

OPUS-RS solution : 940123225R.14O OP1408550335781

opus <opus@ngs.noaa.gov>

Wed 8/20/2014 10:02 AM

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

FILE: 940123225R.14O OP1408550335781

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: 9401225r.14o TIME: 16:01:56 UTC

SOFTWARE: rsgps 1.37 RS51.prl 1.99.2 START: 2014/08/13 17:42:15
EPHEMERIS: igr18053.eph [rapid] STOP: 2014/08/13 19:22:10
NAV FILE: brdc2250.14n OBS USED: 4595 / 6125 : 75%
ANT NAME: CHCX91R NONE QUALITY IND. 20.82/ 64.12
ARP HEIGHT: 1.8 NORMALIZED RMS: 0.323

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2014.61581)

X: -1391669.689(m) 0.005(m) -1391670.564(m) 0.005(m)
Y: -4032759.388(m) 0.010(m) -4032758.165(m) 0.010(m)
Z: 4726894.155(m) 0.010(m) 4726894.146(m) 0.010(m)

LAT: 48 7 27.56375 0.005(m) 48 7 27.58454 0.005(m)
E LON: 250 57 39.23031 0.005(m) 250 57 39.17103 0.005(m)
W LON: 109 2 20.76969 0.005(m) 109 2 20.82897 0.005(m)
EL HGT: 1046.369(m) 0.013(m) 1045.781(m) 0.013(m)
ORTHO HGT: 1061.516(m) 0.016(m) [NAVD88 (Computed using GEOID12A)]

	UTM COORDINATES	STATE PLANE COORDINATES
	UTM (Zone 12)	SPC (2500 MT)
Northing (Y) [meters]	5331977.972	430614.446
Easting (X) [meters]	645919.267	634297.350
Convergence [degrees]	1.46033063	0.33714832
Point Scale	0.99986163	0.99958153
Combined Factor	0.99969768	0.99941763

US NATIONAL GRID DESIGNATOR: 12UXU4591931977(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DG9749	MTMS MONTANA STATE UNI	CORS ARP	N483227.426 W1094111.858	66727.0
DL7731	P053 WHITEWATERMT2007	CORS ARP	N484333.865 W1074331.456	118040.7
DM7133	MTLW LEWISTOWN	CORS ARP	N470314.929 W1092633.764	122816.1
DI2257	P049 ARMINGTON_MT2006	CORS ARP	N472059.850 W1105422.382	164407.5
DI3425	P052 LRRNCHJRDNMT2006	CORS ARP	N472229.026 W1070107.185	172928.0

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	-1425435.582	-3984013.202	4757493.877
p053	-1283559.258	-4015770.328	4771131.608
mtlw	-1449333.483	-4105829.825	4646773.501
p049	-1545099.838	-4044895.876	4669084.576
p052	-1266648.333	-4138194.571	4670709.500
9401	-1391670.564	-4032758.165	4726894.146

Covariance matrix of the stations:

