

**Rocky Mountain Mapping Center
Response to FOIA 05-2003-00764 (Joe Trow)**

In response to FOIA Request 05-2003-00764, the USGS, Rocky Mountain Mapping Center does not have any "records...that establish astronomically the Montana Initial Point as the same point for all governments: Federal, State, County, and local."

However, the accepted geodetic position for the initial point of Montana is published by the National Geodetic Survey (NGS), Department of Commerce. The NGS is the responsible control agency of the Federal Government, and has created the National Spatial Reference System (NSRS) of which the Montana Initial Point is part (The designation of the initial point is "GLO POST 19." Its unique identifier is PID QX0641). A copy of the datasheet is attached (two pages). The NSRS was developed as a means of providing a common reference system covering the entire nation. The NGS values are those accepted by all Federal, State, and County agencies. It is uncertain whether local entities use these values or their own system. The NGS datasheet was provided to Mr. Trow as part of a request for information made in 1997. A copy of the response letter to Mr. Trow is attached (two pages).

The NGS position was initially surveyed in 1922 using conventional surveying methods. Datum conversions and adjustments have occurred over time and are documented by the NGS.

The only astronomical observations that may exist would have been made by the General Land Office (GLO), now the Bureau of Land Management (BLM), when the station was initially set. Additional information should be available through the BLM.

The NGS Data Sheet

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

DATABASE = Sybase ,PROGRAM = datasheet. VERSION = 6.79

1 National Geodetic Survey, Retrieval Date = JULY 16, 2003

QX0641 *****
 QX0641 DESIGNATION - GLO POST 19
 QX0641 PID - QX0641
 QX0641 STATE/COUNTY- MT/GALLATIN
 QX0641 USGS QUAD - WILLOW CREEK (1987)

*CURRENT SURVEY CONTROL

QX0641 NAD 83(1992)- 45 47 12.82377(N) 111 39 35.57619(W) ADJUSTED
 QX0641 NAVD 88 - 1461.5 (meters) 4795. (feet) VERTCON
 QX0641 LAPLACE CORR- -0.20 (seconds) DEFLEC99
 QX0641 GEOID HEIGHT- -11.33 (meters) GEOID99

QX0641 HORIZ ORNER - SECOND

QX0641 The horizontal coordinates were established by classical geodetic methods and adjusted by the National Geodetic Survey in July 1992.

QX0641 The NAVD 88 height was computed by applying the VERTCON shift value to the NGVD 29 height (displayed under SUPERSEDED SURVEY CONTROL.)

QX0641 The Laplace correction was computed from DEFLEC99 derived deflections.

QX0641 The geoid height was determined by GEOID99.

	North	East	Units	Scale	Converg.
QX0641:SPC MF	- 173,136.196	432,132.523	MT	0.99961893	-1 34 47.9
QX0641:UTM 12	- 5,070,582.273	448,708.814	MT	0.99963234	-0 28 22.7

QX0641: Primary Azimuth Mark Grid Az
 QX0641:SPC MT - GLO POST 19 AZ MK 039 52 22.3
 QX0641:UTM 12 - GLO POST 19 AZ MK 038 45 57.1

PID	Reference Object	Distance	Geod. Az
QX0641	QX0642 GLO POST 19 RM 1	3.045 METERS	08821
QX0641	CN3604 GLO POST 19 AZ MK		0381734.4
QX0641	QX0640 GLO POST 19 RM 2	6.390 METERS	08952

SUPERSEDED SURVEY CONTROL

QX0641 NAD 83(1986)- 45 47 12.82408(N) 111 39 35.57155(W) AD() 2
 QX0641 NAD 27 - 45 47 13.07900(N) 111 39 32.65900(W) AD() 2
 QX0641 NGVD 29 - 1460.5 (m) 4792. (f) VERT ANG

QX0641 Superseded values are not recommended for survey control.
 QX0641 NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 QX0641 See file dsdata.txt to determine how the superseded data were derived.

QX0641 U.S. NATIONAL GRID SPATIAL ADDRESS: 12TVR4870B70582(NAD 83)
 QX0641 MARKER: DD = SURVEY DISK
 QX0641 SETTING: 66 = SET IN ROCK OUTCROP

DATASHEETS

http://www.nga.noaa.gov/cgi-bin/ds_quads.pl

QX0641	HISTORY	- Date	Condition	Report By
QX0641	HISTORY	- 1922	MONUMENTED	USGLO
QX0641	HISTORY	- 1956	GOOD	CGS

QX0641
QX0641
QX0641

STATION DESCRIPTION

QX0641 DESCRIBED BY US GENERAL LAND OFFICE 1922 (NMS)
QX0641 STATION IS THE INITIAL POINT OF ALL G.L.O. SURVEYS IN MONTANA.
QX0641 ABOUT 3 MILES S OF THE TOWN OF WILLOW CREEK, ON THE E END OF
QX0641 THE FIRST HIGH RIDGE S OF THE TOWN ON THE W SIDE OF THE
QX0641 YELLOWSTONE TRAIL HIGHWAY. IT CAN BE REACHED FROM THE HIGHWAY S
QX0641 OF IT IN 15 MINUTES CLIMB.
QX0641
QX0641 A CAIRN OF ROCKS 5 FEET HIGH SETS 10 FEET W OF THE STATION.
QX0641
QX0641 STATION AND REFERENCE MARKS ARE STANDARD G.L.O. DISKS SET
QX0641 IN CEMENT IN DRILL HOLES IN OUTCROPPING LIMESTONE.
QX0641
QX0641 THE STATION MARK WAS STAMPED.

