

# OPUS-RS solution : 940123225U.14O OP1408550391226

opus <opus@ngs.noaa.gov>

Wed 8/20/2014 10:03 AM

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

FILE: 940123225U.14O OP1408550391226

## 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 20, 2014  
RINEX FILE: 9401225u.14o                      TIME: 16:02:45 UTC

SOFTWARE: rsgps 1.37 RS53.prl 1.99.2              START: 2014/08/13 20:28:50  
EPHEMERIS: igr18053.eph [rapid]              STOP: 2014/08/13 21:37:45  
NAV FILE: brdc2250.14n                      OBS USED: 3780 / 4145 : 91%  
ANT NAME: CHCX91R              NONE              QUALITY IND. 27.37/ 12.66  
ARP HEIGHT: 1.8                      NORMALIZED RMS:              0.353

REF FRAME: NAD\_83(2011)(EPOCH:2010.0000)              IGS08 (EPOCH:2014.61610)

X:	-1394895.352(m)	0.002(m)	-1394896.227(m)	0.002(m)
Y:	-4032287.440(m)	0.010(m)	-4032286.217(m)	0.010(m)
Z:	4726367.839(m)	0.018(m)	4726367.830(m)	0.018(m)

LAT:	48 7 1.55259	0.007(m)	48 7 1.57336	0.007(m)
E LON:	250 55 4.38148	0.003(m)	250 55 4.32218	0.003(m)
W LON:	109 4 55.61852	0.003(m)	109 4 55.67782	0.003(m)
EL HGT:	1059.927(m)	0.019(m)	1059.340(m)	0.019(m)
ORTHO HGT:	1074.987(m)	0.021(m)	[NAVD88 (Computed using GEOID12A)]	

	UTM COORDINATES	STATE PLANE COORDINATES
	UTM (Zone 12)	SPC (2500 MT )
Northing (Y) [meters]	5331094.239	429793.435
Easting (X) [meters]	642738.584	631100.842
Convergence [degrees]	1.42812503	0.30568372
Point Scale	0.99985035	0.99957907
Combined Factor	0.99968428	0.99941305

US NATIONAL GRID DESIGNATOR: 12UXU4273831094(NAD 83)

## BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DG9749	MTMS MONTANA STATE UNI CORS ARP	N483227.426	W1094111.858	65052.0
DL7731	P053 WHITEWATERMT2007 CORS ARP	N484333.865	W1074331.456	121130.1
DM7133	MTLW LEWISTOWN CORS ARP	N470314.929	W1092633.764	121273.8
DI2257	P049 ARMINGTON_MT2006 CORS ARP	N472059.850	W1105422.382	161249.8
DI3425	P052 LRRNCHJRDNMT2006 CORS ARP	N472229.026	W1070107.185	175390.8

## 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	-1425435.584	-3984013.218	4757493.894
p053	-1283559.261	-4015770.325	4771131.600
mtlw	-1449333.475	-4105829.816	4646773.487
p049	-1545099.836	-4044895.876	4669084.590
p052	-1266648.338	-4138194.567	4670709.491
9401	-1394896.227	-4032286.217	4726367.830

