OPUS-RS solution : 401289226T.14O OP1408550180456

opus <opus@ngs.noaa.gov>

Wed 8/20/2014 9:59 AM

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

FILE: 401289226T.14O OP1408550180456

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: 4012226t.14o TIME: 15:59:19 UTC

SOFTWARE: rsgps 1.37 RS92.prl 1.99.2 START: 2014/08/14 19:00:55
EPHEMERIS: igr18054.eph [rapid] STOP: 2014/08/14 20:01:00
NAV FILE: brdc2260.14n OBS USED: 3005 / 3595 : 84%
ANT NAME: CHCX91R NONE QUALITY IND. 26.57/ 45.19
ARP HEIGHT: 1.8 NORMALIZED RMS: 0.347

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2014.61867)

X:	-1386439.799(m)	0.011(m)	-1386440.674(m)	0.011(m)
Y:	-4032450.691(m)	0.017(m)	-4032449.468(m)	0.017(m)
Z:	4728652.747(m)	0.020(m)	4728652.739(m)	0.020(m)
LAT:	48 8 53.65250	0.005(m)	48 8 53.67336	0.005(m)
E LON:	251 1 33.50041	0.006(m)	251 1 33.44114	0.006(m)
W LON:	108 58 26.49959	0.006(m)	108 58 26.55886	0.006(m)
EL HGT:	1024.587(m)	0.027(m)	1023.999(m)	0.027(m)
ORTHO HGT:	1039.880(m)	0.029(m)	[NAVD88 (Computed using GEOID12A)]	

	UTM COORDINATES (UTM (Zone 12))	STATE PLANE COORDINATES (SPC (2500 MT))
Northing (Y) [meters]	5334761.242	433302.808
Easting (X) [meters]	650691.563	639121.946
Convergence [degrees]	1.50937569	0.38475097
Point Scale	0.99987902	0.99958978
Combined Factor	0.99971848	0.99942929

US NATIONAL GRID DESIGNATOR: 12UXU5069134761(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DG9749	MTMS MONTANA STATE UNI CORS ARP	N483227.426	W1094111.858	68545.5
DL7731	P053 WHITEWATERMT2007 CORS ARP	N484333.865	W1074331.456	112548.8
DM7133	MTLW LEWISTOWN CORS ARP	N470314.929	W1092633.764	126666.4
DI3425	P052 LRRNCHJRDNMT2006 CORS ARP	N472229.026	W1070107.185	169969.6
DI2257	P049 ARMINGTON_MT2006 CORS ARP	N472059.850	W1105422.382	169929.4

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	-1425435.575	-3984013.205	4757493.875
p053	-1283559.258	-4015770.318	4771131.602
mtlw	-1449333.478	-4105829.813	4646773.483
p052	-1266648.330	-4138194.560	4670709.489
p049	-1545099.854	-4044895.906	4669084.613
4012	-1386440.674	-4032449.468	4728652.739

Covariance matrix of the stations:

1 3.6180E-07 7.2490E-07 -8.4730E-07 -4.4220E-08 -1.7990E-07 1.9950E-07 -3.7020E-08 -1.8030E-07 2.1600E-07 -4.5400E-08 -1.7020E-07 2.0750E-07 -3.4870E-08 -1.9460E-07 2.2450E-07 3.4100E-08 -1.5450E-08 1.8570E-08

2 7.2490E-07 2.0630E-06 -2.2670E-06 -1.2190E-07 -3.4600E-07 4.6450E-07 -2.1310E-07 -5.3210E-07 6.2310E-07 -1.1810E-07 -3.9250E-07 4.4960E-07 -2.7060E-07 -5.9200E-07 7.2910E-07 3.5480E-08 1.5870E-07 -1.0850E-07

3 -8.4730E-07 -2.2670E-06 2.8200E-06 2.2850E-07 5.8450E-07 -6.4900E-07 2.0010E-07 5.5370E-07 -6.5280E-07 2.3080E-07 5.5940E-07 -6.6550E-07 1.8700E-07 5.7020E-07 -6.5220E-07 1.8290E-08 3.7280E-08 -7.0320E-09

