OPUS-RS solution : 033845_14_240_A2.14O OP1409697225783

opus <opus@ngs.noaa.gov>

Tue 9/2/2014 4:38 PM

To:John Freetly <John.Freetly@neciusa.com>;

FILE: 033845_14_240_A2.14O OP1409697225783

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

USER: john.freetly@neciusa.com DATE: September 02, 2014
RINEX FILE: 0338240x.14o TIME: 22:37:45 UTC

SOFTWARE: rsgps 1.37 RS52.prl 1.99.2 START: 2014/08/28 23:34:30
EPHEMERIS: igr18074.eph [rapid] STOP: 2014/08/29 01:08:15
NAV FILE: brdc2400.14n OBS USED: 5698 / 6923 : 82%
ANT NAME: CHCX90D-OPUS NONE QUALITY IND. 16.29/ 55.20
ARP HEIGHT: 1.8000 NORMALIZED RMS: 0.282

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2014.65757)

X:	-1331404.366(m)	0.006(m)	-1331405.227(m)	0.006(m)
Y:	-4267438.163(m)	0.011(m)	-4267436.912(m)	0.011(m)
Z:	4535698.489(m)	0.015(m)	4535698.451(m)	0.015(m)
LAT:	45 36 30.07724	0.004(m)	45 36 30.09809	0.004(m)
E LON:	252 40 21.08231	0.005(m)	252 40 21.02719	0.005(m)
W LON:	107 19 38.91769	0.005(m)	107 19 38.97281	0.005(m)
EL HGT:	1114.616(m)	0.018(m)	1113.933(m)	0.018(m)
ORTHO HGT:	1129.206(m)	0.021(m)	[NAVD88 (Computed using GEOID12A)]	

	UTM COORDINATES (Zone 13)	STATE PLANE COORDINATES SPC (2500 MT)
Northing (Y) [meters]	5053169.322	153313.897
Easting (X) [meters]	318511.761	769399.811
Convergence [degrees]	-1.66360848	1.58920961
Point Scale	1.00000497	0.99968934
Combined Factor	0.99983026	0.99951468

US NATIONAL GRID DESIGNATOR: 13TCL1851153169(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DI3062	BIL5 BILLINGS 5 CORS ARP	N455816.237	W1075947.298	65829.2
DM7161	WYSH SHERIDAN CORS ARP	N444801.769	W1070035.715	93200.6
DL7728	P051 BILLINGSAPMT2005 CORS ARP	N454823.741	W1083246.070	97436.2
DL7758	P722 YNPBASSRCHMT2005 CORS ARP	N452725.985	W1093415.586	176074.8
DJ8992	P033 TENSLEEPTRWY2005 CORS ARP	N435710.415	W1072315.121	184058.4
DI3425	P052 LRRNCHJRDNMT2006 CORS ARP	N472229.026	W1070107.185	197800.5
DI2260	P054 TEREKALAKAMT2006 CORS ARP	N455046.833	W1042629.062	226226.5

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)

bil5	-1372156.893	-4223945.790	4563650.227
wysh	-1326396.425	-4335757.875	4472504.197
p051	-1416839.101	-4223178.947	4551064.081
p722	-1501537.054	-4223566.610	4524171.130
p033	-1374663.813	-4389900.527	4405280.410
p052	-1266648.347	-4138194.577	4670709.500
p054	-1110122.546	-4310701.935	4554151.768
0338	-1331405.227	-4267436.912	4535698.451

Covariance matrix of the stations:

1 1.6580E-07 3.4980E-07 -4.1500E-07 -3.3200E-09 -5.6690E-08 6.9520E-08 -3.7420E-09 -6.2990E-08 7.3810E-08 -4.3540E-09 -6.7470E-08 7.9940E-08 -3.5800E-09 -5.9190E-08 7.4630E-08 -3.7780E-09 -5.7360E-08 6.2500E-08 -4.1180E-09 -4.6260E-08 5.4740E-08 1.8850E-08 -2.6800E-09 4.8160E-09

2 3.4980E-07 1.1730E-06 -1.3020E-06 -6.1350E-08 -1.8600E-07 2.2080E-07 -6.2310E-08 -1.5100E-07 1.9930E-07 -6.4910E-08 -1.3510E-07 1.7590E-07 -6.4070E-08 -1.8190E-07 2.0190E-07 -5.1340E-08 -1.5890E-07 2.3310E-07 -4.5390E-08 -2.1760E-07 2.7120E-07 3.9100E-09 4.2630E-08 -2.1420E-08

3 -4.1500E-07 -1.3020E-06 1.6840E-06 6.9000E-08 2.1760E-07 -2.5160E-07 7.0160E-08 2.0440E-07 -2.4460E-07 6.9070E-08 1.9150E-07 -2.2750E-07 6.7360E-08 2.0710E-07 -2.3430E-07 7.1230E-08 2.2720E-07 -2.8310E-07 6.7850E-08 2.5510E-07 -3.0020E-07 6.0750E-10 -1.0690E-08 2.8300E-08