## Covariance matrix of the stations:

1	3.7550E-07	7.4010E-07	-9.0140E-07	-5.4900E-08	-1.7980E-07	1.9650E-07	-3.4060E-08	-1.8050E-07	2.3170E-07	-2.0630E-08	-1.9240E-07	2.3240E-07	-6.5800E-08	-1.8770E-07	2.4100E-07	2.4180E-08	-3.8790E-08	4.2590E-08
2	7.4010E-07	1.9830E-06	-2.2690E-06	-1.9320E-07	-4.4290E-07	5.4670E-07	-1.7770E-07	-4.4220E-07	5.7180E-07	-1.6780E-07	-4.5020E-07	5.7170E-07	-2.0070E-07	-4.4800E-07	5.7830E-07	-1.7640E-08	1.1810E-08	4.0790E-08
3	-9.0140E-07	-2.2690E-06	2.8910E-06	2.7280E-07	6.0220E-07	-6.5380E-07	1.9140E-07	5.3040E-07	-6.6120E-07	1.4020E-07	5.2830E-07	-6.2320E-07	2.9660E-07	6.0910E-07	-7.5310E-07	4.6360E-08	1.0440E-07	-7.5640E-08
4	-5.4900E-08	-1.9320E-07	2.7280E-07	3.2740E-07	6.2350E-07	-7.0080E-07	-3.7830E-08	-1.6560E-07	1.5850E-07	-1.0240E-07	-2.2140E-07	2.5130E-07	6.7580E-08	-4.2580E-08	1.7420E-08	7.1730E-08	7.1550E-08	-6.5620E-08
5	-1.7980E-07	-4.4290E-07	6.0220E-07	6.2350E-07	1.8190E-06	-2.0080E-06	-1.6230E-07	-4.1490E-07	4.8520E-07	-2.2830E-07	-4.7070E-07	5.7920E-07	-5.3950E-08	-2.8980E-07	3.4060E-07	3.3260E-08	8.9790E-08	-3.5090E-08
6	1.9650E-07	5.4670E-07	-6.5380E-07	-7.0080E-07	-2.0080E-06	2.4950E-06	1.7420E-07	4.9710E-07	-5.5330E-07	2.1960E-07	5.5490E-07	-6.3440E-07	1.1190E-07	4.0940E-07	-4.5310E-07	-1.8120E-08	-6.3620E-10	2.3780E-08
7	-3.4060E-08	-1.7770E-07	1.9140E-07	-3.7830E-08	-1.6230E-07	1.7420E-07	3.4600E-07	6.8890E-07	-7.6650E-07	-3.4920E-08	-1.9350E-07	2.1930E-07	-3.9100E-08	-1.5580E-07	1.8200E-07	2.7080E-08	-3.1570E-08	2.6200E-08
8	-1.8050E-07	-4.4220E-07	5.3040E-07	-1.6560E-07	-4.1490E-07	4.9710E-07	6.8890E-07	1.8960E-06	-2.0260E-06	-1.8580E-07	-4.4610E-07	5.3110E-07	-1.5690E-07	-3.9320E-07	4.6790E-07	-1.8040E-08	3.1190E-09	2.3270E-08
9	2.3170E-07	5.7180E-07	-6.6120E-07	1.5850E-07	4.8520E-07	-5.5330E-07	-7.6650E-07	-2.0260E-06	2.4320E-06	2.5480E-07	5.5870E-07	-6.0430E-07	1.2080E-07	4.0990E-07	-4.1270E-07	-2.8900E-10	-1.5150E-08	6.9440E-08