4 -4.4220E-08 -1.2190E-07 2.2850E-07 3.9860E-07 7.7150E-07 -8.2190E-07 -7.3330E-08 -2.5870E-07 2.3010E-07 9.7560E-08 -2.9230E-08 -5.6120E-08 -1.7900E-07 -3.6100E-07 4.1880E-07 1.0780E-07 1.9070E-07 -1.8980E-07

5 -1.7990E-07 -3.4600E-07 5.8450E-07 7.7150E-07 2.1160E-06 -2.2440E-06 -2.3510E-07 -5.9600E-07 6.1010E-07 5.0240E-08 -2.2270E-07 1.4090E-07 -4.0760E-07 -7.5110E-07 9.0910E-07 1.1430E-07 3.4990E-07 -3.0520E-07

6 1.9950E-07 4.6450E-07 -6.4900E-07 -8.2190E-07 -2.2440E-06 2.6450E-06 2.3840E-07 6.5310E-07 -6.4460E-07 -6.7480E-09 3.2040E-07 -2.2910E-07 3.9170E-07 8.0660E-07 -9.2270E-07 -9.7000E-08 -2.5430E-07 2.8700E-07

7 -3.7020E-08 -2.1310E-07 2.0010E-07 -7.3330E-08 -2.3510E-07 2.3840E-07 3.8770E-07 8.1290E-07 -8.7190E-07 -7.7260E-08 -2.0490E-07 2.6060E-07 -1.7520E-11 -1.6020E-07 1.7320E-07 5.1610E-09 -1.0040E-07 9.7980E-08

8 -1.8030E-07 -5.3210E-07 5.5370E-07 -2.5870E-07 -5.9600E-07 6.5310E-07 8.1290E-07 2.2980E-06 -2.4130E-06 -2.7100E-07 -5.5370E-07 7.1610E-07 -1.0270E-07 -4.1700E-07 4.8990E-07 -7.7920E-08 -1.8230E-07 2.1500E-07

9 2.1600E-07 6.2310E-07 -6.5280E-07 2.3010E-07 6.1010E-07 -6.4460E-07 -8.7190E-07 -2.4130E-06 2.7950E-06 2.2690E-07 5.7270E-07 -6.4050E-07 1.9860E-07 6.0630E-07 -6.5650E-07 4.7720E-08 1.3310E-07 -8.4250E-08

10 -4.5400E-08 -1.1810E-07 2.3080E-07 9.7560E-08 5.0240E-08 -6.7480E-09 -7.7260E-08 -2.7100E-07 2.2690E-07 4.2270E-07 7.2660E-07 -8.9390E-07 -1.9830E-07 -3.8700E-07 4.4210E-07 1.1940E-07 2.1820E-07 -2.2440E-07

11 -1.7020E-07 -3.9250E-07 5.5940E-07 -2.9230E-08 -2.2270E-07 3.2040E-07 -2.0490E-07 -5.5370E-07 5.7270E-07 7.2660E-07 2.0400E-06 -2.2390E-06 -3.2470E-07 -6.7100E-07 7.8720E-07 7.9680E-08 2.2420E-07 -2.0350E-07

12 2.0750E-07 4.4960E-07 -6.6550E-07 -5.6120E-08 1.4090E-07 -2.2910E-07 2.6060E-07 7.1610E-07 -6.4050E-07 -8.9390E-07 -2.2390E-06 2.7740E-06 4.8400E-07 9.3130E-07 -1.0390E-06 -1.4760E-07 -3.7830E-07 4.4010E-07

