

Hydrographic and Overbank  
Surveys of the Missouri River  
at the Vermillion Reach,  
Myron Grove Game Production Area,  
and North Alabama Bend  
near Vermillion, South Dakota

Conducted for:

The U.S. Army Corps of Engineers, Omaha District  
Contract No. DACW45-01-D-0003, Delivery Order No. 8

Surveyed by:

**Eisenbraun and Associates, Inc.**

Yankton, South Dakota

As a Sub-consultant to:

**WEST Consultants, Inc.**

**September 2001**



# Myron Grove Game Production Area

Missouri River Mile  
788.5 to 787.5, Left Bank

Clay County,  
South Dakota

Survey Control  
Information  
and  
Site Specific  
Control Point  
Documentation

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NM1052 *****
NM1052 CBN - This is a Cooperative Base Network Control Station.
NM1052 DESIGNATION - W 272
NM1052 PID - NM1052
NM1052 STATE/COUNTY- NE/CEDAR
NM1052 USGS QUAD - ST HELENA (1994)
NM1052
NM1052 *CURRENT SURVEY CONTROL
NM1052
NM1052* NAD 83(1995)- 42 47 13.54632(N) 097 13 10.36026(W) ADJUSTED
NM1052* NAVD 88 - 392.924 (meters) 1289.12 (feet) ADJUSTED
NM1052
NM1052 X - -589,189.066 (meters) COMP
NM1052 Y - -4,651,151.616 (meters) COMP
NM1052 Z - 4,310,423.700 (meters) COMP
NM1052 LAPLACE CORR- -0.50 (seconds) DEFLEC99
NM1052 ELLIP HEIGHT- 367.41 (meters) GPS OBS
NM1052 GEOID HEIGHT- -25.50 (meters) GEOID99
NM1052 DYNAMIC HT - 392.809 (meters) 1288.74 (feet) COMP
NM1052 MODELED GRAV- 980,316.2 (mgal) NAVD 88
NM1052
NM1052 HORZ ORDER - B
NM1052 VERT ORDER - SECOND CLASS 0
NM1052 ELLP ORDER - FOURTH CLASS I
NM1052
NM1052.The horizontal coordinates were established by GPS observations
NM1052.and adjusted by the National Geodetic Survey in June 1996.
NM1052
NM1052.The orthometric height was determined by differential leveling
NM1052.and adjusted by the National Geodetic Survey in June 1991.
NM1052
NM1052.The X, Y, and Z were computed from the position and the ellipsoidal ht.
NM1052
NM1052.The Laplace correction was computed from DEFLEC99 derived deflections.
NM1052
NM1052.The ellipsoidal height was determined by GPS observations
NM1052.and is referenced to NAD 83.
NM1052
NM1052.The geoid height was determined by GEOID99.
NM1052
NM1052.The dynamic height is computed by dividing the NAVD 88
NM1052.geopotential number by the normal gravity value computed on the
NM1052.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
NM1052.degrees latitude (g = 980.6199 gals.).
NM1052
NM1052.The modeled gravity was interpolated from observed gravity values.
NM1052
NM1052;
NM1052;SPC NE - North 331,628.240 East 727,442.409 Units MT Scale 0.99990933 Converg. +1 50 33.4
NM1052;UTM 14 - 4,738,709.833 645,623.891 MT 0.99986090 +1 12 34.7
NM1052
NM1052 SUPERSEDED SURVEY CONTROL
NM1052
NM1052 ELLIP HT - 367.47 (m) GP( ) 1 1
NM1052 NGVD 29 - 392.720 (m) 1288.45 (f) ADJ UNCH 2 0
NM1052
NM1052.Superseded values are not recommended for survey control.
NM1052.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
NM1052.See file dsdata.txt to determine how the superseded data were derived.
NM1052
NM1052_MARKER: DB = BENCH MARK DISK
NM1052_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
    
