

OPUS-RS solution : 018697_14_231_A0.14O OP1408627670894

opus <opus@ngs.noaa.gov>

Thu 8/21/2014 7:31 AM

To:Chad Mozol <Chad.Mozol@neciusa.com>;

FILE: 018697_14_231_A0.14O OP1408627670894

NGS OPUS-RS SOLUTION REPORT =====

All computed coordinate accuracies are listed as 1-sigma RMS values.
For additional information: <http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy>

USER: cmozol@neciusa.com DATE: August 21, 2014
RINEX FILE: 0186231r.14o TIME: 13:30:43 UTC

SOFTWARE: rsgps 1.37 RS91.prl 1.99.2 START: 2014/08/19 17:50:45
EPHEMERIS: igr18062.eph [rapid] STOP: 2014/08/19 18:48:00
NAV FILE: brdc2310.14n OBS USED: 2525 / 3155 : 80%
ANT NAME: CHCX90D-OPUS NONE QUALITY IND. 17.40/ 6.10
ARP HEIGHT: 1.8 NORMALIZED RMS: 0.370

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2014.63223)

X:	-1375246.190(m)	0.007(m)	-1375247.066(m)	0.007(m)
Y:	-4029959.534(m)	0.028(m)	-4029958.311(m)	0.028(m)
Z:	4733861.470(m)	0.033(m)	4733861.462(m)	0.033(m)

LAT:	48 13 10.44252	0.006(m)	48 13 10.46346	0.006(m)
E LON:	251 9 27.02285	0.006(m)	251 9 26.96356	0.006(m)
W LON:	108 50 32.97715	0.006(m)	108 50 33.03644	0.006(m)
EL HGT:	916.762(m)	0.043(m)	916.173(m)	0.043(m)
ORTHO HGT:	932.384(m)	0.044(m)	[NAVD88 (Computed using GEOID12A)]	

	UTM COORDINATES	STATE PLANE COORDINATES
	UTM (Zone 12)	SPC (2500 MT)
Northing (Y) [meters]	5342955.128	441304.812
Easting (X) [meters]	660251.966	648838.716
Convergence [degrees]	1.60920086	0.48096866
Point Scale	0.99991555	0.99961543
Combined Factor	0.99977190	0.99947182

US NATIONAL GRID DESIGNATOR: 12UXU6025142955(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DG9749	MTMS MONTANA STATE UNI CORS ARP	N483227.426	W1094111.858	72030.1
DL7731	P053 WHITEWATERMT2007 CORS ARP	N484333.865	W1074331.456	99985.1
DM7133	MTLW LEWISTOWN CORS ARP	N470314.929	W1092633.764	137221.0
DI3425	P052 LRRNCHJRDNMT2006 CORS ARP	N472229.026	W1070107.185	165822.0
DI2257	P049 ARMINGTON_MT2006 CORS ARP	N472059.850	W1105422.382	182398.3

NEAREST NGS PUBLISHED CONTROL POINT

Information on nearest mark is not available due to database connectivity issues or has restrictions on when or how it can be published.

OPUS-RS Extended Output, Level 2

FINAL COORDINATES (ITRF at epoch of observations)

mtms	-1425435.578	-3984013.206	4757493.877
p053	-1283559.264	-4015770.325	4771131.597
mtlw	-1449333.481	-4105829.817	4646773.499
p052	-1266648.337	-4138194.562	4670709.493
p049	-1545099.837	-4044895.892	4669084.595
0186	-1375247.066	-4029958.311	4733861.462

Covariance matrix of the stations:

1	2.6060E-07	5.0930E-07	-5.4200E-07	-2.8510E-09	-1.0390E-07	1.2220E-07	-2.2380E-08	-1.4070E-07	1.4350E-07	-7.0700E-09	-1.3080E-07	1.3470E-07	-2.8010E-08	-1.3400E-07	1.4190E-07	4.6610E-08	2.3400E-08	-1.7320E-08
2	5.0930E-07	2.0540E-06	-2.1240E-06	-1.5430E-08	-3.7000E-07	6.3480E-07	-1.9600E-07	-4.9250E-07	4.5890E-07	-6.8680E-08	-7.2170E-07	7.2960E-07	-2.2770E-07	-2.6980E-07	3.0020E-07	8.9510E-08	3.7930E-07	-2.9530E-07
3	-5.4200E-07	-2.1240E-06	2.6740E-06	1.1080E-07	5.2480E-07	-6.6800E-07	1.5000E-07	5.2300E-07	-5.8170E-07	1.2510E-07	6.2950E-07	-6.9890E-07	1.5460E-07	4.4810E-07	-5.2510E-07	-1.8580E-08	-1.0360E-07	1.2460E-07
4	-2.8510E-09	-1.5430E-08	1.1080E-07	2.9690E-07	4.9400E-07	-4.2770E-07	-5.2510E-08	-1.6700E-07	9.1450E-08	3.9070E-08	-2.5230E-07	2.0070E-07	-8.1030E-08	-5.8170E-08	2.4470E-08	9.9500E-08	1.8970E-07	-1.6450E-07
5	-1.0390E-07	-3.7000E-07	5.2480E-07	4.9400E-07	2.0900E-06	-2.2630E-06	-1.4220E-07	-5.0360E-07	5.6440E-07	-9.8910E-08	-6.1530E-07	6.9110E-07	-1.4910E-07	-3.9950E-07	4.8330E-07	3.4380E-08	1.0450E-07	-2.9230E-08
6	1.2220E-07	6.3480E-07	-6.6800E-07	-4.2770E-07	-2.2630E-06	2.9620E-06	8.4210E-08	5.3170E-07	-7.0570E-07	1.6320E-07	4.9340E-07	-6.4500E-07	5.8190E-08	6.0300E-07	-7.4470E-07	4.8360E-08	2.2840E-07	-2.0040E-07
7	-2.2380E-08	-1.9600E-07	1.5000E-07	-5.2510E-08	-1.4220E-07	8.4210E-08	3.0490E-07	5.9640E-07	-5.5190E-07	-3.9690E-08	-5.6510E-08	8.8670E-08	9.7250E-09	-2.0220E-07	2.2910E-07	4.0970E-10	-1.2730E-07	1.0940E-07
8	-1.4070E-07	-4.9250E-07	5.2300E-07	-1.6700E-07	-5.0360E-07	5.3170E-07	5.9640E-07	2.2050E-06	-2.2230E-06	-1.6990E-07	-5.1880E-07	6.0100E-07	-1.1910E-07	-4.9110E-07	5.6690E-07	-4.8420E-08	-9.5130E-08	1.0230E-07
9	1.4350E-07	4.5890E-07	-5.8170E-07	9.1450E-08	5.6440E-07	-7.0570E-07	-5.5190E-07	-2.2230E-06	2.6720E-06	1.1680E-07	7.4570E-07	-7.3060E-07	2.0050E-07	4.5330E-07	-4.5320E-07	-2.0660E-08	-1.0300E-07	1.5410E-07
10	-7.0700E-09	-6.8680E-08	1.2510E-07	3.9070E-08	-9.8910E-08	1.6320E-07	-3.9690E-08	-1.6990E-07	1.1680E-07	2.6640E-07	4.4100E-07	-4.8260E-07	-5.9460E-08	-1.0240E-07	7.6750E-08	7.7580E-08	1.0740E-07	-9.8880E-08
11	-1.3080E-07	-7.2170E-07	6.2950E-07	-2.5230E-07	-6.1530E-07	4.9340E-07	-5.6510E-08	-5.1880E-07	7.4570E-07	4.4100E-07	2.7500E-06	-2.7130E-06	-3.6350E-09	-6.9340E-07	8.4550E-07	-1.1530E-07	-4.5230E-07	4.3300E-07
12	1.3470E-07	7.2960E-07	-6.9890E-07	2.0070E-07	6.9110E-07	-6.4500E-07	8.8670E-08	6.0100E-07	-7.3060E-07	-4.8260E-07	-2.7130E-06	3.0560E-06	6.0650E-08	6.8940E-07	-7.8220E-07	6.5160E-08	3.2540E-07	-2.3960E-07
13	-2.8010E-08	-2.2770E-07	1.5460E-07	-8.1030E-08	-1.4910E-07	5.8190E-08	9.7250E-09	-1.1910E-07	2.0050E-07									

```

-5.9460E-08 -3.6350E-09 6.0650E-08 3.5950E-07 4.9820E-07 -4.7340E-07 -2.4130E-08 -1.9290E-07 1.7090E-07
 14 -1.3400E-07 -2.6980E-07 4.4810E-07 -5.8170E-08 -3.9950E-07 6.0300E-07 -2.0220E-07 -4.9110E-07 4.5330E-07
-1.0240E-07 -6.9340E-07 6.8940E-07 4.9820E-07 2.0520E-06 -2.1950E-06 4.0240E-08 2.6450E-07 -2.1140E-07
 15 1.4190E-07 3.0020E-07 -5.2510E-07 2.4470E-08 4.8330E-07 -7.4470E-07 2.2910E-07 5.6690E-07 -4.5320E-07
7.6750E-08 8.4550E-07 -7.8220E-07 -4.7340E-07 -2.1950E-06 2.7060E-06 -7.4290E-08 -3.4710E-07 3.6130E-07
 16 4.6610E-08 8.9510E-08 -1.8580E-08 9.9500E-08 3.4380E-08 4.8360E-08 4.0970E-10 -4.8420E-08 -2.0660E-08
7.7580E-08 -1.1530E-07 6.5160E-08 -2.4130E-08 4.0240E-08 -7.4290E-08 2.6140E-06 6.1520E-06 -6.5040E-06
 17 2.3400E-08 3.7930E-07 -1.0360E-07 1.8970E-07 1.0450E-07 2.2840E-07 -1.2730E-07 -9.5130E-08 -1.0300E-07
1.0740E-07 -4.5230E-07 3.2540E-07 -1.9290E-07 2.6450E-07 -3.4710E-07 6.1520E-06 2.4280E-05 -2.6700E-05
 18 -1.7320E-08 -2.9530E-07 1.2460E-07 -1.6450E-07 -2.9230E-08 -2.0040E-07 1.0940E-07 1.0230E-07 1.5410E-07
-9.8880E-08 4.3300E-07 -2.3960E-07 1.7090E-07 -2.1140E-07 3.6130E-07 -6.5040E-06 -2.6700E-05 3.2600E-05

