 MILE NORTH-NORTHWEST OF TWO HARBORS, 0.5 MILE NORTH ALONG LAKE COUNTY 26 ROAD FROM THE JUNCTION OF LAKE COUNTY 26 ROAD AND TRUNK HIGHWAY 61 (7TH AVENUE) IN TWO HARBORS.

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

Geoid Separations(ft): GEOID18 = -94.590 12B = -94.570 09 = -94.491 03 = -94.399



Mn/DOT Name: TBM 59 L799

NGS Name: TBM 59

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9120](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	25	53 N	11 W	470230.00	914056.00		

<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	1933	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: (2011)

Stamping:

1.4 MILES NORTH-NORTHWEST OF TWO HARBORS, 1.1 MILES NORTH AND NORTHWEST ALONG LAKE COUNTY 26 FROM THE JUNCTION OF LAKE COUNTY 26 AND TRUNK HIGHWAY 61 (7TH AVENUE) IN TWO HARBORS, THEN 0.3 MILE NORTH ALONG 10TH STREET.

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

Geoid Separations(ft): GEOID18 = -94.478 12B = -94.458 09 = -94.386 03 = -94.288



Mn/DOT Name: TBM 60 L799

NGS Name: TBM 60

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9121](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	25	53 N	11 W	470306.00	914105.00		

<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	1933	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: (2011)

Stamping:

2.1 MILES NORTH-NORTHWEST OF TWO HARBORS, 1.6 MILES NORTH ALONG COUNTY ROAD 122 (15TH STREET/WALDO ROAD) FROM THE JUNCTION OF COUNTY ROAD 122 AND TRUNK HIGHWAY 61 (7TH AVENUE) IN TWO HARBORS.

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

Geoid Separations(ft): GEOID18 = -94.344 12B = -94.324 09 = -94.255 03 = -94.157



Mn/DOT Name: TBM 61 L799

NGS Name: TBM 61

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9122](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	23	53 N	11 W	470355.00	914126.00		

<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	1933	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: (2011)

Stamping:

3.1 MILES NORTH-NORTHWEST OF TWO HARBORS, 2.9 MILES NORTH ALONG COUNTY ROAD 122 (15TH STREET/WALDO ROAD) FROM THE JUNCTION OF COUNTY ROAD 122 AND TRUNK HIGHWAY 61 IN TWO HARBORS.

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

Geoid Separations(ft): GEOID18 = -94.157 12B = -94.134 09 = -94.058 03 = -93.970



Mn/DOT Name: TBM 62 L799

NGS Name: TBM 62

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9123](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	53 N	11 W	470414.00	914139.00		

<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	1933	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: (2011)

Stamping:

3.5 MILES NORTH-NORTHWEST OF TWO HARBORS, 3.2 MILES NORTH ALONG COUNTY ROAD 122 (15TH STREET/WALDO ROAD) FROM THE JUNCTION OF COUNTY ROAD 122 AND TRUNK HIGHWAY 61 (7TH AVENUE) IN TWO HARBORS, THEN 0.3 MILE WEST ALONG COUNTY ROAD 12 (WESTOVER ROAD).

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

Geoid Separations(ft): GEOID18 = -94.075 12B = -94.048 09 = -93.973 03 = -93.888



Mn/DOT Name: TBM 63 L799

NGS Name: TBM 63

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9124](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	53 N	11 W	470434.00	914153.00		

<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	1933	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: (2011)

Stamping:

3.9 MILES NORTH-NORTHWEST OF TWO HARBORS, 3.7 MILES NORTH ALONG COUNTY ROAD 122 (15TH STREET/WALDO ROAD) FROM THE JUNCTION OF COUNTY ROAD 122 AND TRUNK HIGHWAY 61 (7TH AVENUE) IN TWO HARBORS.

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

Geoid Separations(ft): GEOID18 = -93.986 12B = -93.957 09 = -93.881 03 = -93.799



Mn/DOT Name: TBM 64 L799

NGS Name: TBM 64

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9125](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	14	53 N	11 W	470454.00	914206.00		

<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	1933	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: (2011)

Stamping:

4.3 MILES NORTH-NORTHWEST OF TWO HARBORS, 4.2 MILES NORTH ALONG COUNTY ROAD 122 (15TH STREET/WALDO ROAD) FROM THE JUNCTION OF COUNTY ROAD 122 AND TRUNK HIGHWAY 61 (7TH AVENUE) IN TWO HARBORS, THEN 0.5 MILE WEST ALONG UT-36 ROAD, THEN 0.3 MILE SOUTHWEST ALONG UT-163 ROAD.

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

Geoid Separations(ft): GEOID18 = -93.897 12B = -93.868 09 = -93.792 03 = -93.714





Mn/DOT Name: TBM 65 L799

NGS Name: TBM 65

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9126](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	11	53 N	11 W	470513.00	914220.00		

<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	1933	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: (2011)

Stamping:

4.7 MILES NORTH-NORTHWEST OF TWO HARBORS, 3.2 MILES NORTH ALONG COUNTY ROAD 122 (15TH STREET/WALDO ROAD) FROM THE JUNCTION OF COUNTY ROAD 122 AND TRUNK HIGHWAY 61 (7TH AVENUE) IN TWO HARBORS, THEN 0.9 MILE WEST ON COUNTY ROAD 12 (WESTOVER ROAD), THEN 1.4 MILES NORTH ALONG COUNTY ROAD 124 (BIG ROCK ROAD/OLD DRUMMOND ROAD).

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

Geoid Separations(ft): GEOID18 = -93.809 12B = -93.779 09 = -93.707 03 = -93.625



Mn/DOT Name: TBM 66 L799

NGS Name: TBM 66

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9127](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	53 N	11 W	470558.00	914229.00		

<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	1933	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: (2011)

Stamping:

5.6 MILES NORTH-NORTHWEST OF TWO HARBORS, 3.2 MILES NORTH ALONG COUNTY ROAD 122 (15TH STREET/WALKDO ROAD) FROM THE JUNCTION OF COUNTY ROAD 122 AND TRUNK HIGHWAY 61 (7TH AVENUE) IN TWO HARBORS, THEN 0.9 MILES WEST ALONG COUNTY ROAD 12 (WESTOVER ROAD), THEN 2.1 NORTH ALONG COUNTY ROAD 124 (BIG ROCK ROAD/OLD DRUMMOND ROAD).

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

Geoid Separations(ft): GEOID18 = -93.655 12B = -93.628 09 = -93.556 03 = -93.478



Mn/DOT Name: TBM 67 L799

NGS Name: TBM 67

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9128](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	2	53 N	11 W	470627.00	914225.00		

<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	1933	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: (2011)

Stamping:

6.1 MILES NORTH-NORTHWEST OF TWO HARBORS, 3.2 MILES NORTH ALONG COUNTY ROAD 122 (15TH STREET/WALDO ROAD) FROM THE JUNCTION OF COUNTY ROAD 122 AND TRUNK HIGHWAY 61 (7TH AVENUE) IN TWO HARBORS, THEN 0.9 MILE WEST ALONG COUNTY ROAD 12 (WESTOVER ROAD), THEN 2.7 MILES NORTH ALONG COUNTY ROAD 124 (BIG ROCK ROAD/OLD DRUMMOND ROAD).

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

Geoid Separations(ft): GEOID18 = -93.579 12B = -93.556 09 = -93.481 03 = -93.405



Mn/DOT Name: TBM 68 L799

NGS Name: TBM 68

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9129](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	35	54 N	11 W	470654.00	914222.00		

<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	1933	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: (2011)

Stamping:

6.6 MILES NORTH-NORTHWEST OF TWO HARBORS, 3.2 MILES NORTH ALONG COUNTY ROAD 122 (15TH STREET/WALDO ROAD) FROM THE JUNCTION OF COUNTY ROAD 122 AND TRUNK HIGHWAY 61 (7TH AVENUE) IN TWO HARBORS, THEN 0.9 MILES WEST ALONG COUNTY ROAD 12 (WESTOVER ROAD), THEN 3.2 MILES NORTH ALONG COUNTY ROAD 124 (BIG ROCK ROAD/OLD DRUMMOND ROAD).

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

Geoid Separations(ft): GEOID18 = -93.507 12B = -93.484 09 = -93.405 03 = -93.336



Mn/DOT Name: TBM 69 L799

NGS Name: TBM 69

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9130](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	35	54 N	11 W	470718.00	914219.00		

<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	1933	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: (2011)

Stamping:

7.0 MILES NORTH- NORTHWEST OF TWO HARBORS, 3.2 MILES NORTH ALONG COUNTY ROAD 122 (15TH STREET/WALDO ROAD) FROM THE JUNCTION OF COUNTY ROAD 122 AND COUNTY ROAD 11 (7TH AVENUE) IN TWO HARBORS, THEN 0.9 MILE WEST ALONG WESTOVER ROAD, THEN 3.5 MILES NORTH ALONG COUNTY ROAD 124/COUNTY ROAD 132.

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

Geoid Separations(ft): GEOID18 = -93.445 12B = -93.425 09 = -93.343 03 = -93.277



Mn/DOT Name: TBM 70 L799

NGS Name: TBM 70

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9131](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	54 N	11 W	470757.00	914158.00		

<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	1933	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: (2011)

Stamping:

7.7 MILES NORTH-NORTHWEST FROM TWO HARBORS, 8.5 MILES NORTH ALONG COUNTY ROAD 2 (4TH STREET) FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 (7TH AVENUE) IN TWO HARBORS, THEN 2.2 MILES WEST AND SOUTHWEST ALONG ALGER GRADE WEST.

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

Geoid Separations(ft): GEOID18 = -93.376 12B = -93.356 09 = -93.271 03 = -93.215



Mn/DOT Name: TBM 71 L799

NGS Name: TBM 71

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9132](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	23	54 N	11 W	470843.00	914135.00		

<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	1933	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: (2011)

Stamping:

8.5 MILES NORTH-NORTHWEST OF TWO HARBORS, 8.5 MILES NORTH ALONG COUNTY ROAD 2 (4TH STREET) FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 (7TH AVENUE) IN TWO HARBORS, THEN 1.6 MILES WEST ALONG ALGER GRADE WEST.

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

Geoid Separations(ft): GEOID18 = -93.297 12B = -93.277 09 = -93.192 03 = -93.140



Mn/DOT Name: TBM 72 L799

NGS Name: TBM 72

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9133](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	23	54 N	11 W	470916.00	914139.00		

<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	1933	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: (2011)

Stamping:

9.2 MILES NORTH-NORTHWEST OF TWO HARBORS, 8.5 MILES NORTH ALONG COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD TWO AND TRUNK HIGHWAY 61 IN TWO HARBORS, THEN 0.9 MILE WEST ALONG ALGER GRADE WEST.

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

Geoid Separations(ft): GEOID18 = -93.205 12B = -93.189 09 = -93.100 03 = -93.054





Mn/DOT Name: TBM 73 L799

NGS Name: TBM 73

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9134](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	14	54 N	11 W	470954.00	914143.00		

<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	1933	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: (2011)

Stamping:

9.1 MILES NORTH-NORTHWEST FROM TWO HARBORS, 11.5 MILES NORTH ALONG COUNTY ROAD 2 (WILLOW STREET) FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 (7TH AVENUE) IN TWO HARBORS, THEN 1.5 MILES SOUTHWEST ALONG COUNTY ROAD 39.

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

Geoid Separations(ft): GEOID18 = -93.113 12B = -93.094 09 = -93.008 03 = -92.966



Mn/DOT Name: TBM 74 L799

NGS Name: TBM 74

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9135](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	11	54 N	11 W	471036.00	914148.00		

<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	1933	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: (2011)

Stamping:

10.7 MILES NORTH-NORTHWEST OF TWO HARBORS, 11.5 MILES NORTH ALONG COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61, THEN 1.5 MILES SOUTHWEST ALONG COUNTY ROAD 39

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

Geoid Separations(ft): GEOID18 = -93.025 12B = -93.008 09 = -92.916 03 = -92.880



Mn/DOT Name: TBM 75 L799

NGS Name: TBM 75

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9136](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	54 N	11 W	471129.00	914218.00		

<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	1933	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:** (2011)

**Stamping:**

11.8 MILES NORTH-NORTHWEST OF TWO HARBORS, 11.5 MILES NORTH ALONG COUNTY ROAD 2 (WILLOW STREET) FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 IN TWO HARBORS, THEN 1.6 MILES SOUTHWEST AND NORTHWEST ALONG COUNTY ROAD 39.

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

Geoid Separations(ft): GEOID18 = -92.907 12B = -92.897 09 = -92.805 03 = -92.766



Mn/DOT Name: TBM 76 L799

NGS Name: TBM 76

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9137](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	3	54 N	11 W	471155.00	914246.00		

<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	1933	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: (2011)

Stamping:

12.3 MILES NORTH-NORTHWEST FROM TWO HARBORS, 13.0 MILES NORTH ON COUNTY ROAD 2 (WILLOW STREET) FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 IN TWO HARBORS, THEN 2.0 MILES WEST ON COUNTY ROAD 14 (WALES ROAD), THEN 1.4 MILES SOUTH ALONG HIGHLAND ROAD/HIGHLAND LAKE ROAD.

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

Geoid Separations(ft): GEOID18 = -92.848 12B = -92.841 09 = -92.756 03 = -92.716



Mn/DOT Name: TBM 77 L799

NGS Name: TBM 77

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9138](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	27	55 N	11 W	471249.00	914336.00		

<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	1933	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: (2011)

Stamping:

13.5 MILES NORTH-NORTHWEST OF TWO HARBORS, 13.0 MILES NORTH ALONG COUNTY ROAD 2 (WILLOW STREET) FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 (7TH AVENUE) IN TWO HARBORS, THEN 2.0 MILES WEST ALONG COUNTY ROAD 14 (WALES ROAD), THEN 0.9 MILE ALONG HIGHLAND ROAD/HIGHLAND LAKE ROAD.

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

Geoid Separations(ft): GEOID18 = -92.785 12B = -92.782 09 = -92.703 03 = -92.661



Mn/DOT Name: TBM 78 L799

NGS Name: TBM 78

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9139](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	28	55 N	11 W	471321.00	914400.00		

<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	1933	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: (2011)

Stamping:

7.7 MILES NORTH-NORTHWEST FROM TWO HARBORS, 13.0 MILES NORTH ALONG COUNTY ROAD 2 (WILLOW STREET) FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 (7TH AVENUE0 IN TWO HARBORS, THEN 2.0 MILES WEST ALONG COUNTY ROAD 14 (WALES ROAD), THEN 0.7 MILE SOUTHWEST ALONG HIGHLAND ROAD/HIGHLAND LAKE ROAD.