```

NM1052\_STAMPING: W 272 1949

NM1052\_MARK LOGO: CGS

NM1052\_MAGNETIC: N = NO MAGNETIC MATERIAL

NM1052\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

NM1052+STABILITY: SURFACE MOTION

NM1052

NM1052	HISTORY	- Date	Condition	Report By
NM1052	HISTORY	- 1949	MONUMENTED	CGS
NM1052	HISTORY	- 19950621	GOOD	NGS
NM1052	HISTORY	- 19960611	GOOD	NGS
NM1052	HISTORY	- 20000613	GOOD	NEDR

NM1052

NM1052

STATION DESCRIPTION

NM1052

NM1052'DESCRIBED BY COAST AND GEODETIC SURVEY 1949

NM1052'3 MI SE FROM ST HELENA.

NM1052'0.6 MILE SOUTH ALONG A GRAVELED ROAD FROM THE CATHOLIC CHURCH

NM1052'AT ST. HELENA, THENCE 0.8 MILE EAST ALONG A GRADED DIRT ROAD,

NM1052'THENCE 0.4 MILE SOUTH ALONG A GRADED DIRT ROAD, THENCE 0.75 MILE

NM1052'EAST ALONG A GRADED DIRT ROAD, THENCE 0.5 MILE SOUTH ALONG A

NM1052'GRADED DIRT ROAD, 158 FEET NORTH OF THE CENTER LINE OF AN

NM1052'EAST-WEST ROAD, 28 FEET EAST OF THE CENTER LINE OF A T ROAD

NM1052'LEADING NORTH, 97.0 FEET NORTH OF A FENCE CORNER POST, 1.4 FEET

NM1052'WEST OF A FENCE, 2.0 FEET SOUTH OF A REFERENCE POST, AND SET IN

NM1052'THE TOP OF A 5.5-FOOT CONCRETE POST PROJECTING 0.5 FOOT ABOVE

NM1052'THE GROUND.

NM1052

NM1052

STATION RECOVERY (1995)

NM1052

NM1052'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (JAO)

NM1052'THE MARK IS LOCATED ABOUT 4 MI (6.4 KM) NORTHWEST OF WYNOT, 2.5 MI

NM1052'(4.0 KM) SOUTHEAST OF SAINT HELENA, 1.5 MI (2.4 KM) SOUTHWEST OF THE

NM1052'MISSOURI RIVER, ON THE EAST RIGHT-OF-WAY OF A GRAVELED COUNTY ROAD AND

NM1052'IN THE SW1/4 OF THE SE1/4, SEC32, T33N, R2E. TO REACH THE MARK FROM

NM1052'THE CATHOLIC CHURCH IN SAINT HELENA, GO SOUTH ON STATE HIGHWAY 14H

NM1052'SPUR FOR 1.6 MI (2.6 KM) TO A GRAVELED CROSSROAD. TURN LEFT AND GO

NM1052'EAST ON A GRAVELED ROAD FOR 1.5 MI (2.4 KM) TO A SIDE ROAD ON THE LEFT

NM1052'AND THE MARK IN THE NORTHEAST ANGLE OF THE INTERSECTION. THE DISK IS

NM1052'SET INTO THE TOP OF A ROUND CONCRETE MONUMENT THAT PROJECTS ABOUT 1 FT

NM1052'(0.3 M) ABOVE THE GROUND. IT IS 159.5 FT (48.6 M) NORTH OF THE

NM1052'CENTERLINE OF THE EAST-WEST ROAD, 29.5 FT (9.0 M) EAST OF THE

NM1052'CENTERLINE OF THE ROAD LEADING NORTH, 2.7 FT (0.8 M) NORTH-NORTHEAST

NM1052'OF A CARSONITE WITNESS POST, 2.0 FT (0.6 M) SOUTH OF A WOODEN WITNESS

NM1052'POST, 1.2 FT (0.4 M) WEST OF THE EAST RIGHT-OF-WAY FENCE AND ABOUT 1.5

NM1052'FT (0.5 M) LOWER THAN THE ROAD.

NM1052

NM1052

STATION RECOVERY (1996)

NM1052

NM1052'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1996 (DFC)

NM1052'RECOVERED AS DESCRIBED.

NM1052

NM1052

STATION RECOVERY (2000)

NM1052

NM1052'RECOVERY NOTE BY NEBRASKA ROADS DEPARTMENT 2000 (JAO)

NM1052'RECOVERED AS DESCRIBED.

1 National Geodetic Survey, Retrieval Date = AUGUST 31, 2001

NM1857 \*\*\*\*\*  
 NM1857 DESIGNATION - STYLE  
 NM1857 PID - NM1857  
 NM1857 STATE/COUNTY- SD/CLAY  
 NM1857 USGS QUAD - MECKLING (1994)

NM1857  
 NM1857 \*CURRENT SURVEY CONTROL

NM1857\* NAD 83(1996)- 42 49 21.17105(N) 097 02 27.44787(W) ADJUSTED  
 NM1857\* NAVD 88 - 351.190 (meters) 1152.20 (feet) ADJUSTED  
 NM1857  
 NM1857 LAPLACE CORR- -0.04 (seconds) DEFLEC99  
 NM1857 GEOID HEIGHT- -25.56 (meters) GEOID99  
 NM1857 DYNAMIC HT - 351.087 (meters) 1151.86 (feet) COMP  
 NM1857 MODELED GRAV- 980,319.6 (mgal) NAVD 88

NM1857  
 NM1857 HORZ ORDER - FIRST  
 NM1857 VERT ORDER - FIRST CLASS II  
 NM1857

NM1857.The horizontal coordinates were established by classical geodetic methods  
 NM1857.and adjusted by the National Geodetic Survey in January 1998.  
 NM1857

NM1857.The orthometric height was determined by differential leveling  
 NM1857.and adjusted by the National Geodetic Survey in June 1994.  
 NM1857

NM1857.The Laplace correction was computed from DEFLEC99 derived deflections.  
 NM1857

NM1857.The geoid height was determined by GEOID99.  
 NM1857

NM1857.The dynamic height is computed by dividing the NAVD 88  
 NM1857.geopotential number by the normal gravity value computed on the  
 NM1857.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
 NM1857.degrees latitude (g = 980.6199 gals.).  
 NM1857

NM1857.The modeled gravity was interpolated from observed gravity values.  
 NM1857

NM1857;		North	East	Units	Scale	Converg.
NM1857;SPC SD S	-	59,683.759	869,164.951	MT	1.00000257	+2 16 16.5
NM1857;SPC NE	-	336,048.735	741,910.600	MT	0.99992345	+1 57 39.4
NM1857;UTM 14	-	4,742,970.597	660,139.472	MT	0.99991550	+1 19 54.8

NM1857:		Primary Azimuth Mark	Grid Az
NM1857:SPC SD S	-	STYLE AZ MK	019 28 07.2
NM1857:SPC NE	-	STYLE AZ MK	019 46 44.3
NM1857:UTM 14	-	STYLE AZ MK	020 24 28.9

NM1857	PID	Reference Object	Distance	Geod. Az
NM1857				ddmmss.s
NM1857	NM2145	STYLE AZ MK		0214423.7
NM1857	NM1854	VERMILLION UNIV OF S DAK STK	APPROX.10.5 KM	1134653.6
NM1857	NM1852	VERMILLION UNIV OF S DAK TK	APPROX.10.4 KM	1135335.5
NM1857	NM1849	VERMILLION UNIV OF S DAK CUP	APPROX.10.5 KM	1141324.2
NM1857	NM1848	VERMILLION FIRST CONG CH CUP	APPROX.10.4 KM	1171234.2
NM1857	NM1850	VERMILLION MUN L AND P CO STK	APPROX.10.1 KM	1174104.2
NM1857	NM1853	VERMILLION TANK	APPROX.10.1 KM	1193328.8
NM1857	NM2060	STYLE RM 1	32.413 METERS	16601
NM1857	TZ5025	STYLE RM 2	23.845 METERS	26342
NM1857	NM1858	GAYVILLE TANK	APPROX.13.1 KM	3041129.6
NM1857	NM1859	VOLIN TANK	APPROX.18.8 KM	3222631.3

NM1857

NM1857 SUPERSEDED SURVEY CONTROL  
 NM1857  
 NM1857 NAD 83(1995)- 42 49 21.17121(N) 097 02 27.44778(W) AD( ) 1  
 NM1857 NAD 83(1986)- 42 49 21.17665(N) 097 02 27.43850(W) AD( ) 1  
 NM1857 NAD 27 - 42 49 21.18600(N) 097 02 26.27100(W) AD( ) 1  
 NM1857

NM1857.Superseded values are not recommended for survey control.  
 NM1857.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
 NM1857.See file dsdata.txt to determine how the superseded data were derived.  
 NM1857

NM1857\_MARKER: DS = TRIANGULATION STATION DISK  
 NM1857\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
 NM1857\_STAMPING: STYLE 1935  
 NM1857\_MARK LOGO: CGS  
 NM1857\_MAGNETIC: N = NO MAGNETIC MATERIAL  
 NM1857\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
 NM1857+STABILITY: SURFACE MOTION  
 NM1857\_SATELLITE: THE SITE LOCATION WAS REPORTED AS NOT SUITABLE FOR  
 NM1857+SATELLITE: SATELLITE OBSERVATIONS - September 08, 1993  
 NM1857

NM1857	HISTORY	- Date	Condition	Report By
NM1857	HISTORY	- 1935	MONUMENTED	CGS
NM1857	HISTORY	- 1935	GOOD	CGS
NM1857	HISTORY	- 1948	GOOD	CGS
NM1857	HISTORY	- 19930908	GOOD	NGS

NM1857  
 NM1857 STATION DESCRIPTION

NM1857'DESCRIBED BY COAST AND GEODETIC SURVEY 1935 (CIA)  
 NM1857'STATION IS IN THE NORTHWEST QUARTER SEC. 6, T. 92 N., R. 52 W.,  
 NM1857'ON PROPERTY OWNED BY HENRY TAYLOR, AND RENTED BY D.V. STYLES.  
 NM1857'POINT IS ABOUT 6 MILES WEST AND 2 MILES NORTH OF VERMILLION  
 NM1857'AND 1-1/2 MILES SOUTH OF MECKLING. MARK IS SET IN FRONT  
 NM1857'FARMYARD OF THE D.V. STYLES HOUSE, 81-1/2 FEET NORTH OF  
 NM1857'NORTH SIDE OF HOUSE, 49 FEET SOUTH OF CENTERLINE OF ROAD,  
 NM1857'24 FEET WEST OF WEST FENCE OF GARDEN AND ABOUT 0.05 MILE  
 NM1857'EAST OF NORTH-SOUTH SECTION-LINE ROAD. MARK IS FLUSH WITH  
 NM1857'GROUND.

NM1857'  
 NM1857'REACHED FROM INTERSECTION OF STATE HIGHWAYS 19 AND 50 AT  
 NM1857'WEST EDGE OF VERMILLION BY GOING NORTHWEST ON STATE HIGHWAY  
 NM1857'50 FOR 4.95 MILES TO DIRT CROSS ROAD, TURN LEFT AND GO WEST  
 NM1857'1 MILE, THENCE LEFT (SOUTH) FOR 0.05 MILE TO FARM ENTRANCE  
 NM1857'ON EAST SIDE OF ROAD AND GO 0.05 MILE EAST TO FARMHOUSE AND  
 NM1857'STATION.

NM1857'  
 NM1857'REFERENCE MARK NO. 1 IS SET IN SOUTHWEST FENCE CORNER OF  
 NM1857'GARDEN, 18 FEET EAST OF SOUTHEAST CORNER OF HOUSE.

NM1857'  
 NM1857'REFERENCE MARK NO. 2 IS SET AT EAST EDGE OF COTTONWOOD TREE  
 NM1857'GROVE, AND 60 FEET SOUTH OF CENTERLINE OF ROAD.

NM1857'  
 NM1857'AZIMUTH MARK IS ABOUT 0.5 MILE NORTHEAST OF STATION ON RAILROAD  
 NM1857'RIGHT-OF-WAY. FROM STATION, GO NORTH 0.6 MILE TO STATE  
 NM1857'HIGHWAY 50, TURN RIGHT (SOUTHEAST) AND GO 0.25 MILE TO MARK,  
 NM1857'SET 60 FEET NORTHEAST OF CENTERLINE OF STATE HIGHWAY 50  
 NM1857'AND 6 FEET SOUTH OF SOUTH RAIL OF RAILROAD TRACKS.

NM1857'  
 NM1857'AZIMUTH AND REFERENCE MARKS PROJECT ABOUT 8 INCHES ABOVE  
 NM1857'GROUND.

NM1857'  
 NM1857'HEIGHT OF LIGHT ABOVE STATION MARK - 26 METERS.

NM1857  
 NM1857 STATION RECOVERY (1935)

NM1857

NM1857'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1935

NM1857'RECOVERED IN GOOD CONDITION.

NM1857

NM1857

STATION RECOVERY (1948)

NM1857

NM1857'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1948 (MEW)

NM1857'STATION RECOVERED AS DESCRIBED AND ALL MARKS FOUND IN GOOD

NM1857'CONDITION BUT DUE TO SOME CHANGES IN HOW TO REACH, A NEW

NM1857'DESCRIPTION FOLLOWS.

NM1857'

NM1857'LOCATED ABOUT 6 MILES WEST AND 2 MILES NORTH OF VERMILLION

NM1857'AND 1-1/2 MILES SOUTH OF MECKLING. IN THE NORTHWEST 1/4

NM1857'OF SEC. 6, T. 92 N., R. 52 W. ON PROPERTY NOW OWNED AND

NM1857'OCCUPIED BY MR. G.L. IVERSON. IT IS 81 FEET NORTH OF THE

NM1857'FARMHOUSE, 49 FEET SOUTH OF THE APPROXIMATE CENTERLINE OF

NM1857'THE EAST-WEST ROAD AND 24 FEET WEST OF THE WEST FENCE LINE

NM1857'OF THE GARDEN. THE STATION MARK

NM1857'IS FLUSH WITH THE GROUND AND THE DISC IS STAMPED

NM1857'STYLES 1935.

NM1857'

NM1857'REFERENCE MARK NO. 1 IS SOUTHEAST OF THE STATION, 18 FEET

NM1857'EAST OF THE SOUTHEAST CORNER OF THE HOUSE, BETWEEN THE DRIVEWAY

NM1857'AND THE HOUSE. THE MARK PROJECTS

NM1857'ABOUT 2 INCHES AND THE DISC IS STAMPED STYLE NO 1 1935.

NM1857'

NM1857'REFERENCE MARK NO. 2 IS WEST OF THE STATION, 60 FEET SOUTH

NM1857'OF THE CENTERLINE OF THE EAST-WEST ROAD, 3 FEET NORTH OF

NM1857'A LARGE COTTONWOOD TREE WHICH IS AT THE EAST EDGE OF THE

NM1857'GROVE. THE MARK PROJECTS ABOUT 1

NM1857'INCH AND THE DISC IS STAMPED STYLES NO 2 1935.

NM1857'

NM1857'THE AZIMUTH MARK IS ABOUT 0.5 MILE NORTHEAST OF THE STATION.

NM1857'IT IS ON THE RAILROAD RIGHT-OF-WAY, 6 FEET SOUTH OF THE

NM1857'SOUTH RAIL AND 60 FEET NORTH OF THE CENTERLINE OF STATE

NM1857'HIGHWAY 50. THE MARK PROJECTS

NM1857'4 INCHES AND THE DISC IS STAMPED STYLE 1935.

NM1857'

NM1857'STATION WAS REACHED FROM THE JUNCTION OF STATE HIGHWAYS

NM1857'50 AND 19, AT THE WEST EDGE OF VERMILLION, BY GOING WESTERLY

NM1857'ON HIGHWAY 50 FOR 5.7 MILES TO THE AZIMUTH MARK ON THE RIGHT

NM1857'AS DESCRIBED ABOVE. CONTINUE WEST FOR 0.3 MILE TO CROSSROADS.

NM1857'TURN LEFT AND TAKE LEFT FORK, SOUTH, FOR 0.5 MILE TO A

NM1857'T-INTERSECTION OF ROADS. TAKE LEFT FORK AND GO EAST 0.05

NM1857'MILE TO THE ENTRANCE TO THE FARM AND THE STATION SITE IN

NM1857'THE LAWN NORTH OF THE HOUSE.

NM1857'

NM1857'HEIGHT OF LIGHT ABOVE STATION MARK - 22 METERS.

NM1857

NM1857

STATION RECOVERY (1993)

NM1857

NM1857'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1993

NM1857'9.1 KM (5.65 MI) WESTERLY ALONG STATE HIGHWAY 50 FROM THE JUNCTION OF

NM1857'STATE HIGHWAY 19 IN VERMILLION, THENCE 0.8 KM (0.50 MI) SOUTHERLY

NM1857'ALONG A GRAVELED ROAD, THENCE 0.1 KM (0.05 MI) EASTERLY ALONG A

NM1857'GRAVELED ROAD, 32.4 M (106.3 FT) NORTH-NORTHWEST OF REFERENCE MARK 1,

NM1857'20.6 M (67.6 FT) NORTH-NORTHEAST OF THE NORTHWEST CORNER OF A HOUSE,

NM1857'20.0 M (65.6 FT) NORTH OF THE NORTHEAST CORNER OF THE HOUSE, 15.5 M

NM1857'(50.9 FT) WEST OF THE CENTER OF A DRIVEWAY, 15.3 M (50.2 FT) NORTH OF

NM1857'THE ROAD CENTER, AND THE MONUMENT IS RECESSED 0.1 M (0.3 FT) BELOW

NM1857'THE GROUND SURFACE. NOTE--THE MONUMENT IS ON PROPERTY OWNED BY BROOK

NM1857'BYE, RR 3, BOX 117, VERMILLION, SD. THE ORIGINAL DESCRIPTION STATES

NM1857'THE DISK WAS STAMPED STYLES, BUT IT IS STAMPED AS ABOVE.

The Geographic Calculator - Version 3.05

Re entered to 'Bernhard, Eisenbraun and Associates'

Date: 09/05/01 Time: 12:29:25

Blue Marble Geographics  
46 Water Street, Gardiner, Maine 04345 USA  
(207) 582-6747 FAX (207) 582-7001

	Style	Style
Latitude: (Degrees)	42 49 21.17121 N	
Longitude: (Degrees)	097 02 27.44778 W	
Ellip. Ht.: (Meters)	0.00	
Northing: (US Feet)		195816.9269
Easting: (US Feet)		2883200.3777