4 -3.3200E-09 -6.1350E-08 6.9000E-08 1.5950E-07 3.5900E-07 -4.0080E-07 -4.1910E-09 -6.2890E-08 7.0830E-08 -5.8020E-09 -6.5340E-08 7.3590E-08 -3.0550E-09 -6.1410E-08 6.7100E-08 -1.5690E-09 -5.7500E-08 6.5110E-08 1.1800E-09 -5.0410E-08 5.5140E-08 1.9700E-08 -4.2630E-09 2.4510E-09

5 -5.6690E-08 -1.8600E-07 2.1760E-07 3.5900E-07 1.2770E-06 -1.3480E-06 -5.4360E-08 -1.8710E-07 2.2040E-07 -5.0370E-08 -1.8980E-07 2.2710E-07 -5.7630E-08 -1.8170E-07 2.3730E-07 -6.4500E-08 -1.9460E-07 2.1230E-07 -7.5830E-08 -1.9500E-07 2.3380E-07 -8.3350E-09 -8.3530E-09 2.6070E-08

6 6.9520E-08 2.2080E-07 -2.5160E-07 -4.0080E-07 -1.3480E-06 1.6570E-06 7.0350E-08 2.1290E-07 -2.4080E-07 7.1050E-08 1.9750E-07 -2.1950E-07 6.4830E-08 2.1540E-07 -2.1910E-07 6.7430E-08 2.3630E-07 -2.8810E-07