10	-2.0630E-08	-1.6780E-07	1.4020E-07	-1.0240E-07	-2.2830E-07	2.1960E-07	-3.4920E-08	-1.8580E-07	2.5480E-07	4.9020E-07	8.3770E-07	-9.5170E-07	-1.3190E-07	-2.5700E-07	3.3800E-07	-1.3070E-08	-1.1830E-07	1.1620E-07
11	-1.9240E-07	-4.5020E-07	5.2830E-07	-2.2140E-07	-4.7070E-07	5.5490E-07	-1.9350E-07	-4.4610E-07	5.5870E-07	8.3770E-07	2.0380E-06	-2.2300E-06	-2.2890E-07	-4.7190E-07	5.8800E-07	-5.7030E-08	-4.9560E-08	8.8320E-08
12	2.3240E-07	5.7170E-07	-6.2320E-07	2.5130E-07	5.7920E-07	-6.3440E-07	2.1930E-07	5.3110E-07	-6.0430E-07	-9.5170E-07	-2.2300E-06	2.6860E-06	2.4690E-07	5.4780E-07	-6.2410E-07	6.1080E-08	9.0770E-08	-4.9050E-08
13	-6.5800E-08	-2.0070E-07	2.9660E-07	6.7580E-08	-5.3950E-08	1.1190E-07	-3.9100E-08	-1.5690E-07	1.2080E-07									

```

-1.3190E-07 -2.2890E-07 2.4690E-07 3.6890E-07 6.4140E-07 -7.7700E-07 9.0090E-08 1.1730E-07 -1.1940E-07
 14 -1.8770E-07 -4.4800E-07 6.0910E-07 -4.2580E-08 -2.8980E-07 4.0940E-07 -1.5580E-07 -3.9320E-07 4.0990E-07
-2.5700E-07 -4.7190E-07 5.4780E-07 6.4140E-07 1.8030E-06 -1.9760E-06 5.9600E-08 1.4530E-07 -1.1750E-07
 15 2.4100E-07 5.7830E-07 -7.5310E-07 1.7420E-08 3.4060E-07 -4.5310E-07 1.8200E-07 4.6790E-07 -4.1270E-07
3.3800E-07 5.8800E-07 -6.2410E-07 -7.7700E-07 -1.9760E-06 2.4430E-06 -8.9200E-08 -1.8010E-07 2.3200E-07
 16 2.4180E-08 -1.7640E-08 4.6360E-08 7.1730E-08 3.3260E-08 -1.8120E-08 2.7080E-08 -1.8040E-08 -2.8900E-10
-1.3070E-08 -5.7030E-08 6.1080E-08 9.0090E-08 5.9600E-08 -8.9200E-08 3.4310E-06 7.6490E-06 -8.9220E-06
 17 -3.8790E-08 1.1810E-08 1.0440E-07 7.1550E-08 8.9790E-08 -6.3620E-10 -3.1570E-08 3.1190E-09 -1.5150E-08
-1.1830E-07 -4.9560E-08 9.0770E-08 1.1730E-07 1.4530E-07 -1.8010E-07 7.6490E-06 2.0570E-05 -2.3230E-05
 18 4.2590E-08 4.0790E-08 -7.5640E-08 -6.5620E-08 -3.5090E-08 2.3780E-08 2.6200E-08 2.3270E-08 6.9440E-08
1.1620E-07 8.8320E-08 -4.9050E-08 -1.1940E-07 -1.1750E-07 2.3200E-07 -8.9220E-06 -2.3230E-05 2.8320E-05