```

Covariance Matrix for the xyz OPUS Rover Position (meters^2).

```

0.0000026140 0.0000061520 -0.0000065040
0.0000061520 0.0000242800 -0.0000267000
-0.0000065040 -0.0000267000 0.0000326000

```

Covariance Matrix for the enu OPUS Position (meters^2).

```

0.0000011131 0.0000003464 0.0000030076
0.0000003464 0.0000016137 0.0000005027
0.0000030076 0.0000005027 0.0000567671

```

Horizontal network accuracy = 0.00290 meters.

Vertical network accuracy = 0.01477 meters.

		Vectors		
To	From	X	Y	Z
mtms	0186	-50188.512	45945.105	23632.415
p053	0186	91687.802	14187.986	37270.135
mtlw	0186	-74086.415	-75871.506	-87087.962
p052	0186	108598.729	-108236.251	-63151.969
p049	0186	-169852.771	-14937.581	-64776.867

Covariance matrix of the 5 vectors

```

1 2.7814E-06 6.5484E-06 -7.0101E-06 2.4650E-06 5.9903E-06 -6.4128E-06 2.5446E-06 6.0363E-06 -6.3225E-06
2.4827E-06 6.1131E-06 -6.4171E-06 2.5635E-06 5.9544E-06 -6.2705E-06
2 6.5484E-06 2.5575E-05 -2.8425E-05 5.8574E-06 2.3426E-05 -2.5998E-05 5.9938E-06 2.3503E-05 -2.5843E-05
5.8864E-06 2.3631E-05 -2.6000E-05 6.0277E-06 2.3366E-05 -2.5757E-05
3 -7.0101E-06 -2.8425E-05 3.5025E-05 -6.2101E-06 -2.6042E-05 3.2008E-05 -6.4448E-06 -2.6176E-05 3.1740E-05
-6.2614E-06 -2.6400E-05 3.2016E-05 -6.5017E-06 -2.5937E-05 3.1589E-05
4 2.4650E-06 5.8574E-06 -6.2101E-06 2.7119E-06 6.4219E-06 -6.8156E-06 2.4616E-06 5.8437E-06 -6.2274E-06
2.4760E-06 5.8253E-06 -6.2040E-06 2.4576E-06 5.8639E-06 -6.2407E-06
5 5.9903E-06 2.3426E-05 -2.6042E-05 6.4219E-06 2.6161E-05 -2.9162E-05 6.1027E-06 2.3767E-05 -2.6003E-05
5.9113E-06 2.4013E-05 -2.6305E-05 6.1614E-06 2.3512E-05 -2.5840E-05
6 -6.4128E-06 -2.5998E-05 3.2008E-05 -6.8156E-06 -2.9162E-05 3.5963E-05 -6.5776E-06 -2.6499E-05 3.1941E-05
-6.2903E-06 -2.6868E-05 3.2395E-05 -6.6651E-06 -2.6114E-05 3.1694E-05
7 2.5446E-06 5.9938E-06 -6.4448E-06 2.4616E-06 6.1027E-06 -6.5776E-06 2.9181E-06 6.9241E-06 -7.1446E-06
2.4963E-06 6.3381E-06 -6.5899E-06 2.6474E-06 6.0369E-06 -6.3100E-06
8 6.0363E-06 2.3503E-05 -2.6176E-05 5.8437E-06 2.3767E-05 -2.6499E-05 6.9241E-06 2.6675E-05 -2.8922E-05
5.9231E-06 2.4309E-05 -2.6527E-05 6.2742E-06 2.3620E-05 -2.5888E-05
9 -6.3225E-06 -2.5843E-05 3.1740E-05 -6.2274E-06 -2.6003E-05 3.1941E-05 -7.1446E-06 -2.8922E-05 3.4964E-05
-6.2677E-06 -2.6284E-05 3.1955E-05 -6.4537E-06 -2.5932E-05 3.1631E-05