Convergence: (Degrees)	- - - - -	2° 16' 17.34308"
Scale Factor:	- - - - -	1.000002569671
System:	Geodetic	United States State Plane 1927
Datum Transf.:	North American Datum 1983	NAD 1927 - CONUS
Ellipsoid:	GRS 1980	Clarke 1866
Zone:	- - - - -	4002 - South Dakota South
Datum Shift: (Seconds)	0.02619" N , 1.21290" E	
Datum Shift: (Meters)	0.81 N , 27.55 E	

Geodetic Datum Transformation 'NAD 1927 - CONUS'  
Transformation Method - Molodensky  
Semimajor Axis (meters): 6378206.400000  
Reciprocal Flattening (1/f): 294.9786982000  
Prime Meridian shift from Greenwich (deg): 0.0000000000  
X Shift to WGS 84 (meters): -8.00000  
Y Shift to WGS 84 (meters): 160.00000  
Z Shift to WGS 84 (meters): 176.00000

The Geographic Calculator - Version 3.05

Registered to 'Bernhard, Eisenbraun and Associates'

Date: 09/05/01 Time: 12:28:04

Blue Marble Geographics  
46 Water Street, Gardiner, Maine 04345 USA  
(207) 582-6747 FAX (207) 582-7001

W 272

W 272

Latitude: (Degrees) 42 47 13.54632 N  
Longitude: (Degrees) 097 13 10.36026 W  
Ellip. Ht.: (Meters) 0.00

Northing: (US Feet) 181057.8914  
Easting: (US Feet) 2835807.2459

Convergence: (Degrees) - - - - - 2° 8' 53.84309"  
Scale Factor: - - - - - 1.000011265423

System: Geodetic United States State Plane 1927  
Datum Transf.: North American Datum 1983 NAD 1927 - CONUS  
Ellipsoid: GRS 1980 Clarke 1866  
Zone: - - - - - 4002 - South Dakota South

Datum Shift: (Seconds) 0.02726" N , 1.23385" E  
Datum Shift: (Meters) 0.84 N , 28.04 E

Geodetic Datum Transformation 'NAD 1927 - CONUS'  
Transformation Method - Molodensky  
Semimajor Axis (meters): 6378206.400000  
Reciprocal Flattening (1/f): 294.9786982000  
Prime Meridian shift from Greenwich (deg): 0.0000000000  
X Shift to WGS 84 (meters): -8.00000  
Y Shift to WGS 84 (meters): 160.00000  
Z Shift to WGS 84 (meters): 176.00000

# Hydrographic and Overbank Surveys of the Missouri River at the Vermillion Reach, Myron Grove Game Production Area, and North Alabama Bend near Vermillion, South Dakota

Conducted for:

The U.S. Army Corps of Engineers, Omaha District  
Contract No. DACW45-01-D-0003, Delivery Order No. 8

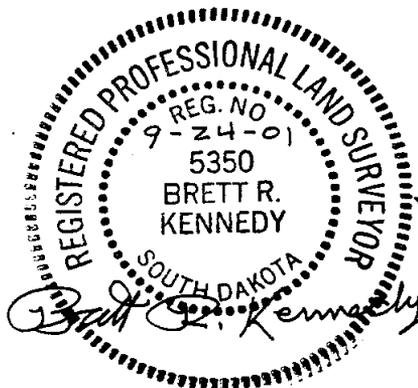
Surveyed by:

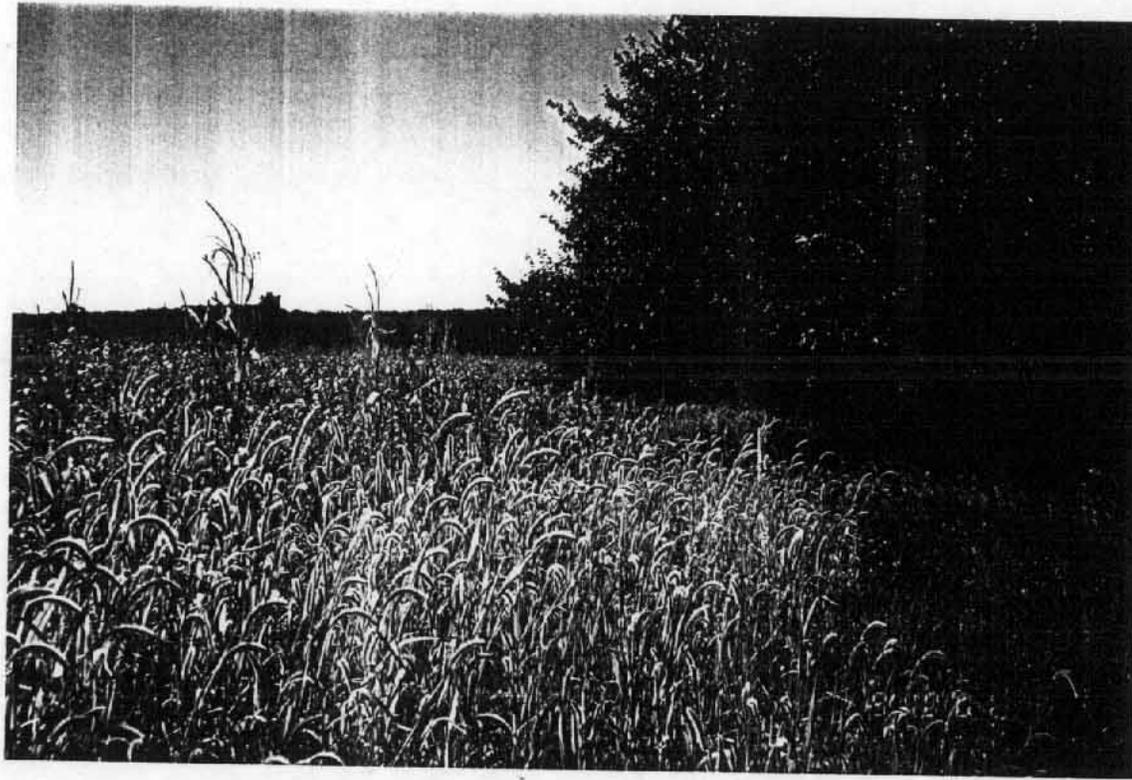
**Eisenbraun and Associates, Inc.**  
Yankton, South Dakota

As a Sub-consultant to:

**WEST Consultants, Inc.**

**September 2001**





Myron Grove CP 1

N = 179462.40

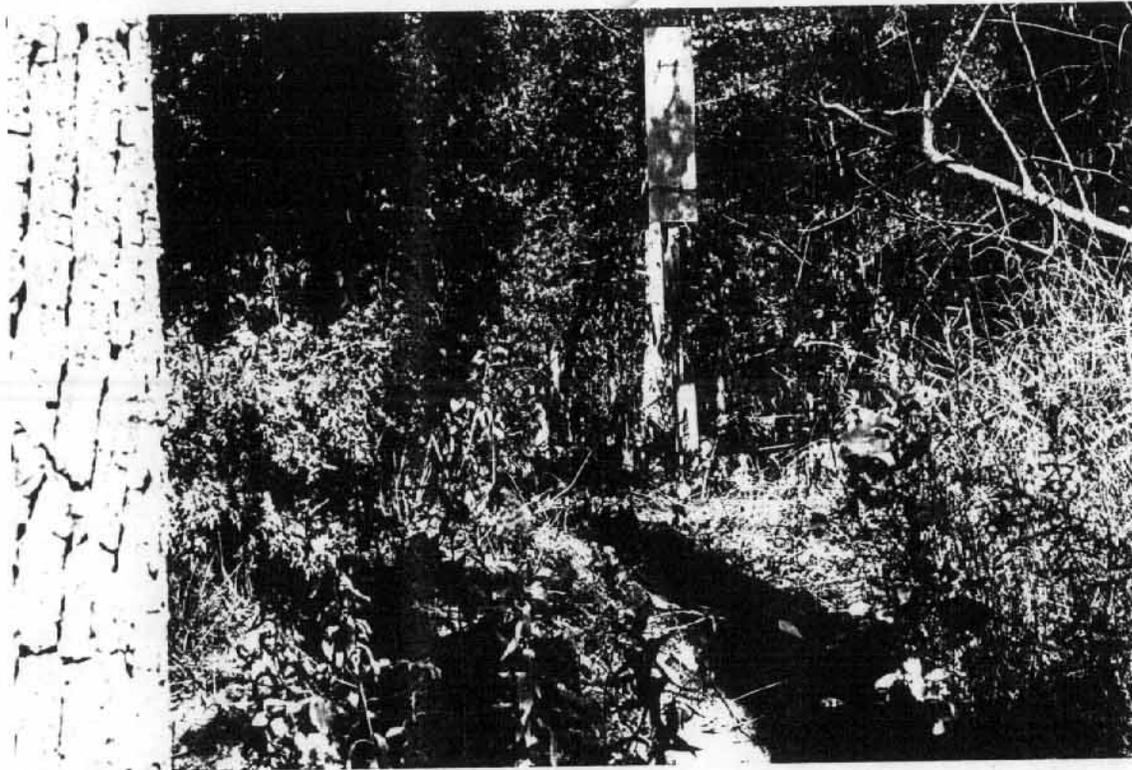
E = 2859767.62

Elev. = 1155.78

Description:

5/8" x 48" Rebar with Brass Cap stamped CP 1 with Steel  
Fence Post

Near upstream end of the north end of north-south treeline, and 50 feet back of the  
high bank



Myron Grove CP 2

N = 177612.06

E = 2859635.90

Elev. = 1157.41

Description:

5/8" x 48" Rebar with Brass Cap stamped CP 2 with Steel  
Fence Post

Near Range 822.0, 35.5 feet landward of the pipe on Range 822.0. Also, pipe is used for mile 787.6L water surface profile.

# STATE PLANE COORDINATE CONVERSION WORKSHEET

DATE: 9-21-01  
 NAME: JSM  
 PROJECT NUMBER: 400151507  
 PROJECT NAME: Myran Grove Hydro Survey

Triangulation Station: Brass Cap CP2

State Plane (Grid) Coordinates: (Easting) X = 2859635.90

(Northing) Y = 177612.06

Station Latitude: 42° 46' 30.64016 N

Mean Project Latitude: 42° 46' 41.42098 N

Elevation of Station: 1157.41

Average Project Elevation: 1155.95

From state projection tables, interpolate latitude to obtain scale factor expressed as a ratio.

Scale Factor (SF) = 1.0000135

Sea Level Factor =  $1 - \frac{h}{20,906,000}$  (where H = average project elevation)

Sea Level Factor (SLF) =  $1 - \frac{1155.95}{20,906,000} = \underline{0.9999447}$

COMBINATION FACTOR = Scale Factor x Sea Level Factor

CF =  $\frac{1.0000135}{\text{Scale Factor}} \times \frac{0.9999447}{\text{Sea Level Factor}} = \frac{0.9999582}{\text{Combination Factor}}$

PROJECT DATUM COORDINATES = GRID COORDINATES / CF  
 (Use *all* significant figures in this computation)

(Easting) X = \_\_\_\_\_

(Northing) Y = \_\_\_\_\_

To differentiate project datum coordinates from State Plane (Grid) Coordinates, record project datum coordinates with only 5 places left of decimal.

PROJECT DATUM COORDINATES TO BE USED:

(Easting) X = \_\_\_\_\_

(Northing) Y = \_\_\_\_\_



Field Notes  
from  
Electronic  
Data Collectors

Project : Y00151S07 Myron Grove Game Production Area  
 User name: JJM Date & Time: 7:15:38 AM 9/11/01  
 Coordinate System: Projection from data collector  
 Zone: Zone from data collector  
 Project Datum: (WGS 84)  
 Vertical Datum & Geoid Model: Not selected  
 Coordinate Units: US survey feet  
 Distance Units: US survey feet  
 Height Units: US survey feet

1034 179052.318 2859473.797 1138.381

WE

Point listing

Name	Northing	Easting	Elevation	Feature Code
1	195816.927	2883200.378	1151.468	STYLE
2	181057.891	2835807.246	1288.450	W272
10	177035.116	2862408.808	1157.883	CP10
11	177039.593	2862312.338	1157.314	CP11
12	178220.934	2858107.078	1139.995	CP12
101	195816.927	2883200.378	?	?
102	181057.891	2835807.246	1288.450	STYLE
500	179462.396	2859767.616	1155.752	W 272
501	177612.064	2859635.899	1157.272	CP1-BRASS CAP
502	177582.894	2859615.708	1159.008	CP2-BRASS CAP
1000	179552.854	2859792.851	1156.517	PIPE Range 787.6LB
1001	179529.535	2859836.807	1156.889	HB
1002	179399.389	2859687.810	1156.288	G
1003	179219.297	2859574.727	1154.515	HB
1004	179047.012	2859481.118	1154.759	HB
1005	178865.612	2859385.988	1165.679	HB
1006	178691.844	2859312.135	1155.946	HB
1007	178506.446	2859255.853	1157.739	HB
1008	178285.830	2859238.293	1156.164	HB
1009	178104.968	2859269.821	1156.200	HB
1010	177563.194	2859598.794	1150.447	HB
1011	177580.704	2859608.971	1164.739	G
1012	177556.623	2859593.554	1139.786	T
1013	177553.644	2859589.562	1137.802	WE
1014	177738.157	2859445.956	1138.478	T
1015	177734.899	2859442.920	1137.761	WE
1016	177912.465	2859329.788	1138.023	WE
1017	177904.481	2859315.329	1135.335	W
1018	177919.099	2859342.263	1142.608	T
1019	177925.525	2859351.557	1156.569	HB
1020	177748.581	2859461.084	1157.506	HB
1021	178100.980	2859260.170	1139.399	T
1022	178099.287	2859256.978	1137.899	WE
1023	178093.661	2859236.807	1135.718	W
1024	178288.514	2859207.253	1135.187	W
1025	178289.226	2859228.170	1138.123	WE
1026	178508.860	2859242.765	1138.015	WE
1027	178513.929	2859227.913	1135.595	W
1028	178694.910	2859297.818	1138.339	WE
1029	178872.216	2859377.759	1138.398	WE
1030	179224.766	2859566.171	1138.434	WE
1031	179558.755	2859784.190	1138.750	WE
1032	179561.647	2859781.138	1137.429	W
1033	179408.333	2859679.017	1139.000	WE

North Alabama  
Bend

Missouri River Mile  
780.5 to 779.0, Right Bank

Dixon County,  
Nebraska

Survey Control  
Information  
and  
Site Specific  
Control Point  
Documentation

NM1070 \*\*\*\*\*

NM1070 DESIGNATION - LIME CREEK #3  
 NM1070 PID - NM1070  
 NM1070 STATE/COUNTY- NE/DIXON  
 NM1070 USGS QUAD - OBERT (1968)

NM1070 \*CURRENT SURVEY CONTROL

NM1070\* NAD 83(1995)- 42 43 50.87809(N) 097 00 54.14838(W) ADJUSTED  
 NM1070\* NAVD 88 - 435.719 (meters) 1429.52 (feet) ADJUSTED

NM1070 LAPLACE CORR- 0.30 (seconds) DEFLECC99  
 NM1070 GEOID HEIGHT- -25.54 (meters) GEOID99  
 NM1070 DYNAMIC HT - 435.586 (meters) 1429.09 (feet) COMP  
 NM1070 MODELED GRAV- 980,302.0 (mgal) NAVD 88

NM1070 HORZ ORDER - SECOND  
 NM1070 VERT ORDER - SECOND CLASS 0

NM1070.The horizontal coordinates were established by classical geodetic methods and adjusted by the National Geodetic Survey in August 1997.

NM1070.The orthometric height was determined by differential leveling and adjusted by the National Geodetic Survey in June 1991.

NM1070.The Laplace correction was computed from DEFLECC99 derived deflections.

NM1070.The geoid height was determined by GEOID99.

NM1070.The dynamic height is computed by dividing the NAVD 88 geopotential number by the normal gravity value computed on the Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45 degrees latitude (g = 980.6199 gals.).

NM1070.The modeled gravity was interpolated from observed gravity values.

	North	East	Units	Scale	Converg.
NM1070; SPC NE	- 325,936.462	744,380.293	MT	0.99988771	+1 58 41.2
NM1070; SPC SD S	- 49,583.928	871,689.711	MT	1.00002585	+2 17 20.9
NM1070; UTM 14	- 4,732,831.631	662,497.867	MT	0.99992487	+1 20 49.9

	Primary Azimuth Mark	Grid Az
NM1070: SPC NE	- LIME CREEK AZ MK	356 31 29.9
NM1070: SPC SD S	- LIME CREEK AZ MK	356 12 50.2
NM1070: UTM 14	- LIME CREEK AZ MK	357 09 21.2

PID	Reference Object	Distance	Geod. Az
NM1070	NM1069 LIME CREEK RM 1		dddmmss.s
NM1070	NM1071 LIME CREEK RM 2		15534
NM1070	LIME CREEK AZ MK		25301
NM1070			3583011.1

NM1070 SUPERSEDED SURVEY CONTROL

NM1070 NAD 83(1986)- 42 43 50.88357(N) 097 00 54.14017(W) AD( ) 2  
 NM1070 NAD 27 - 42 43 50.89100(N) 097 00 52.97700(W) AD( ) 2  
 NM1070 NGVD 29 - 435.517 (m) 1428.86 (f) ADJ UNCH 2 0

NM1070.Superseded values are not recommended for survey control.  
 NM1070.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
 NM1070.See file dsdata.txt to determine how the superseded data were derived.

NM1070

NM1070 MARKER: P = PIPE CAP

NM1070 SETTING: 17 = SET INTO TOP OF METAL PIPE DRIVEN INTO GROUND

NM1070 STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY

NM1070

NM1070	HISTORY	- Date	Condition	Report By
NM1070	HISTORY	- 1948	MONUMENTED	MORC
NM1070	HISTORY	- 1949	GOOD	NGS

NM1070

## STATION DESCRIPTION

NM1070

NM1070 DESCRIBED BY MISSOURI RIVER COMMISSION 1948 (MEW)

NM1070 STATION IS LOCATED ABOUT 8 MILES EAST OF WYNOT AND 4 MILES

NM1070 NORTHWEST OF OBERT ON NORTH FACE OF HIGHEST BLUFF. STATION

NM1070 IS 40 FEET EAST OF FENCELINE. STATION MARK IS A STANDARD

NM1070 MISSOURI RIVER COMMISSION MARK WHICH IS A 2 INCH IRON PIPE

NM1070 WITH CAP SET IN A SQUARE BLOCK OF CONCRETE AND PROJECTS

NM1070 ABOUT 4 INCHES.

NM1070

NM1070 REFERENCE MARK NO. 1 IS 41.20 FEET (SLOPE MEASUREMENT) SOUTH

NM1070 SOUTHEAST OF STATION. THE DISK IS SET IN CONCRETE IN A

NM1070 STOVEPIPE WHICH PROJECTS ABOUT 2 INCHES AND IS STAMPED LIME

NM1070 CREEK MRC NO 1 1948.

NM1070

NM1070 REFERENCE MARK NO. 2 IS 68.80 FEET (SLOPE MEASUREMENT) SOUTHWEST

NM1070 OF STATION AND 1 FOOT EAST OF FENCE. THE DISK IS SET IN

NM1070 CONCRETE IN A STOVEPIPE WHICH PROJECTS ABOUT 3 INCHES AND

NM1070 IS STAMPED LIME CREEK MRC NO 2 1948.

NM1070

NM1070 AZIMUTH MARK IS APPROXIMATELY 1.5 MILES NORTH OF STATION, 12

NM1070 FEET WEST OF FENCECORNER, 10 FEET NORTH OF THE APPROXIMATE

NM1070 CENTERLINE OF FARM ROAD, 2 FEET WEST OF WITNESS POST AND

NM1070 1 FOOT SOUTH OF FENCE. THE MARK PROJECTS ABOUT 4 INCHES

NM1070 AND THE DISK IS STAMPED LIME CREEK MRC 1948.

NM1070

NM1070 TO REACH STATION FROM THE POST OFFICE IN WYNOT GO SOUTH

NM1070 ON MAIN STREET FOR 0.05 MILE TO CROSS STREET. TURN LEFT

NM1070 AND GO EAST FOR 0.05 MILE TO STATE HIGHWAY 12. TURN RIGHT

NM1070 AND GO SOUTH AND EAST ON STATE HIGHWAY 12 FOR 1.65 MILE

NM1070 TO T ROAD LEFT AT SERVICE STATION. TURN LEFT AND GO EAST AND

NM1070 NORTHEAST ON GRAVEL ROAD FOR 3.75 MILES TO T INTERSECTION.

NM1070 TURN LEFT AND GO 0.65 MILE TO ANOTHER T INTERSECTION. TURN

NM1070 RIGHT AND GO EAST FOR 2.05 MILES TO A T ROAD RIGHT. TURN

NM1070 RIGHT AND GO SOUTH FOR 1.45 MILES TO A T ROAD LEFT. TURN LEFT

NM1070 AND GO EAST FOR 1.0 MILE TO POINT WHERE MAIN ROAD TURNS

NM1070 LEFT. KEEP STRAIGHT AHEAD ON FARM ROAD ALONG EDGE OF

NM1070 BLUFFS FOR 0.2 MILE TO WIRE GATE BETWEEN TWO TREES NEAR

NM1070 FARMHOUSE. GO THROUGH GATE AND FOLLOW FARM ROAD ALONG

NM1070 EDGE OF FIELD FOR 0.2 MILE TO END OF LANE ON RIGHT AND END

NM1070 OF TRUCK TRAVEL. PACK THROUGH WIRE GATE INTO SOUTHEAST

NM1070 CORNER OF PASTURE THEN BEAR RIGHT UP STEEP BLUFF FOR

NM1070 ABOUT 0.3 MILE TO STATION ON HIGHEST BLUFF AS DESCRIBED.

NM1070

NM1070 TO REACH AZIMUTH MARK FROM POINT WHERE MAIN ROAD TURNS LEFT

NM1070 OR NORTH GO NORTH ON MAIN ROAD FOR 1.0 MILE TO FARM ROAD

NM1070 AND AZIMUTH ON LEFT OR WEST SIDE OF ROAD AS DESCRIBED.

NM1070

NM1070 A 74 FOOT SIGNAL AT STATION WILLOUGHBY 1935 IS VISIBLE FROM

NM1070 THE GROUND.