```

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

```

0.0000034310 0.0000076490 -0.0000089220
0.0000076490 0.0000205700 -0.0000232300
-0.0000089220 -0.0000232300 0.0000283200

```

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

```

0.0000005363 -0.0000000276 -0.0000011031
-0.0000000276 0.0000009041 -0.0000001205
-0.0000011031 -0.0000001205 0.0000508806

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Horizontal network accuracy = 0.00209 meters.

Vertical network accuracy = 0.01399 meters.

		Vectors		
To	From	X	Y	Z
mtms	9401	-30539.357	48272.999	31126.063
p053	9401	111336.966	16515.892	44763.769
mtlw	9401	-54437.248	-73543.599	-79594.343
p049	9401	-150203.609	-12609.659	-57283.240
p052	9401	128247.889	-105908.350	-55658.339

Covariance matrix of the 5 vectors

```

1 3.7581E-06 8.4455E-06 -9.9124E-06 3.2802E-06 7.4747E-06 -8.7500E-06 3.3457E-06 7.5253E-06 -8.7326E-06
3.3993E-06 7.5524E-06 -8.7933E-06 3.2509E-06 7.4405E-06 -8.6344E-06
2 8.4455E-06 2.2529E-05 -2.5644E-05 7.4019E-06 2.0025E-05 -2.2723E-05 7.5205E-06 2.0113E-05 -2.2684E-05
7.6171E-06 2.0158E-05 -2.2790E-05 7.3486E-06 1.9965E-05 -2.2512E-05
3 -9.9124E-06 -2.5644E-05 3.1362E-05 -8.6299E-06 -2.2697E-05 2.7718E-05 -8.8032E-06 -2.2827E-05 2.7665E-05
-8.9444E-06 -2.2894E-05 2.7821E-05 -8.5524E-06 -2.2608E-05 2.7411E-05
4 3.2802E-06 7.4019E-06 -8.6299E-06 3.6149E-06 8.1677E-06 -9.5391E-06 3.2944E-06 7.4299E-06 -8.6976E-06
3.2699E-06 7.4131E-06 -8.6662E-06 3.3368E-06 7.4753E-06 -8.7498E-06
5 7.4747E-06 2.0025E-05 -2.2697E-05 8.1677E-06 2.2209E-05 -2.5202E-05 7.4850E-06 2.0062E-05 -2.2695E-05
7.5057E-06 2.0059E-05 -2.2706E-05 7.4445E-06 2.0045E-05 -2.2674E-05
6 -8.7500E-06 -2.2723E-05 2.7718E-05 -9.5391E-06 -2.5202E-05 3.0767E-05 -8.7559E-06 -2.2756E-05 2.7673E-05
-8.8005E-06 -2.2763E-05 2.7711E-05 -8.6726E-06 -2.2702E-05 2.7611E-05
7 3.3457E-06 7.5205E-06 -8.8032E-06 3.2944E-06 7.4850E-06 -8.7559E-06 3.7228E-06 8.3875E-06 -9.7144E-06
3.3821E-06 7.5441E-06 -8.7900E-06 3.2747E-06 7.4652E-06 -8.6770E-06
8 7.5253E-06 2.0113E-05 -2.2827E-05 7.4299E-06 2.0062E-05 -2.2756E-05 8.3875E-06 2.2460E-05 -2.5264E-05
7.5995E-06 2.0170E-05 -2.2813E-05 7.3928E-06 2.0028E-05 -2.2605E-05
9 -8.7326E-06 -2.2684E-05 2.7665E-05 -8.6976E-06 -2.2695E-05 2.7673E-05 -9.7144E-06 -2.5264E-05 3.0613E-05
-8.7831E-06 -2.2744E-05 2.7695E-05 -8.6815E-06 -2.2687E-05 2.7606E-05

```

10 3.3993E-06 7.6171E-06 -8.9444E-06 3.2699E-06 7.5057E-06 -8.8005E-06 3.3821E-06 7.5995E-06 -8.7831E-06  
3.9473E-06 8.6620E-06 -1.0051E-05 3.2221E-06 7.4507E-06 -8.6110E-06  
11 7.5524E-06 2.0158E-05 -2.2894E-05 7.4131E-06 2.0059E-05 -2.2763E-05 7.5441E-06 2.0170E-05 -2.2744E-05  
8.6620E-06 2.2707E-05 -2.5639E-05 7.3598E-06 2.0002E-05 -2.2550E-05  
12 -8.7933E-06 -2.2790E-05 2.7821E-05 -8.6662E-06 -2.2706E-05 2.7711E-05 -8.7900E-06 -2.2813E-05 2.7695E-05  
-1.0051E-05 -2.5639E-05 3.1104E-05 -8.6168E-06 -2.2655E-05 2.7513E-05  
13 3.2509E-06 7.3486E-06 -8.5524E-06 3.3368E-06 7.4445E-06 -8.6726E-06 3.2747E-06 7.3928E-06 -8.6815E-06  
3.2221E-06 7.3598E-06 -8.6168E-06 3.6197E-06 8.1135E-06 -9.4904E-06  