5.7940E-08 2.6460E-07 -2.9470E-07 3.3240E-10 5.6560E-09 2.4190E-08
7 -3.7420E-09 -6.2310E-08 7.0160E-08 -4.1910E-09 -5.4360E-08 7.0350E-08 1.7440E-07 3.4980E-07 -4.1400E-07 -2.7090E-09 -7.3370E-08 8.6360E-08 -3.7080E-09 -5.7600E-08 8.0110E-08 -6.7360E-09 -6.0570E-08 5.7800E-08 -1.0290E-08 -4.1870E-08 4.9570E-08 1.5340E-08 -1.0040E-08 1.3140E-08
8 -6.2990E-08 -1.5100E-07 2.0440E-07 -6.2890E-08 -1.8710E-07 2.1290E-07 3.4980E-07 1.1530E-06 -1.2710E-06 -7.0870E-08 -1.1760E-07 1.5410E-07 -6.7070E-08 -1.8120E-07 1.8430E-07 -4.8490E-08 -1.4840E-07 2.3600E-07 -3.6600E-08 -2.2510E-07 2.7840E-07 2.8830E-09 4.6650E-08 -2.8230E-08
9 7.3810E-08 1.9930E-07 -2.4460E-07 7.0830E-08 2.2040E-07 -2.4080E-07 -4.1400E-07 -1.2710E-06 1.6340E-06 7.8040E-08 1.6480E-07 -1.9490E-07 7.1530E-08 2.0710E-07 -2.0800E-07 6.6040E-08 2.1160E-07 -2.8970E-07 5.3100E-08 2.6780E-07 -3.1320E-07 4.8120E-10 -2.0100E-08 4.0420E-08
10 -4.3540E-09 -6.4910E-08 6.9070E-08 -5.8020E-09 -5.0370E-08 7.1050E-08 -2.7090E-09 -7.0870E-08 7.8040E-08 1.9220E-07 3.4040E-07 -3.9610E-07 -4.1270E-09 -5.4780E-08 8.8150E-08 -1.1680E-08 -6.5440E-08 4.9730E-08 -2.0360E-08 -3.4700E-08 4.0840E-08 1.1200E-08 -1.7060E-08 2.0690E-08
11 -6.7470E-08 -1.3510E-07 1.9150E-07 -6.5340E-08 -1.8980E-07 1.9750E-07 -7.3370E-08 -1.1760E-07 1.6480E-07 3.4040E-07 1.1330E-06 -1.2390E-06 -7.2470E-08 -1.8050E-07 1.4930E-07 -4.2140E-08 -1.2790E-07 2.4280E-07 -1.8050E-08 -2.4030E-07 2.9280E-07 6.8400E-09 7.1500E-08 -6.0500E-08
12 7.9940E-08 1.7590E-07 -2.2750E-07 7.3590E-08 2.2710E-07 -2.1950E-07 8.6360E-08 1.5410E-07 -1.9490E-07 -3.9610E-07 -1.2390E-06 1.5840E-06 7.9140E-08 2.0810E-07 -1.5470E-07 5.4410E-08 1.8040E-07 -3.0470E-07 2.1450E-08 2.9410E-07 -3.3980E-07 -7.1430E-09 -5.8340E-08 8.9070E-08
13 -3.5800E-09 -6.4070E-08 6.7360E-08 -3.0550E-09 -5.7630E-08 6.4830E-08 -3.7080E-09 -6.7070E-08 7.1530E-08 -4.1270E-09 -7.2470E-08 7.9140E-08 1.6710E-07 3.6890E-07 -3.8910E-07 -4.7370E-09 -6.1880E-08 5.9090E-08 -5.1010E-09 -4.5820E-08 4.7370E-08 1.7100E-08 -9.8930E-09 6.4830E-09
14 -5.9190E-08 -1.8190E-07 2.0710E-07 -6.1410E-08 -1.8170E-07 2.1540E-07 -5.7600E-08 -1.8120E-07 2.0710E-07 -5.4780E-08 -1.8050E-07 2.0810E-07 3.6890E-07 1.2570E-06 -1.2760E-06 -6.4260E-08 -1.9020E-07 2.0840E-07 -7.1810E-08 -1.9870E-07 2.3010E-07 -8.8140E-09 -2.7210E-09 1.1420E-08
15 7.4630E-08 2.0190E-07 -2.3430E-07 6.7100E-08 2.3730E-07 -2.1910E-07 8.0110E-08 1.8430E-07 -2.0800E-07 8.8150E-08 1.4930E-07 -1.5470E-07 -3.8910E-07 -1.2760E-06 1.5790E-06 5.4870E-08 2.1000E-07 -3.0330E-07 2.4400E-08 2.9220E-07 -3.1670E-07 -8.3300E-09 -2.8110E-08 7.3270E-08
16 -3.7780E-09 -5.1340E-08 7.1230E-08 -1.5690E-09 -6.4500E-08 6.7430E-08 -6.7360E-09 -4.8490E-08 6.6040E-08 -1.1680E-08 -4.2140E-08 5.4410E-08 -4.7370E-09 -6.4260E-08 5.4870E-08 1.5360E-07 3.3410E-07 -3.9160E-07 1.7740E-08 -6.3150E-08 7.7220E-08 2.5740E-08 1.3370E-08 -1.0750E-08
17 -5.7360E-08 -1.5890E-07 2.2720E-07 -5.7500E-08 -1.9460E-07 2.3630E-07 -6.0570E-08 -1.4840E-07 2.1160E-07 -6.5440E-08 -1.2790E-07 1.8040E-07 -6.1880E-08 -1.9020E-07 2.1000E-07 3.3410E-07 1.1920E-06 -1.3620E-06 -3.1510E-08 -2.2860E-07 2.9570E-07 8.6070E-09 4.0100E-08 -6.6900E-09
18 6.2500E-08 2.3310E-07 -2.8310E-07 6.5110E-08 2.1230E-07 -2.8810E-07 5.7800E-08 2.3600E-07 -2.8970E-07 4.9730E-08 2.4280E-07 -3.0470E-07 5.9090E-08 2.0840E-07 -3.0330E-07 -3.9160E-07 -1.3620E-06 1.9010E-06 9.7470E-08 2.3000E-07 -2.8920E-07 9.1710E-09 3.4880E-08 -4.3800E-08
19 -4.1180E-09 -4.5390E-08 6.7850E-08 1.1800E-09 -7.5830E-08 5.7940E-08 -1.0290E-08 -3.6600E-08 5.3100E-08 -2.0360E-08 -1.8050E-08 2.1450E-08 -5.1010E-09 -7.1810E-08 2.4400E-08 1.7740E-08 -3.1510E-08 9.7470E-08 1.6350E-07 2.8010E-07 -3.2320E-07 3.4900E-08 3.0530E-08 -3.6810E-08
20 -4.6260E-08 -2.1760E-07 2.5510E-07 -5.0410E-08 -1.9500E-07 2.6460E-07 -4.1870E-08 -2.2510E-07 2.6780E-07 -3.4700E-08 -2.4030E-07 2.9410E-07 -4.5820E-08 -1.9870E-07 2.9220E-07 -6.3150E-08 -2.2860E-07 2.3000E-07 2.8010E-07 1.4490E-06 -1.6040E-06 -5.0660E-09 -4.6990E-08 7.9380E-08
21 5.4740E-08 2.7120E-07 -3.0020E-07 5.5140E-08 2.3380E-07 -2.9470E-07 4.9570E-08 2.7840E-07 -3.1320E-07 4.0840E-08 2.9280E-07 -3.3980E-07 4.7370E-08 2.3010E-07 -3.1670E-07 7.7220E-08 2.9570E-07 -2.8920E-07 -3.2320E-07 -1.6040E-06 1.9960E-06 4.7550E-09 7.6400E-08 -6.8220E-08
22 1.8850E-08 3.9100E-09 6.0750E-10 1.9700E-08 -8.3350E-09 3.3240E-10 1.5340E-08 2.8830E-09 4.8120E-10 1.1200E-08 6.8400E-09 -7.1430E-09 1.7100E-08 -8.8140E-09 -8.3300E-09 2.5740E-08 8.6070E-09 9.1710E-09 3.4900E-08 -5.0660E-09 4.7550E-09 1.8350E-06 4.7350E-06 -5.5380E-06
23 -2.6800E-09 4.2630E-08 -1.0690E-08 -4.2630E-09 -8.3530E-09 5.6560E-09 -1.0040E-08 4.6650E-08 -2.0100E-08 -1.7060E-08 7.1500E-08 -5.8340E-08 -9.8930E-09 -2.7210E-09 -2.8110E-08 1.3370E-08 4.0100E-08 3.4880E-08