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

Geoid Separations(ft): GEOID18 = -92.782 12B = -92.779 09 = -92.700 03 = -92.654



Mn/DOT Name: TBM 79 L799

NGS Name: TBM 79

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9140](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	21	55 N	11 W	471352.00	914424.00		

<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	1933	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: (2011)

Stamping:

14.8 MILES NORTH-NORTHWEST FROM TWO HARBORS, 13.0 MILES NORTH ALONG COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 (7TH STREET) IN TWO HARBORS, THEN 4.3 MILES WEST AND NORTHWEST ALONG COUNTY ROAD 14 (WALES ROAD), THEN 0.3 MILE SOUTH ALONG BERGSTROM ROAD.

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

Geoid Separations(ft): GEOID18 = -92.795 12B = -92.795 09 = -92.713 03 = -92.664



Mn/DOT Name: TBM 80 L799

NGS Name: TBM 80

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9141](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091331/  
 USGS Quad: KING 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	20	55 N	11 W	471413.00	914518.00		

<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	1933	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: (2011)

Stamping:

15.3 MILES NORTH-NORTHWEST FROM TWO HARBORS, 13.0 MILES NORTH ALONG COUNTY ROAD 2 (WILLOW STREET) FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 (7TH AVENUE), THEN 5.3 MILES WEST AND NORTHWEST ALONG COUNTY ROAD 14 (WALES ROAD).

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

Geoid Separations(ft): GEOID18 = -92.834 12B = -92.838 09 = -92.756 03 = -92.700





Mn/DOT Name: TBM 81 L799

NGS Name: TBM 81

County: LAKE, MN (Sheet 1)

NGS ACRN: [BQ9142](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091331/  
 USGS Quad: KING 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	19	55 N	11 W	471416.00	914658.00		

<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	1933	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: (2011)

Stamping:

15.8 MILES NORTH-NORTHWEST FROM TWO HARBORS, 13.0 MILES NORTH ALONG COUNTY ROAD 2 (WILLOW STREET) FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 (7TH AVENUE) IN TWO HARBORS, THEN 6.4 MILES WEST AND NORTHWEST ALONG COUNTY ROAD 14 (WALES ROAD).

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

Geoid Separations(ft): GEOID18 = -92.920 12B = -92.930 09 = -92.851 03 = -92.785



Mn/DOT Name: TBM ETG READING MARK L24492-1

NGS Name: TBM ETG READING MARK

County: LAKE, MN (Sheet 1)

NGS ACRN: [AJ9510](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	1	52 N	11 W	470102.00	914038.00		

<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>
1979	1979	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: (2011)

Stamping:

0.5 MILE SOUTHWEST OF TWO HARBORS, 0.1 MILE SOUTH ALONG COUNTY ROAD 20 (POPLAR STREET) FROM THE JUNCTION OF COUNTY ROAD 20 (POPLAR STREET) AND COUNTY ROAD 20 (6TH STREET) IN TWO HARBORS, THEN 0.3 MILE WEST ALONG WATERFRONT DRIVE.

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

Geoid Separations(ft): GEOID18 = -94.810 12B = -94.790 09 = -94.698 03 = -94.619



Mn/DOT Name: TETTE MNDT

NGS Name: TETTE

County: LAKE, MN (Sheet 1)

NGS ACRN: [AH3160](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	14	56 N	7 W	472034.31	911142.54	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>
1987	2011	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	HORIZONTAL CONTROL DISK	MNDT

Description: (1987)                      Stamping: TETTE 1987

0.5 MILE SOUTHWEST OF ILLGEN CITY, 0.6 MILE SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND TRUNK HIGHWAY 1 AT ILLGEN CITY, AT TRUNK HIGHWAY 61 MILEPOINT 58.8, THEN 500.0 FEET NORTHWEST ALONG A POLE LINE, THEN NORTH 0.15 MILE ALONG AN OLD POLE LINE, 22.5 FEET EAST OF A SOUTHEAST CUT-OFF POWER POLE, 10.66 FEET NORTH OF TETTE MNDT RM 1, 24.26 FEET EAST OF TETTE MNDT RM 2, 10.0 FEET NORTHEAST OF A WITNESS POST.

**Station Notes**

8/29/2011 OLD POLE LINE IS DIFFICULT TO FIND DUE TO TREES THAT HAVE GROWN IN. THE MARK IS UNUSABLE. NOT SEARCHED FOR.

**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>	
880.553	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
880.556	.016	2/1					VERTICAL CONTROL SURVEY	2008	VSHOR2	

**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>	
				784.096	.054	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800	
880.536	.262			784.241	.197	2007	GPS - RTRN	2011	RTRN2011	
				784.182	.047	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300	
880.510	.131			784.326	.066	1996	HORIZONTAL ADJUSTMENT	2002	GPS1736	
880.510	.131			784.326	.066	1996	GPS - STATIC	2002	HISAB	
880.477	.131			784.326	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648	
880.510							GPS - STATIC	1992	HORZ	

**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>	
880.444							LEVELING	1987	HORZ	

Geoid Separations(ft): GEOID18 = -96.384    12B = -96.345    09 = -96.299    03 = -96.191

**Lat/Lon and County Coordinates (Feet)**

**NAD83(2011)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 20 34.31099	91 11 42.54402	675489.860	301883.668	.026		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 20 34.31053	91 11 42.54569	675489.744	301883.623	.131	3	GPS - RTRN	2011	RTRN2011
47 20 34.31109	91 11 42.54487	675489.802	301883.679	.023		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 20 34.31158	91 11 42.54257	675489.961	301883.726	.033	C	ADJUSTMENT	2002	GPS1736
47 20 34.31158	91 11 42.54257	675489.961	301883.727	.033	C	GPS - STATIC	2002	HISAB
47 20 34.31158	91 11 42.54257	675489.961	301883.726	.033	C	ADJUSTMENT	1999	17648

**NAD83(1986)**

Geodetic Position		Lake County		Project Info	
Latitude	Longitude	X	Y	Year	Reference
47 20 34.31391	91 11 42.53703	553102.503	200830.367	1998	GPS1147

**NAD83(1986)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 20 34.31391	91 11 42.53703	675490.348	301883.957	.033	C	GPS - STATIC	1988	HBEA1

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3096852.470	641329.291	2087701.250	17207465.298	.026		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3096852.356	641329.241	2087701.136	17207465.249	.131	3	GPS - RTRN	2011	RTRN2011
3096852.411	641329.299	2087701.191	17207465.307	.023		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3096852.568	641329.353	2087701.348	17207465.360	.033	C	ADJUSTMENT	2002	GPS1736
3096852.568	641329.353	2087701.348	17207465.360	.033	C	GPS - STATIC	2002	HISAB
3096852.568	641329.353	2087701.348	17207465.360	.033	C	ADJUSTMENT	1999	17648

**NAD83(1986)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3096852.944	641329.598	2087701.724	17207465.605	.033	1	ADJUSTMENT	1998	GPS1147
3096852.944	641329.598	2087701.724	17207465.605	.033	C	GPS - STATIC	1988	HBEA1

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE-AH3160-3W-30AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE-AH3160-3W-30AUG2011.jpg</a>	W	Aug 30, 2011
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE-AH3160-2-30AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE-AH3160-2-30AUG2011.jpg</a>		Aug 30, 2011
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE-AH3160-1-30AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE-AH3160-1-30AUG2011.jpg</a>		Aug 30, 2011

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



Mn/DOT Name: TETTE MNDT RM 1

NGS Name: TETTE RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4573](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	14	56 N	7 W	472034.21	911142.51	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	2011	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	REFERENCE MARK DISK	MNDT

**Description:** (2007)                      **Stamping:** TETTE NO 1 1987

0.5 MILE SOUTHWEST OF ILLGEN CITY, 0.6 MILE SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND TRUNK HIGHWAY 1 IN ILLGEN CITY, TO TRUNK HIGHWAY 61 MILEPOINT 58.80, THEN 500.0 FEET NORTHWEST ALONG A POLE LINE, THEN 0.15 MILE NORTHEAST ALONG AN OLD POLE LINE, 10.66 FEET SOUTH OF STATION TETTE MNDT, 9.30 FEET SOUTHEAST OF A WITNESS POST.

**Station Notes**

8/29/2011 OLD POLE LINE IS DIFFICULT TO FIND DUE TO TREES THAT HAVE GROWN IN. NOT SEARCHED FOR.

**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>	
880.999	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
881.002	.016	2/1					VERTICAL CONTROL SURVEY	2008	VSHOR2	

**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>	
880.960	.262			784.664	.197	2007	GPS - RTRN	2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -96.384    12B = -96.345    09 = -96.299    03 = -96.191

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>			
47 20 34.20787	91 11 42.51280	675491.848	301873.187	.131	3	GPS - RTRN		2011	RTRN2011			

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>MN State Plane - North 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>
3096854.877	641318.899	2087703.641	17207454.904	.131	3	GPS - RTRN		2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE_RM_1-DM4573-3NW-30AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE_RM_1-DM4573-3NW-30AUG2011.jpg</a>	NW	Aug 30, 2011
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE_RM_1-DM4573-2-30AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE_RM_1-DM4573-2-30AUG2011.jpg</a>		Aug 30, 2011
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE_RM_1-DM4573-1-30AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE_RM_1-DM4573-1-30AUG2011.jpg</a>		Aug 30, 2011

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



Mn/DOT Name: TETTE MNDT RM 2

NGS Name: TETTE RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4574](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	14	56 N	7 W	472034.29	911142.90	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	2011	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	REFERENCE MARK DISK	MNDT

**Description:** (2007) **Stamping:** TETTE NO 2 1987

0.5 MILE SOUTHWEST OF ILLGEN CITY, 0.6 MILE SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND TRUNK HIGHWAY 1 IN ILLGEN CITY, TO TRUNK HIGHWAY 61 MILEPOINT 58.80, THEN 500.0 FEET NORTHWEST ALONG A POLE LINE, THEN 0.15 MILE NORTHEAST ALONG AN OLD POLE LINE, 24.6 FEET WEST OF STATION TETTE MNDT, 19.20 FEET WEST OF A WITNESS POST.

**Station Notes**

8/29/2011 OLD POLE LINE IS DIFFICULT TO FIND DUE TO TREES THAT HAVE GROWN IN. NOT SEARCHED FOR.

**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>	
882.003	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
882.009	.016	2/1					VERTICAL CONTROL SURVEY	2008	VSHOR2	

**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>	
881.944	.262			785.651	.197	2007	GPS - RTRN	2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -96.381 12B = -96.345 09 = -96.296 03 = -96.187

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>Geodetic Position</u>						<u>Lake County - Lake (North Shore) Zone</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>			
47 20 34.29387	91 11 42.89645	675465.563	301882.311	.131	3	GPS - RTRN	2011	RTRN2011			

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>MN State Plane - North 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>	
3096828.251	641326.958	2087677.029	17207463.002	.131	3	GPS - RTRN	2011	RTRN2011	

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE_RM_2-DM4574-3E-30AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE_RM_2-DM4574-3E-30AUG2011.jpg</a>	E	Aug 30, 2011
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE_RM_2-DM4574-2-19JUN2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE_RM_2-DM4574-2-19JUN2007.jpg</a>		Jun 19, 2007
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE_RM_2-DM4574-1-30AUG2011.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE_RM_2-DM4574-1-30AUG2011.jpg</a>		Aug 30, 2011

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



Mn/DOT Name: TETTE MNDT RM 3

NGS Name: TETTE RM 3

County: LAKE, MN (Sheet 1)

NGS ACRN: [AH3161](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	11	56 N	7 W	472039.81	911122.89	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>
1987	2017	GOOD	Horz=NO Vert=NO	YES		PROJECTS 1 IN.	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	REFERENCE MARK DISK	MNDT

**Description:** (2000)                      **Stamping:** TETTE NO 3 1987

0.25 MILE SOUTHWEST OF ILLGEN CITY, 0.2 MILE SOUTHWEST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 1 AND TRUNK HIGHWAY 61, 65.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 MILEPOINT 59.10, 5.0 FEET SOUTHEAST OF THE EDGE OF A ROCK OUTCROP, 67.8 FEET SOUTHWEST OF A POWER POLE, 6.6 FEET NORTHWEST OF A WITNESS POST.

**Station Notes**  
 DO NOT USE.

**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>	
739.713	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
739.716	.016	2/1					VERTICAL CONTROL SURVEY	2011	VBCKY-R	
739.716	.016	2/1					VERTICAL CONTROL SURVEY	2009	VBCKY	
739.716	.016	2/1					VERTICAL CONTROL SURVEY	2008	VSHOR2	

**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>	
739.762	.262			643.355	.197	2011	GPS - RTRN	2017	RTRN2017	
				643.188	.056	2011	HORIZONTAL ADJUSTMENT	2012	GPS2800	
739.729	.262			643.371	.197	2007	GPS - RTRN	2011	RTRN2011	
				643.270	.048	2007	HORIZONTAL ADJUSTMENT	2007	GPS2300	
				643.414	.066	1996	GPS - STATIC	1999	GPS1147	
739.631	.131			643.414	.066	1996	HORIZONTAL ADJUSTMENT	1999	17648	
739.697							LEVELING	1992	HORZ	

<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>	
739.500							RECIPROCAL VERTICAL ANGLE	1987	HORZ	

Geoid Separations(ft): GEOID18 = -96.447    12B = -96.411    09 = -96.358    03 = -96.253

**Lat/Lon and County Coordinates (Feet)**

**NAD83(2011)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 20 39.80445	91 11 22.89420	676851.623	302419.233	.131	3	GPS - RTRN	2017	RTRN2017
47 20 39.80529	91 11 22.89474	676851.587	302419.319	.026		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 20 39.80510	91 11 22.89538	676851.543	302419.300	.131	3	GPS - RTRN	2011	RTRN2011
47 20 39.80540	91 11 22.89559	676851.529	302419.331	.023		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 20 39.80566	91 11 22.89353	676851.671	302419.356	.033	C	GPS - STATIC	1999	GPS1147
47 20 39.80566	91 11 22.89353	676851.671	302419.355	.033	C	ADJUSTMENT	1999	17648

**NAD83(1986)**

Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info		
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference
47 20 39.80755	91 11 22.88808	676852.049	302419.543	.033	C	GPS - STATIC	1988	HBEA1

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3098191.475	641919.079	2089040.974	17208053.048	.131	3	GPS - RTRN	2017	RTRN2017
3098191.436	641919.163	2089040.935	17208053.133	.026		ADJUSTMENT	2012	GPS2800

**NAD83(2007)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3098191.392	641919.142	2089040.891	17208053.112	.131	3	GPS - RTRN	2011	RTRN2011
3098191.377	641919.173	2089040.876	17208053.143	.023		ADJUSTMENT	2007	GPS2300

**NAD83(1996)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3098191.518	641919.202	2089041.017	17208053.172	.033	C	GPS - STATIC	1999	GPS1147
3098191.518	641919.202	2089041.017	17208053.172	.033	C	ADJUSTMENT	1999	17648

**NAD83(1986)**

MN State Plane - North Zone		UTM - Zone 15				Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3098191.889	641919.403	2089041.388	17208053.372	.033	C	GPS - STATIC	1988	HBEA1

**Station Photos**

Type	File Name	Dir	Date
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE_RM_3-AH3161-3SE-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE_RM_3-AH3161-3SE-19SEP2017.jpg</a>	SE	Sep 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE_RM_3-AH3161-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE_RM_3-AH3161-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE_RM_3-AH3161-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TETTE_RM_3-AH3161-1-19SEP2017.jpg</a>		Sep 19, 2017

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





Mn/DOT Name: TH 100

NGS Name: TH 100

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4489](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	52 N	10 W	470038.00	914010.00	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>
1982	2012	GOOD	Horz=NO Vert=YES	YES			NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
WALL	SURVEY DISK	USACE

**Description:** (2008)                      **Stamping:** TH 100 1982

IN TWO HARBORS, 0.4 MILE SOUTH ALONG WATERFRONT DRIVE FROM THE JUNCTION OF WATERFRONT DRIVE AND TRUNK HIGHWAY 61 IN TWO HARBORS, THEN 0.3 MILE EAST ON SOUTH AVENUE, THEN 0.4 MILE SOUTH ON 3RD STREET TO THE SOUTH END OF A PARKING LOT, THEN WALK TO THE END OF A BREAK WALL, IN A BREAK WALL UNDER A LIGHTHOUSE, 9.0 FEET NORTHWEST OF THE SOUTHEAST LEG OF A LIGHTHOUSE, 9.0 FEET SOUTHEAST OF THE NORTHWEST LEG OF A LIGHTHOUSE.