NM1070

NM1070 A 74 FOOT SIGNAL AT STATION WALTON 1935 IS VISIBLE FROM THE

NM1070 GROUND.

NM1070

NM1070 A 100 FOOT SIGNAL AT STATION STYLE 1935 IS VISIBLE FROM THE

NM1070'GROUND.  
NM1070'  
NM1070'HEIGHT OF LIGHT ABOVE STATION MARK 1 METERS.  
NM1070  
NM1070  
NM1070  
NM1070  
NM1070  
NM1070'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1949  
NM1070'11.9 MI E FROM WYNOT.  
NM1070'0.15 MILE WEST ALONG STATE HIGHWAY 12 FROM THE HIGH SCHOOL AT  
NM1070'WYNOT, THENCE 0.9 MILE NORTH ALONG A GRAVELED ROAD, THENCE 0.55  
NM1070'MILE NORTHEAST ALONG A GRAVELED ROAD, THENCE 0.75 MILE EAST ALONG  
NM1070'A GRADED DIRT ROAD, THENCE 0.2 MILE SOUTH ALONG A GRADED DIRT  
NM1070'ROAD, THENCE 6.4 MILES EAST ALONG A GRADED DIRT ROAD, THENCE 1.35  
NM1070'MILES SOUTH ALONG A GRADED DIRT ROAD, THENCE 1.05 MILES EAST  
NM1070'ALONG A GRADED DIRT ROAD, THENCE 0.25 MILE SOUTHEAST ALONG A  
NM1070'DIRT ROAD, THENCE ABOUT 0.3 MILE SOUTHWEST THROUGH A PASTURE  
NM1070'AND TO THE TOP OF A HILL AND THE VICINITY OF THE MARK, 67.0 FEET  
NM1070'EAST OF A NORTH AND SOUTH FENCE WHICH IS ON THE DIXON-CEDAR COUNTY  
NM1070'LINE, A 2 INCH BRASS CAP ON THE TOP OF A 2 INCH IRON PIPE WHICH  
NM1070'IS SET IN CONCRETE AND PROJECTS 0.4 FOOT ABOVE THE GROUND.

NM0895 \*\*\*\*\*

NM0895 DESIGNATION - WILLOUGHBY #1  
 NM0895 PID - NM0895  
 NM0895 STATE/COUNTY- NE/DIXON  
 NM0895 USGS QUAD - MASKELL (1994)

NM0895  
 NM0895 \*CURRENT SURVEY CONTROL

NM0895\* NAD 83(1995)- 42 40 10.19434(N) 096 56 03.47849(W) ADJUSTED  
 NM0895\* NAVD 88 - 462.084 (meters) 1516.02 (feet) ADJUSTED

NM0895 LAPLACE CORR- 0.37 (seconds) DEFLEC99  
 NM0895 GEOID HEIGHT- -25.43 (meters) GEOID99  
 NM0895 DYNAMIC HT - 461.939 (meters) 1515.54 (feet) COMP  
 NM0895 MODELED GRAV- 980,293.3 (mgal) NAVD 88

NM0895  
 NM0895 HORZ ORDER - FIRST  
 NM0895 VERT ORDER - SECOND CLASS 0

NM0895.The horizontal coordinates were established by classical geodetic methods  
 NM0895.and adjusted by the National Geodetic Survey in August 1997.

NM0895.The orthometric height was determined by differential leveling  
 NM0895.and adjusted by the National Geodetic Survey in June 1991.

NM0895.The Laplace correction was computed from DEFLEC99 derived deflections.

NM0895.The geoid height was determined by GEOID99.

NM0895.The dynamic height is computed by dividing the NAVD 88  
 NM0895.geopotential number by the normal gravity value computed on the  
 NM0895.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
 NM0895.degrees latitude (g = 980.6199 gals.).

NM0895.The modeled gravity was interpolated from observed gravity values.

	North	East	Units	Scale	Converg.
NM0895; SPC NE	- 319,363.148	751,229.307	MT	0.99986528	+2 01 53.9
NM0895; SPC SD S	- 43,046.988	878,575.516	MT	1.00004281	+2 20 41.4
NM0895; UTM 14	- 4,726,182.867	669,274.489	MT	0.99995254	+1 24 01.4

	Primary Azimuth Mark	Grid Az
NM0895: SPC NE	- WILLOUGHBY AZ MK	190 55 00.8
NM0895: SPC SD S	- WILLOUGHBY AZ MK	190 36 13.3
NM0895: UTM 14	- WILLOUGHBY AZ MK	191 32 53.3

PID	Reference Object	Distance	Geod. Az
NM0895			dddmsss.s
NM0895	NM1853 VERMILLION TANK	APPROX.12.0 KM	0002424.7
NM0895	NM1848 VERMILLION FIRST CONG CH CUP	APPROX.12.2 KM	0022827.5
NM0895	NM1852 VERMILLION UNIV OF S DAK TK	APPROX.12.8 KM	0034222.5
NM0895	NM1854 VERMILLION UNIV OF S DAK STK	APPROX.12.8 KM	0035500.8
NM0895	NM1846 CHURCH SPIRE D	APPROX.23.0 KM	0182213.4
NM0895	NM0896 WILLOUGHBY RM 1	30.037 METERS	02539
NM0895	WILLOUGHBY AZ MK		1925654.7
NM0895	NM0897 WILLOUGHBY RM 2	41.203 METERS	35553

NM0895  
 NM0895 SUPERSEDED SURVEY CONTROL

NM0895 NAD 83(1986)- 42 40 10.19925(N) 096 56 03.47083(W) AD( ) 1  
 NM0895 NAD 27 - 42 40 10.20200(N) 096 56 02.31300(W) AD( ) 1

NM0895 NGVD 29 - 461.888 (m) 1515.38 (f) ADJ UNCH 2 0  
 NM0895

NM0895.Superseded values are not recommended for survey control.

NM0895.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

NM0895.See file dsdata.txt to determine how the superseded data were derived.

NM0895

NM0895\_MARKER: DS = TRIANGULATION STATION DISK

NM0895\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

NM0895\_STAMPING: WILLOUGHBY 1935

NM0895\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

NM0895+STABILITY: SURFACE MOTION

NM0895

NM0895	HISTORY	- Date	Condition	Report By
NM0895	HISTORY	- 1935	MONUMENTED	CGS
NM0895	HISTORY	- 1948	GOOD	CGS
NM0895	HISTORY	- 1949	GOOD	NGS
NM0895	HISTORY	- 1962	GOOD	USGS

NM0895

NM0895

#### STATION DESCRIPTION

NM0895

NM0895'DESCRIBED BY COAST AND GEODETIC SURVEY 1935 (CIA)  
 NM0895'STATION IS LOCATED IN THE SOUTHWEST QUARTER SEC. 11, T. 31 N.,  
 NM0895'R. 4 E., ABOUT 3 MILES NORTHWEST OF NEWCASTLE AND 3 MILES  
 NM0895'SOUTHEAST OF MASKELL, ON A HILL OVERLOOKING THE MISSOURI  
 NM0895'VALLEY TO THE NORTH AND VERMILLION SOUTH DAKOTA IS ON THE  
 NM0895'NORTH.

NM0895'

NM0895'TO REACH FROM THE SECURITY STATE BANK IN MASKELL, GO 0.05  
 NM0895'MILE TO NORTH END OF TOWN, TURN RIGHT (EAST) ON A GRADED DIRT  
 NM0895'ROAD AND GO 1.5 MILES, TURN RIGHT (SOUTH) AT T-FORK, FOLLOWING  
 NM0895'MAIN ROAD AND GO 2.0 MILES, TURN SHARP LEFT (NORTH) AND GO  
 NM0895'0.35 MILE, TURN RIGHT (NORTHEAST AND EAST) ON A DIM ROAD  
 NM0895'ACROSS FIELD PASSING A CLUMP OF BUSHES. GO 0.25 MILE TO TOP  
 NM0895'OF RIDGE, TURN SHARP RIGHT (WEST) (SOUTH) AND GO 0.05 MILE TO  
 NM0895'100 FEET SOUTH OF POINT OF RISE AND STATION. STATION IS IN  
 NM0895'AN EAST-WEST FENCE LINE.

NM0895'

NM0895'REFERENCE MARK NO. 1 IS LOCATED 98.55 FEET EAST-NORTHEAST  
 NM0895'OF STATION, 40 FEET SOUTHEAST OF TOP OF RIDGE.

NM0895'

NM0895'REFERENCE MARK NO. 2 IS LOCATED 135.18 FEET NORTH-NORTHWEST  
 NM0895'OF STATION, 20 FEET SOUTHWEST OF TOP OF RIDGE.

NM0895'

NM0895'AZIMUTH MARK IS LOCATED 0.7 MILE SOUTH-SOUTHWEST OF STATION  
 NM0895'ON RIGHT (WEST) OF NORTH-SOUTH ROAD, 30 FEET WEST OF CENTERLINE  
 NM0895'OF ROAD, IN NORTH-SOUTH FENCE LINE, JUST NORTH OF TURN IN  
 NM0895'ROAD.

NM0895'

NM0895'HEIGHT OF LIGHT ABOVE STATION MARK - 23 METERS.

NM0895

NM0895

NM0895

#### STATION RECOVERY (1948)

NM0895'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1948 (MEW)

NM0895'THE STATION WAS RECOVERED AS DESCRIBED BY C.I.A. IN 1948 AND  
 NM0895'ALL MARKS WERE FOUND IN GOOD CONDITION. DISTANCES TO REFERENCE

NM0895'MARKS WERE CHECKED AND FOUND TO BE CORRECT. A DIFFERENCE  
 NM0895'WAS FOUND IN THE DIRECTION TO THE AZIMUTH MARK. A COMPLETE  
 NM0895'NEW DESCRIPTION FOLLOWS.

NM0895'

NM0895'THE STATION IS LOCATED ABOUT 3 MILES NORTHWEST OF NEWCASTLE, ABOUT  
 NM0895'3 MILES SOUTHEAST OF MASKELL, ABOUT 7-3/4 MILES SOUTH OF  
 NM0895'VERMILLION, SOUTH DAKOTA, ON A HILL OVERLOOKING THE MISSOURI  
 NM0895'RIVER TO THE NORTH. IT IS SET IN AN EAST-WEST FENCE LINE,  
 NM0895'0.25 MILE EAST OF A DIRT ROAD, AND IS ABOUT 150 FEET SOUTH

NM0895' OF THE HIGHEST POINT OF THE HILL. THE DISK IS STAMPED  
NM0895' WILLOUGHBY 1935.

NM0895'

NM0895' REFERENCE MARK NO. 1 IS 98.55 FEET NORTH-NORTHEAST OF THE  
NM0895' STATION, AND IS ABOUT 40 FEET SOUTHEAST OF THE TOP OF THE  
NM0895' HILL. THE DISK IS STAMPED WILLOUGHBY NO 1 1935.

NM0895'

NM0895' REFERENCE MARK NO. 2 IS 135.18 FEET NORTH-NORTHWEST OF THE  
NM0895' STATION, AND ABOUT 20 FEET SOUTHWEST OF THE TOP OF THE HILL.  
NM0895' THE DISK IS STAMPED WILLOUGHBY NO 2 1935.

NM0895'

NM0895' THE AZIMUTH MARK IS ABOUT 0.8 MILE SOUTH-SOUTHWEST OF THE  
NM0895' STATION, 30 FEET WEST OF THE CENTER LINE OF A DIRT ROAD AND  
NM0895' JUST NORTH OF A SIDE ROAD EAST. THE DISK IS STAMPED WILLOUGHBY  
NM0895' 1935.

NM0895'

NM0895' TO REACH THE STATION FROM THE POST OFFICE IN NEWCASTLE,  
NM0895' GO WEST ON STATE HIGHWAY 12 FOR 2.5 MILES TO A CROSSROAD.  
NM0895' TURN RIGHT AND GO NORTH ON A DIRT ROAD FOR 0.6 MILE TO A  
NM0895' SIDE ROAD LEFT. TURN LEFT AND GO WEST FOR 1.05 MILE TO A  
NM0895' T ROAD INTERSECTION AND THE AZIMUTH MARK ON THE LEFT JUST  
NM0895' AFTER TURNING TO THE RIGHT. CONTINUE NORTH FOR 0.8 MILE  
NM0895' THENCE TURN RIGHT AND GO EAST ALONG FENCE LINE FOR 0.25 MILE  
NM0895' TO THE STATION.

NM0895'

NM0895' HEIGHT OF TOWER- 64 FEET.

NM0895'

NM0895'

STATION RECOVERY (1949)

NM0895'

NM0895' RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1949

NM0895' 4.4 MI SE FROM MASKELL.

NM0895' 0.2 MILE NORTH ALONG A GRAVELED STREET FROM THE MASKELL HIGH  
NM0895' SCHOOL AT MASKELL, THENCE 1.45 MILES EAST ALONG A GRADED DIRT  
NM0895' ROAD, THENCE 2.15 MILES SOUTHEAST ALONG A GRADED DIRT ROAD,  
NM0895' THENCE 0.35 MILE NORTH ALONG A DIRT ROAD, THENCE 0.2 MILE EAST  
NM0895' ALONG A DIM PRIVATE ROAD, AT THE TOP OF A HILL AND IN AN  
NM0895' EAST-WEST FENCE LINE, 135 FEET SOUTH OF THE HIGHEST POINT OF  
NM0895' THE HILL, 20 FEET SOUTH OF THE CENTER LINE OF THE PRIVATE ROAD,  
NM0895' 2.0 FEET WEST OF A REFERENCE POST, AND SET IN THE TOP OF A  
NM0895' CONCRETE POST PROJECTING 0.3 FEET ABOVE THE GROUND.

NM0895'

NM0895'

STATION RECOVERY (1962)

NM0895'

NM0895'

NM0895' RECOVERY NOTE BY US GEOLOGICAL SURVEY 1962

NM0895' RECOVERED IN GOOD CONDITION.

# The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

DATABASE = Sybase ,PROGRAM = datasheet, VERSION = 6.52

1 National Geodetic Survey, Retrieval Date = AUGUST 31, 2001

NM1743 \*\*\*\*\*

NM1743 FBN - This is a Candidate for Federal Base Network Control.

NM1743 DESIGNATION - BRANDT

NM1743 PID - NM1743

NM1743 STATE/COUNTY- NE/DIXON

NM1743 USGS QUAD - BURBANK (1994)

NM1743

NM1743 \*CURRENT SURVEY CONTROL

NM1743

NM1743\* NAD 83(1995)- 42 41 15.52029(N) 096 52 06.62399(W) ADJUSTED

NM1743\* NAVD 88 - 457.5 (meters) 1501. (feet) GPS OBS

NM1743

NM1743 X - -561,584.030 (meters) COMP

NM1743 Y - -4,662,165.373 (meters) COMP

NM1743 Z - 4,302,352.680 (meters) COMP

NM1743 LAPLACE CORR- -0.72 (seconds) DEFLEC99

NM1743 ELLIP HEIGHT- 431.99 (meters) GPS OBS

NM1743 GEOID HEIGHT- -25.46 (meters) GEOID99

NM1743

NM1743 HORZ ORDER - B

NM1743 ELLP ORDER - FOURTH CLASS I

NM1743

NM1743.The horizontal coordinates were established by GPS observations

NM1743.and adjusted by the National Geodetic Survey in June 1996.

NM1743

NM1743.The orthometric height was determined by GPS observations and a

NM1743.high-resolution geoid model.

NM1743

NM1743.The X, Y, and Z were computed from the position and the ellipsoidal ht.

NM1743

NM1743.The Laplace correction was computed from DEFLEC99 derived deflections.

NM1743

NM1743.The ellipsoidal height was determined by GPS observations

NM1743.and is referenced to NAD 83.

NM1743

NM1743.The geoid height was determined by GEOID99.

NM1743

NM1743; North East Units Scale Converg.

NM1743;SPC NE - 321,570.578 756,545.614 MT 0.99987180 +2 04 30.8

NM1743;UTM 14 - 4,728,331.869 674,615.272 MT 0.99997513 +1 26 43.9

NM1743

NM1743: Primary Azimuth Mark Grid Az

NM1743:SPC NE - BRANDT AZ MK 168 38 38.9

NM1743:UTM 14 - BRANDT AZ MK 169 16 25.8

NM1743

NM1743|-----|

NM1743| PID Reference Object Distance Geod. Az |

NM1743| | dddmmss.s |

NM1743| BRANDT RM 1 20.950 METERS 02819 |

NM1743| BRANDT AZ MK 1704309.7 |

NM1743| BRANDT RM 2 28.085 METERS 30914 |

NM1743|-----|

NM1743

NM1743 SUPERSEDED SURVEY CONTROL

NM1743

NM1743 ELLIP HT - 432.04 (m) GP( ) 1 1

NM1743 NAD 83(1986)- 42 41 15.52464(N) 096 52 06.61528(W) AD( ) 1

NM1743 NAD 27 - 42 41 15.52835(N) 096 52 05.46612(W) AD( ) 1  
 NM1743 NGVD 29 - 458.0 (m) 1503. (f) VERT ANG  
 NM1743

NM1743.Superseded values are not recommended for survey control.  
 NM1743.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
 NM1743.See file dsdata.txt to determine how the superseded data were derived.  
 NM1743

NM1743\_MARKER: DS = TRIANGULATION STATION DISK  
 NM1743\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
 NM1743\_STAMPING: BRANDT 1966  
 NM1743\_MARK LOGO: CGS  
 NM1743\_MAGNETIC: A = STEEL ROD ADJACENT TO MONUMENT  
 NM1743\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
 NM1743+STABILITY: SURFACE MOTION  
 NM1743

NM1743	HISTORY	- Date	Condition	Report By
NM1743	HISTORY	- 1966	MONUMENTED	CGS
NM1743	HISTORY	- 19950622	GOOD	NGS