13 -3.4870E-08 -2.7060E-07 1.8700E-07 -1.7900E-07 -4.0760E-07 3.9170E-07 -1.7520E-11 -1.0270E-07 1.9860E-07

-1.9830E-07 -3.2470E-07 4.8400E-07 6.1280E-07 1.1050E-06 -1.2600E-06 -6.6500E-08 -2.9290E-07 2.9770E-07
14 -1.9460E-07 -5.9200E-07 5.7020E-07 -3.6100E-07 -7.5110E-07 8.0660E-07 -1.6020E-07 -4.1700E-07 6.0630E-07
-3.8700E-07 -6.7100E-07 9.3130E-07 1.1050E-06 2.6300E-06 -2.9150E-06 -1.5140E-07 -3.5030E-07 4.0220E-07
15 2.2450E-07 7.2910E-07 -6.5220E-07 4.1880E-07 9.0910E-07 -9.2270E-07 1.7320E-07 4.8990E-07 -6.5650E-07
4.4210E-07 7.8720E-07 -1.0390E-06 -1.2600E-06 -2.9150E-06 3.4710E-06 1.7840E-07 4.6160E-07 -4.3540E-07
16 3.4100E-08 3.5480E-08 1.8290E-08 1.0780E-07 1.1430E-07 -9.7000E-08 5.1610E-09 -7.7920E-08 4.7720E-08
1.1940E-07 7.9680E-08 -1.4760E-07 -6.6500E-08 -1.5140E-07 1.7840E-07 3.7710E-06 8.7280E-06 -9.8410E-06
17 -1.5450E-08 1.5870E-07 3.7280E-08 1.9070E-07 3.4990E-07 -2.5430E-07 -1.0040E-07 -1.8230E-07 1.3310E-07
2.1820E-07 2.2420E-07 -3.7830E-07 -2.9290E-07 -3.5030E-07 4.6160E-07 8.7280E-06 2.4890E-05 -2.7740E-05
18 1.8570E-08 -1.0850E-07 -7.0320E-09 -1.8980E-07 -3.0520E-07 2.8700E-07 9.7980E-08 2.1500E-07 -8.4250E-08
-2.2440E-07 -2.0350E-07 4.4010E-07 2.9770E-07 4.0220E-07 -4.3540E-07 -9.8410E-06 -2.7740E-05 3.2890E-05

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

0.0000037710	0.0000087280	-0.0000098410
0.0000087280	0.0000248900	-0.0000277400
-0.0000098410	-0.0000277400	0.0000328900

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

0.0000006364	0.0000000968	-0.0000004736
0.0000000968	0.0000009308	-0.0000006128
-0.0000004736	-0.0000006128	0.0000599838

Horizontal network accuracy = 0.00218 meters.
Vertical network accuracy = 0.01519 meters.

Vectors

To	From	X	Y	Z
mtms	4012	-38994.901	48436.263	28841.135
p053	4012	102881.416	16679.150	42478.863
mtlw	4012	-62892.803	-73380.345	-81879.256
p052	4012	119792.344	-105745.092	-57943.250
p049	4012	-158659.180	-12446.438	-59568.126

Covariance matrix of the 5 vectors
1 4.0646E-06 9.4329E-06 -1.0725E-05 3.5849E-06 8.4493E-06 -9.5631E-06 3.6947E-06 8.6411E-06 -9.6913E-06
3.5721E-06 8.4936E-06 -9.5045E-06 3.7685E-06 8.7003E-06 -9.8135E-06
2 9.4329E-06 2.6636E-05 -2.9936E-05 8.3799E-06 2.4035E-05 -2.6913E-05 8.5798E-06 2.4382E-05 -2.7141E-05
8.3562E-06 2.4115E-05 -2.6804E-05 8.7148E-06 2.4490E-05 -2.7364E-05
3 -1.0725E-05 -2.9936E-05 3.5724E-05 -9.4410E-06 -2.6888E-05 3.1961E-05 -9.7572E-06 -2.7439E-05 3.2328E-05
-9.4041E-06 -2.7014E-05 3.1791E-05 -9.9700E-06 -2.7609E-05 3.2680E-05
4 3.5849E-06 8.3799E-06 -9.4410E-06 3.9540E-06 9.1945E-06 -1.0376E-05 3.5847E-06 8.3565E-06 -9.4688E-06
3.6414E-06 8.4284E-06 -9.5597E-06 3.5507E-06 8.3277E-06 -9.4108E-06
5 8.4493E-06 2.4035E-05 -2.6888E-05 9.1945E-06 2.6306E-05 -2.9424E-05 8.4790E-06 2.4126E-05 -2.6958E-05
8.4457E-06 2.4093E-05 -2.6916E-05 8.4990E-06 2.4139E-05 -2.6987E-05
6 -9.5631E-06 -2.6913E-05 3.1961E-05 -1.0376E-05 -2.9424E-05 3.4961E-05 -9.6036E-06 -2.7048E-05 3.2043E-05
-9.5263E-06 -2.6962E-05 3.1934E-05 -9.6500E-06 -2.7081E-05 3.2116E-05
7 3.6947E-06 8.5798E-06 -9.7572E-06 3.5847E-06 8.4790E-06 -9.6036E-06 4.1484E-06 9.7192E-06 -1.0859E-05
3.5692E-06 8.5438E-06 -9.5308E-06 3.8323E-06 8.8196E-06 -9.9442E-06
8 8.6411E-06 2.4382E-05 -2.7439E-05 8.3565E-06 2.4126E-05 -2.7048E-05 9.7192E-06 2.7553E-05 -3.0501E-05
8.3167E-06 2.4294E-05 -2.6861E-05 8.9961E-06 2.5006E-05 -2.7927E-05
9 -9.6913E-06 -2.7141E-05 3.2328E-05 -9.4688E-06 -2.6958E-05 3.2043E-05 -1.0859E-05 -3.0501E-05 3.5853E-05
-9.4374E-06 -2.7097E-05 3.1894E-05 -9.9878E-06 -2.7669E-05 3.2753E-05