**Station Notes**  
 UNDER A LIGHT HOUSE (ISSUE).

**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>	
609.057	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
609.057	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3	

**Geoid Separations(ft):** GEOID18 = -94.970    12B = -94.954    09 = -94.855    03 = -94.780

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TH_100-DM4489-3W-18JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TH_100-DM4489-3W-18JUN2008.jpg</a>	W	Jun 18, 2008
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TH_100-DM4489-2-18JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TH_100-DM4489-2-18JUN2008.jpg</a>		Jun 18, 2008
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TH_100-DM4489-1-18JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TH_100-DM4489-1-18JUN2008.jpg</a>		Jun 18, 2008

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



Mn/DOT Name: TH 101

NGS Name: TH 101

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4488](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	52 N	10 W	470042.50	913959.30	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>
1982	2018	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
WALL - HEAVY RETAINING	SURVEY DISK	USACE

**Description:** (2009)                      **Stamping:** TH 101 1982

IN TWO HARBORS, 0.4 MILE SOUTH ALONG WATERFRONT DRIVE FROM THE JUNCTION OF WATERFRONT DRIVE AND TRUNK HIGHWAY 61 IN TWO HARBORS, THEN 0.3 MILE EAST ON SOUTH AVENUE, THEN 0.4 MILE SOUTH ON 3RD STREET TO THE SOUTH END OF A PARKING LOT, THEN WALK TO THE END OF A BREAK WALL, IN THE MIDDLE OF A BREAK WALL AT A BEND TO THE WEST, 5.0 FEET SOUTHEAST OF THE WEST SIDE OF A BREAK WALL AT A GUARDRAIL.

**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>
609.211	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963
609.221	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE
609.238	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691
609.234	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3

**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>
609.182	.262			514.300	.197	2007	GPS - RTRN	2011	RTRN2011
609.080	.262			514.277	.197	1996	GPS - RTRN	2008	RTRN2008

Geoid Separations(ft): GEOID18 = -94.997    12B = -94.977    09 = -94.882    03 = -94.803

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 00 42.50046	91 39 59.30453			556057.249	183312.698	.131	3	GPS - RTRN	2011	RTRN2011

<u>NAD83(1996)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 00 42.50228	91 39 59.30473			556057.240	183312.882	.131	3	GPS - RTRN	2008	RTRN2008

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2982272.905	518079.052			1972959.173	17084411.156	.131	3	GPS - RTRN	2011	RTRN2011

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2982272.887	518079.236			1972959.156	17084411.340	.131	3	GPS - RTRN	2008	RTRN2008

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TH_101-DM4488-3N-18JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TH_101-DM4488-3N-18JUN2008.jpg</a>	N	Jun 18, 2008
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TH_101-DM4488-2-18JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TH_101-DM4488-2-18JUN2008.jpg</a>		Jun 18, 2008
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TH_101-DM4488-1-18JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TH_101-DM4488-1-18JUN2008.jpg</a>		Jun 18, 2008

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



Mn/DOT Name: TH 102

NGS Name: TH 102

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4486](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	52 N	10 W	470048.59	913955.20	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>
1982	2018	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
WALL - HEAVY RETAINING	SURVEY DISK	USACE

**Description:** (2009)                      **Stamping:** TH 102 1982

IN TWO HARBORS, 0.4 MILE SOUTH ALONG WATERFRONT DRIVE FROM THE JUNCTION OF WATERFRONT DRIVE AND TRUNK HIGHWAY 61 IN TWO HARBORS, THEN 0.3 MILE EAST ON SOUTH AVENUE, THEN 0.4 MILE SOUTH ON 3RD STREET TO THE SOUTH END OF A PARKING LOT, THEN WALK TO THE END OF A BREAK WALL, IN THE CENTER OF THE NORTH END OF THE BREAK WALL, 20.5 FEET SOUTH OF THE NORTH END OF THE WALL, 4.8 FEET WEST OF THE EAST EDGE OF THE WALL.

**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>		
609.372	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963		
609.375	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE		
609.375	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691		
609.375	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3		

**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>		
609.359	.262		514.481	.197	2007	GPS - RTRN	2011	RTRN2011		
609.297	.262		514.500	.197	1996	GPS - RTRN	2008	RTRN2008		

Geoid Separations(ft): GEOID18 = -94.990 12B = -94.974 09 = -94.878 03 = -94.796

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 00 48.59056	91 39 55.19616			556355.082	183923.515	.131	3	GPS - RTRN	2011	RTRN2011

<u>NAD83(1996)</u>				<u>Lake County - Lake (North Shore) Zone</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>									
47 00 48.59195	91 39 55.19712			556355.018	183923.657	.131	3	GPS - RTRN	2008	RTRN2008

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2007)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2982546.107	518701.249			1973233.243	17085032.764	.131	3	GPS - RTRN	2011	RTRN2011

<u>NAD83(1996)</u>				<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>									
2982546.038	518701.389			1973233.174	17085032.904	.131	3	GPS - RTRN	2008	RTRN2008

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TH_102-DM4486-3S-18JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TH_102-DM4486-3S-18JUN2008.jpg</a>	S	Jun 18, 2008
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TH_102-DM4486-2-18JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TH_102-DM4486-2-18JUN2008.jpg</a>		Jun 18, 2008
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TH_102-DM4486-1-18JUN2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TH_102-DM4486-1-18JUN2008.jpg</a>		Jun 18, 2008

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



Mn/DOT Name: TT 25 WM

NGS Name: TT 25 WM

County: LAKE, MN (Sheet 1)

NGS ACRN: [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

	<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	471530.00	911804.00		
12				
55 N				
8 W				

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1951	2017	DESTROYED	Horz=NO Vert=NO	YES			SEE DESCRIPTION

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

Description: (1951)                      Stamping: TT 25 WM 1951

AT BEAVER BAY, 73.0 FEET SOUTH OF THE MAIN ENTRANCE TO THE COMMUNITY HALL, 52.0 FEET NORTH OF TRUNK HIGHWAY 61, 34.0 FEET SOUTH AND 53.0 FEET EAST OF CROSSROADS, 3.0 FEET NORTH OF A SIGN POLE.

Station Notes

PULLED THE TIES, NO SIGN OF THE MARK. THE MARK WAS DESTROYED BY CONSTRUCTION.

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

Geoid Separations(ft): GEOID18 = -96.394    12B = -96.365    09 = -96.269    03 = -96.181

<u>Type</u>	<u>Station Photos</u>		<u>Dir</u>	<u>Date</u>
	<u>Location:</u>	<u>File Name</u>		
<u>Monument:</u>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TT_25_WM-3NW-20SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TT_25_WM-3NW-20SEP2017.jpg</a>		NW	Sep 20, 2017
<u>Disk:</u>				

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







Mn/DOT Name: TT 5 FJH USGS

NGS Name: TT 5 FJH

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0584](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	11	52 N	11 W	470037.41	914226.79	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>
1957	2018	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	USGS

**Description:** (2007)                      **Stamping:** TT 5 FJH 1952

0.85 MILE SOUTHWEST ALONG COUNTY ROAD 61 SCENIC DRIVE FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 61 (SCENIC DRIVE) IN TWO HARBORS, 0.45 MILE SOUTHWEST OF A RAILROAD CROSSING, IN THE MIDDLE OF THE SOUTHEAST HEADWALL OF THE COUNTY ROAD 61 (SCENIC DRIVE) CULVERT, 30.0 FEET SOUTHEAST OF COUNTY ROAD 61 (SCENIC DRIVE).

**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>
725.153	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963
725.169	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE
725.153	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691
725.153	.016	2/1					VERTICAL CONTROL SURVEY	2010	VSHOR4
725.153	.007	1/2					VERTICAL ADJUSTMENT	1991	00000025

**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>
725.071	.262			630.642	.197	2007	GPS - RTRN	2011	RTRN2011

Geoid Separations(ft): GEOID18 = -94.537    12B = -94.521    09 = -94.429    03 = -94.360

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 00 37.40663	91 42 26.78860	545827.563	183017.871	.131	3	GPS - RTRN	2011	RTRN2011	

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(2007)</u>		<u>UTM - Zone 15</u>				<u>Project Info</u>		
<u>MN State Plane - North 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>							
2972063.534	517376.233	1962751.638	17083724.003	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TT_5_FJH-SH0584-3SE-21AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TT_5_FJH-SH0584-3SE-21AUG2007.jpg</a>	SE	Aug 21, 2007
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TT_5_FJH-SH0584-2-21AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TT_5_FJH-SH0584-2-21AUG2007.jpg</a>		Aug 21, 2007
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TT_5_FJH-SH0584-1-21AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TT_5_FJH-SH0584-1-21AUG2007.jpg</a>		Aug 21, 2007

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



Mn/DOT Name: TUNTWO  
County: LAKE, MN (Sheet 1)

NGS Name: TUNTWO

NGS ACRN: [DR1378](#) [Get Map](#)  
NGS Quad / Sta Num : 47091322/  
USGS Quad: CASTLE DANGER

1/4	Sec	Twp	Rng	Reference Latitude	Reference Longitude	Vert Order	Horz Order
NW	12	53 N	10 W	470542.23	913315.74	2	C

Year Set	Last Recovery	Condition	Geodetic Usability	Photos	Bridge Num	F/P/R	Magnetic Properties
2017	2019	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 12 FT)	METAL ROD (WITH REMOVABLE ID DISK)	MNDT

Description: (2017)                      Stamping: TUNTWO 2017

8.5 MILES NORTHEAST OF TWO HARBORS, 8.5 MILES NORTHEAST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, AT TRUNK HIGHWAY 61 MILEPOINT 34.0, 46.2 FEET SOUTH OF TRUNK HIGHWAY 61, 99.0 FEET EAST OF THE GATE 12 ROAD, 21.5 FEET SOUTH OF A GUARDRAIL, 1.5 FEET NORTH OF A WITNESS POST.

Station Pair: 3805 M - LAKE, MN

**Leveling-Derived Orthometric Heights (Feet)**

NAVD88			Orthometric Height			Ellipsoid (NAD83)			Determination Method		Project Info	
Height	Acc	Order (/Class)	Height	Acc	Adj				Year	Reference		
678.923	.016	2/1				VERTICAL ADJUSTMENT			2021	00000963		
678.923	.016	2/1				VERTICAL CONTROL SURVEY			2019	VNSHORE		

**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		
678.877			583.526	.022	2011	HORIZONTAL ADJUSTMENT			2019	GPS3328		
678.923	.131		583.719	.066	1996	GPS - STATIC			2019	Hlake2		
678.877			583.526	.022	2011	GPS - STATIC			2019	Hlake2		
678.890	.262		583.565	.197	2011	GPS - RTRN			2017	RTRN2017		

Geoid Separations(ft): GEOID18 = -95.380 12B = -95.328 09 = -95.223 03 = -95.177

**Lat/Lon and County Coordinates (Feet)**

NAD83(2011)		Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
47 05 42.23104	91 33 15.73735	584625.325	213096.693	.016		ADJUSTMENT	2019	GPS3328	
47 05 42.23104	91 33 15.73735	584625.325	213096.693	.016	C	GPS - STATIC	2019	Hlake2	
47 05 42.23013	91 33 15.73658	584625.376	213096.600	.131	3	GPS - RTRN	2017	RTRN2017	

NAD83(1996)		Geodetic Position		Lake County - Lake (North Shore) Zone				Project Info	
Latitude	Longitude	X	Y	Acc	Order	Determination Method	Year	Reference	
47 05 42.23080	91 33 15.73785	584625.290	213096.670	.033	C	GPS - STATIC	2019	Hlake2	

**State Plane and UTM Coordinates (Feet)**

NAD83(2011)		MN State Plane - North Zone		UTM - Zone 15		Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3009627.012	548979.132	2000353.006	17115261.767	.016		ADJUSTMENT	2019	GPS3328
3009627.012	548979.132	2000353.006	17115261.767	.016	C	GPS - STATIC	2019	Hlake2
3009627.067	548979.040	2000353.061	17115261.676	.131	3	GPS - RTRN	2017	RTRN2017

NAD83(1996)		MN State Plane - North Zone		UTM - Zone 15		Project Info		
X	Y	X	Y	Acc	Order	Determination Method	Year	Reference
3009626.977	548979.107	2000352.972	17115261.742	.033	C	GPS - STATIC	2019	Hlake2





**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TUN TWO-DR1378-3S-16OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TUN TWO-DR1378-3S-16OCT2017.jpg</a>	S	Oct 16, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TUN TWO-DR1378-2-16OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TUN TWO-DR1378-2-16OCT2017.jpg</a>		Oct 16, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TUN TWO-DR1378-1-16OCT2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TUN TWO-DR1378-1-16OCT2017.jpg</a>		Oct 16, 2017

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



Mn/DOT Name: TWO HARBORS

NGS Name: TWO HARBORS

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0816](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	53 N	11 W	470233.23	914238.00		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>
1952	1989	GOOD	Horz=YES Vert=YES	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	TRIANGULATION STATION DISK	NGS

**Description:** (2004)                      **Stamping:** TWO HARBORS 1952

1.5 MILES NORTHWEST OF TWO HARBORS, ON A HIGH WOODED HILL, AT THE NORTHWEST END OF A ROCK OUTCROP, 1.0 MILE NORTHWEST OF COUNTY ROAD 11 FROM THE JUNCTION OF COUNTY ROAD 11 AND TRUNK HIGHWAY 61, THEN 0.45 MILE NORTH OF TRUNK HIGHWAY 11, STATION TWO HARBORS IS 0.15 MILE NORTH OF A ROAD ON THE TOP OF A HILL, 44.35 FEET WEST OF TWO HARBORS RM 1, 44.16 FEET NORTH OF TWO HARBORS RM 2.