NM1743	HISTORY	- 19960611	GOOD	NGS
NM1743	HISTORY	- 20000510	GOOD	NGS

NM1743  
 NM1743  
 NM1743

STATION DESCRIPTION

NM1743'DESCRIBED BY COAST AND GEODETIC SURVEY 1966 (COP)  
 NM1743'STATION IS LOCATED ABOUT 9 MILES WEST OF ELK POINT, ABOUT 9 MILES  
 NM1743'SOUTHEAST OF VERMILLION, ABOUT 5 MILES SOUTHWEST OF BURBANK, ABOUT  
 NM1743'2-1/2 MILES NORTH OF NEWCASTLE AND ABOUT 2 MILES NORTH OF THE SOUTH  
 NM1743'BANK OF THE MISSOURI RIVER. IT IS LOCATED ON THE HIGH HILL ON  
 NM1743'PROPERTY OWNED BY MR. RANDOLPH BRANDT AND IN THE SOUTHEAST  
 NM1743'QUARTER OF SECTION 5, TOWNSHIP 31 NORTH, RANGE 5 EAST. THE STATION  
 NM1743'MARK IS 64 FEET NORTHEAST OF AN ELM TREE, 62-1/2 FEET SOUTHEAST OF  
 NM1743'A MULBERRY TREE AND 61 FEET SOUTH OF FENCELINE. THE STATION IS  
 NM1743'MARKED BY A STANDARD TRIANGULATION STATION DISK SET IN THE TOP  
 NM1743'OF A 12 INCH CONCRETE CYLINDER MONUMENT THAT IS 3 INCHES BELOW  
 NM1743'THE SURFACE OF THE GROUND. THE DISK IS STAMPED BRANDT 1966.  
 NM1743'

NM1743'TO REACH THE STATION FROM THE SCHOOLHOUSE IN NEWCASTLE, GO EAST ON  
 NM1743'STATE HIGHWAY 12 FOR 0.2 MILE TO A CROSSROAD. TURN LEFT AND GO  
 NM1743'NORTH AND EAST ON A GRAVELED ROAD FOR 0.35 MILE TO A SIDE ROAD LEFT.  
 NM1743'TURN LEFT ON MAIN TRAVELED DIRT AND GRAVELED ROAD AND GO NORTHEAST  
 NM1743'FOR 0.0 MILES TO A SIDE ROAD LEFT. TURN LEFT AND GO NORTH ON  
 NM1743'DIRT ROAD FOR 0.4 MILE TO THE AZIMUTH MARK ON THE LEFT, ON THE TOP  
 NM1743'OF HILL AND IN THE FENCELINE. CONTINUE NORTHWESTERLY ON DIRT ROAD  
 NM1743'FOR 0.1 MILE TO WHERE POWERLINE CROSSES THE ROAD. TURN RIGHT AND GO  
 NM1743'NORTH TO A LONE LARGE TREE AND GATE IN FENCELINE. PASS THROUGH  
 NM1743'GATE AND GO NORTHERLY FOLLOWING FENCELINE FOR 0.2 MILE TO THE TOP OF  
 NM1743'HILL. TURN RIGHT AND GO NORTH EAST FOLLOWING RIDGE LINE FOR 0.2  
 NM1743'MILE TO THE TOP OF HILL AND STATION AS DESCRIBED.  
 NM1743'

NM1743'AZIMUTH MARK IS 2.2 FEET NORTHEAST OF METAL WITNESS POST WITH SIGN  
 NM1743'ATTACHED AND 1-1/2 FEET NORTH OF FENCELINE. IT IS MARKED BY A  
 NM1743'STANDARD DISK SET IN THE TOP OF A 12 INCH CONCRETE CYLINDER  
 NM1743'MONUMENT THAT IS FLUSH WITH THE SURFACE OF THE GROUND. THE DISK IS  
 NM1743'STAMPED BRANDT 1966.  
 NM1743'

NM1743'REFERENCE MARK NO. 1 IS 49 FEET EAST OF MULBERRY TREE, 36 FEET WEST  
 NM1743'OF A MULBERRY TREE AND 2 FEET SOUTH OF FENCELINE. IT IS MARKED BY A  
 NM1743'STANDARD DISK SET IN THE TOP OF A 12 INCH CONCRETE CYLINDER  
 NM1743'MONUMENT THAT PROJECTS 2 INCHES ABOVE THE SURFACE OF THE GROUND.  
 NM1743'THE DISK IS STAMPED BRANDT NO 1 1966.  
 NM1743'

NM1743'REFERENCE MARK NO. 2 IS 100 FEET NORTH OF AN ELM TREE AND 1-1/2 FEET  
 NM1743'SOUTH OF FENCELINE. IT IS MARKED BY A STANDARD DISK SET IN THE TOP  
 NM1743'OF A 12 INCH CONCRETE CYLINDER MONUMENT THAT IS FLUSH WITH THE

NM1743'SURFACE OF THE GROUND. THE DISK IS STAMPED BRANDT NO 2 1966.

NM1743'

NM1743'A MEASUREMENT COULD NOT BE MADE BETWEEN REFERENCE MARKS DUE TO A  
NM1743'TREE IN THE FENCELINE.

NM1743'

NM1743'THIS IS A PACK STATION IN WET WEATHER, PACK FROM POWERLINE.

NM1743'

NM1743'HEIGHT OF LIGHT ABOVE STATION MARK 18.54 METERS.

NM1743

NM1743

STATION RECOVERY (1995)

NM1743

NM1743'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (JAO)

NM1743'THE MARK IS LOCATED ABOUT 5.75 MI (9.25 KM) EAST OF MASKELL, 3.0 MI  
NM1743'(4.8 KM) NORTH OF NEWCASTLE, 2 MI (3.2 KM) SOUTH OF THE MISSOURI  
NM1743'RIVER, NEAR THE CENTER OF SEC5, T31N, R5E, ATOP A HIGH HILL IN A  
NM1743'PASTURE ON PROPERTY OWNED BY EUGENE BRANDT, RURAL ROUTE 1, BOX 104,  
NM1743'NEWCASTLE, NEBRASKA 68757, TELEPHONE 402-355-2220. TO REACH THE MARK  
NM1743'FROM THE SAINT PETERS CATHOLIC CHURCH IN NEWCASTLE, GO EAST ON STATE  
NM1743'HIGHWAY 12 FOR 1 BLOCK TO MARTHA STREET. TURN LEFT AND GO NORTH ON  
NM1743'MARTHA STREET FOR 0.1 MI (0.2 KM) TO A CURVE TO THE RIGHT. CONTINUE  
NM1743'EAST ON A GRAVELED STREET FOR 0.25 MI (0.40 KM), PASSING THE NEWCASTLE  
NM1743'CEMETERY, TO A CURVE LEFT, AND NORTH. CONTINUE NORTH ON A GRAVELED  
NM1743'COUNTY ROAD FOR 2.1 MI (3.4 KM) TO A PRIVATE DRIVEWAY ON THE LEFT.  
NM1743'TURN LEFT AND GO WESTERLY ON THE DRIVEWAY FOR 0.50 MI (0.80 KM), TO A  
NM1743'POINT JUST BEFORE REACHING AN OLD FARMSTEAD. AT THIS POINT BEAR RIGHT  
NM1743'AND GO NORTHWEST FOR 0.05 MI (0.08 KM) TO AN OLD EAST-WEST FENCE.  
NM1743'CROSS THE FENCE BETWEEN A TWIN-TRUNKED BOX ELDER TREE AND A T-FENCE  
NM1743'CORNER. BEAR RIGHT AND CONTINUE NORTHERLY, ACROSS A PASTURE AND ALONG  
NM1743'THE EAST SIDE OF A FENCE FOR 0.2 MI (0.3 KM) TO THE CREST OF A LOW  
NM1743'HILL. BEAR RIGHT AND CONTINUE NORTHEAST, ALONG THE EAST SIDE OF THE  
NM1743'FENCE, FOR 0.1 MI (0.2 KM) TO A T-FENCE CORNER AND THE MARK, ON THE  
NM1743'HIGHEST POINT OF A HIGH HILL. THE DISK IS SET INTO THE TOP OF A ROUND  
NM1743'CONCRETE MONUMENT THAT IS RECESSED ABOUT 0.3 FT (9.1 CM) BELOW THE  
NM1743'GROUND SURFACE. IT IS 75.4 FT (23.0 M) SOUTHEAST OF A T-FENCE CORNER  
NM1743'AND A FIBERGLASS WITNESS POST, 62.0 FT (18.9 M) SOUTH OF THE EAST-WEST  
NM1743'FENCE, 69.2 FT (21.1 M) EAST OF THE NORTH-SOUTH FENCE AND 2.7 FT (0.8  
NM1743'M) NORTH OF A PLASTIC WITNESS POST. REBAR WAS DRIVEN ALONG THE SOUTH  
NM1743'SIDE OF THE MARK.

NM1743

NM1743

STATION RECOVERY (1996)

NM1743

NM1743'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1996 (DFC)

NM1743'RECOVERED AS DESCRIBED.

NM1743

NM1743

STATION RECOVERY (2000)

NM1743

NM1743'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2000 (JBW)

NM1743'RECOVERED AS DESCRIBED WITH NEW TO REACH AS FOLLOWS--TO REACH THE  
NM1743'STATION FROM THE SAINT PETERS CATHOLIC CHURCH IN NEWCASTLE, GO EAST ON  
NM1743'STATE HIGHWAY 12 FOR 0.10 MI (0.16 KM) TO A SIDE ROAD ON THE LEFT  
NM1743'MARTHA STREET, TURN LEFT AND GO NORTH ON MARTHA STREET FOR 0.1 MI (0.2  
NM1743'KM) TO A CURVE TO THE RIGHT, CONTINUE EAST ON GRAVELED ROAD FOR 0.25  
NM1743'MI, (0.40 KM) PASSING THE NEWCASTLE CEMETARY, TO A CURVE LEFT AND  
NM1743'NORTH, CONTINUE NORTH ON ROAD FOR 2.1 MI (3.4 KM) TO A DRIVEWAY ON THE  
NM1743'LEFT, TURN LEFT AND GO WESTERLY ON THE DRIVE FOR 0.5 MI (0.8 KM) TO A  
NM1743'GRAVELED ROAD ON THE RIGHT AND AN OLD FARMSTEAD AHEAD, TURN RIGHT ON  
NM1743'GRAVEL ROAD FOR 0.05 MI (0.08 KM) TO A SHARP TURN TO THE LEFT (ROAD  
NM1743'LEADS TO MR. BRANDT HOUSE) AND A TRACK ROAD AHEAD, CONTINUE NORTH ON  
NM1743'THE TRACK ROAD THROUGH A FIELD FOR 0.01 MI (0.02 KM) TO AN ELECTRIC  
NM1743'FENCE GATE, PASS THROUGH THE GATE (CLOSE IT BEHIND YOU CATTLE IN AREA)  
NM1743'AND CONTINUE NORTHERLY FOR 0.1 MI (0.2 KM) TO A GATE ON THE LEFT IN  
NM1743'THE SADDLE OF THE HILL, BEAR RIGHT NORTHEAST FOR 0.1 MI (0.2 KM) TO  
NM1743'THE HIGH POINT OF THE HILL AND THE STATION. NOTE--GO BY MR. BRANDT  
NM1743'HOUSE OR CALL HIM IN ADVANCE AND HE WILL TURN THE ELECTRIC FENCE OFF.



The Geographic Calculator - Version 3.05

Registered to 'Bernhard, Eisenbraun and Associates'

Date: 09/05/01 Time: 11:02:16

Blue Marble Geographics  
6 Water Street, Gardiner, Maine 04345 USA  
(207) 582-6747 FAX (207) 582-7001

Brandt

Brandt

Latitude: (Degrees) 42 41 15.52835 N  
Longitude: (Degrees) 096 52 05.46612 W  
Ellip. Ht.: (Meters) 0.0

Orthoging: (US Feet) 509022.1925  
Easting: (US Feet) 2841881.4397

Convergence: (Degrees) - - - - -  
Scale Factor: - - - - - 2° 6' 32.84379"  
0.999983569384

System: Geodetic United States State Plane 1927  
Datum Transf.: North American Datum 1927 NAD 1927 - CONUS  
Ellipsoid: Clarke 1866 Clarke 1866  
Zone: - - - - - 2601 - Nebraska North

Datum Shift: (Seconds) 0.00000" N , 0.00005" E  
Datum Shift: (Meters) 0.00 N , 0.00 E

Geodetic Datum Transformation 'North American Datum 1927'  
Transformation Method - Molodensky  
Semimajor Axis (meters): 6378206.400000  
Reciprocal Flattening (1/f): 294.9786982000  
Prime Meridian shift from Greenwich (deg): 0.0000000000  
X Shift to WGS 84 (meters): -8.000000  
Y Shift to WGS 84 (meters): 160.000000  
Z Shift to WGS 84 (meters): 176.000000

Geodetic Datum Transformation 'NAD 1927 - CONUS'  
Transformation Method - Molodensky  
Semimajor Axis (meters): 6378206.400000  
Reciprocal Flattening (1/f): 294.9786982000  
Prime Meridian shift from Greenwich (deg): 0.0000000000  
X Shift to WGS 84 (meters): -8.000000  
Y Shift to WGS 84 (meters): 160.000000  
Z Shift to WGS 84 (meters): 176.000000

The Geographic Calculator - Version 3.05

Registered to 'Bernhard, Eisenbraun and Associates'

Date: 09/05/01 Time: 11:07:22

Blue Marble Geographics  
6 Water Street, Gardiner, Maine 04345 USA  
(207) 582-6747 FAX (207) 582-7001

Willoughby

Willoughby

Latitude: (Degrees) 42 40 10.20200 N  
Longitude: (Degrees) 096 56 02.31300 W  
Elevation: (Meters) 0.0

Orthographic: (US Feet) 501768.9937  
Stereographic: (US Feet) 2824441.8479

Convergence: (Degrees) - - - - - 2° 3' 53.33907"  
Scale Factor: - - - - - 0.999981666253

System: Geodetic United States State Plane 1927  
Datum Transf.: North American Datum 1927 NAD 1927 - CONUS  
Ellipsoid: Clarke 1866  
Zone: - - - - - 2601 - Nebraska North

Datum Shift: (Seconds) 0.00000" N , 0.00005" E  
Datum Shift: (Meters) 0.00 N , 0.00 E

Geodetic Datum Transformation 'North American Datum 1927'  
Transformation Method - Molodensky  
Semimajor Axis (meters): 6378206.400000  
Reciprocal Flattening (1/f): 294.9786982000  
Prime Meridian shift from Greenwich (deg): 0.0000000000  
X Shift to WGS 84 (meters): -8.00000  
Y Shift to WGS 84 (meters): 160.00000  
Z Shift to WGS 84 (meters): 176.00000

Geodetic Datum Transformation 'NAD 1927 - CONUS'  
Transformation Method - Molodensky  
Semimajor Axis (meters): 6378206.400000  
Reciprocal Flattening (1/f): 294.9786982000  
Prime Meridian shift from Greenwich (deg): 0.0000000000  
X Shift to WGS 84 (meters): -8.00000  
Y Shift to WGS 84 (meters): 160.00000  
Z Shift to WGS 84 (meters): 176.00000

The Geographic Calculator - Version 3.05

Referenced to 'Bernhard, Eisenbraun and Associates'

Date: 09/05/01 Time: 11:13:56

Blue Marble Geographics  
46 Water Street, Gardiner, Maine 04345 USA  
(207) 582-6747 FAX (207) 582-7001

Lime Creek

Lime Creek

Latitude: (Degrees) 42 43 50.89100 N  
Longitude: (Degrees) 097 00 52.97700 W  
Ellip. Ht.: (Meters) 0.0

Northing: (US Feet)  
Easting: (US Feet)

523324.6801  
2801956.4330

Convergence: (Degrees)  
Scale Factor:

- - - - -  
- - - - -

2° 0' 37.59117"  
0.999988499355

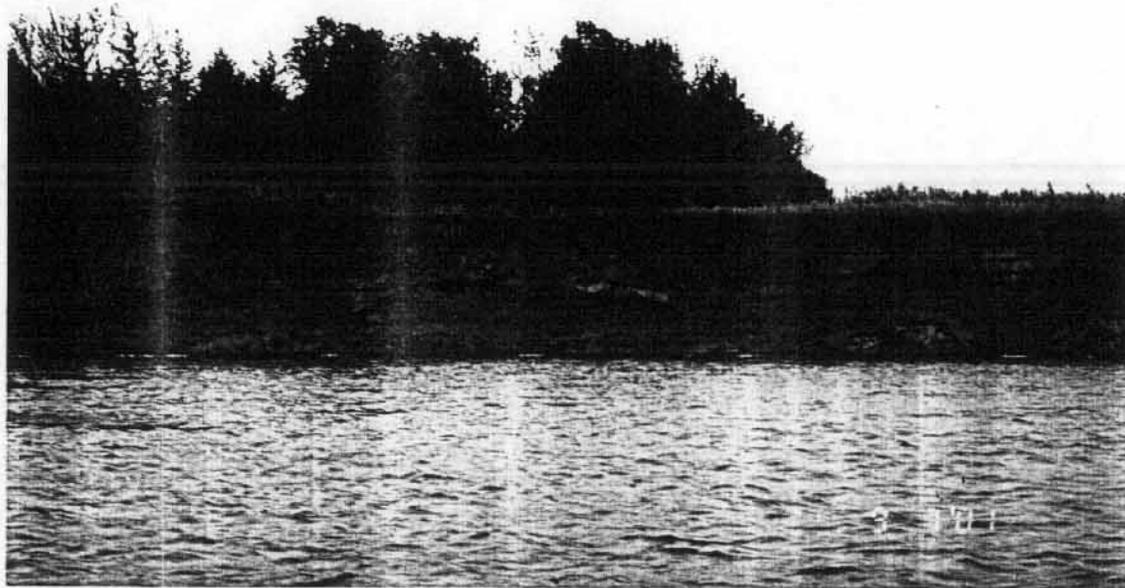
System: Geodetic  
Datum Transf.: North American Datum 1927  
Ellipsoid: Clarke 1866  
Zone: - - - - -

United States State Plane 1927  
NAD 1927 - CONUS  
Clarke 1866  
2601 - Nebraska North

Datum Shift: (Seconds) 0.00000" N , 0.00005" E  
Datum Shift: (Meters) 0.00 N , 0.00 E

Geodetic Datum Transformation 'North American Datum 1927'  
Transformation Method - Molodensky  
Semimajor Axis (meters): 6378206.400000  
Reciprocal Flattening (1/f): 294.9786982000  
Prime Meridian shift from Greenwich (deg): 0.0000000000  
X Shift to WGS 84 (meters): -8.00000  
Y Shift to WGS 84 (meters): 160.00000  
Z Shift to WGS 84 (meters): 176.00000

Geodetic Datum Transformation 'NAD 1927 - CONUS'  
Transformation Method - Molodensky  
Semimajor Axis (meters): 6378206.400000  
Reciprocal Flattening (1/f): 294.9786982000  
Prime Meridian shift from Greenwich (deg): 0.0000000000  
X Shift to WGS 84 (meters): -8.00000  
Y Shift to WGS 84 (meters): 160.00000  
Z Shift to WGS 84 (meters): 176.00000



North Alabama Bend CP 1

N = 530929.71

E = 2806281.29

Elev. = 1145.50

Description:

5/8" x 48" Rebar with Brass Cap stamped CP 1 with Steel  
Fence Post

Near the upstream end of the project along the west treeline, 50' back of high bank



North Alabama Bend CP 2

N = 531372.66

E = 2810593.86

Elev. = 1143.54

Description:

5/8" x 48" Rebar with Brass Cap stamped CP 2 with Steel Fence Post

Near the west edge of the field, 4335 feet east of CP.1 and 100 feet back of the high bank.



North Alabama Bend CP 3

N = 531277.05

E = 2811797.00

Elev. = 1142.39