3.0530E-08 -4.6990E-08 7.6400E-08 4.7350E-06 1.6010E-05 -1.8140E-05
24 4.8160E-09 -2.1420E-08 2.8300E-08 2.4510E-09 2.6070E-08 2.4190E-08 1.3140E-08 -2.8230E-08 4.0420E-08
2.0690E-08 -6.0500E-08 8.9070E-08 6.4830E-09 1.1420E-08 7.3270E-08 -1.0750E-08 -6.6900E-09 -4.3800E-08
-3.6810E-08 7.9380E-08 -6.8220E-08 -5.5380E-06 -1.8140E-05 2.2640E-05

Covariance Matrix for the xyz OPUS Rover Position (meters^2).
0.0000018350 0.0000047350 -0.0000055380
0.0000047350 0.0000160100 -0.0000181400
-0.0000055380 -0.0000181400 0.0000226400

Covariance Matrix for the enu OPUS Position (meters^2).
0.0000003999 -0.0000000149 0.0000001775
-0.0000000149 0.0000010407 0.0000023218
0.0000001775 0.0000023218 0.0000390444

Horizontal network accuracy = 0.00214 meters.
Vertical network accuracy = 0.01225 meters.

Vectors

To	From	X	Y	Z
bil5	0338	-40751.666	43491.122	27951.776
wysh	0338	5008.802	-68320.963	-63194.254
p051	0338	-85433.873	44257.965	15365.630
p722	0338	-170131.826	43870.302	-11527.321
p033	0338	-43258.586	-122463.615	-130418.042
p052	0338	64756.880	129242.335	135011.048
p054	0338	221282.682	-43265.023	18453.317

Covariance matrix of the 7 vectors
1 1.9631E-06 5.0836E-06 -5.9584E-06 1.7931E-06 4.6893E-06 -5.4736E-06 1.7971E-06 4.6718E-06 -5.4695E-06
1.8006E-06 4.6634E-06 -5.4557E-06 1.7955E-06 4.6873E-06 -5.4599E-06 1.7866E-06 4.6717E-06 -5.4895E-06
1.7771E-06 4.6965E-06 -5.4928E-06
2 5.0836E-06 1.7098E-05 -1.9410E-05 4.6740E-06 1.5790E-05 -1.7903E-05 4.6788E-06 1.5770E-05 -1.7899E-05
4.6832E-06 1.5761E-05 -1.7884E-05 4.6769E-06 1.5788E-05 -1.7889E-05 4.6664E-06 1.5768E-05 -1.7920E-05
4.6552E-06 1.5797E-05 -1.7924E-05
3 -5.9584E-06 -1.9410E-05 2.4267E-05 -5.4721E-06 -1.7938E-05 2.2336E-05 -5.4816E-06 -1.7897E-05 2.2327E-05
-5.4902E-06 -1.7877E-05 2.2295E-05 -5.4777E-06 -1.7934E-05 2.2304E-05 -5.4566E-06 -1.7895E-05 2.2372E-05
-5.4339E-06 -1.7954E-05 2.2380E-05
4 1.7931E-06 4.6740E-06 -5.4721E-06 1.9551E-06 5.1066E-06 -5.9416E-06 1.7958E-06 4.6735E-06 -5.4701E-06
1.7983E-06 4.6671E-06 -5.4597E-06 1.7951E-06 4.6867E-06 -5.4650E-06 1.7880E-06 4.6732E-06 -5.4845E-06
1.7816E-06 4.6939E-06 -5.4901E-06
5 4.6893E-06 1.5790E-05 -1.7938E-05 5.1066E-06 1.7304E-05 -1.9520E-05 4.6990E-06 1.5785E-05 -1.7926E-05
4.7100E-06 1.5757E-05 -1.7881E-05 4.6956E-06 1.5839E-05 -1.7901E-05 4.6655E-06 1.5784E-05 -1.7989E-05
4.6370E-06 1.5870E-05 -1.8009E-05
6 -5.4736E-06 -1.7903E-05 2.2336E-05 -5.9416E-06 -1.9520E-05 2.4249E-05 -5.4811E-06 -1.7905E-05 2.2335E-05
-5.4880E-06 -1.7888E-05 2.2307E-05 -5.4800E-06 -1.7942E-05 2.2323E-05 -5.4602E-06 -1.7903E-05 2.2372E-05
-5.4436E-06 -1.7960E-05 2.2389E-05
7 1.7971E-06 4.6788E-06 -5.4816E-06 1.7958E-06 4.6990E-06 -5.4811E-06 1.9787E-06 5.0920E-06 -5.9656E-06
1.8058E-06 4.6648E-06 -5.4576E-06 1.7989E-06 4.6963E-06 -5.4627E-06 1.7872E-06 4.6759E-06 -5.5025E-06
1.7745E-06 4.7082E-06 -5.5063E-06