```

10 2.4827E-06 5.8864E-06 -6.2614E-06 2.4760E-06 5.9113E-06 -6.2903E-06 2.4963E-06 5.9231E-06 -6.2677E-06
2.7252E-06 6.6009E-06 -6.9529E-06 2.5011E-06 5.9020E-06 -6.2541E-06
11 6.1131E-06 2.3631E-05 -2.6400E-05 5.8253E-06 2.4013E-05 -2.6868E-05 6.3381E-06 2.4309E-05 -2.6284E-05
6.6009E-06 2.7935E-05 -3.0171E-05 6.4566E-06 2.3774E-05 -2.5940E-05
12 -6.4171E-06 -2.6000E-05 3.2016E-05 -6.2040E-06 -2.6305E-05 3.2395E-05 -6.5899E-06 -2.6527E-05 3.1955E-05
-6.9529E-06 -3.0171E-05 3.6135E-05 -6.6794E-06 -2.6125E-05 3.1696E-05
13 2.5635E-06 6.0277E-06 -6.5017E-06 2.4576E-06 6.1614E-06 -6.6651E-06 2.6474E-06 6.2742E-06 -6.4537E-06
2.5011E-06 6.4566E-06 -6.6794E-06 3.0218E-06 6.8029E-06 -7.0740E-06
14 5.9544E-06 2.3366E-05 -2.5937E-05 5.8639E-06 2.3512E-05 -2.6114E-05 6.0369E-06 2.3620E-05 -2.5932E-05
5.9020E-06 2.3774E-05 -2.6125E-05 6.8029E-06 2.5803E-05 -2.8336E-05
15 -6.2705E-06 -2.5757E-05 3.1589E-05 -6.2407E-06 -2.5840E-05 3.1694E-05 -6.3100E-06 -2.5888E-05 3.1631E-05
-6.2541E-06 -2.5940E-05 3.1696E-05 -7.0740E-06 -2.8336E-05 3.4583E-05