Description:

5/8" x 48" Rebar with Brass Cap stamped CP 3 with Steel  
Fence Post

Near the east edge of the field, 1207 feet east of CP 2 and 150 feet back of the high bank.

## STATE PLANE COORDINATE CONVERSION WORKSHEET

DATE: 9-21-01  
 NAME: JJM  
 PROJECT NUMBER: Y00151508  
 PROJECT NAME: North Alabama Bend Hydro

~~Triangulation Station~~ Brass Cap CP2

State Plane (Grid) Coordinates: (Easting) X = 2810593.86

(Northing) Y = 531372.66

Station Latitude: 42° 45' 07.38287 N

Mean Project Latitude: 42° 45' 08.32734 N

Elevation of Station: 1143.54

Average Project Elevation: 1143.59

From state projection tables, interpolate latitude to obtain scale factor expressed as a ratio.

Scale Factor (SF) = 0.9999911

Sea Level Factor =  $1 - \frac{h}{20,906,000}$  (where H = average project elevation)

Sea Level Factor (SLF) =  $1 - \frac{1143.59}{20,906,000} = \underline{0.9999453}$

COMBINATION FACTOR = Scale Factor x Sea Level Factor

CF =  $\frac{0.9999911}{\text{Scale Factor}} \times \frac{0.9999453}{\text{Sea Level Factor}} = \frac{0.9999364}{\text{Combination Factor}}$

PROJECT DATUM COORDINATES = GRID COORDINATES / CF  
 (Use *all* significant figures in this computation)

(Easting) X = \_\_\_\_\_

(Northing) Y = \_\_\_\_\_

To differentiate project datum coordinates from State Plane (Grid) Coordinates, record project datum coordinates with only 5 places left of decimal.

PROJECT DATUM COORDINATES TO BE USED:

(Easting) X = \_\_\_\_\_

(Northing) Y = \_\_\_\_\_



Field Notes  
from  
Electronic  
Data Collectors



Vermillion  
Reach

Missouri River Mile  
774.5 to 772.5, Right Bank

Dixon County,  
Nebraska

Survey Control  
Information  
and  
Site Specific  
Control Point  
Documentation

NM1070 \*\*\*\*\*

NM1070 DESIGNATION - LIME CREEK #3  
 NM1070 PID - NM1070  
 NM1070 STATE/COUNTY- NE/DIXON  
 NM1070 USGS QUAD - OBERT (1968)  
 NM1070  
 NM1070 \*CURRENT SURVEY CONTROL  
 NM1070  
 NM1070\* NAD 83(1995)- 42 43 50.87809(N) 097 00 54.14838(W) ADJUSTED  
 NM1070\* NAVD 88 - 435.719 (meters) 1429.52 (feet) ADJUSTED  
 NM1070  
 NM1070 LAPLACE CORR- 0.30 (seconds) DEFLEC99  
 NM1070 GEOID HEIGHT- -25.54 (meters) GEOID99  
 NM1070 DYNAMIC HT - 435.586 (meters) 1429.09 (feet) COMP  
 NM1070 MODELED GRAV- 980,302.0 (mgal) NAVD 88  
 NM1070  
 NM1070 HORZ ORDER - SECOND  
 NM1070 VERT ORDER - SECOND CLASS 0  
 NM1070

NM1070.The horizontal coordinates were established by classical geodetic methods and adjusted by the National Geodetic Survey in August 1997.

NM1070.The orthometric height was determined by differential leveling and adjusted by the National Geodetic Survey in June 1991.

NM1070.The Laplace correction was computed from DEFLEC99 derived deflections.

NM1070.The geoid height was determined by GEOID99.

NM1070.The dynamic height is computed by dividing the NAVD 88 geopotential number by the normal gravity value computed on the Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45 degrees latitude (g = 980.6199 gals.).

NM1070.The modeled gravity was interpolated from observed gravity values.

NM1070;	North	East	Units	Scale	Converg.
NM1070;SPC NE	- 325,936.462	744,330.293	MT	0.99989771	+1 58 41.2
NM1070;SPC SD S	- 49,583.928	871,689.711	MT	1.00002585	+2 17 20.9
NM1070;UTM 14	- 4,732,831.631	662,497.867	MT	0.99992487	+1 20 49.9
NM1070:	Primary Azimuth Mark				Grid Az
NM1070:SPC NE	- LIME CREEK AZ MK				356 31 29.9
NM1070:SPC SD S	- LIME CREEK AZ MK				356 12 50.2
NM1070:UTM 14	- LIME CREEK AZ MK				357 09 21.2

NM1070	PID	Reference Object	Distance	Geod. Az
NM1070				dddmmss.s
NM1070	NM1069	LIME CREEK RM 1		15534
NM1070	NM1071	LIME CREEK RM 2		25301
NM1070		LIME CREEK AZ MK		3583011.1

NM1070  
 NM1070 SUPERSEDED SURVEY CONTROL  
 NM1070  
 NM1070 NAD 83(1986)- 42 43 50.89357(N) 097 00 54.14017(W) AD( ) 2  
 NM1070 NAD 27 - 42 43 50.89100(N) 097 00 52.97700(W) AD( ) 2  
 NM1070 NGVD 29 - 435.517 (m) 1428.86 (f) ADJ UNCH 2 0  
 NM1070

NM1070.Superseded values are not recommended for survey control.  
 NM1070.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
 NM1070.See file dsdata.txt to determine how the superseded data were derived.

NM1070

NM1070\_MARKER: P = PIPE CAP

NM1070\_SETTING: 17 = SET INTO TOP OF METAL PIPE DRIVEN INTO GROUND

NM1070\_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY

NM1070

NM1070	HISTORY	- Date	Condition	Report By
NM1070	HISTORY	- 1948	MONUMENTED	MORC
NM1070	HISTORY	- 1949	GOOD	NGS

NM1070

STATION DESCRIPTION

NM1070

NM1070'DESCRIBED BY MISSOURI RIVER COMMISSION 1948 (MEW)  
 NM1070'STATION IS LOCATED ABOUT 8 MILES EAST OF WYNOT AND 4 MILES  
 NM1070'NORTHWEST OF OBERT ON NORTH FACE OF HIGHEST BLUFF. STATION  
 NM1070'IS 40 FEET EAST OF FENCELINE. STATION MARK IS A STANDARD  
 NM1070'MISSOURI RIVER COMMISSION MARK WHICH IS A 2 INCH IRON PIPE  
 NM1070'WITH CAP SET IN A SQUARE BLOCK OF CONCRETE AND PROJECTS  
 NM1070'ABOUT 4 INCHES.

NM1070'

NM1070'REFERENCE MARK NO. 1 IS 41.20 FEET (SLOPE MEASUREMENT) SOUTH  
 NM1070'SOUTHEAST OF STATION. THE DISK IS SET IN CONCRETE IN A  
 NM1070'STOVEPIPE WHICH PROJECTS ABOUT 2 INCHES AND IS STAMPED LIME  
 NM1070'CREEK MRC NO 1 1948.

NM1070'

NM1070'REFERENCE MARK NO. 2 IS 68.80 FEET (SLOPE MEASUREMENT) SOUTHWEST  
 NM1070'OF STATION AND 1 FOOT EAST OF FENCE. THE DISK IS SET IN  
 NM1070'CONCRETE IN A STOVEPIPE WHICH PROJECTS ABOUT 3 INCHES AND  
 NM1070'IS STAMPED LIME CREEK MRC NO 2 1948.

NM1070'

NM1070'AZIMUTH MARK IS APPROXIMATELY 1.5 MILES NORTH OF STATION, 12  
 NM1070'FEET WEST OF FENCECORNER, 10 FEET NORTH OF THE APPROXIMATE  
 NM1070'CENTERLINE OF FARM ROAD, 2 FEET WEST OF WITNESS POST AND  
 NM1070'1 FOOT SOUTH OF FENCE. THE MARK PROJECTS ABOUT 4 INCHES  
 NM1070'AND THE DISK IS STAMPED LIME CREEK MRC 1948.

NM1070'

NM1070'TO REACH STATION FROM THE POST OFFICE IN WYNOT GO SOUTH  
 NM1070'ON MAIN STREET FOR 0.05 MILE TO CROSS STREET. TURN LEFT  
 NM1070'AND GO EAST FOR 0.05 MILE TO STATE HIGHWAY 12. TURN RIGHT  
 NM1070'AND GO SOUTH AND EAST ON STATE HIGHWAY 12 FOR 1.65 MILE  
 NM1070'TO T ROAD LEFT AT SERVICE STATION. TURN LEFT AND GO EAST AND  
 NM1070'NORTHEAST ON GRAVEL ROAD FOR 3.75 MILES TO T INTERSECTION.  
 NM1070'TURN LEFT AND GO 0.65 MILE TO ANOTHER T INTERSECTION. TURN  
 NM1070'RIGHT AND GO EAST FOR 2.05 MILES TO A T ROAD RIGHT. TURN  
 NM1070'RIGHT AND GO SOUTH FOR 1.45 MILES TO A T ROAD LEFT. TURN LEFT  
 NM1070'AND GO EAST FOR 1.0 MILE TO POINT WHERE MAIN ROAD TURNS  
 NM1070'LEFT. KEEP STRAIGHT AHEAD ON FARM ROAD ALONG EDGE OF  
 NM1070'BLUFFS FOR 0.2 MILE TO WIRE GATE BETWEEN TWO TREES NEAR  
 NM1070'FARMHOUSE. GO THROUGH GATE AND FOLLOW FARM ROAD ALONG  
 NM1070'EDGE OF FIELD FOR 0.2 MILE TO END OF LANE ON RIGHT AND END  
 NM1070'OF TRUCK TRAVEL. PACK THROUGH WIRE GATE INTO SOUTHEAST  
 NM1070'CORNER OF PASTURE THEN BEAR RIGHT UP STEEP BLUFF FOR  
 NM1070'ABOUT 0.3 MILE TO STATION ON HIGHEST BLUFF AS DESCRIBED.

NM1070'

NM1070'TO REACH AZIMUTH MARK FROM POINT WHERE MAIN ROAD TURNS LEFT  
 NM1070'OR NORTH GO NORTH ON MAIN ROAD FOR 1.0 MILE TO FARM ROAD  
 NM1070'AND AZIMUTH ON LEFT OR WEST SIDE OF ROAD AS DESCRIBED.

NM1070'

NM1070'A 74 FOOT SIGNAL AT STATION WILLOUGHBY 1935 IS VISIBLE FROM  
 NM1070'THE GROUND.

NM1070'

NM1070'A 74 FOOT SIGNAL AT STATION WALTON 1935 IS VISIBLE FROM THE  
 NM1070'GROUND.

NM1070'

NM1070'A 100 FOOT SIGNAL AT STATION STYLE 1935 IS VISIBLE FROM THE

NM1070'GROUND.

NM1070'

NM1070'HEIGHT OF LIGHT ABOVE STATION MARK 1 METERS.

NM1070

NM1070

STATION RECOVERY (1949)

NM1070

NM1070'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1949

NM1070'11.9 MI E FROM WYNOT.

NM1070'0.15 MILE WEST ALONG STATE HIGHWAY 12 FROM THE HIGH SCHOOL AT  
NM1070'WYNOT, THENCE 0.9 MILE NORTH ALONG A GRAVELED ROAD, THENCE 0.55  
NM1070'MILE NORTHEAST ALONG A GRAVELED ROAD, THENCE 0.75 MILE EAST ALONG  
NM1070'A GRADED DIRT ROAD, THENCE 0.2 MILE SOUTH ALONG A GRADED DIRT  
NM1070'ROAD, THENCE 6.4 MILES EAST ALONG A GRADED DIRT ROAD, THENCE 1.35  
NM1070'MILES SOUTH ALONG A GRADED DIRT ROAD, THENCE 1.05 MILES EAST  
NM1070'ALONG A GRADED DIRT ROAD, THENCE 0.25 MILE SOUTHEAST ALONG A  
NM1070'DIRT ROAD, THENCE ABOUT 0.3 MILE SOUTHWEST THROUGH A PASTURE  
NM1070'AND TO THE TOP OF A HILL AND THE VICINITY OF THE MARK, 67.0 FEET  
NM1070'EAST OF A NORTH AND SOUTH FENCE WHICH IS ON THE DIXON-CEDAR COUNTY  
NM1070'LINE, A 2 INCH BRASS CAP ON THE TOP OF A 2 INCH IRON PIPE WHICH  
NM1070'IS SET IN CONCRETE AND PROJECTS 0.4 FOOT ABOVE THE GROUND.

NM0895 \*\*\*\*\*  
 NM0895 DESIGNATION - WILLOUGHBY #/  
 NM0895 PID - NM0895  
 NM0895 STATE/COUNTY- NE/DIXON  
 NM0895 USGS QUAD - MASKELL (1994)  
 NM0895  
 NM0895 \*CURRENT SURVEY CONTROL  
 NM0895

NM0895*	NAD 83(1995)-	42 40 10.19434(N)	096 56 03.47849(W)	ADJUSTED
NM0895*	NAVD 88	- 462.084 (meters)	1516.02 (feet)	ADJUSTED

NM0895	LAPLACE CORR-	0.37 (seconds)		DEFLEC99
NM0895	GEOID HEIGHT-	-25.43 (meters)		GEOID99
NM0895	DYNAMIC HT -	461.939 (meters)	1515.54 (feet)	COMP
NM0895	MODELED GRAV-	980,293.3 (mgal)		NAVD 88

NM0895  
 NM0895 HORZ ORDER - FIRST  
 NM0895 VERT ORDER - SECOND CLASS 0  
 NM0895

NM0895.The horizontal coordinates were established by classical geodetic methods  
 NM0895.and adjusted by the National Geodetic Survey in August 1997.  
 NM0895

NM0895.The orthometric height was determined by differential leveling  
 NM0895.and adjusted by the National Geodetic Survey in June 1991.  
 NM0895

NM0895.The Laplace correction was computed from DEFLEC99 derived deflections.  
 NM0895

NM0895.The geoid height was determined by GEOID99.  
 NM0895

NM0895.The dynamic height is computed by dividing the NAVD 88  
 NM0895.geopotential number by the normal gravity value computed on the  
 NM0895.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45  
 NM0895.degrees latitude (g = 980.6199 gals.).  
 NM0895

NM0895.The modeled gravity was interpolated from observed gravity values.  
 NM0895

	North	East	Units	Scale	Converg.
NM0895; SPC NE	- 319,363.148	751,229.307	MT	0.99986528	+2 01 53.9
NM0895; SPC SD S	- 43,046.988	878,575.516	MT	1.00004281	+2 20 41.4
NM0895; UTM 14	- 4,726,182.867	669,274.489	MT	0.99995254	+1 24 01.4

	Primary Azimuth Mark	Grid Az
NM0895: SPC NE	- WILLOUGHBY AZ MK	190 55 00.8
NM0895: SPC SD S	- WILLOUGHBY AZ MK	190 36 13.3
NM0895: UTM 14	- WILLOUGHBY AZ MK	191 32 53.3

PID	Reference Object	Distance	Geod. Az
NM0895	NM1853 VERMILLION TANK	APPROX.12.0 KM	0002424.7
NM0895	NM1848 VERMILLION FIRST CONG CH CUP	APPROX.12.2 KM	0022827.5
NM0895	NM1852 VERMILLION UNIV OF S DAK TK	APPROX.12.8 KM	0034222.5
NM0895	NM1854 VERMILLION UNIV OF S DAK STK	APPROX.12.8 KM	0035500.8
NM0895	NM1846 CHURCH SPIRE D	APPROX.23.0 KM	0182213.4
NM0895	NM0896 WILLOUGHBY RM 1	30.037 METERS	02539
NM0895	WILLOUGHBY AZ MK		1925654.7
NM0895	NM0897 WILLOUGHBY RM 2	41.203 METERS	35553

NM0895  
 NM0895  
 NM0895 SUPERSEDED SURVEY CONTROL  
 NM0895

NM0895	NAD 83(1986)-	42 40 10.19925(N)	096 56 03.47083(W)	AD( ) 1
NM0895	NAD 27	- 42 40 10.20200(N)	096 56 02.31300(W)	AD( ) 1

NM0895 NGVD 29 - 461.888 (m) 1515.38 (f) ADJ UNCH 2 0  
 NM0895

NM0895. Superseded values are not recommended for survey control.  
 NM0895. NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.  
 NM0895. See file dsdata.txt to determine how the superseded data were derived.  
 NM0895

NM0895\_MARKER: DS = TRIANGULATION STATION DISK  
 NM0895\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT  
 NM0895\_STAMPING: WILLOUGHBY 1935  
 NM0895\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO  
 NM0895+STABILITY: SURFACE MOTION

NM0895  
 NM0895 HISTORY - Date Condition Report By  
 NM0895 HISTORY - 1935 MONUMENTED CGS  
 NM0895 HISTORY - 1948 GOOD CGS  
 NM0895 HISTORY - 1949 GOOD NGS  
 NM0895 HISTORY - 1962 GOOD USGS

NM0895  
 NM0895 STATION DESCRIPTION

NM0895 'DESCRIBED BY COAST AND GEODETIC SURVEY 1935 (CIA)  
 NM0895 'STATION IS LOCATED IN THE SOUTHWEST QUARTER SEC. 11, T. 31 N.,  
 NM0895 'R. 4 E., ABOUT 3 MILES NORTHWEST OF NEWCASTLE AND 3 MILES  
 NM0895 'SOUTHEAST OF MASKELL, ON A HILL OVERLOOKING THE MISSOURI  