1	1.4440E-07	2.4690E-07	-2.7570E-07	1.5410E-08	-5.3040E-08	5.7170E-08	1.3440E-08	-6.6980E-08	7.5520E-08
1.1760E-08	-7.4370E-08	8.3250E-08	1.5270E-08	-5.2740E-08	5.9950E-08	4.0440E-08	2.3590E-09	-1.1050E-09	
2	2.4690E-07	1.0250E-06	-1.0460E-06	-2.3190E-08	-1.3980E-07	2.3170E-07	-8.5400E-08	-2.4720E-07	2.8300E-07
-1.0610E-07	-2.1690E-07	2.7560E-07	-3.1140E-08	-2.2130E-07	2.5450E-07	1.4210E-08	1.1110E-07	-5.5700E-08	
3	-2.7570E-07	-1.0460E-06	1.3210E-06	6.7410E-08	2.5660E-07	-2.7460E-07	6.9310E-08	2.6380E-07	-2.8270E-07
7.0000E-08	2.6180E-07	-2.8270E-07	6.7970E-08	2.6460E-07	-2.8110E-07	-1.4280E-09	-2.0970E-08	5.5150E-08	
4	1.5410E-08	-2.3190E-08	6.7410E-08	1.6310E-07	2.5740E-07	-2.4490E-07	-4.3380E-09	-9.8010E-08	7.1660E-08
-3.0700E-08	-8.3260E-08	8.1640E-08	5.6220E-08	-5.2040E-08	2.3690E-08	5.5100E-08	5.3440E-08	-4.2650E-08	
5	-5.3040E-08	-1.3980E-07	2.5660E-07	2.5740E-07	1.0500E-06	-1.0480E-06	-8.5120E-08	-2.6480E-07	2.8180E-07
-1.1890E-07	-2.2670E-07	2.7880E-07	-8.5330E-10	-2.1770E-07	2.3130E-07	2.4720E-08	1.0970E-07	-4.9260E-08	
6	5.7170E-08	2.3170E-07	-2.7460E-07	-2.4490E-07	-1.0480E-06	1.2870E-06	7.0400E-08	2.8540E-07	-2.7930E-07
8.8250E-08	2.7230E-07	-2.8460E-07	2.9420E-08	2.5890E-07	-2.4930E-07	-1.5210E-08	-2.6910E-08	5.2170E-08	
7	1.3440E-08	-8.5400E-08	6.9310E-08	-4.3380E-09	-8.5120E-08	7.0400E-08	1.6360E-07	3.0260E-07	-2.9680E-07
2.9710E-08	-7.5470E-08	8.3430E-08	-2.3170E-09	-5.6980E-08	7.3900E-08	3.0730E-08	-3.4300E-08	2.6950E-08	
8	-6.6980E-08	-2.4720E-07	2.6380E-07	-9.8010E-08	-2.6480E-07	2.8540E-07	3.0260E-07	1.1780E-06	-1.1390E-06
-3.9610E-08	-2.2510E-07	2.7900E-07	-9.8000E-08	-2.4160E-07	3.1060E-07	-2.1440E-08	-3.2150E-08	5.3910E-08	
9	7.5520E-08	2.8300E-07	-2.8270E-07	7.1660E-08	2.8180E-07	-2.7930E-07	-2.9680E-07	-1.1390E-06	1.3230E-06
7.8400E-08	2.8560E-07	-2.8210E-07	7.1360E-08	2.8780E-07	-2.7910E-07	1.1530E-08	3.1220E-08	2.0470E-08	
10	1.1760E-08	-1.0610E-07	7.0000E-08	-3.0700E-08	-1.1890E-07	8.8250E-08	2.9710E-08	-3.9610E-08	7.8400E-08
2.1620E-07	3.2050E-07	-3.3120E-07	-2.6450E-08	-5.7130E-08	9.5290E-08	2.0050E-08	-6.6000E-08	5.5190E-08	
11	-7.4370E-08	-2.1690E-07	2.6180E-07	-8.3260E-08	-2.2670E-07	2.7230E-07	-7.5470E-08	-2.2510E-07	2.8560E-07
3.2050E-07	1.1060E-06	-1.1180E-06	-8.6030E-08	-2.3850E-07	2.9760E-07	-2.0960E-08	5.8630E-09	2.8890E-08	
12	8.3250E-08	2.7560E-07	-2.8270E-07	8.1640E-08	2.7880E-07	-2.8460E-07	8.3430E-08	2.7900E-07	-2.8210E-07
-3.3120E-07	-1.1180E-06	1.3380E-06	8.1810E-08	2.8580E-07	-2.8740E-07	2.0250E-08	2.6350E-08	1.6770E-08	
13	1.5270E-08	-3.1140E-08	6.7970E-08	5.6220E-08	-8.5330E-10	2.9420E-08	-2.3170E-09	-9.8000E-08	7.1360E-08

```

-2.6450E-08 -8.6030E-08 8.1810E-08 1.5670E-07 2.1710E-07 -2.5120E-07 5.3670E-08 4.4660E-08 -3.8540E-08
 14 -5.2740E-08 -2.2130E-07 2.6460E-07 -5.2040E-08 -2.1770E-07 2.5890E-07 -5.6980E-08 -2.4160E-07 2.8780E-07
-5.7130E-08 -2.3850E-07 2.8580E-07 2.1710E-07 1.1200E-06 -1.0960E-06 3.5940E-09 5.9110E-09 2.2140E-08
 15 5.9950E-08 2.5450E-07 -2.8110E-07 2.3690E-08 2.3130E-07 -2.4930E-07 7.3900E-08 3.1060E-07 -2.7910E-07
9.5290E-08 2.9760E-07 -2.8740E-07 -2.5120E-07 -1.0960E-06 1.2960E-06 -1.5150E-08 -9.9750E-09 5.5550E-08
 16 4.0440E-08 1.4210E-08 -1.4280E-09 5.5100E-08 2.4720E-08 -1.5210E-08 3.0730E-08 -2.1440E-08 1.1530E-08
2.0050E-08 -2.0960E-08 2.0250E-08 5.3670E-08 3.5940E-09 -1.5150E-08 1.3310E-06 3.2340E-06 -3.5040E-06
 17 2.3590E-09 1.1110E-07 -2.0970E-08 5.3440E-08 1.0970E-07 -2.6910E-08 -3.4300E-08 -3.2150E-08 3.1220E-08
-6.6000E-08 5.8630E-09 2.6350E-08 4.4660E-08 5.9110E-09 -9.9750E-09 3.2340E-06 1.3190E-05 -1.4140E-05
 18 -1.1050E-09 -5.5700E-08 5.5150E-08 -4.2650E-08 -4.9260E-08 5.2170E-08 2.6950E-08 5.3910E-08 2.0470E-08
5.5190E-08 2.8890E-08 1.6770E-08 -3.8540E-08 2.2140E-08 5.5550E-08 -3.5040E-06 -1.4140E-05 1.6820E-05