10 3.5721E-06 8.3562E-06 -9.4041E-06 3.6414E-06 8.4457E-06 -9.5263E-06 3.5692E-06 8.3167E-06 -9.4374E-06 3.9549E-06 9.1567E-06 -1.0363E-05 3.5198E-06 8.2742E-06 -9.3529E-06
11 8.4936E-06 2.4115E-05 -2.7014E-05 8.4284E-06 2.4093E-05 -2.6962E-05 8.5438E-06 2.4294E-05 -2.7097E-05 9.1567E-06 2.6482E-05 -2.9397E-05 8.6165E-06 2.4345E-05 -2.7211E-05
12 -9.5045E-06 -2.6804E-05 3.1791E-05 -9.5597E-06 -2.6916E-05 3.1934E-05 -9.5308E-06 -2.6861E-05 3.1894E-05 -1.0363E-05 -2.9397E-05 3.4784E-05 -9.5071E-06 -2.6833E-05 3.1846E-05
13 3.7685E-06 8.7148E-06 -9.9700E-06 3.5507E-06 8.4990E-06 -9.6500E-06 3.8323E-06 8.9961E-06 -9.9878E-06 3.5198E-06 8.6165E-06 -9.5071E-06 4.5168E-06 1.0277E-05 -1.1577E-05
14 8.7003E-06 2.4490E-05 -2.7609E-05 8.3277E-06 2.4139E-05 -2.7081E-05 8.8196E-06 2.5006E-05 -2.7669E-05 8.2742E-06 2.4345E-05 -2.6833E-05 1.0277E-05 2.8221E-05 -3.1519E-05
15 -9.8135E-06 -2.7364E-05 3.2680E-05 -9.4108E-06 -2.6987E-05 3.2116E-05 -9.9442E-06 -2.7927E-05 3.2753E-05 -9.3529E-06 -2.7211E-05 3.1846E-05 -1.1577E-05 -3.1519E-05 3.7232E-05