8 4.6718E-06 1.5770E-05 -1.7897E-05 4.6735E-06 1.5785E-05 -1.7905E-05 5.0920E-06 1.7070E-05 -1.9363E-05 4.6783E-06 1.5774E-05 -1.7899E-05 4.6749E-06 1.5785E-05 -1.7899E-05 4.6703E-06 1.5775E-05 -1.7911E-05 4.6650E-06 1.5785E-05 -1.7910E-05

9 -5.4695E-06 -1.7899E-05 2.2327E-05 -5.4701E-06 -1.7926E-05 2.2335E-05 -5.9656E-06 -1.9363E-05 2.4193E-05 -5.4811E-06 -1.7895E-05 2.2316E-05 -5.4734E-06 -1.7924E-05 2.2318E-05 -5.4617E-06 -1.7902E-05 2.2354E-05 -5.4486E-06 -1.7931E-05 2.2355E-05

10 1.8006E-06 4.6832E-06 -5.4902E-06 1.7983E-06 4.7100E-06 -5.4880E-06 1.8058E-06 4.6783E-06 -5.4811E-06 2.0048E-06 5.0856E-06 -5.9476E-06 1.8026E-06 4.7061E-06 -5.4622E-06 1.7864E-06 4.6780E-06 -5.5181E-06 1.7685E-06 4.7224E-06 -5.5226E-06

11 4.6634E-06 1.5761E-05 -1.7877E-05 4.6671E-06 1.5757E-05 -1.7888E-05 4.6648E-06 1.5774E-05 -1.7895E-05 5.0856E-06 1.7000E-05 -1.9260E-05 4.6656E-06 1.5761E-05 -1.7902E-05 4.6727E-06 1.5771E-05 -1.7872E-05 4.6796E-06 1.5745E-05 -1.7863E-05

12 -5.4557E-06 -1.7884E-05 2.2295E-05 -5.4597E-06 -1.7881E-05 2.2307E-05 -5.4576E-06 -1.7899E-05 2.2316E-05 -5.9476E-06 -1.9260E-05 2.4046E-05 -5.4582E-06 -1.7885E-05 2.2323E-05 -5.4657E-06 -1.7895E-05 2.2290E-05 -5.4726E-06 -1.7867E-05 2.2279E-05

13 1.7955E-06 4.6769E-06 -5.4777E-06 1.7951E-06 4.6956E-06 -5.4800E-06 1.7989E-06 4.6749E-06 -5.4734E-06 1.8026E-06 4.6656E-06 -5.4582E-06 1.9679E-06 5.1226E-06 -5.9253E-06 1.7874E-06 4.6744E-06 -5.4946E-06 1.7779E-06 4.7041E-06 -5.5019E-06

14 4.6873E-06 1.5788E-05 -1.7934E-05 4.6867E-06 1.5839E-05 -1.7942E-05 4.6963E-06 1.5785E-05 -1.7924E-05 4.7061E-06 1.5761E-05 -1.7885E-05 5.1226E-06 1.7272E-05 -1.9399E-05 4.6662E-06 1.5782E-05 -1.7978E-05 4.6415E-06 1.5861E-05 -1.7998E-05

15 -5.4599E-06 -1.7889E-05 2.2304E-05 -5.4650E-06 -1.7901E-05 2.2323E-05 -5.4627E-06 -1.7899E-05 2.2318E-05 -5.4622E-06 -1.7902E-05 2.2323E-05 -5.9253E-06 -1.9399E-05 2.4072E-05 -5.4640E-06 -1.7895E-05 2.2307E-05 -5.4685E-06 -1.7899E-05 2.2318E-05

16 1.7866E-06 4.6664E-06 -5.4566E-06 1.7880E-06 4.6655E-06 -5.4602E-06 1.7872E-06 4.6703E-06 -5.4617E-06 1.7864E-06 4.6727E-06 -5.4657E-06 1.7874E-06 4.6662E-06 -5.4640E-06 1.9371E-06 5.0471E-06 -5.9280E-06 1.7921E-06 4.6635E-06 -5.4548E-06

17 4.6717E-06 1.5768E-05 -1.7895E-05 4.6732E-06 1.5784E-05 -1.7903E-05 4.6759E-06 1.5775E-05 -1.7902E-05 4.6780E-06 1.5771E-05 -1.7895E-05 4.6744E-06 1.5782E-05 -1.7895E-05 5.0471E-06 1.7122E-05 -1.9530E-05 4.6644E-06 1.5788E-05 -1.7914E-05