```

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

```

0.0000013310 0.0000032340 -0.0000035040
0.0000032340 0.0000131900 -0.0000141400
-0.0000035040 -0.0000141400 0.0000168200

```

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

```

0.0000005985 0.0000000463 0.0000017099
0.0000000463 0.0000007896 -0.0000000418
0.0000017099 -0.0000000418 0.0000299529

```

Horizontal network accuracy = 0.00204 meters.

Vertical network accuracy = 0.01073 meters.

		Vectors		
To	From	X	Y	Z
mtms	9401	-33765.018	48744.963	30599.732
p053	9401	108111.306	16987.837	44237.462
mtlw	9401	-57662.919	-73071.660	-80120.645
p049	9401	-153429.275	-12137.711	-57809.570
p052	9401	125022.230	-105436.406	-56184.646

Covariance matrix of the 5 vectors

```

1 1.3945E-06 3.4643E-06 -3.7772E-06 1.2509E-06 3.1539E-06 -3.4305E-06 1.2733E-06 3.1861E-06 -3.4389E-06
1.2823E-06 3.1782E-06 -3.4399E-06 1.2522E-06 3.1753E-06 -3.4278E-06
2 3.4643E-06 1.3993E-05 -1.5109E-05 3.1432E-06 1.2829E-05 -1.3826E-05 3.1687E-06 1.2864E-05 -1.3833E-05
3.1797E-06 1.2856E-05 -1.3835E-05 3.1440E-06 1.2852E-05 -1.3820E-05
3 -3.7772E-06 -1.5109E-05 1.8031E-05 -3.3925E-06 -1.3813E-05 1.6438E-05 -3.4602E-06 -1.3909E-05 1.6462E-05
-3.4878E-06 -1.3886E-05 1.6465E-05 -3.3961E-06 -1.3877E-05 1.6428E-05
4 1.2509E-06 3.1432E-06 -3.3925E-06 1.3839E-06 3.4132E-06 -3.6910E-06 1.2408E-06 3.1040E-06 -3.4012E-06
1.2252E-06 3.1183E-06 -3.4000E-06 1.2785E-06 3.1249E-06 -3.4225E-06
5 3.1539E-06 1.2829E-05 -1.3813E-05 3.4132E-06 1.4021E-05 -1.5112E-05 3.1585E-06 1.2848E-05 -1.3840E-05
3.1564E-06 1.2848E-05 -1.3838E-05 3.1638E-06 1.2857E-05 -1.3849E-05
6 -3.4305E-06 -1.3826E-05 1.6438E-05 -3.6910E-06 -1.5112E-05 1.8003E-05 -3.4453E-06 -1.3882E-05 1.6468E-05
-3.4557E-06 -1.3870E-05 1.6466E-05 -3.4208E-06 -1.3876E-05 1.6463E-05
7 1.2733E-06 3.1687E-06 -3.4602E-06 1.2408E-06 3.1585E-06 -3.4453E-06 1.4331E-06 3.5923E-06 -3.8393E-06
1.3099E-06 3.2138E-06 -3.4678E-06 1.2443E-06 3.2077E-06 -3.4419E-06
8 3.1861E-06 1.2864E-05 -1.3909E-05 3.1040E-06 1.2848E-05 -1.3882E-05 3.5923E-06 1.4432E-05 -1.5364E-05
3.2818E-06 1.2991E-05 -1.3941E-05 3.1128E-06 1.2975E-05 -1.3873E-05
9 -3.4389E-06 -1.3833E-05 1.6462E-05 -3.4012E-06 -1.3840E-05 1.6468E-05 -3.8393E-06 -1.5364E-05 1.8102E-05
-3.4923E-06 -1.3915E-05 1.6501E-05 -3.4056E-06 -1.3906E-05 1.6465E-05