 NM0895 'VALLEY TO THE NORTH AND VERMILLION SOUTH DAKOTA IS ON THE  
 NM0895 'NORTH.

NM0895 '  
 NM0895 'TO REACH FROM THE SECURITY STATE BANK IN MASKELL, GO 0.05  
 NM0895 'MILE TO NORTH END OF TOWN, TURN RIGHT (EAST) ON A GRADED DIRT  
 NM0895 'ROAD AND GO 1.5 MILES, TURN RIGHT (SOUTH) AT T-FORK, FOLLOWING  
 NM0895 'MAIN ROAD AND GO 2.0 MILES, TURN SHARP LEFT (NORTH) AND GO  
 NM0895 '0.35 MILE, TURN RIGHT (NORTHEAST AND EAST) ON A DIM ROAD  
 NM0895 'ACROSS FIELD PASSING A CLUMP OF BUSHES. GO 0.25 MILE TO TOP  
 NM0895 'OF RIDGE, TURN SHARP RIGHT (WEST) (SOUTH) AND GO 0.05 MILE TO  
 NM0895 '100 FEET SOUTH OF POINT OF RISE AND STATION. STATION IS IN  
 NM0895 'AN EAST-WEST FENCE LINE.

NM0895 '  
 NM0895 'REFERENCE MARK NO. 1 IS LOCATED 98.55 FEET EAST-NORTHEAST  
 NM0895 'OF STATION, 40 FEET SOUTHEAST OF TOP OF RIDGE.

NM0895 '  
 NM0895 'REFERENCE MARK NO. 2 IS LOCATED 135.18 FEET NORTH-NORTHWEST  
 NM0895 'OF STATION, 20 FEET SOUTHWEST OF TOP OF RIDGE.

NM0895 '  
 NM0895 'AZIMUTH MARK IS LOCATED 0.7 MILE SOUTH-SOUTHWEST OF STATION  
 NM0895 'ON RIGHT (WEST) OF NORTH-SOUTH ROAD, 30 FEET WEST OF CENTERLINE  
 NM0895 'OF ROAD, IN NORTH-SOUTH FENCE LINE, JUST NORTH OF TURN IN  
 NM0895 'ROAD.

NM0895 '  
 NM0895 'HEIGHT OF LIGHT ABOVE STATION MARK - 23 METERS.

NM0895  
 NM0895 STATION RECOVERY (1948)

NM0895 'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1948 (MEW)  
 NM0895 'THE STATION WAS RECOVERED AS DESCRIBED BY C.I.A. IN 1948 AND  
 NM0895 'ALL MARKS WERE FOUND IN GOOD CONDITION. DISTANCES TO REFERENCE  
 NM0895 'MARKS WERE CHECKED AND FOUND TO BE CORRECT. A DIFFERENCE  
 NM0895 'WAS FOUND IN THE DIRECTION TO THE AZIMUTH MARK. A COMPLETE  
 NM0895 'NEW DESCRIPTION FOLLOWS.

NM0895 '  
 NM0895 'THE STATION IS LOCATED ABOUT 3 MILES NORTHWEST OF NEWCASTLE, ABOUT  
 NM0895 '3 MILES SOUTHEAST OF MASKELL, ABOUT 7-3/4 MILES SOUTH OF  
 NM0895 'VERMILLION, SOUTH DAKOTA, ON A HILL OVERLOOKING THE MISSOURI  
 NM0895 'RIVER TO THE NORTH. IT IS SET IN AN EAST-WEST FENCE LINE,  
 NM0895 '0.25 MILE EAST OF A DIRT ROAD, AND IS ABOUT 150 FEET SOUTH

NM0895' OF THE HIGHEST POINT OF THE HILL. THE DISK IS STAMPED  
NM0895' WILLOUGHBY 1935.

NM0895'

NM0895' REFERENCE MARK NO. 1 IS 98.55 FEET NORTH-NORTHEAST OF THE  
NM0895' STATION, AND IS ABOUT 40 FEET SOUTHEAST OF THE TOP OF THE  
NM0895' HILL. THE DISK IS STAMPED WILLOUGHBY NO 1 1935.

NM0895'

NM0895' REFERENCE MARK NO. 2 IS 135.18 FEET NORTH-NORTHWEST OF THE  
NM0895' STATION, AND ABOUT 20 FEET SOUTHWEST OF THE TOP OF THE HILL.  
NM0895' THE DISK IS STAMPED WILLOUGHBY NO 2 1935.

NM0895'

NM0895' THE AZIMUTH MARK IS ABOUT 0.8 MILE SOUTH-SOUTHWEST OF THE  
NM0895' STATION, 30 FEET WEST OF THE CENTER LINE OF A DIRT ROAD AND  
NM0895' JUST NORTH OF A SIDE ROAD EAST. THE DISK IS STAMPED WILLOUGHBY  
NM0895' 1935.

NM0895'

NM0895' TO REACH THE STATION FROM THE POST OFFICE IN NEWCASTLE,  
NM0895' GO WEST ON STATE HIGHWAY 12 FOR 2.5 MILES TO A CROSSROAD.  
NM0895' TURN RIGHT AND GO NORTH ON A DIRT ROAD FOR 0.6 MILE TO A  
NM0895' SIDE ROAD LEFT. TURN LEFT AND GO WEST FOR 1.05 MILE TO A  
NM0895' T ROAD INTERSECTION AND THE AZIMUTH MARK ON THE LEFT JUST  
NM0895' AFTER TURNING TO THE RIGHT. CONTINUE NORTH FOR 0.8 MILE  
NM0895' THENCE TURN RIGHT AND GO EAST ALONG FENCE LINE FOR 0.25 MILE  
NM0895' TO THE STATION.

NM0895'

NM0895' HEIGHT OF TOWER- 64 FEET.

NM0895'

NM0895'

STATION RECOVERY (1949)

NM0895'

NM0895' RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1949

NM0895' 4.4 MI SE FROM MASKELL.

NM0895' 0.2 MILE NORTH ALONG A GRAVELED STREET FROM THE MASKELL HIGH  
NM0895' SCHOOL AT MASKELL, THENCE 1.45 MILES EAST ALONG A GRADED DIRT  
NM0895' ROAD, THENCE 2.15 MILES SOUTHEAST ALONG A GRADED DIRT ROAD,  
NM0895' THENCE 0.35 MILE NORTH ALONG A DIRT ROAD, THENCE 0.2 MILE EAST  
NM0895' ALONG A DIM PRIVATE ROAD, AT THE TOP OF A HILL AND IN AN  
NM0895' EAST-WEST FENCE LINE, 135 FEET SOUTH OF THE HIGHEST POINT OF  
NM0895' THE HILL, 20 FEET SOUTH OF THE CENTER LINE OF THE PRIVATE ROAD,  
NM0895' 2.0 FEET WEST OF A REFERENCE POST, AND SET IN THE TOP OF A  
NM0895' CONCRETE POST PROJECTING 0.3 FEET ABOVE THE GROUND.

NM0895'

NM0895'

STATION RECOVERY (1962)

NM0895'

NM0895' RECOVERY NOTE BY US GEOLOGICAL SURVEY 1962

NM0895' RECOVERED IN GOOD CONDITION.

# The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

DATABASE = Sybase , PROGRAM = datasheet, VERSION = 6.52

1 National Geodetic Survey, Retrieval Date = AUGUST 31, 2001

NM1743 \*\*\*\*\*  
 NM1743 FBN - This is a Candidate for Federal Base Network Control.

NM1743 DESIGNATION - BRANDT  
 NM1743 PID - NM1743  
 NM1743 STATE/COUNTY- NE/DIXON  
 NM1743 USGS QUAD - BURBANK (1994)

NM1743  
 NM1743 \*CURRENT SURVEY CONTROL  
 NM1743

NM1743*	NAD 83(1995)-	42 41 15.52029(N)	096 52 06.62399(W)	ADJUSTED
NM1743*	NAVD 88	- 457.5 (meters)	1501. (feet)	GPS OBS
NM1743	X	- 561,584.030 (meters)		COMP
NM1743	Y	- 4,662,165.373 (meters)		COMP
NM1743	Z	4,302,352.680 (meters)		COMP
NM1743	LAPLACE CORR-	-0.72 (seconds)		DEFLEC99
NM1743	ELLIP HEIGHT-	431.99 (meters)		GPS OBS
NM1743	GEOID HEIGHT-	-25.46 (meters)		GEOID99

NM1743  
 NM1743 HORZ ORDER - B  
 NM1743 ELLP ORDER - FOURTH CLASS I  
 NM1743

NM1743.The horizontal coordinates were established by GPS observations  
 NM1743.and adjusted by the National Geodetic Survey in June 1996.

NM1743.The orthometric height was determined by GPS observations and a  
 NM1743.high-resolution geoid model.

NM1743.The X, Y, and Z were computed from the position and the ellipsoidal ht.  
 NM1743

NM1743.The Laplace correction was computed from DEFLEC99 derived deflections.  
 NM1743

NM1743.The ellipsoidal height was determined by GPS observations  
 NM1743.and is referenced to NAD 83.

NM1743  
 NM1743.The geoid height was determined by GEOID99.

NM1743;		North	East	Units	Scale	Converg.
NM1743;SPC NE	-	321,570.578	756,545.614	MT	0.99987180	+2 04 30.8
NM1743;UTM 14	-	4,728,331.869	674,615.272	MT	0.99997513	+1 26 43.9

NM1743:		Primary Azimuth Mark	Grid Az
NM1743:SPC NE	-	BRANDT AZ MK	168 38 38.9
NM1743:UTM 14	-	BRANDT AZ MK	169 16 25.8

NM1743	PID	Reference Object	Distance	Geod. Az
NM1743				dddmmss.s
NM1743		BRANDT RM 1	20.950 METERS	02819
NM1743		BRANDT AZ MK		1704309.7
NM1743		BRANDT RM 2	28.085 METERS	30914

NM1743  
 NM1743 SUPERSEDED SURVEY CONTROL  
 NM1743

NM1743	ELLIP HT	-	432.04 (m)	GP(	)	1 1
NM1743	NAD 83(1986)-	42 41 15.52464(N)	096 52 06.61528(W)	AD(	)	1

NM1743 NAD 27 - 42 41 15.52835(N) 096 52 05.46612(W) AD( ) 1  
 NM1743 NGVD 29 - 458.0 (m) 1503. (f) VERT ANG  
 NM1743

NM1743.Superseded values are not recommended for survey control.

NM1743.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.

NM1743.See file dsdata.txt to determine how the superseded data were derived.

NM1743

NM1743\_MARKER: DS = TRIANGULATION STATION DISK

NM1743\_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT

NM1743\_STAMPING: BRANDT 1966

NM1743\_MARK LOGO: CGS

NM1743\_MAGNETIC: A = STEEL ROD ADJACENT TO MONUMENT

NM1743\_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO

NM1743+STABILITY: SURFACE MOTION

NM1743

NM1743	HISTORY	- Date	Condition	Report By
NM1743	HISTORY	- 1966	MONUMENTED	CGS
NM1743	HISTORY	- 19950622	GOOD	NGS
NM1743	HISTORY	- 19960611	GOOD	NGS
NM1743	HISTORY	- 20000510	GOOD	NGS

NM1743

NM1743

#### STATION DESCRIPTION

NM1743

NM1743'DESCRIBED BY COAST AND GEODETIC SURVEY 1966 (COP)

NM1743'STATION IS LOCATED ABOUT 9 MILES WEST OF ELK POINT, ABOUT 9 MILES

NM1743'SOUTHEAST OF VERMILLION, ABOUT 5 MILES SOUTHWEST OF BURBANK, ABOUT

NM1743'2-1/2 MILES NORTH OF NEWCASTLE AND ABOUT 2 MILES NORTH OF THE SOUTH

NM1743'BANK OF THE MISSOURI RIVER. IT IS LOCATED ON THE HIGH HILL ON

NM1743'PROPERTY OWNED BY MR. RANDOLPH BRANDT AND IN THE SOUTHEAST

NM1743'QUARTER OF SECTION 5, TOWNSHIP 31 NORTH, RANGE 5 EAST. THE STATION

NM1743'MARK IS 64 FEET NORTHEAST OF AN ELM TREE, 62-1/2 FEET SOUTHEAST OF

NM1743'A MULBERRY TREE AND 61 FEET SOUTH OF FENCELINE. THE STATION IS

NM1743'MARKED BY A STANDARD TRIANGULATION STATION DISK SET IN THE TOP

NM1743'OF A 12 INCH CONCRETE CYLINDER MONUMENT THAT IS 3 INCHES BELOW

NM1743'THE SURFACE OF THE GROUND. THE DISK IS STAMPED BRANDT 1966.

NM1743'

NM1743'TO REACH THE STATION FROM THE SCHOOLHOUSE IN NEWCASTLE, GO EAST ON

NM1743'STATE HIGHWAY 12 FOR 0.2 MILE TO A CROSSROAD. TURN LEFT AND GO

NM1743'NORTH AND EAST ON A GRAVELED ROAD FOR 0.35 MILE TO A SIDE ROAD LEFT.

NM1743'TURN LEFT ON MAIN TRAVELED DIRT AND GRAVELED ROAD AND GO NORTHEAST

NM1743'FOR 2.0 MILES TO A SIDE ROAD LEFT. TURN LEFT AND GO NORTH ON

NM1743'DIRT ROAD FOR 0.4 MILE TO THE AZIMUTH MARK ON THE LEFT, ON THE TOP

NM1743'OF HILL AND IN THE FENCELINE. CONTINUE NORTHWESTERLY ON DIRT ROAD

NM1743'FOR 0.1 MILE TO WHERE POWERLINE CROSSES THE ROAD. TURN RIGHT AND GO

NM1743'NORTH TO A LONE LARGE TREE AND GATE IN FENCELINE. PASS THROUGH

NM1743'GATE AND GO NORTHERLY FOLLOWING FENCELINE FOR 0.2 MILE TO THE TOP OF

NM1743'HILL. TURN RIGHT AND GO NORTH EAST FOLLOWING RIDGE LINE FOR 0.2

NM1743'MILE TO THE TOP OF HILL AND STATION AS DESCRIBED.

NM1743'

NM1743'AZIMUTH MARK IS 2.2 FEET NORTHEAST OF METAL WITNESS POST WITH SIGN

NM1743'ATTACHED AND 1-1/2 FEET NORTH OF FENCELINE. IT IS MARKED BY A

NM1743'STANDARD DISK SET IN THE TOP OF A 12 INCH CONCRETE CYLINDER

NM1743'MONUMENT THAT IS FLUSH WITH THE SURFACE OF THE GROUND. THE DISK IS

NM1743'STAMPED BRANDT 1966.

NM1743'

NM1743'REFERENCE MARK NO. 1 IS 48 FEET EAST OF MULBERRY TREE, 36 FEET WEST

NM1743'OF A MULBERRY TREE AND 2 FEET SOUTH OF FENCELINE. IT IS MARKED BY A

NM1743'STANDARD DISK SET IN THE TOP OF A 12 INCH CONCRETE CYLINDER

NM1743'MONUMENT THAT PROJECTS 2 INCHES ABOVE THE SURFACE OF THE GROUND.

NM1743'THE DISK IS STAMPED BRANDT NO 1 1966.

NM1743'

NM1743'REFERENCE MARK NO. 2 IS 100 FEET NORTH OF AN ELM TREE AND 1-1/2 FEET

NM1743'SOUTH OF FENCELINE. IT IS MARKED BY A STANDARD DISK SET IN THE TOP

NM1743'OF A 12 INCH CONCRETE CYLINDER MONUMENT THAT IS FLUSH WITH THE

NM1743'SURFACE OF THE GROUND. THE DISK IS STAMPED BRANDT NO 2 1966.

NM1743'

NM1743'A MEASUREMENT COULD NOT BE MADE BETWEEN REFERENCE MARKS DUE TO A  
NM1743'TREE IN THE FENCELINE.

NM1743'

NM1743'THIS IS A PACK STATION IN WET WEATHER, PACK FROM POWERLINE.

NM1743'

NM1743'HEIGHT OF LIGHT ABOVE STATION MARK 18.54 METERS.

NM1743

NM1743

STATION RECOVERY (1995)

NM1743

NM1743'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1995 (JAO)

NM1743'THE MARK IS LOCATED ABOUT 5.75 MI (9.25 KM) EAST OF MASKELL, 3.0 MI

NM1743'(4.8 KM) NORTH OF NEWCASTLE, 2 MI (3.2 KM) SOUTH OF THE MISSOURI

NM1743'RIVER, NEAR THE CENTER OF SEC5, T31N, R5E, ATOP A HIGH HILL IN A

NM1743'PASTURE ON PROPERTY OWNED BY EUGENE BRANDT, RURAL ROUTE 1, BOX 104,

NM1743'NEWCASTLE, NEBRASKA 68757, TELEPHONE 402-355-2220. TO REACH THE MARK

NM1743'FROM THE SAINT PETERS CATHOLIC CHURCH IN NEWCASTLE, GO EAST ON STATE

NM1743'HIGHWAY 12 FOR 1 BLOCK TO MARTHA STREET. TURN LEFT AND GO NORTH ON

NM1743'MARTHA STREET FOR 0.1 MI (0.2 KM) TO A CURVE TO THE RIGHT. CONTINUE

NM1743'EAST ON A GRAVELED STREET FOR 0.25 MI (0.40 KM), PASSING THE NEWCASTLE

NM1743'CEMETERY, TO A CURVE LEFT, AND NORTH. CONTINUE NORTH ON A GRAVELED

NM1743'COUNTY ROAD FOR 2.1 MI (3.4 KM) TO A PRIVATE DRIVEWAY ON THE LEFT.

NM1743'TURN LEFT AND GO WESTERLY ON THE DRIVEWAY FOR 0.50 MI (0.80 KM), TO A

NM1743'POINT JUST BEFORE REACHING AN OLD FARMSTEAD. AT THIS POINT BEAR RIGHT

NM1743'AND GO NORTHWEST FOR 0.05 MI (0.08 KM) TO AN OLD EAST-WEST FENCE.

NM1743'CROSS THE FENCE BETWEEN A TWIN-TRUNKED BOX ELDER TREE AND A T-FENCE

NM1743'CORNER. BEAR RIGHT AND CONTINUE NORTHERLY, ACROSS A PASTURE AND ALONG

NM1743'THE EAST SIDE OF A FENCE FOR 0.2 MI (0.3 KM) TO THE CREST OF A LOW

NM1743'HILL. BEAR RIGHT AND CONTINUE NORTHEAST, ALONG THE EAST SIDE OF THE

NM1743'FENCE, FOR 0.1 MI (0.2 KM) TO A T-FENCE CORNER AND THE MARK, ON THE

NM1743'HIGHEST POINT OF A HIGH HILL. THE DISK IS SET INTO THE TOP OF A ROUND