18 -5.4895E-06 -1.7920E-05 2.2372E-05 -5.4845E-06 -1.7989E-05 2.2372E-05 -5.5025E-06 -1.7911E-05 2.2354E-05 -5.5181E-06 -1.7872E-05 2.2290E-05 -5.4946E-06 -1.7978E-05 2.2307E-05 -5.9280E-06 -1.9530E-05 2.4629E-05 -5.4129E-06 -1.8024E-05 2.2463E-05

19 1.7771E-06 4.6552E-06 -5.4339E-06 1.7816E-06 4.6370E-06 -5.4436E-06 1.7745E-06 4.6650E-06 -5.4486E-06 1.7685E-06 4.6796E-06 -5.4726E-06 1.7779E-06 4.6415E-06 -5.4685E-06 1.7921E-06 4.6644E-06 -5.4129E-06 1.9287E-06 4.9896E-06 -5.8291E-06

20 4.6965E-06 1.5797E-05 -1.7954E-05 4.6939E-06 1.5870E-05 -1.7960E-05 4.7082E-06 1.5785E-05 -1.7931E-05 4.7224E-06 1.5745E-05 -1.7867E-05 4.7041E-06 1.5861E-05 -1.7899E-05 4.6635E-06 1.5788E-05 -1.8024E-05 4.9896E-06 1.7553E-05 -1.9900E-05

21 -5.4928E-06 -1.7924E-05 2.2380E-05 -5.4901E-06 -1.8009E-05 2.2389E-05 -5.5063E-06 -1.7910E-05 2.2355E-05 -5.5226E-06 -1.7863E-05 2.2279E-05 -5.5019E-06 -1.7998E-05 2.2318E-05 -5.4548E-06 -1.7914E-05 2.2463E-05 -5.8291E-06 -1.9900E-05 2.4772E-05

Correlation matrix of the 7 vectors

1 1.0000E+00 8.7746E-01 -8.6327E-01 9.1528E-01 8.0458E-01 -7.9334E-01 9.1180E-01 8.0705E-01 -7.9365E-01 9.0763E-01 8.0724E-01 -7.9408E-01 9.1349E-01 8.0496E-01 -7.9424E-01 9.1619E-01 8.0581E-01 -7.8948E-01 9.1331E-01 8.0007E-01 -7.8766E-01

2 8.7746E-01 1.0000E+00 -9.5289E-01 8.0842E-01 9.1799E-01 -8.7927E-01 8.0441E-01 9.2308E-01 -8.8007E-01 7.9991E-01 9.2445E-01 -8.8203E-01 8.0628E-01 9.1873E-01 -8.8175E-01 8.1083E-01 9.2160E-01 -8.7329E-01 8.1065E-01 9.1185E-01 -8.7092E-01

3 -8.6327E-01 -9.5289E-01 1.0000E+00 -7.9443E-01 -8.7536E-01 9.2076E-01 -7.9105E-01 -8.7932E-01 9.2144E-01

-7.8712E-01 -8.8017E-01 9.2295E-01 -7.9266E-01 -8.7595E-01 9.2281E-01 -7.9586E-01 -8.7792E-01 9.1513E-01 -7.9428E-01 -8.6989E-01 9.1276E-01

4 9.1528E-01 8.0842E-01 -7.9443E-01 1.0000E+00 8.7797E-01 -8.6293E-01 9.1301E-01 8.0899E-01 -7.9536E-01 9.0833E-01 8.0954E-01 -7.9628E-01 9.1519E-01 8.0650E-01 -7.9661E-01 9.1876E-01 8.0770E-01 -7.9038E-01 9.1746E-01 8.0126E-01 -7.8888E-01

5 8.0458E-01 9.1799E-01 -8.7536E-01 8.7797E-01 1.0000E+00 -9.5293E-01 8.0305E-01 9.1844E-01 -8.7611E-01 7.9968E-01 9.1872E-01 -8.7658E-01 8.0467E-01 9.1620E-01 -8.7708E-01 8.0584E-01 9.1699E-01 -8.7138E-01 8.0266E-01 9.1063E-01 -8.6982E-01

6 -7.9334E-01 -8.7927E-01 9.2076E-01 -8.6293E-01 -9.5293E-01 1.0000E+00 -7.9129E-01 -8.8005E-01 9.2212E-01 -7.8711E-01 -8.8102E-01 9.2381E-01 -7.9329E-01 -8.7668E-01 9.2397E-01 -7.9668E-01 -8.7862E-01 9.1544E-01 -7.9599E-01 -8.7056E-01 9.1351E-01

7 9.1180E-01 8.0441E-01 -7.9105E-01 9.1301E-01 8.0305E-01 -7.9129E-01 1.0000E+00 8.7615E-01 -8.6222E-01 9.0663E-01 8.0430E-01 -7.9121E-01 9.1159E-01 8.0331E-01 -7.9151E-01 9.1285E-01 8.0333E-01 -7.8822E-01 9.0833E-01 7.9890E-01 -7.8648E-01