```

10 1.2823E-06 3.1797E-06 -3.4878E-06 1.2252E-06 3.1564E-06 -3.4557E-06 1.3099E-06 3.2818E-06 -3.4923E-06
1.5071E-06 3.6415E-06 -3.9106E-06 1.2308E-06 3.2393E-06 -3.4487E-06
11 3.1782E-06 1.2856E-05 -1.3886E-05 3.1183E-06 1.2848E-05 -1.3870E-05 3.2138E-06 1.2991E-05 -1.3915E-05
3.6415E-06 1.4284E-05 -1.5313E-05 3.1243E-06 1.2940E-05 -1.3861E-05
12 -3.4399E-06 -1.3835E-05 1.6465E-05 -3.4000E-06 -1.3838E-05 1.6466E-05 -3.4678E-06 -1.3941E-05 1.6501E-05
-3.9106E-06 -1.5313E-05 1.8124E-05 -3.4039E-06 -1.3903E-05 1.6460E-05
13 1.2522E-06 3.1440E-06 -3.3961E-06 1.2785E-06 3.1638E-06 -3.4208E-06 1.2443E-06 3.1128E-06 -3.4056E-06
1.2308E-06 3.1243E-06 -3.4039E-06 1.3804E-06 3.4028E-06 -3.7015E-06
14 3.1753E-06 1.2852E-05 -1.3877E-05 3.1249E-06 1.2857E-05 -1.3876E-05 3.2077E-06 1.2975E-05 -1.3906E-05
3.2393E-06 1.2940E-05 -1.3903E-05 3.4028E-06 1.4298E-05 -1.5248E-05
15 -3.4278E-06 -1.3820E-05 1.6428E-05 -3.4225E-06 -1.3849E-05 1.6463E-05 -3.4419E-06 -1.3873E-05 1.6465E-05
-3.4487E-06 -1.3861E-05 1.6460E-05 -3.7015E-06 -1.5248E-05 1.8005E-05