NM1743'CONCRETE MONUMENT THAT IS RECESSED ABOUT 0.3 FT (9.1 CM) BELOW THE

NM1743'GROUND SURFACE. IT IS 75.4 FT (23.0 M) SOUTHEAST OF A T-FENCE CORNER

NM1743'AND A FIBERGLASS WITNESS POST, 62.0 FT (18.9 M) SOUTH OF THE EAST-WEST

NM1743'FENCE, 69.2 FT (21.1 M) EAST OF THE NORTH-SOUTH FENCE AND 2.7 FT (0.8

NM1743'M) NORTH OF A PLASTIC WITNESS POST. REBAR WAS DRIVEN ALONG THE SOUTH

NM1743'SIDE OF THE MARK.

NM1743

NM1743

STATION RECOVERY (1996)

NM1743

NM1743'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1996 (DFC)

NM1743'RECOVERED AS DESCRIBED.

NM1743

NM1743

STATION RECOVERY (2000)

NM1743

NM1743'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2000 (JBW)

NM1743'RECOVERED AS DESCRIBED WITH NEW TO REACH AS FOLLOWS--TO REACH THE

NM1743'STATION FROM THE SAINT PETERS CATHOLIC CHURCH IN NEWCASTLE, GO EAST ON

NM1743'STATE HIGHWAY 12 FOR 0.10 MI (0.16 KM) TO A SIDE ROAD ON THE LEFT

NM1743'MARTHA STREET, TURN LEFT AND GO NORTH ON MARTHA STREET FOR 0.1 MI (0.2

NM1743'KM) TO A CURVE TO THE RIGHT, CONTINUE EAST ON GRAVELED ROAD FOR 0.25

NM1743'MI, (0.40 KM) PASSING THE NEWCASTLE CEMETARY, TO A CURVE LEFT AND

NM1743'NORTH, CONTINUE NORTH ON ROAD FOR 2.1 MI (3.4 KM) TO A DRIVEWAY ON THE

NM1743'LEFT, TURN LEFT AND GO WESTERLY ON THE DRIVE FOR 0.5 MI (0.8 KM) TO A

NM1743'GRAVELED ROAD ON THE RIGHT AND AN OLD FARMSTEAD AHEAD, TURN RIGHT ON

NM1743'GRAVEL ROAD FOR 0.05 MI (0.08 KM) TO A SHARP TURN TO THE LEFT (ROAD

NM1743'LEADS TO MR. BRANDT HOUSE) AND A TRACK ROAD AHEAD, CONTINUE NORTH ON

NM1743'THE TRACK ROAD THROUGH A FIELD FOR 0.01 MI (0.02 KM) TO AN ELECTRIC

NM1743'FENCE GATE, PASS THROUGH THE GATE (CLOSE IT BEHIND YOU CATTLE IN AREA)

NM1743'AND CONTINUE NORTHERLY FOR 0.1 MI (0.2 KM) TO A GATE ON THE LEFT IN

NM1743'THE SADDLE OF THE HILL, BEAR RIGHT NORTHEAST FOR 0.1 MI (0.2 KM) TO

NM1743'THE HIGH POINT OF THE HILL AND THE STATION. NOTE--GO BY MR. BRANDT

NM1743'HOUSE OR CALL HIM IN ADVANCE AND HE WILL TURN THE ELECTRIC FENCE OFF.



The Geographic Calculator - Version 3.05

Registered to 'Bernhard, Eisenbraun and Associates'

at 09/05/01 Time: 11:02:16

Blue Marble Geographics  
5 Water Street, Gardiner, Maine 04345 USA  
(207) 582-6747 FAX (207) 582-7001

Brandt

Brandt

Latitude: (Degrees) 42 41 15.52835 N  
Longitude: (Degrees) 096 52 05.46612 W  
Elev. Ht.: (Meters) 0.0

Ortho. Height: (US Feet) 509022.1925  
Geoid Height: (US Feet) 2841881.4397

Convergence: (Degrees) - - - - - 2° 6' 32.84379"  
Scale Factor: - - - - - 0.999983569384

System: Geodetic United States State Plane 1927  
Datum Transf.: North American Datum 1927 NAD 1927 - CONUS  
Spheroid: Clarke 1866 Clarke 1866  
Zone: - - - - - 2601 - Nebraska North

Datum Shift: (Seconds) 0.00000" N , 0.00005" E  
Datum Shift: (Meters) 0.00 N , 0.00 E

Geodetic Datum Transformation 'North American Datum 1927'  
Transformation Method - Molodensky  
Semimajor Axis (meters): 6378206.400000  
Reciprocal Flattening (1/f): 294.9786982000  
Prime Meridian shift from Greenwich (deg): 0.0000000000  
X Shift to WGS 84 (meters): -8.00000  
Y Shift to WGS 84 (meters): 160.00000  
Z Shift to WGS 84 (meters): 176.00000

Geodetic Datum Transformation 'NAD 1927 - CONUS'  
Transformation Method - Molodensky  
Semimajor Axis (meters): 6378206.400000  
Reciprocal Flattening (1/f): 294.9786982000  
Prime Meridian shift from Greenwich (deg): 0.0000000000  
X Shift to WGS 84 (meters): -8.00000  
Y Shift to WGS 84 (meters): 160.00000  
Z Shift to WGS 84 (meters): 176.00000

Geographic Calculator - Version 3.05

Registered to 'Bernhard, Eisenbraun and Associates'

Date: 9/05/01 Time: 11:07:22

Marble Geographics  
10 Water Street, Gardiner, Maine 04345 USA  
(207) 582-6747 FAX (207) 582-7001

Willoughby

Willoughby

Latitude: (Degrees) 42 40 10.20200 N  
Longitude: (Degrees) 096 56 02.31300 W  
Elev. Ht.: (Meters) 0.0

Ortho Dist: (US Feet) 501768.9937  
Spher Dist: (US Feet) 2824441.8479

Convergence: (Degrees) - - - - -  
Scale Factor: - - - - - 2° 3' 53.33907"  
0.999981666253

System: Geodetic United States State Plane 1927  
Datum Transf.: North American Datum 1927 NAD 1927 - CONUS  
Spheroid: Clarke 1866 Clarke 1866  
Datum: - - - - - 2601 - Nebraska North

North Shift: (Seconds) 0.00000" N , 0.00005" E  
South Shift: (Meters) 0.00 N , 0.00 E

Geodetic Datum Transformation 'North American Datum 1927'  
Transformation Method - Molodensky  
Semi-major Axis (meters): 6378206.400000  
Reciprocal Flattening (1/f): 294.9786982000  
Prime Meridian shift from Greenwich (deg): 0.0000000000  
Shift to WGS 84 (meters): -8.00000  
Shift to WGS 84 (meters): 160.00000  
Shift to WGS 84 (meters): 176.00000

Geodetic Datum Transformation 'NAD 1927 - CONUS'  
Transformation Method - Molodensky  
Semi-major Axis (meters): 6378206.400000  
Reciprocal Flattening (1/f): 294.9786982000  
Prime Meridian shift from Greenwich (deg): 0.0000000000  
Shift to WGS 84 (meters): -8.00000  
Shift to WGS 84 (meters): 160.00000  
Shift to WGS 84 (meters): 176.00000

The Geographic Calculator - Version 3.05

Registered to 'Bernhard, Eisenbraun and Associates'

at 09/05/01 Time: 11:13:56

Blue Marble Geographics  
5 Water Street, Gardiner, Maine 04345 USA  
(207) 582-6747 FAX (207) 582-7001

Lime Creek

Lime Creek

Latitude: (Degrees) 42 43 50.89100 N  
Longitude: (Degrees) 097 00 52.97700 W  
Elev. Ht.: (Meters) 0.0

Northing: (US Feet) 523324.6801  
Easting: (US Feet) 2801956.4330

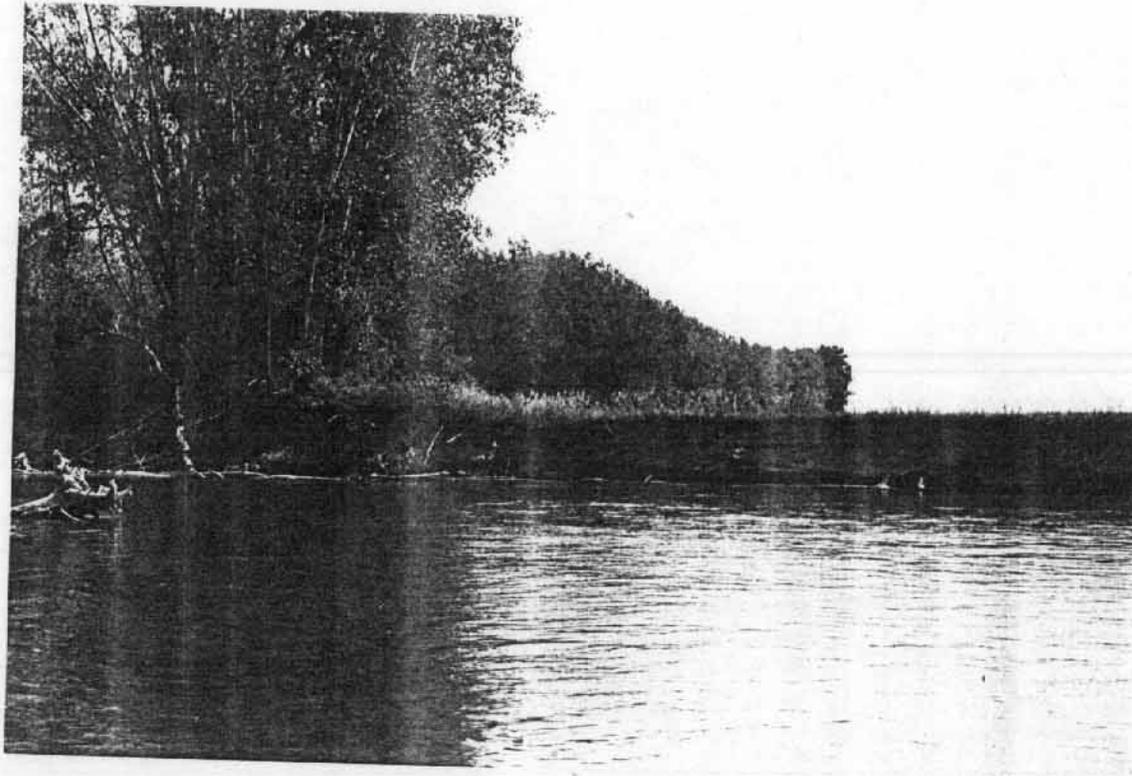
Convergence: (Degrees) - - - - - 2° 0' 37.59117"  
Scale Factor: - - - - - 0.999988499355

System: Geodetic United States State Plane 1927  
Datum Transf.: North American Datum 1927 NAD 1927 - CONUS  
Spheroid: Clarke 1866 Clarke 1866  
Zone: - - - - - 2601 - Nebraska North

Datum Shift: (Seconds) 0.00000" N , 0.00005" E  
Datum Shift: (Meters) 0.00 N , 0.00 E

Geodetic Datum Transformation 'North American Datum 1927'  
Transformation Method - Molodensky  
Semimajor Axis (meters): 6378206.400000  
Reciprocal Flattening (1/f): 294.9786982000  
Prime Meridian shift from Greenwich (deg): 0.0000000000  
X Shift to WGS 84 (meters): -8.00000  
Y Shift to WGS 84 (meters): 160.00000  
Z Shift to WGS 84 (meters): 176.00000

Geodetic Datum Transformation 'NAD 1927 - CONUS'  
Transformation Method - Molodensky  
Semimajor Axis (meters): 6378206.400000  
Reciprocal Flattening (1/f): 294.9786982000  
Prime Meridian shift from Greenwich (deg): 0.0000000000  
X Shift to WGS 84 (meters): -8.00000  
Y Shift to WGS 84 (meters): 160.00000  
Z Shift to WGS 84 (meters): 176.00000



Vermillion Reach CP 1

N = 521282.51

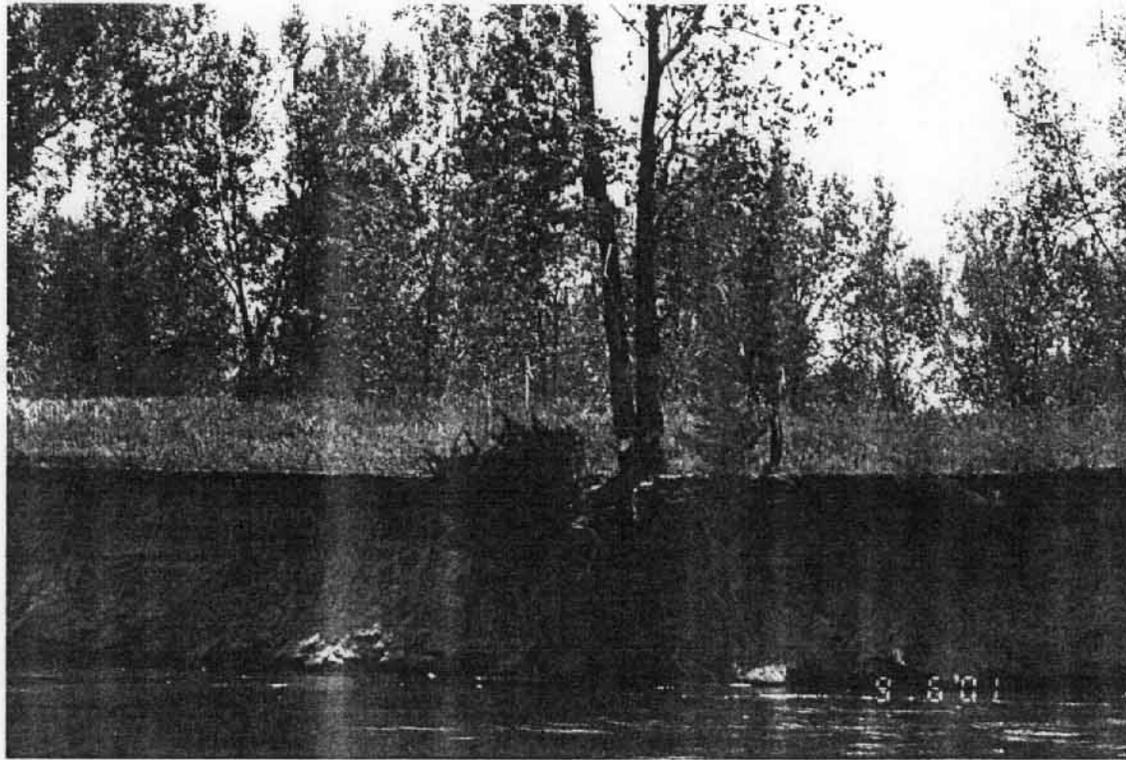
E = 2826972.95

Elev. = 1127.24

Description:

5/8" x 48" Rebar with Brass Cap stamped CP 1 with Steel  
Fence Post

North side of the old chute's tree margin, 50 feet back of the high bank



Vermillion Reach CP 2

N = 521912.48

E = 2828764.40

Elev. = 1132.29

Description:

5/8" x 48" Rebar with Brass Cap stamped CP 2 with Steel  
Fence Post

Near Rangeline 806.3, halfway between range marker and riverbank; the distance from range marker to CP 2 is 16.8 feet, 15 feet back of the high bank

## STATE PLANE COORDINATE CONVERSION WORKSHEET

DATE: 9-21-01  
 NAME: JJM  
 PROJECT NUMBER: Y00151509  
 PROJECT NAME: Vermillion Reach Hydro Survey

~~Triangulation Station~~ Brass Cap CPZ  
 State Plane (Grid) Coordinates: (Easting) X = 2828764.40  
 (Northing) Y = 521912.48  
 Station Latitude: 42° 43' 27.56161 N  
 Mean Project Latitude: 42° 43' 31.35958 N  
 Elevation of Station: 1132.29  
 Average Project Elevation: 1131.83

From state projection tables, interpolate latitude to obtain scale factor expressed as a ratio.  
 Scale Factor (SF) = 0.9999878

Sea Level Factor =  $1 - \frac{h}{20,906,000}$  (where H = average project elevation)

Sea Level Factor (SLF) =  $1 - \frac{1131.83}{20,906,000} = \underline{0.99994586}$

COMBINATION FACTOR = Scale Factor x Sea Level Factor

CF =  $\frac{0.9999878}{\text{Scale Factor}} \times \frac{0.99994586}{\text{Sea Level Factor}} = \frac{0.9999337}{\text{Combination Factor}}$

PROJECT DATUM COORDINATES = GRID COORDINATES / CF  
 (Use *all* significant figures in this computation)

(Easting) X = \_\_\_\_\_  
 (Northing) Y = \_\_\_\_\_

To differentiate project datum coordinates from State Plane (Grid) Coordinates, record project datum coordinates with only 5 places left of decimal.

PROJECT DATUM COORDINATES TO BE USED:

(Easting) X = \_\_\_\_\_  
 (Northing) Y = \_\_\_\_\_



Field Notes  
from  
Electronic  
Data Collectors

Project : Y00151S09 Vermillion Reach  
 User name: JJM Date & Time: 6:22:24 AM 9/7/01  
 Coordinate System: Projection from data collector  
 Zone: Zone from data collector  
 Project Datum: (WGS 84)  
 Vertical Datum & Geoid Model: Not selected  
 Coordinate Units: US survey feet  
 Distance Units: US survey feet  
 Height Units: US survey feet

Point listing

Name	Northing	Easting	Elevation	Feature Code
1	501768.968	2824441.704	1515.380	
2	509022.253	2841881.529	1500.005	WILLOUGHBY
3	523324.645	2801956.488	1428.860	BRANDT
10	518078.249	2821500.476	1139.967	LIME CREEK
101	501768.994	2824441.848	1515.380	CP10
102	509022.193	2841881.440	?	WILLOUGHBY
103	523324.680	2801956.433	1428.860	BRANDT
500	521282.505	2826972.945	1127.433	LIME CREEK
501	521897.547	2828772.035	1135.433	CP1-BRASS CAP
502	521912.483	2828764.402	1132.473	RANGE 806.3 B-CAP
1000	521259.453	2826903.462	1127.225	CP2-BRASS CAP
1001	521226.974	2826935.703	1127.660	HB
1002	521424.500	2827172.232	1132.130	G
1003	521381.879	2827184.386	1131.609	HB
1004	521517.576	2827447.100	1132.742	G
1005	521469.719	2827462.814	1132.531	HB
1006	521601.309	2827718.394	1133.333	G
1007	521554.311	2827730.480	1134.866	HB
1008	521665.118	2828015.791	1133.218	G
1009	521615.668	2828021.940	1131.941	HB
1010	521726.806	2828302.332	1132.033	G
1011	521677.615	2828311.174	1132.536	HB
1012	521844.207	2828579.147	1130.844	G
1013	521797.762	2828592.576	1132.604	HB
1014	521969.693	2828854.333	1130.197	G
1015	521921.755	2828871.338	1130.966	HB
1016	522128.249	2829102.775	1132.073	G
1017	522078.780	2829140.553	1132.851	HB
1018	521925.992	2828758.036	1130.441	G
1019	522318.638	2829354.318	1131.829	HB
1020	522280.252	2829383.571	1134.370	G
1021	522518.351	2829570.101	1135.755	HB
1022	522486.769	2829605.094	1137.776	G
1023	522791.111	2829687.482	1129.040	HB
1024	522776.558	2829734.916	1128.069	G
1025	523096.031	2829746.111	1129.079	HB
1026	523094.631	2829796.199	1129.407	G
1027	523368.345	2829766.975	1126.916	HB
1028	523373.124	2829817.190	1126.884	G
1029	523659.245	2829825.085	1126.353	HB
1030	523646.882	2829874.566	1126.475	G
1031	523895.890	2829972.610	1126.567	HB
1032	523861.915	2830007.179	1126.283	G

1033	524025.298	2830216.816	1126.684	HB
1034	523977.766	2830222.870	1125.982	G
1035	523998.178	2830492.859	1126.450	HB
1036	523955.363	2830484.038	1126.976	G
1037	523879.614	2830762.796	1127.407	HB
1038	523836.953	2830747.466	1128.720	G
1039	523894.364	2830767.539	1120.916	T
1040	523917.357	2830776.362	1122.115	BB
1041	523813.555	2831050.416	1119.411	WE
1042	523803.214	2831045.393	1120.970	BB
1043	523798.054	2831041.838	1122.897	BB
1044	523761.582	2831015.761	1127.768	HB
1045	523729.268	2830984.376	1127.686	G
1046	523767.482	2831021.337	1123.290	T
1047	523920.443	2830777.370	1119.366	WE
1048	524008.668	2830497.361	1119.536	WE
1049	524030.624	2830217.117	1119.494	WE
1050	523901.610	2829968.422	1119.753	WE
1051	523659.269	2829821.190	1119.954	WE
1052	523368.347	2829762.297	1120.071	WE
1053	523096.917	2829740.558	1120.234	WE
1054	522793.906	2829681.702	1120.454	WE
1055	522527.059	2829555.411	1120.480	WE
1056	522325.698	2829348.022	1120.482	WE
1057	522132.329	2829099.302	1120.519	WE
1058	521975.860	2828851.823	1120.627	WE
1059	521851.621	2828577.308	1120.615	WE
1060	521736.657	2828300.004	1120.792	WE
1061	521671.805	2828014.004	1120.903	WE
1062	521614.633	2827715.199	1120.970	WE
1063	521531.012	2827443.166	1120.997	WE
1064	521437.076	2827165.070	1121.001	WE
1065	521260.646	2826900.202	1121.103	WE