8 8.0705E-01 9.2308E-01 -8.7932E-01 8.0899E-01 9.1844E-01 -8.8005E-01 8.7615E-01 1.0000E+00 -9.5281E-01 7.9972E-01 9.2600E-01 -8.8349E-01 8.0661E-01 9.1929E-01 -8.8301E-01 8.1217E-01 9.2274E-01 -8.7353E-01 8.1303E-01 9.1193E-01 -8.7095E-01

9 -7.9365E-01 -8.8007E-01 9.2144E-01 -7.9536E-01 -8.7611E-01 9.2212E-01 -8.6222E-01 -9.5281E-01 1.0000E+00 -7.8702E-01 -8.8237E-01 9.2521E-01 -7.9325E-01 -8.7683E-01 9.2481E-01 -7.9782E-01 -8.7957E-01 9.1576E-01 -7.9763E-01 -8.7015E-01 9.1314E-01

10 9.0763E-01 7.9991E-01 -7.8712E-01 9.0833E-01 7.9968E-01 -7.8711E-01 9.0663E-01 7.9972E-01 -7.8702E-01 1.0000E+00 8.7113E-01 -8.5662E-01 9.0752E-01 7.9974E-01 -7.8627E-01 9.0648E-01 7.9846E-01 -7.8530E-01 8.9939E-01 7.9608E-01 -7.8365E-01

11 8.0724E-01 9.2445E-01 -8.8017E-01 8.0954E-01 9.1872E-01 -8.8102E-01 8.0430E-01 9.2600E-01 -8.8237E-01 8.7113E-01 1.0000E+00 -9.5261E-01 8.0664E-01 9.1976E-01 -8.8495E-01 8.1426E-01 9.2437E-01 -8.7341E-01 8.1724E-01 9.1148E-01 -8.7046E-01

12 -7.9408E-01 -8.8203E-01 9.2295E-01 -7.9628E-01 -8.7658E-01 9.2381E-01 -7.9121E-01 -8.8349E-01 9.2521E-01 -8.5662E-01 -9.5261E-01 1.0000E+00 -7.9347E-01 -8.7759E-01 9.2784E-01 -8.0084E-01 -8.8191E-01 9.1595E-01 -8.0360E-01 -8.6967E-01 9.1285E-01

13 9.1349E-01 8.0628E-01 -7.9266E-01 9.1519E-01 8.0467E-01 -7.9329E-01 9.1159E-01 8.0661E-01 -7.9325E-01 9.0752E-01 8.0664E-01 -7.9347E-01 1.0000E+00 8.7864E-01 -8.6089E-01 9.1548E-01 8.0529E-01 -7.8925E-01 9.1258E-01 8.0039E-01 -7.8800E-01

14 8.0496E-01 9.1873E-01 -8.7595E-01 8.0650E-01 9.1620E-01 -8.7668E-01 8.0331E-01 9.1929E-01 -8.7683E-01 7.9974E-01 9.1976E-01 -8.7759E-01 8.7864E-01 1.0000E+00 -9.5137E-01 8.0669E-01 9.1775E-01 -8.7165E-01 8.0417E-01 9.1092E-01 -8.7007E-01

15 -7.9424E-01 -8.8175E-01 9.2281E-01 -7.9661E-01 -8.7708E-01 9.2397E-01 -7.9151E-01 -8.8301E-01 9.2481E-01 -7.8627E-01 -8.8495E-01 9.2784E-01 -8.6089E-01 -9.5137E-01 1.0000E+00 -8.0016E-01 -8.8146E-01 9.1615E-01 -8.0255E-01 -8.7075E-01 9.1394E-01

16 9.1619E-01 8.1083E-01 -7.9586E-01 9.1876E-01 8.0584E-01 -7.9668E-01 9.1285E-01 8.1217E-01 -7.9782E-01 9.0648E-01 8.1426E-01 -8.0084E-01 9.1548E-01 8.0669E-01 -8.0016E-01 1.0000E+00 8.7638E-01 -8.5825E-01 9.2715E-01 7.9977E-01 -7.8744E-01

17 8.0581E-01 9.2160E-01 -8.7792E-01 8.0770E-01 9.1699E-01 -8.7862E-01 8.0333E-01 9.2274E-01 -8.7957E-01 7.9846E-01 9.2437E-01 -8.8191E-01 8.0529E-01 9.1775E-01 -8.8146E-01 8.7638E-01 1.0000E+00 -9.5107E-01 8.1168E-01 9.1072E-01 -8.6983E-01

18 -7.8948E-01 -8.7329E-01 9.1513E-01 -7.9038E-01 -8.7138E-01 9.1544E-01 -7.8822E-01 -8.7353E-01 9.1576E-01 -7.8530E-01 -8.7341E-01 9.1595E-01 -7.8925E-01 -8.7165E-01 9.1615E-01 -8.5825E-01 -9.5107E-01 1.0000E+00 -7.8538E-01 -8.6689E-01 9.0941E-01