Correlation matrix of the 5 vectors

1 1.0000E+00 7.8425E-01 -7.5326E-01 9.0042E-01 7.1326E-01 -6.8467E-01 9.0067E-01 7.1020E-01 -6.8445E-01
8.8450E-01 7.1210E-01 -6.8423E-01 9.0251E-01 7.1110E-01 -6.8408E-01
2 7.8425E-01 1.0000E+00 -9.5123E-01 7.1427E-01 9.1595E-01 -8.7110E-01 7.0759E-01 9.0521E-01 -8.6913E-01
6.9241E-01 9.0935E-01 -8.6875E-01 7.1537E-01 9.0859E-01 -8.7067E-01
3 -7.5326E-01 -9.5123E-01 1.0000E+00 -6.7915E-01 -8.6877E-01 9.1238E-01 -6.8069E-01 -8.6224E-01 9.1118E-01
-6.6907E-01 -8.6526E-01 9.1082E-01 -6.8073E-01 -8.6424E-01 9.1178E-01
4 9.0042E-01 7.1427E-01 -6.7915E-01 1.0000E+00 7.7487E-01 -7.3948E-01 8.8108E-01 6.9454E-01 -6.7955E-01
8.4833E-01 7.0134E-01 -6.7887E-01 9.2499E-01 7.0250E-01 -6.8564E-01
5 7.1326E-01 9.1595E-01 -8.6877E-01 7.7487E-01 1.0000E+00 -9.5119E-01 7.0461E-01 9.0318E-01 -8.6875E-01
6.8665E-01 9.0785E-01 -8.6809E-01 7.1916E-01 9.0804E-01 -8.7167E-01
6 -6.8467E-01 -8.7110E-01 9.1238E-01 -7.3948E-01 -9.5119E-01 1.0000E+00 -6.7830E-01 -8.6120E-01 9.1224E-01
-6.6344E-01 -8.6491E-01 9.1159E-01 -6.8623E-01 -8.6490E-01 9.1442E-01
7 9.0067E-01 7.0759E-01 -6.8069E-01 8.8108E-01 7.0461E-01 -6.7830E-01 1.0000E+00 7.8989E-01 -7.5377E-01
8.9132E-01 7.1030E-01 -6.8041E-01 8.8466E-01 7.0862E-01 -6.7758E-01
8 7.1020E-01 9.0521E-01 -8.6224E-01 6.9454E-01 9.0318E-01 -8.6120E-01 7.8989E-01 1.0000E+00 -9.5055E-01
7.0368E-01 9.0480E-01 -8.6199E-01 6.9740E-01 9.0321E-01 -8.6063E-01
9 -6.8445E-01 -8.6913E-01 9.1118E-01 -6.7955E-01 -8.6875E-01 9.1224E-01 -7.5377E-01 -9.5055E-01 1.0000E+00
-6.6862E-01 -8.6532E-01 9.1097E-01 -6.8130E-01 -8.6434E-01 9.1201E-01
10 8.8450E-01 6.9241E-01 -6.6907E-01 8.4833E-01 6.8665E-01 -6.6344E-01 8.9132E-01 7.0368E-01 -6.6862E-01
1.0000E+00 7.8483E-01 -7.4825E-01 8.5336E-01 6.9781E-01 -6.6206E-01
11 7.1210E-01 9.0935E-01 -8.6526E-01 7.0134E-01 9.0785E-01 -8.6491E-01 7.1030E-01 9.0480E-01 -8.6532E-01
7.8483E-01 1.0000E+00 -9.5171E-01 7.0360E-01 9.0543E-01 -8.6433E-01
12 -6.8423E-01 -8.6875E-01 9.1082E-01 -6.7887E-01 -8.6809E-01 9.1159E-01 -6.8041E-01 -8.6199E-01 9.1097E-01
-7.4825E-01 -9.5171E-01 1.0000E+00 -6.8053E-01 -8.6363E-01 9.1119E-01
13 9.0251E-01 7.1537E-01 -6.8073E-01 9.2499E-01 7.1916E-01 -6.8623E-01 8.8466E-01 6.9740E-01 -6.8130E-01
8.5336E-01 7.0360E-01 -6.8053E-01 1.0000E+00 7.6596E-01 -7.4248E-01
14 7.1110E-01 9.0859E-01 -8.6424E-01 7.0250E-01 9.0804E-01 -8.6490E-01 7.0862E-01 9.0321E-01 -8.6434E-01
6.9781E-01 9.0543E-01 -8.6363E-01 7.6596E-01 1.0000E+00 -9.5035E-01
15 -6.8408E-01 -8.7067E-01 9.1178E-01 -6.8564E-01 -8.7167E-01 9.1442E-01 -6.7758E-01 -8.6063E-01 9.1201E-01
-6.6206E-01 -8.6433E-01 9.1119E-01 -7.4248E-01 -9.5035E-01 1.0000E+00

G-FILE for the vectors

Axx2014 8132014 813
B201408131700201408131900 5 rsgps 1.37IGS
lant_info.003 NGS
C00060001 -337650181 11 487449632 37 305997315 42
C00060002 1081113058 11 169878367 37 442374624 42