QX0641
QX0641
QX0641

STATION RECOVERY (1956)

QX0641 RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1956 (WFD).
QX0641 THE STATION AND THE TWO REFERENCE MARKS WERE RECOVERED IN
QX0641 GOOD CONDITION. THE ORIGINAL DESCRIPTION OF THE STATION
QX0641 IS ADEQUATE AND CORRECT WITH THE EXCEPTION OF THE DESCRIPTION
QX0641 TO REACH THE STATION. A DESCRIPTION FOR THE 1956 AZIMUTH
QX0641 MARK AND A LETTER DESCRIPTION TO REACH THE STATION FOLLOWS--
QX0641
QX0641 THE AZIMUTH MARK IS 30 FEET EAST OF THE CENTER OF A DIRT ROAD,
QX0641 AND 7 FEET EAST-SOUTHEAST OF A WHITE 4 IN X 4 IN WITNESS POST.
QX0641 THE MARK IS A STANDARD AZIMUTH MARK DISK SET IN CEMENT IN A
QX0641 DRILL HOLE IN OUTCROPPING LIMESTONE. THE DISK IS STAMPED
QX0641 GLO POST 19 USBLM 1956.
QX0641
QX0641 TO REACH THE STATION FROM THE POST OFFICE IN WILLOW CREEK,
QX0641 GO SOUTH ON A MACADAM ROAD FOR 1.4 MILES TO A ROAD FORK,
QX0641 CONTINUE SOUTHERLY ON THE LEFT ROAD FOR 0.8 MILE TO LARGE
QX0641 RANCH BUILDINGS ON THE LEFT (EAST) AND A WIRE GATE ON THE
QX0641 RIGHT. TURN RIGHT (WEST) THROUGH GATE AND FOLLOW RANCH ROAD
QX0641 FOR 0.1 MILE TO THE AZIMUTH MARK ON THE LEFT, CONTINUE ON
QX0641 DIRT ROAD ON THE EAST SIDE OF A FENCE FOR 0.3 MILE TO A
QX0641 FENCE CORNER, TURN RIGHT AND FOLLOW ALONG THE FENCE FOR 0.3
QX0641 MILE, TURN LEFT AND FOLLOW BIR TRACK ROAD UP CREST OF ROCKY
QX0641 RIDGE FOR 0.5 MILE TO THE HIGHEST POINT OF THE HILL AND
QX0641 STATION.
QX0641
QX0641 HEIGHT OF STAND ABOVE STATION MARK 2.27 METERS.

*** retrieval complete.
Elapsed Time = 00:00:02

Mr. Gary A. Baden
Mr. Joe Trow
Exemption 6

August 8, 1997

Re: Montana Boundary Letter,
dated May 30, 1997

Dear Messrs. Baden and Trow,

This letter is in response to your correspondence dated May 30, 1997 regarding questions about the Montana state boundary and initial point to which all Montana Public Land Survey System (PLSS) cadastral surveys have been directly or indirectly tied.

Enclosed please find the official data sheet published by the National Geodetic Survey for the initial point for Montana Surveys. The point has been given the reference name of "GLO POST 19". The data sheet provides a written description of the mark, its most current geodetic position based on a 1992 adjustment of North American Datum 1983 (NAD83), and its superseded positions including the North American Datum 1927 (NAD27) position. The NAD27 position agrees exactly with the position provided to Governor Racicot by the Bureau of Land Management in their letter of September 3, 1996 (your enclosure V).

One topic about which you are concerned is the inconsistency of positional data that appears in government records. Perhaps a clarification of datums will help. When the boundaries and initial point for Montana were surveyed in the late 1800's and early 1900's, different datums were used. One, as you have mentioned, was tied to the dome of the old Naval Observatory in Washington, D.C. Another was simply listed as west of Greenwich. The datum upon which many of the more current records (and nearly all U.S. Geological Survey topographic maps) are based is NAD27. Regardless of inconsistencies in coordinate values based on different datums, the physical location of the monument on the ground, or feature which has been accepted over time, is what is legally binding with respect to property ownership, not its geodetic position.

All USGS 1:100,000-scale maps are based on NAD27. The 1992 Bozeman 100K Quadrangle was compiled from thirty-two USGS 7.5-minute quadrangles dated 1987-1988, also based on NAD27. The initial point for Montana PLSS is located on the Willow Creek Quadrangle (copy enclosed). The position was plotted from its NAD27 geodetic coordinates.

The representation of PLSS, including the Principal Meridian and Baseline, on USGS maps is based on a combination of ground evidence found and identified on mapping photography or fieldboards, plat distances and angles, and descriptive data found in the official PLSS field notes. Very few PLSS corner locations have geodetic positions established for them, and therefore very few were plotted on USGS maps by their coordinates. This, however, does not mean that the points were inaccurately surveyed or that their positions should be considered suspect.

As mentioned earlier, the state boundary of Montana was officially surveyed and monumented in the late 1800's and early 1900's. Please see the enclosed pages from Geological Survey Professional Paper 909, "Boundaries of the United States and the Several States," 1976, for more

specific information. In addition, the "Bulletin of the United States Geological Survey No. 170; Survey of the Boundary Line Between Idaho and Montana from the International Boundary to the Crest of the Bitterroot Mountains--Goode, 1900" provides detailed facts and plats of the survey, descriptions and photographs of the monumentation, and narratives about the survey itself. Enclosed is a copy of the title page of this document. The document itself is out-of-print, but if you are interested in seeing a copy, the USGS Field Records Library in Denver has two copies that they make available on interlibrary loan. You may contact your local library, who will need to contact Ms. Carol Edwards at 303-236-1005 to make the necessary arrangements.

Hopefully this information will be of some assistance to you.

Sincerely,

Randle W. Olsen
Chief, Rocky Mountain Mapping Center

Enclosures:

NGS Desc.
Willow Creek Quad
USGS Prof. Paper 909 (part)
USGS Bulletin 170 (title page)