Correlation matrix of the 5 vectors
1 1.0000E+00 9.0657E-01 -8.9005E-01 8.9423E-01 8.1711E-01 -8.0223E-01 8.9977E-01 8.1654E-01 -8.0280E-01 8.9094E-01 8.1867E-01 -7.9934E-01 8.7952E-01 8.1234E-01 -7.9773E-01
2 9.0657E-01 1.0000E+00 -9.7046E-01 8.1656E-01 9.0801E-01 -8.8193E-01 8.1622E-01 9.0001E-01 -8.7829E-01 8.1416E-01 9.0798E-01 -8.8059E-01 7.9453E-01 8.9324E-01 -8.6894E-01
3 -8.9005E-01 -9.7046E-01 1.0000E+00 -7.9436E-01 -8.7709E-01 9.0437E-01 -8.0150E-01 -8.7458E-01 9.0331E-01 -7.9117E-01 -8.7830E-01 9.0186E-01 -7.8487E-01 -8.6954E-01 8.9608E-01
4 8.9423E-01 8.1656E-01 -7.9436E-01 1.0000E+00 9.0153E-01 -8.8252E-01 8.8511E-01 8.0062E-01 -7.9526E-01 9.2083E-01 8.2367E-01 -8.1515E-01 8.4020E-01 7.8836E-01 -7.7562E-01
5 8.1711E-01 9.0801E-01 -8.7709E-01 9.0153E-01 1.0000E+00 -9.7026E-01 8.1166E-01 8.9615E-01 -8.7779E-01 8.2802E-01 9.1284E-01 -8.8979E-01 7.7969E-01 8.8596E-01 -8.6233E-01
6 -8.0223E-01 -8.8193E-01 9.0437E-01 -8.8252E-01 -9.7026E-01 1.0000E+00 -7.9745E-01 -8.7148E-01 9.0505E-01 -8.1015E-01 -8.8610E-01 9.1574E-01 -7.6793E-01 -8.6217E-01 8.9016E-01
7 8.9977E-01 8.1622E-01 -8.0150E-01 8.8511E-01 8.1166E-01 -7.9745E-01 1.0000E+00 9.0910E-01 -8.9037E-01 8.8117E-01 8.1516E-01 -7.9342E-01 8.8533E-01 8.1513E-01 -8.0015E-01
8 8.1654E-01 9.0001E-01 -8.7458E-01 8.0062E-01 8.9615E-01 -8.7148E-01 9.0910E-01 1.0000E+00 -9.7044E-01 7.9672E-01 8.9940E-01 -8.6765E-01 8.0641E-01 8.9675E-01 -8.7193E-01
9 -8.0280E-01 -8.7829E-01 9.0331E-01 -7.9526E-01 -8.7779E-01 9.0505E-01 -8.9037E-01 -9.7044E-01 1.0000E+00 -7.9254E-01 -8.7939E-01 9.0313E-01 -7.8486E-01 -8.6985E-01 8.9646E-01
10 8.9094E-01 8.1416E-01 -7.9117E-01 9.2083E-01 8.2802E-01 -8.1015E-01 8.8117E-01 7.9672E-01 -7.9254E-01 1.0000E+00 8.9475E-01 -8.8354E-01 8.3279E-01 7.8320E-01 -7.7076E-01
11 8.1867E-01 9.0798E-01 -8.7830E-01 8.2367E-01 9.1284E-01 -8.8610E-01 8.1516E-01 8.9940E-01 -8.7939E-01 8.9475E-01 1.0000E+00 -9.6860E-01 7.8785E-01 8.9055E-01 -8.6659E-01
12 -7.9934E-01 -8.8059E-01 9.0186E-01 -8.1515E-01 -8.8979E-01 9.1574E-01 -7.9342E-01 -8.6765E-01 9.0313E-01 -8.8354E-01 -9.6860E-01 1.0000E+00 -7.5848E-01 -8.5643E-01 8.8494E-01
13 8.7952E-01 7.9453E-01 -7.8487E-01 8.4020E-01 7.7969E-01 -7.6793E-01 8.8533E-01 8.0641E-01 -7.8486E-01 8.3279E-01 7.8785E-01 -7.5848E-01 1.0000E+00 9.1029E-01 -8.9274E-01
14 8.1234E-01 8.9324E-01 -8.6954E-01 7.8836E-01 8.8596E-01 -8.6217E-01 8.1513E-01 8.9675E-01 -8.6985E-01 7.8320E-01 8.9055E-01 -8.5643E-01 9.1029E-01 1.0000E+00 -9.7237E-01
15 -7.9773E-01 -8.6894E-01 8.9608E-01 -7.7562E-01 -8.6233E-01 8.9016E-01 -8.0015E-01 -8.7193E-01 8.9646E-01 -7.7076E-01 -8.6659E-01 8.8494E-01 -8.9274E-01 -9.7237E-01 1.0000E+00

G-FILE for the vectors

Axx2014 8142014 814
B20140814190020140814200 5 rsgps 1.37IGS
lant_info.003 NGS
C00060001 -389949011 20 484362630 51 288411354 59
C00060002 1028814158 19 166791498 51 424788631 59