C00060003 -576629194 11 -730716603 37 -801206448 42
 C00060004-1534292746 12 -121377110 37 -578095701 42
 C00060005 1250222302 11-1054364062 37 -561846457 42
 D 1 2 7842502 1 3 -7532645 1 4 9004248 1 5 7132628 1 6 -6846657
 D 1 7 9006661 1 8 7101979 1 9 -6844532 1 10 8844964 1 11 7121049
 D 1 12 -6842271 1 13 9025084 1 14 7111037 1 15 -6840803 2 3 -9512323
 D 2 4 7142690 2 5 9159478 2 6 -8710962 2 7 7075923 2 8 9052132
 D 2 9 -8691305 2 10 6924069 2 11 9093458 2 12 -8687521 2 13 7153731
 D 2 14 9085891 2 15 -8706725 3 4 -6791453 3 5 -8687678 3 6 9123814
 D 3 7 -6806942 3 8 -8622361 3 9 9111793 3 10 -6690668 3 11 -8652578
 D 3 12 9108207 3 13 -6807272 3 14 -8642422 3 15 9117763 4 5 7748741
 D 4 6 -7394827 4 7 8810819 4 8 6945446 4 9 -6795452 4 10 8483320
 D 4 11 7013436 4 12 -6788735 4 13 9249861 4 14 7025011 4 15 -6856413
 D 5 6 -9511859 5 7 7046083 5 8 9031764 5 9 -8687479 5 10 6866492
 D 5 11 9078503 5 12 -8680936 5 13 7191590 5 14 9080410 5 15 -8716744
 D 6 7 -6782962 6 8 -8611987 6 9 9122420 6 10 -6634381 6 11 -8649062
 D 6 12 9115896 6 13 -6862256 6 14 -8649000 6 15 9144179 7 8 7898877
 D 7 9 -7537745 7 10 8913181 7 11 7103037 7 12 -6804143 7 13 8846646
 D 7 14 7086186 7 15 -6775768 8 9 -9505526 8 10 7036833 8 11 9047987
 D 8 12 -8619889 8 13 6974040 8 14 9032067 8 15 -8606325 9 10 -6686194
 D 9 11 -8653161 9 12 9109714 9 13 -6812982 9 14 -8643390 9 15 9120091
 D 10 11 7848296 10 12 -7482457 10 13 8533571 10 14 6978090 10 15 -6620569
 D 11 12 -9517118 11 13 7035958 11 14 9054315 11 15 -8643308 12 13 -6805312
 D 12 14 -8636264 12 15 9111907 13 14 7659594 13 15 -7424844 14 15 -9503462

ITRF position of 9401 as determined by individual baselines

	X	Y	Z
mtms	-1391670.563	-4032758.180	4726894.153
p053	-1391670.564	-4032758.161	4726894.145
mtlw	-1391670.562	-4032758.169	4726894.159
p049	-1391670.565	-4032758.172	4726894.157
p052	-1391670.574	-4032758.174	4726894.150

Residuals of position determined by individual baselines from the final position

	X	Y	Z	East	North	Up
mtms	0.000	-0.015	0.007	0.005	-0.006	0.015
p053	0.000	0.004	-0.001	-0.001	0.002	-0.003
mtlw	0.002	-0.004	0.013	0.003	0.006	0.012
p049	-0.001	-0.007	0.011	0.001	0.002	0.013
p052	-0.010	-0.009	0.005	-0.006	-0.005	0.011

STATE PLANE COORDINATES - International Foot

SPC (2500 MT)	
Northing (Y) [feet]	1412777.054
Easting (X) [feet]	2081028.051
Convergence [degrees]	0.33714832
Point Scale	0.99958153
Combined Factor	0.99941763

** 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: 1060.516 (m) [PROTOTYPE (Computed using USGG2012,GRS80,IGS08)]

dop from interpolation is 0.495
scatter (mean square distance from rover) is 18078.493
average edop for rover is 0.710
average ndop for rover is 0.800
average hdop for rover is 1.070
average vdop for rover is 1.840
average gdop for rover is 2.440

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.