\* 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>		
1246.717	.197		1152.704	.131	1996	HORIZONTAL ADJUSTMENT	1999	17648		
1246.717						RECIPROCAL VERTICAL ANGLE	1952	HORZ		

Geoid Separations(ft): GEOID18 = -94.176    12B = -94.160    09 = -94.091    03 = -93.999

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>Geodetic Position</u>		<u>Lake 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>
47 02 33.23238	91 42 38.00104	424887.240	91360.653	.066	2	ADJUSTMENT	1999	17648
47 02 33.23637	91 42 37.99477	424887.676	91361.055	.066	2	ADJUSTMENT	1991	17497

<u>NAD83(1986)</u>		<u>Geodetic Position</u>		<u>Lake 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>
47 02 33.23422	91 42 37.99424	424887.712	91360.838	.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>
47 02 33.47100	91 42 37.37200			.100	2	CLASSICAL SURVEY	1956	11100

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>
2971075.715	529095.283	1961781.762	17095441.208	.066	2	ADJUSTMENT	1999	17648
2971076.141	529095.695	1961782.190	17095441.619	.066	2	ADJUSTMENT	1991	17497

<u>NAD83(1986)</u>		<u>MN State Plane - North 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>
2971076.182	529095.478	1961782.230	17095441.402	.066	2	ADJUSTMENT	1986	17289

<u>NAD27</u>		<u>MN State Plane - North 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>
2346462.859	201036.092			.100	2	CLASSICAL SURVEY	1956	11100



Mn/DOT Name: TWO HARBORS BETH LUTH CH SPIRE

NGS Name: TWO HARBORS BETH LUTH CH SPIRE

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0783](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/1029  
 USGS Quad: TWO HARBORS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	52 N	11 W	470122.59	914016.85		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>
1952	1952	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	CHURCH SPIRE	NGS

Description: (1952) Stamping:  
 IN TWO HARBORS, AT THE NORTHWEST CORNER OF 4TH STREET AND 6TH AVENUE

\* No Vertical Positions in the Database \*

Geoid Separations(ft): GEOID18 = -94.816 12B = -94.796 09 = -94.705 03 = -94.623

Lat/Lon and County Coordinates (Feet)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 01 22.59407	91 40 16.84616	554928.994	187400.056	.328	4	ADJUSTMENT	1999	17648
47 01 22.59993	91 40 16.84209	554929.288	187400.643	.328	4	ADJUSTMENT	1991	17497

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 01 22.59739	91 40 16.84082	554929.371	187400.384	.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>
47 01 22.82200	91 40 16.20200			.100	4	CLASSICAL SURVEY	1956	11100

State Plane and UTM Coordinates (Feet)

<u>MN State Plane - North 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>
2980982.438	522117.956	1971675.191	17088450.889	.328	4	ADJUSTMENT	1999	17648
2980982.709	522118.555	1971675.462	17088451.487	.328	4	ADJUSTMENT	1991	17497

<u>MN State Plane - North 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>
2980982.802	522118.299	1971675.555	17088451.231	.328	4	ADJUSTMENT	1986	17289

<u>MN State Plane - North 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>
2356370.954	194057.758			.100	4	CLASSICAL SURVEY	1956	11100



Mn/DOT Name: TWO HARBORS BM

NGS Name: TWO HARBORS

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0338](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	1	52 N	11 W	470114.40	914017.60	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>
1933	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
WALL	BENCH MARK DISK	NGS

**Description:** (2009)                      **Stamping:** TWO HARBORS 1933

IN TWO HARBORS, 2.0 BLOCKS SOUTHWEST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS, THEN 5.0 BLOCKS SOUTH ON WATERFRONT DRIVE, THEN 200.0 FEET WEST ON 2ND AVENUE TO 610TH AVENUE BUILDING (OLD CITY HALL BUILDING -1905) IN THE NORTHEAST WALL, 136.0 FEET WEST OF WATERFRONT DRIVE, 37.0 FEET SOUTH OF 2ND AVENUE, 1.3 FEET WEST OF THE EAST SIDE OF A BUILDING, 1.7 FEET ABOVE THE SIDEWALK, THE DISK IS SET IN THE FRONT BRICK WALL OF A BUILDING.

**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>	
656.967	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
656.974	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	
656.970	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
656.970	.016	2/1					VERTICAL CONTROL SURVEY	2009	VSHOR3	
656.970	.007	1/2					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>	
656.925	.007	1/2					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
656.925	.007	1					VERTICAL CONTROL SURVEY	1933	L29 MINN	

**Geoid Separations(ft):** GEOID18 = -94.839    12B = -94.819    09 = -94.728    03 = -94.645

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS-SH0338-3SE-28AUG2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS-SH0338-3SE-28AUG2008.jpg</a>	SE	Aug 28, 2008
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS-SH0338-2-28AUG2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS-SH0338-2-28AUG2008.jpg</a>		Aug 28, 2008
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS-SH0338-1-28AUG2008.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/TWO_HARBORS-SH0338-1-28AUG2008.jpg</a>		Aug 28, 2008

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



Mn/DOT Name: TWO HARBORS DMIR RR PR PLT STK

NGS Name: TWO HARBORS DMIR RR PR PLT STK

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0782](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/1030  
 USGS Quad: TWO HARBORS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	52 N	11 W	470105.35	914038.20		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>
1952	1952	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	STACK	NGS

Description: (1952) Stamping:  
 IN THE SOUTHWEST PART OF TWO HARBORS.

\* No Vertical Positions in the Database \*

Geoid Separations(ft): GEOID18 = -94.800 12B = -94.780 09 = -94.688 03 = -94.609

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 01 05.35116	91 40 38.19805	553412.341	185685.194	.328	4	ADJUSTMENT	1999	17648
47 01 05.35735	91 40 38.19346	553412.672	185685.814	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 01 05.35479	91 40 38.19219	553412.755	185685.553	.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>
47 01 05.58000	91 40 37.55800			.100	4	CLASSICAL SURVEY	1956	11100

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - North 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>
2979535.506	520343.997	1970225.977	17086679.616	.328	4	ADJUSTMENT	1999	17648
2979535.813	520344.630	1970226.284	17086680.248	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

<u>MN State Plane - North 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>
2979535.906	520344.372	1970226.376	17086679.991	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - North 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>
2354923.696	192283.888			.100	4	CLASSICAL SURVEY	1956	11100



Mn/DOT Name: TWO HARBORS EMMANUEL LUTH CH

NGS Name: TWO HARBORS EMMANUEL LUTH CH

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0784](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/1031  
 USGS Quad: TWO HARBORS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	52 N	11 W	470121.54	914016.27		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>
1952	1952	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	CHURCH SPIRE	NGS

Description: (1952)                      Stamping:  
 IN TWO HARBORS, AT THE SOUTHWEST CORNER OF 4TH STREET AND 6TH AVENUE

\* No Vertical Positions in the Database \*

Geoid Separations(ft): GEOID18 = -94.819    12B = -94.803    09 = -94.711    03 = -94.629

**Lat/Lon and County Coordinates (Feet)**

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 01 21.54497	91 40 16.27180	554966.501	187292.932	.328	4	ADJUSTMENT	1999	17648
47 01 21.55083	91 40 16.26772	554966.796	187293.520	.328	4	ADJUSTMENT	1991	17497

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 01 21.54829	91 40 16.26646	554966.878	187293.261	.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>
47 01 21.77400	91 40 15.62800			.100	4	CLASSICAL SURVEY	1956	11100

**State Plane and UTM Coordinates (Feet)**

<u>MN State Plane - North 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>
2981024.190	522012.420	1971716.770	17088345.318	.328	4	ADJUSTMENT	1999	17648
2981024.461	522013.019	1971717.043	17088345.917	.328	4	ADJUSTMENT	1991	17497

<u>MN State Plane - North 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>
2981024.553	522012.763	1971717.135	17088345.661	.328	4	ADJUSTMENT	1986	17289

<u>MN State Plane - North 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>
2356412.680	193952.333			.100	4	CLASSICAL SURVEY	1956	11100



Mn/DOT Name: TWO HARBORS LIGHTHOUSE

NGS Name: TWO HARBORS LIGHTHOUSE

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0780](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/1032  
 USGS Quad: TWO HARBORS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	52 N	10 W	470050.27	913949.93		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>
1952	2012	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	LIGHTHOUSE	NGS

Description: (1952)

Stamping:

IN THE SOUTHEAST PART OF TWO HARBORS, 0.3 MILE EAST OF THE RAILROAD STATION, 0.4 MILE SOUTH OF SOUTH AVENUE, ALONG 3RD STREET.

\* No Vertical Positions in the Database \*

Geoid Separations(ft): GEOID18 = -95.003 12B = -94.987 09 = -94.892 03 = -94.810

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 00 50.26728	91 39 49.92655	556723.801	184085.561	.328	4	ADJUSTMENT	1999	17648
47 00 50.27381	91 39 49.92266	556724.084	184086.217	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 00 50.27121	91 39 49.92128	556724.174	184085.951	.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>
47 00 50.48800	91 39 49.27400			.100	4	CLASSICAL SURVEY	1956	11100

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - North 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>
2982908.051	518877.878	1973595.354	17085208.794	.328	4	ADJUSTMENT	1999	17648
2982908.308	518878.544	1973595.612	17085209.460	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

<u>MN State Plane - North 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>
2982908.409	518878.283	1973595.712	17085209.198	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - North 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>
2358297.224	190816.979			.100	4	CLASSICAL SURVEY	1956	11100



Mn/DOT Name: TWO HARBORS PWR AND LT CO STK

NGS Name: TWO HARBORS PWR AND LT CO STK

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0781](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/1033  
 USGS Quad: TWO HARBORS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	52 N	10 W	470106.49	913936.44		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>
1952	1952	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
SEE DESCRIPTIVE TEXT	STACK	NGS

Description: (1952)

Stamping:

IN THE SOUTHEAST PART OF TWO HARBORS, 0.55 MILE EAST OF THE RAILROAD STATION, ALONG SOUTH AVENUE.

\* No Vertical Positions in the Database \*

Geoid Separations(ft): GEOID18 = -950000 12B = -94.983 09 = -94.888 03 = -94.806

Lat/Lon and County Coordinates (Feet)

NAD83(1996)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 01 06.48527	91 39 36.43985	557693.191	185708.451	.328	4	ADJUSTMENT	1999	17648
47 01 06.49154	91 39 36.43626	557693.454	185709.081	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 01 06.48896	91 39 36.43483	557693.547	185708.818	.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>
47 01 06.71332	91 39 35.79492			.100	4	CLASSICAL SURVEY	1979	15983
47 01 06.71000	91 39 35.78700			.100	4	CLASSICAL SURVEY	1950	UNK

State Plane and UTM Coordinates (Feet)

NAD83(1996)

<u>MN State Plane - North 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>
2983811.849	520538.110	1974501.420	17086867.193	.328	4	ADJUSTMENT	1999	17648
2983812.086	520538.750	1974501.658	17086867.832	.328	4	ADJUSTMENT	1991	17497

NAD83(1986)

<u>MN State Plane - North 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>
2983812.190	520538.491	1974501.762	17086867.573	.328	4	ADJUSTMENT	1986	17289

NAD27

<u>MN State Plane - North 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>
2359200.505	192477.940			.100	4	CLASSICAL SURVEY	1979	15983
2359201.060	192477.600			.100	4	CLASSICAL SURVEY	1950	UNK





Mn/DOT Name: TWO HARBORS RADIO MAST

NGS Name: TWO HARBORS RADIO MAST

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0788](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	52 N	11 W	470044.92	914114.13		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>
1977	1982	GOOD	Horz=YES Vert=YES	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:  
 1.0 MILE SOUTHWEST OF TWO HARBORS, ON PORK CITY HILL.

\* No Vertical Positions in the Database \*

Geoid Separations(ft): GEOID18 = -94.744 12B = -94.724 09 = -94.629 03 = -94.560

Lat/Lon and County Coordinates (Feet)

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 00 44.92047	91 41 14.12821	550878.418	183669.377	.328	4	ADJUSTMENT	1999	17648
47 00 44.95063	91 41 14.08361	550881.574	183672.366	.328	4	ADJUSTMENT	1991	17497

<u>Geodetic Position</u>		<u>Lake County - Lake (North Shore) Zone</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>
47 00 44.95219	91 41 14.07507	550882.170	183672.511	.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>
47 00 45.25922	91 41 13.27484			.100	4	CLASSICAL SURVEY	1979	15983

State Plane and UTM Coordinates (Feet)

<u>MN State Plane - North 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>
2977084.159	518228.739	1967772.117	17084568.669	.328	4	ADJUSTMENT	1999	17648
2977087.193	518231.851	1967775.155	17084571.775	.328	4	ADJUSTMENT	1991	17497

<u>MN State Plane - North 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>
2977087.782	518232.020	1967775.744	17084571.943	.328	4	ADJUSTMENT	1986	17289

<u>MN State Plane - North 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>
2352486.856	190180.036			.100	4	CLASSICAL SURVEY	1979	15983



Mn/DOT Name: TWO HARBORS RM 1

NGS Name: TWO HARBORS RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2954](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	27	53 N	11 W	470233.20	914237.36		

<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>
1952	1976	GOOD	Horz=YES Vert=YES	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	REFERENCE MARK DISK	NGS

**Description:** **Stamping:** TWO HARBORS NO 1 1952

1.5 MILES NORTHWEST OF TWO HARBORS, ON A HIGH WOODED HILL, AT THE NORTHWEST END OF A ROCK OUTCROP, 1.0 MILE NORTHWEST OF COUNTY ROAD 11 FROM THE JUNCTION OF COUNTY ROAD 11 AND TRUNK HIGHWAY 61, THEN 0.45 MILE NORTH OF TRUNK HIGHWAY 11, STATION TWO HARBORS RM 1 IS 0.15 MILE NORTH OF A ROAD ON THE TOP OF A HILL, ON THE SOUTHEAST END OF THE SAME SHELF OF A ROCK AS STATION TWO HARBORS.