14 7.4405E-06 1.9965E-05 -2.2608E-05 7.4753E-06 2.0045E-05 -2.2702E-05 7.4652E-06 2.0028E-05 -2.2687E-05  
7.4507E-06 2.0002E-05 -2.2655E-05 8.1135E-06 2.2082E-05 -2.4908E-05  
15 -8.6344E-06 -2.2512E-05 2.7411E-05 -8.7498E-06 -2.2674E-05 2.7611E-05 -8.6770E-06 -2.2605E-05 2.7606E-05  
-8.6110E-06 -2.2550E-05 2.7513E-05 -9.4904E-06 -2.4908E-05 3.0299E-05

Correlation matrix of the 5 vectors

1 1.0000E+00 9.1784E-01 -9.1303E-01 8.8994E-01 8.1816E-01 -8.1372E-01 8.9446E-01 8.1910E-01 -8.1415E-01  
8.8256E-01 8.1756E-01 -8.1331E-01 8.8142E-01 8.1676E-01 -8.0915E-01  
2 9.1784E-01 1.0000E+00 -9.6474E-01 8.2020E-01 8.9524E-01 -8.6309E-01 8.2117E-01 8.9412E-01 -8.6375E-01  
8.0773E-01 8.9121E-01 -8.6091E-01 8.1376E-01 8.9510E-01 -8.6165E-01  
3 -9.1303E-01 -9.6474E-01 1.0000E+00 -8.1050E-01 -8.6000E-01 8.9231E-01 -8.1470E-01 -8.6010E-01 8.9284E-01  
-8.0388E-01 -8.5792E-01 8.9077E-01 -8.0268E-01 -8.5908E-01 8.8920E-01  
4 8.8994E-01 8.2020E-01 -8.1050E-01 1.0000E+00 9.1155E-01 -9.0450E-01 8.9801E-01 8.2457E-01 -8.2679E-01  
8.6564E-01 8.1821E-01 -8.1727E-01 9.2244E-01 8.3667E-01 -8.3605E-01  
5 8.1816E-01 8.9524E-01 -8.6000E-01 9.1155E-01 1.0000E+00 -9.6411E-01 8.2316E-01 8.9827E-01 -8.7036E-01  
8.0163E-01 8.9323E-01 -8.6392E-01 8.3029E-01 9.0514E-01 -8.7408E-01  
6 -8.1372E-01 -8.6309E-01 8.9231E-01 -9.0450E-01 -9.6411E-01 1.0000E+00 -8.1812E-01 -8.6564E-01 9.0170E-01  
-7.9856E-01 -8.6119E-01 8.9577E-01 -8.2180E-01 -8.7097E-01 9.0432E-01  
7 8.9446E-01 8.2117E-01 -8.1470E-01 8.9801E-01 8.2316E-01 -8.1812E-01 1.0000E+00 9.1726E-01 -9.0997E-01  
8.8225E-01 8.2052E-01 -8.1685E-01 8.9207E-01 8.2334E-01 -8.1699E-01  
8 8.1910E-01 8.9412E-01 -8.6010E-01 8.2457E-01 8.9827E-01 -8.6564E-01 9.1726E-01 1.0000E+00 -9.6349E-01  
8.0711E-01 8.9316E-01 -8.6312E-01 8.1992E-01 8.9933E-01 -8.6655E-01  
9 -8.1415E-01 -8.6375E-01 8.9284E-01 -8.2679E-01 -8.7036E-01 9.0170E-01 -9.0997E-01 -9.6349E-01 1.0000E+00  
-7.9899E-01 -8.6266E-01 8.9752E-01 -8.2472E-01 -8.7259E-01 9.0643E-01  
10 8.8256E-01 8.0773E-01 -8.0388E-01 8.6564E-01 8.0163E-01 -7.9856E-01 8.8225E-01 8.0711E-01 -7.9899E-01  
1.0000E+00 9.1493E-01 -9.0708E-01 8.5241E-01 7.9803E-01 -7.8739E-01  
11 8.1756E-01 8.9121E-01 -8.5792E-01 8.1821E-01 8.9323E-01 -8.6119E-01 8.2052E-01 8.9316E-01 -8.6266E-01  
9.1493E-01 1.0000E+00 -9.6475E-01 8.1180E-01 8.9326E-01 -8.5972E-01  
12 -8.1331E-01 -8.6091E-01 8.9077E-01 -8.1727E-01 -8.6392E-01 8.9577E-01 -8.1685E-01 -8.6312E-01 8.9752E-01  
-9.0708E-01 -9.6475E-01 1.0000E+00 -8.1208E-01 -8.6445E-01 8.9622E-01  
13 8.8142E-01 8.1376E-01 -8.0268E-01 9.2244E-01 8.3029E-01 -8.2180E-01 8.9207E-01 8.1992E-01 -8.2472E-01  
8.5241E-01 8.1180E-01 -8.1208E-01 1.0000E+00 9.0750E-01 -9.0622E-01  
14 8.1676E-01 8.9510E-01 -8.5908E-01 8.3667E-01 9.0514E-01 -8.7097E-01 8.2334E-01 8.9933E-01 -8.7259E-01  
7.9803E-01 8.9326E-01 -8.6445E-01 9.0750E-01 1.0000E+00 -9.6296E-01  
15 -8.0915E-01 -8.6165E-01 8.8920E-01 -8.3605E-01 -8.7408E-01 9.0432E-01 -8.1699E-01 -8.6655E-01 9.0643E-01  
-7.8739E-01 -8.5972E-01 8.9622E-01 -9.0622E-01 -9.6296E-01 1.0000E+00

G-FILE for the vectors

Axx2014 8132014 813  