Correlation matrix of the 5 vectors

1 1.0000E+00 7.7641E-01 -7.1024E-01 8.9755E-01 7.0225E-01 -6.4120E-01 8.9318E-01 7.0079E-01 -6.4114E-01
9.0178E-01 6.9352E-01 -6.4010E-01 8.8425E-01 7.0286E-01 -6.3935E-01
2 7.7641E-01 1.0000E+00 -9.4974E-01 7.0332E-01 9.0566E-01 -8.5725E-01 6.9381E-01 8.9984E-01 -8.6421E-01
7.0508E-01 8.8411E-01 -8.5527E-01 6.8566E-01 9.0959E-01 -8.6608E-01
3 -7.1024E-01 -9.4974E-01 1.0000E+00 -6.3720E-01 -8.6033E-01 9.0186E-01 -6.3749E-01 -8.5636E-01 9.0699E-01
-6.4089E-01 -8.4400E-01 8.9994E-01 -6.3199E-01 -8.6277E-01 9.0764E-01
4 8.9755E-01 7.0332E-01 -6.3720E-01 1.0000E+00 7.6243E-01 -6.9014E-01 8.7504E-01 6.8707E-01 -6.3953E-01
9.1077E-01 6.6928E-01 -6.2671E-01 8.5851E-01 7.0099E-01 -6.4441E-01
5 7.0225E-01 9.0566E-01 -8.6033E-01 7.6243E-01 1.0000E+00 -9.5075E-01 6.9847E-01 8.9969E-01 -8.5979E-01
7.0009E-01 8.8826E-01 -8.5555E-01 6.9298E-01 9.0494E-01 -8.5909E-01
6 -6.4120E-01 -8.5725E-01 9.0186E-01 -6.9014E-01 -9.5075E-01 1.0000E+00 -6.4208E-01 -8.5556E-01 9.0076E-01
-6.3539E-01 -8.4769E-01 8.9864E-01 -6.3936E-01 -8.5726E-01 8.9871E-01
7 8.9318E-01 6.9381E-01 -6.3749E-01 8.7504E-01 6.9847E-01 -6.4208E-01 1.0000E+00 7.8480E-01 -7.0733E-01
8.8522E-01 7.0200E-01 -6.4175E-01 8.9156E-01 6.9571E-01 -6.2813E-01
8 7.0079E-01 8.9984E-01 -8.5636E-01 6.8707E-01 8.9969E-01 -8.5556E-01 7.8480E-01 1.0000E+00 -9.4704E-01
6.9469E-01 8.9050E-01 -8.5440E-01 6.9884E-01 9.0029E-01 -8.5234E-01
9 -6.4114E-01 -8.6421E-01 9.0699E-01 -6.3953E-01 -8.5979E-01 9.0076E-01 -7.0733E-01 -9.4704E-01 1.0000E+00
-6.4209E-01 -8.4104E-01 8.9901E-01 -6.2787E-01 -8.6337E-01 9.0965E-01
10 9.0178E-01 7.0508E-01 -6.4089E-01 9.1077E-01 7.0009E-01 -6.3539E-01 8.8522E-01 6.9469E-01 -6.4209E-01
1.0000E+00 7.5654E-01 -7.0064E-01 8.7156E-01 7.0382E-01 -6.4421E-01
11 6.9352E-01 8.8411E-01 -8.4400E-01 6.6928E-01 8.8826E-01 -8.4769E-01 7.0200E-01 8.9050E-01 -8.4104E-01
7.5654E-01 1.0000E+00 -9.4964E-01 7.0275E-01 8.8553E-01 -8.3459E-01
12 -6.4010E-01 -8.5527E-01 8.9994E-01 -6.2671E-01 -8.5555E-01 8.9864E-01 -6.4175E-01 -8.5440E-01 8.9901E-01
-7.0064E-01 -9.4964E-01 1.0000E+00 -6.3921E-01 -8.5556E-01 8.9662E-01
13 8.8425E-01 6.8566E-01 -6.3199E-01 8.5851E-01 6.9298E-01 -6.3936E-01 8.9156E-01 6.9884E-01 -6.2787E-01
8.7156E-01 7.0275E-01 -6.3921E-01 1.0000E+00 7.7042E-01 -6.9199E-01
14 7.0286E-01 9.0959E-01 -8.6277E-01 7.0099E-01 9.0494E-01 -8.5726E-01 6.9571E-01 9.0029E-01 -8.6337E-01
7.0382E-01 8.8553E-01 -8.5556E-01 7.7042E-01 1.0000E+00 -9.4859E-01
15 -6.3935E-01 -8.6608E-01 9.0764E-01 -6.4441E-01 -8.5909E-01 8.9871E-01 -6.2813E-01 -8.5234E-01 9.0965E-01
-6.4421E-01 -8.3459E-01 8.9662E-01 -6.9199E-01 -9.4859E-01 1.0000E+00

G-FILE for the vectors

Axx2014 8192014 819
B201408191700201408191800 5 rsgps 1.37IGS
lant_info.003 NGS
C00060001 -501885118 16 459451048 50 236324150 59
C00060002 916878019 16 141879856 51 372701350 59