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

Geoid Separations(ft): GEOID18 = -94.176 12B = -94.160 09 = -94.091 03 = -93.999



Mn/DOT Name: TWO HARBORS RM 2

NGS Name: TWO HARBORS RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2955](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	27	53 N	11 W	470232.81	914238.17		

<u>Year Set</u>	<u>Last Recovery</u>	<u>Condition</u>	<u>Geodetic Usability</u>	<u>Photos</u>	<u>Bridge Num</u>	<u>F/P/R</u>	<u>Magnetic Properties</u>
1952	1976	GOOD	Horz=YES Vert=YES	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (1 TO 3 METERS)	REFERENCE MARK DISK	NGS

**Description:** **Stamping:** TWO HARBORS NO 2 1952

1.5 MILES NORTHWEST OF TWO HARBORS, ON A HIGH WOODED HILL, AT THE NORTHWEST END OF A ROCK OUTCROP, 1.0 MILE NORTHWEST OF COUNTY ROAD 11 FROM THE JUNCTION OF COUNTY ROAD 11 AND TRUNK HIGHWAY 61, THEN 0.45 MILE NORTH OF TRUNK HIGHWAY 11, STATION TWO HARBORS RM 2 IS 0.15 MILE NORTH OF A ROAD ON THE TOP OF A HILL, LOCATED IN AN OUTCROPPING BEDROCK TO THE SOUTH OF STATION TWO HARBORS.

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

Geoid Separations(ft): GEOID18 = -94.176 12B = -94.160 09 = -94.091 03 = -93.999



Mn/DOT Name: U 173

NGS Name: U 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0391](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091313/  
 USGS Quad: KANE 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>
SW	31	56 N	10 W	471720.95	913948.74	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>
1935	2007	NOT FOUND	Horz=NO Vert=YES	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:** (1935)                      **Stamping:** U 173 1935

18.4 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, 11.5 MILES NORTH OF ALGER, 9.1 MILES SOUTHWEST OF THE RANGER STATION, 250.0 FEET SOUTH OF A ROAD CUT, 100.0 FEET NORTH OF A SMALL HILL, 30.0 FEET EAST OF COUNTY ROAD 2, 6.0 FEET SOUTHWEST OF TAMARACK TREES.

**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>	
1711.817	.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>	
1711.434	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1711.434	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -92.746    12B = -92.752    09 = -92.634    03 = -92.582

\* No Horizontal Positions in the Database \*



Mn/DOT Name: U 178

NGS Name: U 178

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0383](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091321/  
 USGS Quad: TWO HARBORS NE

				<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	14	54 N	10 W	470933.72	913428.81	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	1935	GOOD	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:** (1935)                      **Stamping:** U 178 1935

4.8 MILES SOUTHWEST ON COUNTY ROAD 3 FROM LONDON, 9.7 MILES NORTHEAST ON COUNTY ROAD 3 FROM THE JUNCTION OF COUNTY ROAD 3 AND TRUNK HIGHWAY 61 (2.4 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS), 20.0 FEET SOUTH OF A ROAD EAST, 18.0 FEET EAST OF COUNTY ROAD 3, 20.0 FEET NORTH OF A POLE.

**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>	
1166.940	.007	1					VERTICAL CONTROL SURVEY	1993	POSTED	

<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>	
1166.694	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1166.694	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -94.173    12B = -94.137    09 = -94.042    03 = -94.009

\* No Horizontal Positions in the Database \*



Mn/DOT Name: U 19

NGS Name: U 19

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0347](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	35	54 N	11 W	470730.41	914217.45	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>
1933	1962	GOOD	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: (1933)                      Stamping: U 19 1933

6.3 MILES SOUTHEAST ALONG A RAILROAD FROM HIGHLAND, AT YORK, 140.0 FEET SOUTH OF RAILROAD MILEPOST 35, 43.0 FEET SOUTHEAST OF THE SOUTHEAST CORNER OF A RAILROAD STATION, 43.0 FEET EAST OF THE EAST RAIL OF A RAILROAD, 24.0 FEET NORTH OF A ROAD AND A GATE, 3.0 FEET WEST OF A FENCE LINE.

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>
1376.132	.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>
1375.906	.007	1/2				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1375.906	.007	1				VERTICAL CONTROL SURVEY	1933	L29 MINN

Geoid Separations(ft): GEOID18 = -93.412 12B = -93.392 09 = -93.310 03 = -93.248

\* No Horizontal Positions in the Database \*



Mn/DOT Name: U 341

NGS Name: U 341

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0614](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	29	56 N	7 W	471813.00	911454.00	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>
1978	2007	DESTROYED	Horz=NO Vert=NO	NO		PROJECTS 3 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STEEL ROD (NO SLEEVE) (DEPTH 12 FT)	BENCH MARK DISK	NGS

Description: (2000)                      Stamping: U 341 1978

3.8 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER AT BEAVER BAY, 27.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, 1.0 FOOT SOUTHEAST OF TRUNK HIGHWAY 61 MILEPOST 355, 76.0 FEET SOUTHWEST OF A POWER POLE NUMBER 610, 1.0 FOOT NORTHEAST OF A WITNESS POST.

Station Notes  
 THE ROAD CHANGED.

**Leveling-Derived Orthometric Heights (Feet)**

<u>NAVD88</u>							<u>Project Info</u>	
<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</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>			
733.332	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025

  

<u>NGVD29</u>							<u>Project Info</u>	
<u>Orthometric Height</u>			<u>Ellipsoid (NAD83)</u>			<u>Determination Method</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>			
733.138	.033	3				VERTICAL CONTROL SURVEY	1987	CS3806

Geoid Separations(ft): GEOID18 = -96.269 12B = -96.220 09 = -96.178 03 = -96.086

\* No Horizontal Positions in the Database \*



Mn/DOT Name: U 355

NGS Name: U 355

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0523](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	35	53 N	11 W	470159.00	914120.00	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>
1979	2005	DESTROYED	Horz=NO Vert=NO	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STEEL ROD (NO SLEEVE) (DEPTH 19 FT)	VERTICAL CONTROL DISK	NGS

**Description:** (2002)                      **Stamping:** U 355 1979

0.5 MILE WEST ON TRUNK HIGHWAY 61 FROM A RAILROAD OVERPASS OF TRUNK HIGHWAY 61 AT TWO HARBORS THEN NORTH 0.45 MILE ON COUNTY ROAD 19, AT 15TH AVENUE, 21.0 FEET WEST OF COUNTY ROAD 19, 36.0 FEET NORTH OF 15TH AVENUE, 52.0 FEET SOUTHWEST AND ACROSS COUNTY ROAD 19 FROM A FIRE HYDRANT, 3.4 FEET NORTH OF A TELEPHONE POLE, 2.0 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>	
825.490	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025	

**Geoid Separations(ft): GEOID18 = -94.498    12B = -94.481    09 = -94.403    03 = -94.314**

\* No Horizontal Positions in the Database \*





Mn/DOT Name: U 51

NGS Name: U 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0253](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091231/  
 USGS Quad: SPLIT ROCK POINT NE

				<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	22	55 N	8 W	471359.00	911956.00	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	1971	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
IRON ROD	BENCH MARK DISK	NGS

Description: (1971)                      Stamping: U-51 1971

2.3 MILES SOUTHWEST OF BEAVER BAY, 2.3 MILES SOUTHWEST ALONG TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND EDITH STREET IN BEAVER BAY, THEN 0.1 MILE SOUTH ALONG PINE BAY LOOP.

**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>	
695.448	.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>	
695.294	.007	1					VERTICAL CONTROL SURVEY	1934	L95 MINN	

Geoid Separations(ft): GEOID18 = -96.430    12B = -96.401    09 = -96.309    03 = -96.184

\* No Horizontal Positions in the Database \*



Mn/DOT Name: V 173

NGS Name: V 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0390](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091313/  
 USGS Quad: KANE 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	6	55 N	10 W	471705.00	913941.00	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>
1935	2007	NOT FOUND	Horz=NO Vert=YES	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: (1935)                      Stamping: V 173 1935

18.0 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, 11.2 MILES NORTH ON COUNTY ROAD 2 FROM ALGER, 34.0 FEET WEST OF COUNTY ROAD 2, 14.0 FEET SOUTH OF A ROAD, 16.0 FEET WEST OF A DITCH, 6.0 FEET SOUTHEAST OF A POLE.

**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>	
1688.445	.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>	
1688.067	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1688.067	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -92.743    12B = -92.746    09 = -92.631    03 = -92.582

\* No Horizontal Positions in the Database \*



Mn/DOT Name: V 178

NGS Name: V 178

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0382](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091321/  
 USGS Quad: TWO HARBORS NE

				<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	24	54 N	10 W	470914.66	913339.15	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	1957	POOR	Horz=NO Vert=YES	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: (1935) Stamping: V 178 1935

5.5 MILES NORTHWEST OF CASTLE DANGER, 9.7 MILES NORTHEAST ON COUNTY ROAD 3 FROM THE JUNCTION OF COUNTY ROAD 3 AND TRUNK HIGHWAY 61 (2.4 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS) THEN 0.9 MILE SOUTHEAST ON A GRAVEL ROAD, 57.0 FEET EAST OF A LARGE TREE STUMP, 16.0 FEET NORTH OF A GRAVEL ROAD, IN A FIELD.

**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>	
1128.292	.007	1					VERTICAL CONTROL SURVEY	1993	POSTED	

<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>	
1128.049	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1128.049	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -94.413 12B = -94.370 09 = -94.275 03 = -94.242

\* No Horizontal Positions in the Database \*



Mn/DOT Name: V 19

NGS Name: V 19

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0350](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	23	54 N	11 W	470834.00	914134.62	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>
1933	1962	GOOD	Horz=NO Vert=NO	NO	RR		SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
BRIDGE ABUTMENT	BENCH MARK DISK	NGS

**Description:** (1933)                      **Stamping:** V 19 1933

5.0 MILES SOUTHEAST ALONG A RAILROAD FROM HIGHLAND, 1.5 MILES NORTHWEST ALONG A RAILROAD FROM YORK, 0.3 MILE NORTH OF RAILROAD MILEPOST 36, NEAR AN ABANDONED RAILROAD STATION AT ALGER, IN THE NORTHWEST CORNER OF A RAILROAD BRIDGE OVER AN ABANDONED LOGGING RAILROAD, 5.4 FEET WEST OF THE WEST RAIL OF THE NORTHBOUND MAIN RAILROAD TRACK, 0.8 FOOT SOUTH OF THE NORTH END OF AN ABUTMENT.

**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>
1435.250	.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>
1434.974	.007	1/2				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1434.974	.007	1				VERTICAL CONTROL SURVEY	1933	L29 MINN

Geoid Separations(ft): GEOID18 = -93.320 12B = -93.304 09 = -93.215 03 = -93.166

\* No Horizontal Positions in the Database \*



Mn/DOT Name: V 341

NGS Name: V 341

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0616](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	21	56 N	7 W	471901.00	911328.00	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>
1978	2007	DESTROYED	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	BENCH MARK DISK	NGS

Description: (1978)                      Stamping: V 341 1978

5.3 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 BRIDGE OVER BEAVER RIVER IN BEAVER BAY, 0.5 MILE SOUTHWEST OF A PALISADE HEAD ENTRANCE AND A WAYSIDE REST, 33.0 FEET NORTHWEST OF TRUNK HIGHWAY 61, 138.0 FEET NORTH OF DRIVEWAY NUMBER H 170, 1.0 FOOT NORTHWEST OF A WITNESS POST.

Station Notes

THE ROCK WAS REMOVED BY CONSTRUCTION.

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>		
716.580	.007	1/2						VERTICAL ADJUSTMENT		1991	00000025		

Geoid Separations(ft): GEOID18 = -96.381    12B = -96.338    09 = -96.292    03 = -96.194

\* No Horizontal Positions in the Database \*



Mn/DOT Name: V 355

NGS Name: V 355

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0524](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091323/  
 USGS Quad: TWO HARBORS

				<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	25	56 N	11 W	470235.20	914115.90	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>
1979	2009	GOOD	Horz=YES Vert=YES	NO		FLUSH	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	VERTICAL CONTROL DISK	NGS

Description: (2002) Stamping: V 355 1979

0.5 MILE WEST ON TRUNK HIGHWAY 61 FROM A RAILROAD OVERPASS OF TRUNK HIGHWAY 61 AT TWO HARBORS, THEN 1.25 MILES NORTH ON COUNTY ROAD 190, IN A BEDROCK ON THE OUTSIDE EDGE OF A CURVE AT A POWER LINE CROSSING, 47.0 FEET NORTHEAST OF COUNTY ROAD 190, 47.0 FEET NORTH OF A DRIVE TO A HOUSE, 41.0 FEET NORTHWEST OF A POWER POLE WITH 2 GUY WIRES, 9.0 FEET NORTHWEST OF A GUY WIRE ANCHOR ROD, 1.0 FOOT 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>	
967.442	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025	

Geoid Separations(ft): GEOID18 = -94.399 12B = -94.380 09 = -94.308 03 = -94.209

\* No Horizontal Positions in the Database \*



Mn/DOT Name: V 51

NGS Name: V 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0254](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	55 N	8 W	471529.00	911805.00	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	1952	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: (1979)                      Stamping: V 51 1934

AT BEAVER BAY, 14.0 FEET SOUTHEAST OF A PRIVATE ROAD TO BEAVER BAY LODGE, 11.0 FEET SOUTH OF A FLAGPOLE, 26.0 FEET NORTH OF TRUNK HIGHWAY 61, THE STATION IS CONSIDERED LOST.

**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>	
706.567	.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>	
706.393	.007	1					VERTICAL CONTROL SURVEY	1934	L95 MINN	

Geoid Separations(ft): GEOID18 = -96.397    12B = -96.365    09 = -96.269    03 = -96.181

\* No Horizontal Positions in the Database \*



Mn/DOT Name: W 173

NGS Name: W 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0392](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091313/  
 USGS Quad: KANE 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>
SW	18	56 N	10 W	471958.00	913951.00	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>
1935	2008	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)	SEE DESCRIPTION	NGS

Description: (2008)                      Stamping: W 173 1935

21.4 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, 14.6 MILES NORTH ON COUNTY ROAD 2 FROM ALGER, 6.1 MILES SOUTHWEST OF A FOREST RANGER STATION, AT A RAILROAD CROSSING, 40.0 FEET SOUTH OF A RAILROAD MILEPOST 8, 45.0 FEET EAST OF COUNTY ROAD 2, 35.0 FEET SOUTH OF THE RAILROAD TRACKS, 24.0 FEET SOUTHEAST OF A BRACED POLE. THE STATION FALLS IN BOG AREA, PULLED TIES AND NOT THERE.

**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>	
1668.799	.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>	
1668.396	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -92.805    12B = -92.828    09 = -92.690    03 = -92.608

\* No Horizontal Positions in the Database \*





Mn/DOT Name: W 178

NGS Name: W 178

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0381](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091321/  
 USGS Quad: TWO HARBORS NE

				<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	19	54 N	9 W	470859.00	913207.00	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>
1935	1956	NOT FOUND	Horz=YES Vert=YES	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: (1935)                      Stamping: W 178 1935

4.3 MILES NORTHWEST OF CASTLE DANGER, 9.7 MILES NORTHEAST ON COUNTY ROAD 3 FROM THE JUNCTION OF COUNTY ROAD 3 AND TRUNK HIGHWAY 61 (2.4 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS), THEN 2.1 MILES SOUTHEAST ON A GRAVEL ROAD, 0.25 MILE NORTHWEST OF A TEE-ROAD EAST, 60.0 FEET SOUTH OF A FIELD ROAD SOUTH TO A CLEARING, 24.0 FEET NORTH OF A GRAVEL ROAD.