B201408132000201408132100 5 rsgps 1.37IGS  
lant\_info.003 NGS  
C00060001 -305393570 19 482729991 47 311260632 56  
C00060002 1113369656 19 165158919 47 447637693 55

C00060003 -544372478 19 -735435991 47 -795943430 55  
 C00060004-1502036090 19 -126096586 47 -572832400 55  
 C00060005 1282478885 19-1059083503 46 -556583394 55  
 D 1 2 9178375 1 3 -9130327 1 4 8899425 1 5 8181641 1 6 -8137189  
 D 1 7 8944596 1 8 8190991 1 9 -8141479 1 10 8825628 1 11 8175581  
 D 1 12 -8133081 1 13 8814215 1 14 8167552 1 15 -8091537 2 3 -9647405  
 D 2 4 8201956 2 5 8952413 2 6 -8630859 2 7 8211745 2 8 8941221  
 D 2 9 -8637501 2 10 8077278 2 11 8912142 2 12 -8609109 2 13 8137572  
 D 2 14 8950950 2 15 -8616538 3 4 -8105007 3 5 -8599993 3 6 8923050  
 D 3 7 -8146997 3 8 -8600973 3 9 8928388 3 10 -8038836 3 11 -8579160  
 D 3 12 8907744 3 13 -8026841 3 14 -8590755 3 15 8892003 4 5 9115491  
 D 4 6 -9045016 4 7 8980144 4 8 8245732 4 9 -8267889 4 10 8656393  
 D 4 11 8182143 4 12 -8172733 4 13 9224374 4 14 8366680 4 15 -8360484  
 D 5 6 -9641074 5 7 8231644 5 8 8982705 5 9 -8703608 5 10 8016275  
 D 5 11 8932255 5 12 -8639177 5 13 8302881 5 14 9051419 5 15 -8740764  
 D 6 7 -8181198 6 8 -8656429 6 9 9017046 6 10 -7985615 6 11 -8611893  
 D 6 12 8957682 6 13 -8217981 6 14 -8709719 6 15 9043242 7 8 9172617  
 D 7 9 -9099666 7 10 8822529 7 11 8205200 7 12 -8168491 7 13 8920738  
 D 7 14 8233403 7 15 -8169928 8 9 -9634913 8 10 8071095 8 11 8931607  
 D 8 12 -8631173 8 13 8199195 8 14 8993321 8 15 -8665487 9 10 -7989917  
 D 9 11 -8626626 9 12 8975189 9 13 -8247152 9 14 -8725870 9 15 9064280  
 D 10 11 9149268 10 12 -9070836 10 13 8524061 10 14 7980345 10 15 -7873850  
 D 11 12 -9647454 11 13 8118004 11 14 8932583 11 15 -8597171 12 13 -8120797  
 D 12 14 -8644524 12 15 8962190 13 14 9075020 13 15 -9062184 14 15 -9629606

ITRF position of 9401 as determined by individual baselines

	X	Y	Z
mtms	-1394896.226	-4032286.222	4726367.830
p053	-1394896.224	-4032286.218	4726367.842
mtlw	-1394896.228	-4032286.215	4726367.838
p049	-1394896.224	-4032286.199	4726367.797
p052	-1394896.227	-4032286.217	4726367.830

Residuals of position determined by individual baselines from the final position

	X	Y	Z	East	North	Up
mtms	0.001	-0.005	-0.000	0.003	-0.003	0.003
p053	0.003	-0.001	0.011	0.004	0.007	0.008
mtlw	-0.001	0.002	0.008	-0.002	0.007	0.005
p049	0.003	0.018	-0.033	-0.003	-0.009	-0.037
p052	0.000	0.001	-0.000	0.000	0.000	-0.001

STATE PLANE COORDINATES - International Foot

SPC (2500 MT )  
 Northing (Y) [feet] 1410083.448  
 Easting (X) [feet] 2070540.820  
 Convergence [degrees] 0.30568372  
 Point Scale 0.99957907  
 Combined Factor 0.99941305

\*\* 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: 1073.987 (m) [PROTOTYPE (Computed using USGG2012,GRS80,IGS08)]

dop from interpolation is 0.495  
scatter (mean square distance from rover) is 18072.665  
average edop for rover is 0.660  
average ndop for rover is 0.950  
average hdop for rover is 1.157  
average vdop for rover is 1.880  
average gdop for rover is 2.570

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.