C00060003 -740864153 17 -758715061 51 -870879623 59
 C00060004 1085987290 16-1082362508 52 -631519690 60
 C00060005-1698527710 17 -149375811 50 -647768667 58
 D 1 2 7764136 1 3 -7102417 1 4 8975461 1 5 7022515 1 6 -6411999
 D 1 7 8931836 1 8 7007897 1 9 -6411368 1 10 9017760 1 11 6935217
 D 1 12 -6400974 1 13 8842495 1 14 7028616 1 15 -6393482 2 3 -9497361
 D 2 4 7033214 2 5 9056563 2 6 -8572489 2 7 6938117 2 8 8998370
 D 2 9 -8642094 2 10 7050775 2 11 8841076 2 12 -8552739 2 13 6856614
 D 2 14 9095896 2 15 -8660779 3 4 -6371993 3 5 -8603308 3 6 9018643
 D 3 7 -6374913 3 8 -8563595 3 9 9069937 3 10 -6408907 3 11 -8440015
 D 3 12 8999437 3 13 -6319903 3 14 -8627701 3 15 9076412 4 5 7624315
 D 4 6 -6901412 4 7 8750412 4 8 6870656 4 9 -6395285 4 10 9107720
 D 4 11 6692836 4 12 -6267104 4 13 8585080 4 14 7009933 4 15 -6444146
 D 5 6 -9507490 5 7 6984697 5 8 8996910 5 9 -8597915 5 10 7000905
 D 5 11 8882576 5 12 -8555532 5 13 6929847 5 14 9049364 5 15 -8590881
 D 6 7 -6420794 6 8 -8555559 6 9 9007556 6 10 -6353906 6 11 -8476905
 D 6 12 8986405 6 13 -6393637 6 14 -8572580 6 15 8987148 7 8 7848047
 D 7 9 -7073305 7 10 8852160 7 11 7020022 7 12 -6417476 7 13 8915554
 D 7 14 6957085 7 15 -6281271 8 9 -9470418 8 10 6946944 8 11 8905020
 D 8 12 -8544047 8 13 6988362 8 14 9002887 8 15 -8523448 9 10 -6420867
 D 9 11 -8410384 9 12 8990066 9 13 -6278735 9 14 -8633693 9 15 9096519
 D 10 11 7565359 10 12 -7006435 10 13 8715593 10 14 7038154 10 15 -6442096
 D 11 12 -9496400 11 13 7027491 11 14 8855299 11 15 -8345869 12 13 -6392090
 D 12 14 -8555577 12 15 8966165 13 14 7704180 13 15 -6919932 14 15 -9485872

ITRF position of 0186 as determined by individual baselines

	X	Y	Z
mtms	-1375247.074	-4029958.333	4733861.482
p053	-1375247.064	-4029958.331	4733861.498
mtlw	-1375247.070	-4029958.346	4733861.503
p052	-1375247.074	-4029958.345	4733861.494
p049	-1375247.071	-4029958.309	4733861.461

Residuals of position determined by individual baselines from the final position

	X	Y	Z	East	North	Up
mtms	-0.008	-0.022	0.020	-0.001	-0.004	0.031
p053	0.002	-0.020	0.036	0.008	0.011	0.039
mtlw	-0.005	-0.035	0.041	0.007	0.002	0.053
p052	-0.008	-0.034	0.032	0.004	-0.004	0.047
p049	-0.005	0.002	-0.001	-0.006	-0.001	-0.000

STATE PLANE COORDINATES - International Foot

SPC (2500 MT)

Northing (Y) [feet]	1447850.433
Easting (X) [feet]	2128735.945
Convergence [degrees]	0.48096866
Point Scale	0.99961543
Combined Factor	0.99947182

** Orthometric Heights Above Future Geopotential Datum.

Prototype orthometric heights are now being made available as a precursor to the completion of GRAV-D and the replacement of NAVD 88 with a new geopotential reference system. The following height reflects the current best estimate of the true orthometric height, based on the existing gravimetric geoid model. This height is subject to change as data and modeling for the gravimetric geoid change throughout the lifetime of the GRAV-D project, or as new realizations of the ITRF are adopted. However, at the completion of GRAV-D, these heights will supersede the NAVD 88 heights

APPROX ORTHO HGT: 931.382 (m) [PROTOTYPE (Computed using USGG2012,GRS80,IGS08)]

dop from interpolation is 0.519
scatter (mean square distance from rover) is 18954.231
average edop for rover is 0.780
average ndop for rover is 0.810
average hdop for rover is 1.124
average vdop for rover is 1.920
average gdop for rover is 2.560

This position and the above vector components were computed without any knowledge by the National Geodetic Survey regarding the equipment or field operating procedures used.