**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>	
982.879	.007	1				VERTICAL CONTROL SURVEY	1993	POSTED	

<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>	
982.646	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD	
982.646	.007	1				VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -94.793    12B = -94.747    09 = -94.649    03 = -94.613

\* No Horizontal Positions in the Database \*



Mn/DOT Name: W 19

NGS Name: W 19

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0354](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	11	54 N	11 W	471102.98	914151.26	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>
1933	1933	GOOD	Horz=NO Vert=NO	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (0 TO 1 METERS)	BENCH MARK DISK	NGS

**Description:** (1933)                      **Stamping:** W 19 1933

2.0 MILES SOUTHEAST ALONG A RAILROAD FROM HIGHLAND, AT LAUREN, 0.3 MILE NORTH OF RAILROAD MILEPOST 39, BETWEEN THE MAIN RAILROAD LINE AND THE SPUR LINE, 26.0 FEET NORTHEAST OF THE NORTHEAST CORNER OF A RAILROAD STATION, 52.0 FEET EAST OF THE EAST RAIL OF THE SOUTHBOUND MAIN RAILROAD TRACK, 13.0 FEET WEST OF THE WEST RAIL OF THE SPUR TRACK.

**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>
1548.484	.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>
1548.183	.007	1/2				UNKNOWN/APPROXIMATE	1992	UNCHECKD
1548.183	.007	1				VERTICAL CONTROL SURVEY	1933	L29 MINN

Geoid Separations(ft): GEOID18 = -92.976 12B = -92.962 09 = -92.867 03 = -92.831

\* No Horizontal Positions in the Database \*



Mn/DOT Name: W 336

NGS Name: W 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0556](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091342/  
 USGS Quad: BRIMSON

				<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	18	55 N	11 W	471515.00	914720.00	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>
1978	1978	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (0 TO 1 METERS)	VERTICAL CONTROL DISK	NGS

Description: (1978)                      Stamping: W 336 1978

2.5 MILES EAST ON ST. LOUIS COUNTY ROAD 55 FROM THE JUNCTION OF COUNTY ROAD 55 AND COUNTY ROAD 44 AT ROLLINS, THEN 0.2 MILE EAST ON LAKE COUNTY ROAD 14, AT A DIRT ROAD NORTH, AT THE SOUTH END OF A CULVERT WEST, 44.0 FEET NORTHEAST OF COUNTY ROAD 14, 1.0 FOOT 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>	
1602.743	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025	

Geoid Separations(ft): GEOID18 = -93.021    12B = -93.031    09 = -92.949    03 = -92.871

\* No Horizontal Positions in the Database \*



Mn/DOT Name: W 341

NGS Name: W 341

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0617](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	15	56 N	7 W	471946.50	911232.39	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>
1978	2019	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	VERTICAL CONTROL DISK	NGS

Description: (2009) Stamping: W 341 1978

6.4 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY, 0.6 MILE NORTHEAST OF THE PALISADE HEAD ENTRANCE AND A WAYSIDE REST, AT TRUNK HIGHWAY 61 MILEPOINT 57.80, 58.0 FEET NORTHWEST OF TRUNK HIGHWAY 61, 188.0 FEET NORTH OF THE NORTHEAST ENTRANCE TO A HIGHWAY DEPARTMENT, 3.0 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>	
656.925	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963	
656.921	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE	
656.921	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
656.921	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3	
656.921	.016	2/1				VERTICAL CONTROL SURVEY	2008	VSHOR2	
656.921	.007	1/2				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>	
656.711	.033	3				VERTICAL CONTROL SURVEY	1987	CS3806	

**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>	
656.921			560.521	.025	2011	HORIZONTAL ADJUSTMENT	2019	GPS3328	
656.921	.131		560.717	.066	1996	GPS - STATIC	2019	Hlake2	
656.921			560.521	.025	2011	GPS - STATIC	2019	Hlake2	
656.951	.262		560.593	.197	2011	GPS - RTRN	2017	RTRN2017	

Geoid Separations(ft): GEOID18 = -96.397 12B = -96.361 09 = -96.309 03 = -96.204

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Lake County - Lake (North Shore) Zone</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>								
47 19 46.49817	91 12 32.38937	671981.193	297093.296	.016		ADJUSTMENT	2019	GPS3328	
47 19 46.49817	91 12 32.38937	671981.193	297093.296	.016	C	GPS - STATIC	2019	Hlake2	
47 19 46.49788	91 12 32.38939	671981.192	297093.266	.131	3	GPS - RTRN	2017	RTRN2017	

<u>NAD83(1996)</u>		<u>Lake County - Lake (North Shore) Zone</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>								
47 19 46.49791	91 12 32.38986	671981.159	297093.270	.033	C	GPS - STATIC	2019	Hlake2	

State Plane and UTM Coordinates (Feet)

NAD83(2011)

MN State Plane - North 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>
3093539.434	636402.329	2084381.330	17202543.787	.016		ADJUSTMENT	2019	GPS3328
3093539.434	636402.329	2084381.330	17202543.787	.016	C	GPS - STATIC	2019	HLAKE2
3093539.433	636402.299	2084381.329	17202543.758	.131	3	GPS - RTRN	2017	RTRN2017

NAD83(1996)

MN State Plane - North 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>
3093539.401	636402.301	2084381.297	17202543.760	.033	C	GPS - STATIC	2019	HLAKE2

Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/W_341-SH0617-3NW-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/W_341-SH0617-3NW-19SEP2017.jpg</a>	NW	Sep 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/W_341-SH0617-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/W_341-SH0617-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/W_341-SH0617-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/W_341-SH0617-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: W 51

NGS Name: W 51

County: LAKE, MN (Sheet 1)

NGS ACRN: <a href="#">SH0255</a>	<a href="#">Get Map</a>
NGS Quad / Sta Num : 47091242/	
USGS Quad: SILVER BAY	

				<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	12	55 N	8 W	471605.10	911703.35	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>
1934	2017	NOT FOUND	Horz=NO Vert=NO	YES			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
UNKNOWN	BENCH MARK DISK	NGS

**Description:** (1934)                      **Stamping:** W-51 1934

1.1 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 4 IN BEAVER BAY, 64.0 FEET NORTHWEST OF TRUNK HIGHWAY 61 AT MILEPOINT 52.05, 9.0 FEET SOUTHWEST OF A TELEPHONE POLE NUMBER 31, THE MONUMENT IS TILTED AND LOOSE.

**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>	
672.617	.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>	
672.390	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
672.390	.007	1					VERTICAL CONTROL SURVEY	1935	L95 MINN	

**Geoid Separations(ft):** GEOID18 = -96.440    12B = -96.401    09 = -96.315    03 = -96.240

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/W_51-SH0255-3NW-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/W_51-SH0255-3NW-19SEP2017.jpg</a>	NW	Sep 19, 2017
Monument:			
Disk:			

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



Mn/DOT Name: WALES

NGS Name: WALES

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0790](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/1025  
 USGS Quad: HIGHLAND

				<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	27	55 N	11 W	471323.68	914237.16		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>
1952	2000	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	TRIANGULATION STATION DISK	NGS

Description: (1952)                      Stamping: WALES 1952

1.75 MILES SOUTHEAST OF WALES, 12.9 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, THEN 2.0 MILES WEST ON COUNTY ROAD 14 TO A SIDE ROAD WEST, THEN CONTINUE 0.65 MILE NORTH ON COUNTY ROAD 14 TO A SHARP CURVE TO THE LEFT AND DIM WOODS ROAD LEFT, THEN 0.1 MILE SOUTHWEST ON DIM WOODS ROAD TO THE TOP OF A WOODED RIDGE, 17.0 FEET SOUTHWEST OF AN 8.0 INCH DIAMETER MAPLE TREE, 16.0 FEET WEST OF A 6.0 INCH DIAMETER MAPLE TREE, 90.78 FEET SOUTHWEST OF WALES RM 1, 76.63 FEET NORTHWEST OF WALES 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>
1817.582	.197		1724.878	.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>
1817.614						RECIPROCAL VERTICAL ANGLE	1952	HORZ

Geoid Separations(ft): GEOID18 = -92.782    12B = -92.775    09 = -92.693    03 = -92.654

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>Geodetic Position</u>				<u>Lake 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>	
47 13 23.68422	91 42 37.15884	425199.476	157267.245	.066	2	ADJUSTMENT	1999	17648	

<u>NAD83(1986)</u>		<u>Geodetic Position</u>				<u>Lake 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>	
47 13 23.68409	91 42 37.15788	425199.542	157267.231	.066	2	ADJUSTMENT	1986	17289	

<u>NAD27</u>		<u>Geodetic Position</u>				<u>Lake 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>	
47 13 23.95300	91 42 36.52700			.100	2	CLASSICAL SURVEY	1956	11100	

**State Plane and UTM Coordinates (Feet)**

<u>NAD83(1996)</u>		<u>MN State Plane - North 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>	
2969949.348	594986.105	1960753.109	17161316.473	.066	2	ADJUSTMENT	1999	17648	

<u>NAD83(1986)</u>		<u>MN State Plane - North 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>	
2969949.415	594986.093	1960753.175	17161316.460	.066	2	ADJUSTMENT	1986	17289	

<u>NAD27</u>		<u>MN State Plane - North 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>	
2345336.488	266929.717			.100	2	CLASSICAL SURVEY	1956	11100	



Mn/DOT Name: WALES RM 1

NGS Name: WALES RM 1

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2984](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/1025  
 USGS Quad: HIGHLAND

				<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	27	55 N	11 W	471324.26	914236.15		

<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>
1952	1952	GOOD	Horz=YES Vert=YES	NO		PROJECTS 8 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

**Description:** (1952)                      **Stamping:** WALES NO 1 1952

1.75 MILES SOUTHEAST OF WALES, 12.9 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, THEN 2.0 MILES WEST ON COUNTY ROAD 14 TO A SIDE ROAD WEST, THEN CONTINUE 0.65 MILE NORTH ON COUNTY ROAD 14 TO A SHARP CURVE TO THE LEFT AND DIM WOODS ROAD LEFT, THEN 0.1 MILE SOUTHWEST ON DIM WOODS ROAD TO THE TOP OF A WOODED RIDGE, 90.78 FEET NORTHEAST OF STATION WALES.

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

**Geoid Separations(ft): GEOID18 = -92.782    12B = -92.779    09 = -92.693    03 = -92.654**





Mn/DOT Name: WALES RM 2

NGS Name: WALES RM 2

County: LAKE, MN (Sheet 1)

NGS ACRN: [CJ2985](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/1025  
 USGS Quad: HIGHLAND

				<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	27	55 N	11 W	471323.19	914236.32		

<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>
1952	1952	GOOD	Horz=YES Vert=YES	NO		PROJECTS 6 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
CONCRETE MONUMENT (CAST-IN-PLACE)	REFERENCE MARK DISK	NGS

Description: (1952) Stamping: WALES NO 2 1952

1.75 MILES SOUTHEAST OF WALES, 12.9 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, THEN 2.0 MILES WEST ON COUNTY ROAD 14 TO A SIDE ROAD WEST, THEN CONTINUE 0.65 MILE NORTH ON COUNTY ROAD 14 TO A SHARP CURVE TO THE LEFT AND DIM WOODS ROAD LEFT, THEN 0.1 MILE SOUTHWEST ON DIM WOODS ROAD TO THE TOP OF A WOODED RIDGE, 76.63 FEET SOUTHEAST OF STATION WALES.

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

**Geoid Separations(ft): GEOID18 = -92.782 12B = -92.779 09 = -92.693 03 = -92.654**



Mn/DOT Name: WICK

NGS Name: WICK

County: LAKE, MN (Sheet 1)

NGS ACRN: [DM4480](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	54 N	9 W	470731.27	912854.67	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>
1981	2017	NOT FOUND	Horz=YES 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)	SURVEY DISK	NOS

Description: (2011) Stamping: WICK 1981

12.1 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 IN TWO HARBORS TO TRUNK HIGHWAY 61 MILEPOINT 37.80, THEN 0.3 MILE EAST ON COUNTY ROAD 618 (EAST CASTLE DANGER ROAD), THEN 0.2 MILE SOUTHEAST ON DRIVEWAY NUMBER 2982, 220.0 FEET SOUTH OF A PRIVATE DRIVEWAY, 128.0 FEET NORTHEAST OF A POWER POLE WITH A METER AND A TRANSFORMER, 22.5 FEET WEST OF A WITNESS POST.

Station Notes

THERE ARE NO VALUES FOR THIS STATION EXIST IN THE NATIONAL GEODETIC SURVEY (NGS) DATABASE. THE DRIVEWAY IS UNDER CONSTRUCTION.

Leveling-Derived Orthometric 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>		
628.411	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691		
628.414	.016	2/1				VERTICAL CONTROL SURVEY	2009	VSHOR3		

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>		
628.411			532.450	.027	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940		
628.411			532.450	.027	2011	GPS - STATIC	2013	HBBAY		
628.411	.131		532.656	.066	2007	GPS - STATIC	2012	HBBAY		
628.358	.262		532.601	.197	2007	GPS - RTRN	2011	RTRN2011		

Geoid Separations(ft): GEOID18 = -95.935 12B = -95.869 09 = -95.761 03 = -95.725

Lat/Lon and County Coordinates (Feet)

<u>NAD83(2011)</u>			<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 07 31.27430	91 28 54.67475		602896.354	223789.948	.033		ADJUSTMENT	2013	GPS2940		
47 07 31.27430	91 28 54.67475		602896.354	223789.948	.033	C	GPS - STATIC	2013	HBBAY		

  

<u>NAD83(2007)</u>			<u>Geodetic Position</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 07 31.27461	91 28 54.67587		602896.277	223789.981	.033	C	GPS - STATIC	2012	HBBAY		
47 07 31.27343	91 28 54.67709		602896.191	223789.863	.131	3	GPS - RTRN	2011	RTRN2011		

State Plane and UTM Coordinates (Feet)

<u>NAD83(2011)</u>		<u>MN State Plane - North Zone</u>		<u>UTM - Zone 15</u>		<u>Project Info</u>				
<u>X</u>	<u>Y</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>
3027454.649	560394.034	2018193.844	17126647.099	.033				ADJUSTMENT	2013	GPS2940
3027454.649	560394.034	2018193.844	17126647.099	.033	C			GPS - STATIC	2013	HBBAY

  

<u>NAD83(2007)</u>		<u>MN State Plane - North 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>
3027454.571	560394.064	2018193.765	17126647.129	.033	C	GPS - STATIC	2012	HBBAY
3027454.490	560393.942	2018193.683	17126647.008	.131	3	GPS - RTRN	2011	RTRN2011



Station Photos

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/WICK-DM4480-3S-20AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/WICK-DM4480-3S-20AUG2007.jpg</a>	S	Aug 20, 2007
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/WICK-DM4480-2-20AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/WICK-DM4480-2-20AUG2007.jpg</a>		Aug 20, 2007
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/WICK-DM4480-1-20AUG2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/WICK-DM4480-1-20AUG2007.jpg</a>		Aug 20, 2007

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



Mn/DOT Name: X 173

NGS Name: X 173

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0393](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091313/  
 USGS Quad: KANE 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	8	56 N	10 W	472114.00	913810.00	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>
1935	1962	GOOD	Horz=YES Vert=YES	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:** (1935)                      **Stamping:** X 173 1935

21.2 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF COUNTY ROAD 2 AND TRUNK HIGHWAY 61 AT TWO HARBORS, THEN 1.7 MILES NORTHEAST ALONG A RAILROAD, 2.0 MILES NORTHEAST OF ALGER, 4.1 MILES SOUTHWEST OF A FOREST RANGER STATION, 0.5 MILE SOUTH OF THE RAILROAD STATION AT THE DARBY JUNCTION, 15.0 FEET NORTH OF RAILROAD MILEPOST 10, AT THE NORTH END OF A SHORT CUT, 25.0 FEET EAST OF A RAILROAD.