C00060003 -628928034 20 -733803448 52 -818792562 59
C00060004 1197923440 19-1057450919 51 -579432502 58
C00060005-1586591800 21 -124464382 53 -595681260 61
D 1 2 9065749 1 3 -8900500 1 4 8942261 1 5 8171093 1 6 -8022255
D 1 7 8997738 1 8 8165397 1 9 -8027991 1 10 8909369 1 11 8186707
D 1 12 -7993380 1 13 8795238 1 14 8123434 1 15 -7977313 2 3 -9704628
D 2 4 8165641 2 5 9080108 2 6 -8819299 2 7 8162210 2 8 9000111
D 2 9 -8782877 2 10 8141620 2 11 9079808 2 12 -8805892 2 13 7945326
D 2 14 8932382 2 15 -8689430 3 4 -7943625 3 5 -8770860 3 6 9043747
D 3 7 -8015013 3 8 -8745807 3 9 9033147 3 10 -7911677 3 11 -8782991
D 3 12 9018642 3 13 -7848720 3 14 -8695439 3 15 8960818 4 5 9015311
D 4 6 -8825186 4 7 8851082 4 8 8006188 4 9 -7952647 4 10 9208259
D 4 11 8236717 4 12 -8151514 4 13 8401952 4 14 7883582 4 15 -7756239
D 5 6 -9702599 5 7 8116642 5 8 8961530 5 9 -8777879 5 10 8280201
D 5 11 9128371 5 12 -8897878 5 13 7796924 5 14 8859566 5 15 -8623297
D 6 7 -7974474 6 8 -8714761 6 9 9050461 6 10 -8101524 6 11 -8861043
D 6 12 9157357 6 13 -7679270 6 14 -8621730 6 15 8901607 7 8 9090985
D 7 9 -8903666 7 10 8811734 7 11 8151561 7 12 -7934156 7 13 8853344
D 7 14 8151294 7 15 -8001525 8 9 -9704394 8 10 7967150 8 11 8993997
D 8 12 -8676526 8 13 8064148 8 14 8967530 8 15 -8719293 9 10 -7925373
D 9 11 -8793903 9 12 9031293 9 13 -7848551 9 14 -8698503 9 15 8964586
D 10 11 8947466 10 12 -8835376 10 13 8327886 10 14 7832044 10 15 -7707641
D 11 12 -9686019 11 13 7878514 11 14 8905459 11 15 -8665902 12 13 -7584799
D 12 14 -8564285 12 15 8849392 13 14 9102914 13 15 -8927448 14 15 -9723654

ITRF position of 4012 as determined by individual baselines

	X	Y	Z
mtms	-1386440.686	-4032449.487	4728652.759
p053	-1386440.671	-4032449.473	4728652.743
mtlw	-1386440.676	-4032449.478	4728652.760
p052	-1386440.684	-4032449.475	4728652.743
p049	-1386440.660	-4032449.443	4728652.713

Residuals of position determined by individual baselines from the final position

	X	Y	Z	East	North	Up
mtms	-0.012	-0.019	0.020	-0.005	-0.003	0.029
p053	0.003	-0.005	0.004	0.004	-0.000	0.005
mtlw	-0.002	-0.010	0.021	0.001	0.007	0.022
p052	-0.010	-0.007	0.004	-0.007	-0.005	0.010
p049	0.014	0.025	-0.026	0.005	0.004	-0.039

STATE PLANE COORDINATES - International Foot
SPC (2500 MT)

Northing (Y) [feet]	1421597.139
Easting (X) [feet]	2096856.778
Convergence [degrees]	0.38475097
Point Scale	0.99958978
Combined Factor	0.99942929

** 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: 1038.881 (m) [PROTOTYPE (Computed using USGG2012,GRS80,IGS08)]

dop from interpolation is 0.499
scatter (mean square distance from rover) is 18232.972
average edop for rover is 0.670
average ndop for rover is 0.820
average hdop for rover is 1.059
average vdop for rover is 1.900
average gdop for rover is 2.500

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.