**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>	
1708.012	.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>	
1707.582	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1707.582	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -92.743    12B = -92.752    09 = -92.618    03 = -92.539

\* No Horizontal Positions in the Database \*



Mn/DOT Name: X 178

NGS Name: X 178

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0380](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091321/  
 USGS Quad: TWO HARBORS NE

				<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	30	54 N	9 W	470825.13	913107.91	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	1935	GOOD	Horz=YES Vert=YES	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: (1935)                      Stamping: X 178 1935

3.3 MILES NORTHWEST OF CASTLE DANGER, 2.1 MILES WEST ON A DIM TRAIL WEST OF TRUNK HIGHWAY 61, 21.0 FEET NORTH OF A TRAIL.

**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>	
902.984	.007	1					VERTICAL CONTROL SURVEY	1993	POSTED	

<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>	
902.761	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
902.761	.007	1					VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -95.154    12B = -95.098    09 = -95.003    03 = -94.960

\* No Horizontal Positions in the Database \*



Mn/DOT Name: X 19

NGS Name: X 19

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0356](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	34	55 N	11 W	471223.68	914318.23	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>
1933	2007	NOT FOUND	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)	BENCH MARK DISK	NGS

Description: (1979)                      Stamping: X 19 1933

13.0 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS THEN 2.0 MILES WEST ON COUNTY ROAD 14 THEN 1.2 MILES SOUTHWEST ON A GRAVEL ROAD, NORTH AND ACROSS A ROAD FROM AN OLD CONCRETE HOLDING TANK, 154.0 FEET SOUTHEAST OF THE SOUTHEAST END OF A BOX CULVERT UNDER A RAILROAD, 57.0 FEET WEST OF A GRAVEL ROAD, 34.3 FEET SOUTHWEST OF THE SOUTHWEST RAIL OF A RAILROAD, 1.0 FOOT NORTHWEST OF A WITNESS POST.

Station Notes

THE CONCRETE HOLDING TANK WAS REMOVED. 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>	
1634.564	.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>	
1634.357	.007	1/2				UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1634.357	.007	1				VERTICAL CONTROL SURVEY	1933	L29 MINN	

Geoid Separations(ft): GEOID18 = -92.802    12B = -92.798    09 = -92.720    03 = -92.680

\* No Horizontal Positions in the Database \*



Mn/DOT Name: X 199

NGS Name: X 199

County: LAKE, MN (Sheet 1)

NGS ACRN: [TA0067](#) [Get Map](#)  
 NGS Quad / Sta Num : 48091233/  
 USGS Quad: ENSIGN LAKE WEST

				<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	2	64 N	9 W	480257.00	912618.76	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>
1935	2020	GOOD	Horz=YES Vert=YES	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: (1935) Stamping: X 199 1935

AT PRAIRIE PORTAGE ON A TRAIL TO FERNBERG ROAD (COUNTY ROAD 18), 250.0 FEET SOUTH OF PRAIRIE PORTAGE FALLS, AT THE TOP OF A HILL, 100.0 FEET SOUTH OF A CABIN, 150.0 FEET WEST OF THE SUCKER LAKE.

**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>		
1363.967	.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>		
1363.203	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD		
1363.203	.007	1				VERTICAL CONTROL SURVEY	1935	L18 MINN		

Geoid Separations(ft): GEOID18 = -102.077 12B = -102.126 09 = -102.031 03 = -101.676

\* No Horizontal Positions in the Database \*



Mn/DOT Name: X 336

NGS Name: X 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0555](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091331/  
 USGS Quad: KING 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	19	55 N	11 W	471447.00	914651.00	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>
1978	1978	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (0 TO 1 METERS)	VERTICAL CONTROL DISK	NGS

Description: (1978)                      Stamping: X 336 1978

2.5 MILES EAST ON COUNTY ROAD 55 FROM THE JUNCTION OF COUNTY ROAD 55 AND COUNTY ROAD 44 AT ROLLINS, TO THE ST. LOUIS-LAKE COUNTY LINE THEN 0.2 MILE EAST ON LAKE COUNTY ROAD 14, THEN 0.9 MILE SOUTHEAST ON COUNTY ROAD 14, AT THE NORTHWEST END OF A CUT BANK, 56.0 FEET NORTHEAST OF COUNTY ROAD 55, 1.0 FOOT SOUTHEAST OF A WITNESS POST, ON THE TOP OF A 3.0 FOOT BY 5.0 FOOT BOULDER.

**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>	
1638.970	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025	

**Geoid Separations(ft): GEOID18 = -92.949    12B = -92.959    09 = -92.877    03 = -92.805**

\* No Horizontal Positions in the Database \*





Mn/DOT Name: X 341

NGS Name: X 341

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0619](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	11	56 N	7 W	472042.06	911122.49	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>
1978	2020	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	VERTICAL CONTROL DISK	NGS

**Description:** (2007)                      **Stamping:** X 341 1978

IN ILLGEN, 7.7 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY, 0.1 MILE SOUTHWEST OF THE JUNCTION OF TRUNK HIGHWAY 61 AND TRUNK HIGHWAY 1 AT TRUNK HIGHWAY 61 MILEPOINT 59.15, AT THE NORTHEAST END OF A CUT BANK, 51.0 FEET NORTHWEST OF TRUNK HIGHWAY 61, 80.2 FEET SOUTHWEST OF BITUMINOUS DRIVEWAY NUMBER 5763, 1.0 FOOT 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>	
720.248	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963	
720.264	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE	
720.274	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691	
720.274	.016	2/1				VERTICAL CONTROL SURVEY	2011	VBCKY-R	
720.274	.016	2/1				VERTICAL CONTROL SURVEY	2009	VBCKY	
720.274	.016	2/1				VERTICAL CONTROL SURVEY	2008	VSHOR2	
720.274	.007	1/2				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>	
720.054	.033	3				VERTICAL CONTROL SURVEY	1987	CS3806	

**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>	
720.386	.262		623.949	.197	2011	GPS - OPUS	2020	GPSBM	
720.340	.262		623.942	.197	2011	GPS - RTRN	2020	RTRN2020	
720.284	.262		623.887	.197	2011	GPS - RTRN	2017	RTRN2017	
720.274			623.857	.024	2011	HORIZONTAL ADJUSTMENT	2013	GPS2940	
720.274			623.857	.024	2011	GPS - STATIC	2013	HBBAY	
720.274	.131		623.926	.066	2007	GPS - STATIC	2012	HBBAY	
720.294	.262		623.946	.197	2007	GPS - RTRN	2011	RTRN2011	

Geoid Separations(ft): GEOID18 = -96.437    12B = -96.401    09 = -96.348    03 = -96.243

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Geodetic Position</u>					<u>Lake County - Lake (North Shore) Zone</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</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>	
47 20 42.06228	91 11 22.48796	47 20 42.06228	91 11 22.48796	676883.138	302647.548	.131	3	GPS - OPUS	2020	GPSBM	
47 20 42.05982	91 11 22.48646	47 20 42.05982	91 11 22.48646	676883.238	302647.297	.131	3	GPS - RTRN	2020	RTRN2020	
47 20 42.06227	91 11 22.48732	47 20 42.06227	91 11 22.48732	676883.182	302647.546	.131	3	GPS - RTRN	2017	RTRN2017	
47 20 42.06252	91 11 22.48761	47 20 42.06252	91 11 22.48761	676883.163	302647.572	.023		ADJUSTMENT	2013	GPS2940	
47 20 42.06252	91 11 22.48761	47 20 42.06252	91 11 22.48761	676883.163	302647.572	.023	C	GPS - STATIC	2013	HBBAY	

<u>NAD83(2007)</u>		<u>Geodetic Position</u>					<u>Lake County - Lake (North Shore) Zone</u>			<u>Project Info</u>	
<u>Latitude</u>	<u>Longitude</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>	
47 20 42.06260	91 11 22.48862	47 20 42.06260	91 11 22.48862	676883.093	302647.581	.033	C	GPS - STATIC	2012	HBBAY	
47 20 42.06152	91 11 22.48858	47 20 42.06152	91 11 22.48858	676883.094	302647.471	.131	3	GPS - RTRN	2011	RTRN2011	

**State Plane and UTM Coordinates (Feet)**

**NAD83(2011)**

MN State Plane - North 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>
3098213.788	642148.451	2089063.622	17208282.363	.131	3	GPS - OPUS	2020	GPSBM
3098213.898	642148.205	2089063.732	17208282.117	.131	3	GPS - RTRN	2020	RTRN2020
3098213.832	642148.452	2089063.667	17208282.363	.131	3	GPS - RTRN	2017	RTRN2017
3098213.812	642148.476	2089063.646	17208282.388	.023		ADJUSTMENT	2013	GPS2940
3098213.812	642148.476	2089063.646	17208282.388	.023	C	GPS - STATIC	2013	HBBAY

**NAD83(2007)**

MN State Plane - North 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>
3098213.742	642148.483	2089063.576	17208282.394	.033	C	GPS - STATIC	2012	HBBAY
3098213.747	642148.373	2089063.582	17208282.285	.131	3	GPS - RTRN	2011	RTRN2011

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/X_341-SH0619-3NW-27JUL2020.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/X_341-SH0619-3NW-27JUL2020.jpg</a>	NW	Jul 27, 2020
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/X_341-SH0619-2-27JUL2020.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/X_341-SH0619-2-27JUL2020.jpg</a>		Jul 27, 2020
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/X_341-SH0619-1-27JUL2020.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/X_341-SH0619-1-27JUL2020.jpg</a>		Jul 27, 2020

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



Mn/DOT Name: X 51

NGS Name: X 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0256](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091242/  
 USGS Quad: SILVER BAY

				<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	32	56 N	7 W	471724.00	911540.00	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	2008	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: (1971)                      Stamping: X 51 1934

2.9 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM BEAVER BAY, 150.0 FEET SOUTH OF THE SILVER BAY STORE, 26.0 FEET NORTHEAST OF A SILVER BAY SIGN, 10.0 FEET NORTH OF AN ENTRANCE, 36.0 FEET EAST OF TRUNK HIGHWAY 61.

**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>	
691.829	.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>	
691.629	.007	1					VERTICAL CONTROL SURVEY	1944	L95 MINN	

Geoid Separations(ft): GEOID18 = -96.348    12B = -96.302    09 = -96.247    03 = -96.165

\* No Horizontal Positions in the Database \*



Mn/DOT Name: Y 178

NGS Name: Y 178

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0287](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091234/  
 USGS Quad: SPLIT ROCK POINT

				<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	29	54 N	9 W	470816.00	912945.00	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>
1935	2011	NOT FOUND	Horz=NO Vert=YES	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: (1935) Stamping: Y 178 1935

2.2 MILES NORTH OF CASTLE DANGER, 1.0 MILE WEST OF LONDON ROAD FROM THE JUNCTION OF LONDON ROAD AND TRUNK HIGHWAY 61, 25.0 FEET NORTH OF LONDON ROAD, AT A SMALL CLEARING.

**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>	
779.615	.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>	
779.398	.016	2/0				UNKNOWN/APPROXIMATE	1992	UNCHECKD	
779.398	.007	1				VERTICAL CONTROL SURVEY	1935	L49 MINN	

Geoid Separations(ft): GEOID18 = -95.528 12B = -95.472 09 = -95.371 03 = -95.325

\* No Horizontal Positions in the Database \*



Mn/DOT Name: Y 19

NGS Name: Y 19

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0360](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	21	55 N	11 W	471417.00	914443.00	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>
1933	1977	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: (1933)                      Stamping: Y 19 1933

2.6 MILES NORTHWEST ALONG A RAILROAD FROM HIGHLAND, NEAR THE WALES RAILROAD STATION, 400.0 FEET  
 SOUTHEAST OF RAILROAD MILEPOST 44, 96.0 FEET EAST OF THE NORTHEAST CORNER OF A RAILROAD STATION, 70.0  
 FEET NORTH OF THE NORTH RAIL OF THE SOUTHBOUND MAIN TRACK, JUST SOUTH OF AN OLD FENCE.

**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>		
1644.416	.007	1/2						VERTICAL ADJUSTMENT		1991	00000025		

<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>		
1644.049	.007	1						VERTICAL CONTROL SURVEY		1933	L29 MINN		

Geoid Separations(ft): GEOID18 = -92.815    12B = -92.818    09 = -92.736    03 = -92.677

\* No Horizontal Positions in the Database \*



Mn/DOT Name: Y 199

NGS Name: Y 199

County: LAKE, MN (Sheet 1)

NGS ACRN: [TA0068](#) [Get Map](#)  
 NGS Quad / Sta Num : 48091233/  
 USGS Quad: ENSIGN LAKE WEST

				<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	2	64 N	9 W	480258.96	912616.57	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>
1935	1935	GOOD	Horz=YES Vert=YES	NO			SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	BENCH MARK DISK	NGS

Description: (1935)                      Stamping: Y 199 1935

AT PRAIRIE PORTAGE, 60.0 FEET SOUTH OF A DAM BETWEEN SUCKER LAKE AND BASSWOOD LAKE, 70.0 FEET NORTHWEST OF STATION BOUNDARY REF MON 834, 16.0 FEET WEST OF A DOCK TO SUCKER LAKE.

**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>	
1341.848	.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>	
1341.080	.016	2/0					UNKNOWN/APPROXIMATE	1992	UNCHECKD	
1341.080	.033	3					VERTICAL CONTROL SURVEY	1957	USGS-VERT	
1341.080	.007	1					VERTICAL CONTROL SURVEY	1935	L18 MINN	

Geoid Separations(ft): GEOID18 = -102.086 12B = -102.136 09 = -102.040 03 = -101.686

\* No Horizontal Positions in the Database \*



Mn/DOT Name: Y 336

NGS Name: Y 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0554](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091331/  
 USGS Quad: KING 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	19	55 N	11 W	471416.38	914620.20	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>
1978	2021	GOOD	Horz=YES Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (0 TO 1 METERS)	VERTICAL CONTROL DISK	NGS

**Description:** (1978)                      **Stamping:** Y 336 1978

2.5 MILES EAST ALONG COUNTY ROAD 55 FROM THE JUNCTION OF COUNTY ROAD 55 AND COUNTY ROAD 44 IN ROLLINS, THEN 0.2 MILE EAST ON LAKE COUNTY ROAD 14, THEN 1.6 MILES SOUTHEAST ON COUNTY ROAD 14, 47.7 FEET SOUTHWEST OF COUNTY ROAD 14, 48.0 FEET NORTHWEST OF A POWER POLE, IN LINE WITH A ROW OF POWER POLES, 4.0 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>	
1644.990	.007	1/2					VERTICAL ADJUSTMENT	1991	00000025	

**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>	
1644.977	.262			1552.093	.197	2011	GPS - OPUS	2021	GPSBM	
1645.171	.262			1552.287	.197	2011	GPS - OPUS	2021	GPSBM	
1645.059	.262			1552.175	.197	2011	GPS - OPUS	2021	GPSBM	

Geoid Separations(ft): GEOID18 = -92.884    12B = -92.890    09 = -92.815    03 = -92.749

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake 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>
<u>Latitude</u>	<u>Longitude</u>									
47 14 16.38917	91 46 20.20418			409827.729	162673.157	.131	3	GPS - OPUS	2021	GPSBM
47 14 16.38938	91 46 20.20400			409827.742	162673.178	.131	3	GPS - OPUS	2021	GPSBM
47 14 16.38974	91 46 20.20476			409827.690	162673.215	.131	3	GPS - OPUS	2021	GPSBM

**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 - North Zone</u>		<u>X</u>	<u>Y</u>		<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>
<u>X</u>	<u>Y</u>								
2954465.193	600054.515	1945280.130	17166406.059	.131	3	GPS - OPUS	2021	GPSBM	
2954465.205	600054.536	1945280.142	17166406.081	.131	3	GPS - OPUS	2021	GPSBM	
2954465.152	600054.572	1945280.089	17166406.116	.131	3	GPS - OPUS	2021	GPSBM	

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Y_336-SH0554-3SW-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Y_336-SH0554-3SW-17AUG2021.jpg</a>	SW	Aug 17, 2021
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Y_336-SH0554-2-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Y_336-SH0554-2-17AUG2021.jpg</a>		Aug 17, 2021
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Y_336-SH0554-1-17AUG2021.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Y_336-SH0554-1-17AUG2021.jpg</a>		Aug 17, 2021

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



Mn/DOT Name: Y 341

NGS Name: Y 341

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0620](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	56 N	7 W	472110.77	911056.82	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	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	MARKER W/BAR MAGNET

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	VERTICAL CONTROL DISK	NGS

Description: (2007) Stamping: Y 341 1978

5.1 MILES SOUTHWEST ON TRUNK HIGHWAY 61 FROM THE POST OFFICE IN LITTLE MARAIS, 0.5 MILE NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND TRUNK HIGHWAY 1, AT THE NORTHEAST END OF A CUT BANK, AT TRUNK HIGHWAY 61 MILEPOINT 59.75, 57.0 FEET NORTHWEST OF TRUNK HIGHWAY 61, 240.0 FEET SOUTHWEST OF DRIVEWAY NUMBER 5440, 1.6 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>	
682.072	.016	2/1					VERTICAL ADJUSTMENT	2021	00000963	
682.082	.016	2/1					VERTICAL CONTROL SURVEY	2019	VNSHORE	
682.082	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
682.082	.016	2/1					VERTICAL CONTROL SURVEY	2008	VSHOR2	
682.082	.007	1/2					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>	
681.856	.033	3					VERTICAL CONTROL SURVEY	1987	CS3806	

**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>	
682.154	.262			585.783	.197	2011	GPS - RTRN	2017	RTRN2017	

Geoid Separations(ft): GEOID18 = -96.414 12B = -96.371 09 = -96.332 03 = -96.220

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>		<u>Lake County - Lake (North Shore) Zone</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>	
47 21 10.77091	91 10 56.81601	678695.684	305528.829	.131	3	GPS - RTRN	2017	RTRN2017	

**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 - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		
<u>X</u>	<u>Y</u>						
3099908.908	645099.931	2090762.899	17211231.027	.131	3	GPS - RTRN	2017 RTRN2017

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Y_341-SH0620-3NW-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Y_341-SH0620-3NW-19SEP2017.jpg</a>	NW	Sep 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Y_341-SH0620-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Y_341-SH0620-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Y_341-SH0620-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Y_341-SH0620-1-19SEP2017.jpg</a>		Sep 19, 2017

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





Mn/DOT Name: Y 354

NGS Name: Y 354

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0541](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	24	54 N	11 W	470851.00	913959.00	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>
1979	2021	DESTROYED	Horz=NO Vert=NO	NO		RECESSED 1 IN.	SEE DESCRIPTION

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
STEEL ROD (NO SLEEVE) (DEPTH 15 FT)	VERTICAL CONTROL DISK	NGS

Description: (1979)                      Stamping: Y 354 1979

8.5 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS, AT A DIRT ROAD, 41.0 FEET WEST OF COUNTY ROAD 2, 118.0 FEET SOUTH OF A DIRT ROAD, 3.5 FEET NORTHWEST OF A POWER POLE, 2.0 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>	
1354.495	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025	

Geoid Separations(ft): GEOID18 = -93.464    12B = -93.445    09 = -93.353    03 = -93.304

\* No Horizontal Positions in the Database \*



Mn/DOT Name: Y 51

NGS Name: Y 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0257](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	28	56 N	7 W	471840.00	911407.00	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>
1934	1979	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: (1979)                      Stamping: Y-51 1934

1.4 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 5 IN SILVER BAY, 0.35 MILE NORTHEAST ON TRUNK HIGHWAY 61 FROM TRUNK HIGHWAY 61 BRIDGE OVER WILLIAMS CREEK, 37.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 MILEPOINT 55.9, 61.0 FEET WEST OF A POWER POLE, 1.0 FOOT 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>	
746.642	.007	1/2					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>	
746.012	.007	1					VERTICAL CONTROL SURVEY	1935	L95 MINN	

Geoid Separations(ft): GEOID18 = -96.325    12B = -96.276    09 = -96.233    03 = -96.138

\* No Horizontal Positions in the Database \*



Mn/DOT Name: Z 336

NGS Name: Z 336

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0553](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	21	55 N	11 W	471416.00	914442.00	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>
1978	1978	GOOD	Horz=YES Vert=YES	NO			NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK (0 TO 1 METERS)	VERTICAL CONTROL DISK	NGS

Description: (1978)                      Stamping: Z 336 1978

2.5 MILES EAST ON ST. LOUIS COUNTY ROAD 55 FROM THE JUNCTION OF COUNTY ROAD 55 AND COUNTY ROAD 44 AT ROLLINS, THEN 2.6 MILES EASTERLY ON LAKE COUNTY ROAD 14 TO A RAILROAD CROSSING AT WALES, 79.0 FEET SOUTH OF COUNTY ROAD 14, 68.0 FEET NORTH OF THE NORTH RAIL OF A RAILROAD, 21.0 FEET SOUTH OF A POWER POLE, 1.0 FOOT WEST OF A WITNESS POST, ON THE TOP OF A 3.0 FOOT BY 4.0 FOOT BOULDER.

**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>	
1643.051	.007	1/2				VERTICAL ADJUSTMENT	1991	00000025	

**Geoid Separations(ft): GEOID18 = -92.815    12B = -92.818    09 = -92.733    03 = -92.677**

\* No Horizontal Positions in the Database \*



Mn/DOT Name: Z 341  
County: LAKE, MN (Sheet 1)

NGS Name: Z 341

NGS ACRN: [SH0621](#) [Get Map](#)  
NGS Quad / Sta Num : 47091213/  
USGS Quad: ILLGEN CITY

<u>1/4</u>	<u>Sec</u>	<u>Twp</u>	<u>Rng</u>	<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	56 N	7 W	472151.14	911023.23	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	2017	GOOD	Horz=NO Vert=YES	YES		FLUSH	NO MAG MATERIAL

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
ROCK OUTCROP (OVER 3 METERS)	VERTICAL CONTROL DISK	NGS

Description: (2007) Stamping: Z 341 1978

4.25 MILES SOUTHWEST ON TRUNK HIGHWAY 61 FROM COUNTY ROAD 6 IN LITTLE MARAIS, 0.25 MILE SOUTHWEST OF TRUNK HIGHWAY 61 MILEPOST 361, AT THE NORTHEAST END OF A LONG CUT BANK, AT TRUNK HIGHWAY 61 MILEPOINT 60.70, 134.0 FEET SOUTHWEST OF DRIVEWAY NUMBER 5935, 75.0 FEET NORTHWEST OF DRIVEWAY NUMBER 5932 TO A HOUSE, 46.0 FEET NORTHWEST OF TRUNK HIGHWAY 61, 1.0 FOOT SOUTHWEST OF A WITNESS POST, 5.7 FEET NORTHWEST OF ANOTHER 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>		
688.837	.016	2/1				VERTICAL ADJUSTMENT	2021	00000963		
688.834	.016	2/1				VERTICAL CONTROL SURVEY	2019	VNSHORE		
688.834	.016	2/1				VERTICAL ADJUSTMENT	2011	00000691		
688.834	.016	2/1				VERTICAL CONTROL SURVEY	2008	VSHOR2		
688.834	.007	1/2				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>		
688.601	.033	3				VERTICAL CONTROL SURVEY	1987	CS3806		

**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>		
688.850	.262		592.518	.197	2011	GPS - RTRN	2017	RTRN2017		

Geoid Separations(ft): GEOID18 = -96.374 12B = -96.332 09 = -96.306 03 = -96.187

**Lat/Lon and County Coordinates (Feet)**

<u>NAD83(2011)</u>				<u>Lake County - Lake (North Shore) Zone</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>		
47 21 51.13581	91 10 23.23098	681070.490	309582.892	.131	3	GPS - RTRN	2017	RTRN2017		

**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 - North Zone</u>		<u>X</u>	<u>Y</u>	<u>Acc</u>	<u>Order</u>		<u>Year</u>	<u>Reference</u>		
3102118.623	649245.715	2092978.469	17215373.129	.131	3	GPS - RTRN	2017	RTRN2017		

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
Location:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Z_341-SH0621-3NW-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Z_341-SH0621-3NW-19SEP2017.jpg</a>	NW	Sep 19, 2017
Monument:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Z_341-SH0621-2-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Z_341-SH0621-2-19SEP2017.jpg</a>		Sep 19, 2017
Disk:	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Z_341-SH0621-1-19SEP2017.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Z_341-SH0621-1-19SEP2017.jpg</a>		Sep 19, 2017

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



Mn/DOT Name: Z 354

NGS Name: Z 354

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0549](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091324/  
 USGS Quad: HIGHLAND

				<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	27	55 N	11 W	471255.00	914226.40	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>
1979	2007	GOOD	Horz=NO Vert=YES	YES		RECESSED 2 IN.	STEEL SPIKE ADJ TO MON

<u>Monument Type</u>	<u>Disk Type</u>	<u>Mon. Agency</u>
COPPER CLAD ROD (NO SLEEVE) (DEPTH 24 FT)	VERTICAL CONTROL DISK	NGS

Description: (2007)                      Stamping: Z 354 1979

13.0 MILES NORTH ON COUNTY ROAD 2 FROM THE JUNCTION OF TRUNK HIGHWAY 61 AND COUNTY ROAD 2 AT TWO HARBORS, THEN 2.0 MILES WEST ON COUNTY ROAD 14, THEN 0.1 MILE SOUTHWEST ON A GRAVEL ROAD NUMBER 4T47 (HIGHLAND ROAD) TO A POWER LINE CROSSING, 199.0 FEET WEST OF COUNTY ROAD 14, 45.5 FEET NORTHWEST OF A GRAVEL ROAD NUMBER 4T47 (HIGHLAND ROAD), 3.4 FEET NORTH-NORTHWEST OF A POWER POLE, 1.0 FOOT 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>	
1690.331	.016	2/1					VERTICAL ADJUSTMENT	2011	00000691	
1690.331	.016	2/1					VERTICAL CONTROL SURVEY	2011	VBCKY-R	
1690.331	.016	2/1					VERTICAL CONTROL SURVEY	2009	VBCKY	
1690.331	.007	1/2					VERTICAL ADJUSTMENT	1991	00000025	

Geoid Separations(ft): GEOID18 = -92.802    12B = -92.795    09 = -92.713    03 = -92.674

\* No Horizontal Positions in the Database \*

**Station Photos**

<u>Type</u>	<u>File Name</u>	<u>Dir</u>	<u>Date</u>
<b>Location:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Z_354-SH0549-3SW-30JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Z_354-SH0549-3SW-30JUL2007.jpg</a>	SW	Jul 30, 2007
<b>Monument:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Z_354-SH0549-2-30JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Z_354-SH0549-2-30JUL2007.jpg</a>		Jul 30, 2007
<b>Disk:</b>	<a href="https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Z_354-SH0549-1-30JUL2007.jpg">https://www.olmweb.dot.state.mn.us/geod/StationPhotos/lake/Z_354-SH0549-1-30JUL2007.jpg</a>		Jul 30, 2007

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



Mn/DOT Name: Z 51

NGS Name: Z 51

County: LAKE, MN (Sheet 1)

NGS ACRN: [SH0258](#) [Get Map](#)  
 NGS Quad / Sta Num : 47091213/  
 USGS Quad: ILLGEN CITY

				<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	15	56 N	7 W	471959.00	911221.00	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	1979	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: (1979) Stamping: Z 51 1934

6.6 MILES NORTHEAST ON TRUNK HIGHWAY 61 FROM A TRUNK HIGHWAY 61 BRIDGE OVER THE BEAVER RIVER IN BEAVER BAY, 72.0 FEET SOUTHEAST OF TRUNK HIGHWAY 61, AT TRUNK HIGHWAY 61 MILEPOST 358, 15.0 FEET SOUTHWEST OF A POWER POLE, 33.0 FEET SOUTHWEST OF A DRIVEWAY SOUTHEAST.

**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>	
669.254	.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>	
669.028	.007	1					VERTICAL CONTROL SURVEY	1935	L95 MINN	

Geoid Separations(ft): GEOID18 = -96.384 12B = -96.348 09 = -96.299 03 = -96.194

\* No Horizontal Positions in the Database \*