19 9.1331E-01 8.1065E-01 -7.9428E-01 9.1746E-01 8.0266E-01 -7.9599E-01 9.0833E-01 8.1303E-01 -7.9763E-01 8.9939E-01 8.1724E-01 -8.0360E-01 9.1258E-01 8.0417E-01 -8.0255E-01 9.2715E-01 8.1168E-01 -7.8538E-01 1.0000E+00 8.5755E-01 -8.4331E-01

20 8.0007E-01 9.1185E-01 -8.6989E-01 8.0126E-01 9.1063E-01 -8.7056E-01 7.9890E-01 9.1193E-01 -8.7015E-01

7.9608E-01 9.1148E-01 -8.6967E-01 8.0039E-01 9.1092E-01 -8.7075E-01 7.9977E-01 9.1072E-01 -8.6689E-01 8.5755E-01 1.0000E+00 -9.5431E-01
21 -7.8766E-01 -8.7092E-01 9.1276E-01 -7.8888E-01 -8.6982E-01 9.1351E-01 -7.8648E-01 -8.7095E-01 9.1314E-01 -7.8365E-01 -8.7046E-01 9.1285E-01 -7.8800E-01 -8.7007E-01 9.1394E-01 -7.8744E-01 -8.6983E-01 9.0941E-01 -8.4331E-01 -9.5431E-01 1.0000E+00

G-FILE for the vectors

Axx2014 8282014 829
B201408282300201408290100 7 rsgps 1.37IGS
lant_info.003 NGS
C00080001 -407516655 14 434911218 41 279517758 49
C00080002 50088024 13 -683209628 41 -631942543 49
C00080003 -854338734 14 442579649 41 153656298 49
C00080004-1701318264 14 438703022 41 -115273214 49
C00080005 -432585856 14-1224636154 41-1304180415 49
C00080006 647568796 13 1292423352 41 1350110484 49
C00080007-2082140481 13 -432650225 41 184533166 49
D 1 2 8774618 1 3 -8632737 1 4 9152844 1 5 8045806 1 6 -7933422
D 1 7 9118032 1 8 8070505 1 9 -7936501 1 10 9076314 1 11 8072428
D 1 12 -7940753 1 13 9134934 1 14 8049613 1 15 -7942363 1 16 9161901
D 1 17 8058055 1 18 -7894791 1 19 9133056 1 20 8000670 1 21 -7876633
D 2 3 -9528885 2 4 8084164 2 5 9179850 2 6 -8792725 2 7 8044050
D 2 8 9230849 2 9 -8800705 2 10 7999107 2 11 9244504 2 12 -8820301
D 2 13 8062847 2 14 9187262 2 15 -8817511 2 16 8108349 2 17 9216005
D 2 18 -8732880 2 19 8106508 2 20 9118496 2 21 -8709151 3 4 -7944281
D 3 5 -8753616 3 6 9207643 3 7 -7910474 3 8 -8793219 3 9 9214382
D 3 10 -7871240 3 11 -8801690 3 12 9229501 3 13 -7926610 3 14 -8759507
D 3 15 9228124 3 16 -7958558 3 17 -8779212 3 18 9151264 3 19 -7942760
D 3 20 -8698898 3 21 9127642 4 5 8779658 4 6 -8629272 4 7 9130063
D 4 8 8089913 4 9 -7953616 4 10 9083257 4 11 8095367 4 12 -7962795
D 4 13 9151947 4 14 8064969 4 15 -7966124 4 16 9187610 4 17 8077018
D 4 18 -7903758 4 19 9174628 4 20 8012640 4 21 -7888758 5 6 -9529292
D 5 7 8030546 5 8 9184407 5 9 -8761069 5 10 7996834 5 11 9187153
D 5 12 -8765831 5 13 8046737 5 14 9162027 5 15 -8770800 5 16 8058368
D 5 17 9169871 5 18 -8713831 5 19 8026622 5 20 9106286 5 21 -8698165
D 6 7 -7912866 6 8 -8800480 6 9 9221215 6 10 -7871053 6 11 -8810193
D 6 12 9238089 6 13 -7932943 6 14 -8766830 6 15 9239689 6 16 -7966783
D 6 17 -8786167 6 18 9154442 6 19 -7959924 6 20 -8705584 6 21 9135097
D 7 8 8761523 7 9 -8622182 7 10 9066301 7 11 8043020 7 12 -7912110
D 7 13 9115946 7 14 8033088 7 15 -7915073 7 16 9128487 7 17 8033316
D 7 18 -7882226 7 19 9083310 7 20 7988966 7 21 -7864756 8 9 -9528093
D 8 10 7997242 8 11 9260006 8 12 -8834941 8 13 8066062 8 14 9192872
D 8 15 -8830073 8 16 8121749 8 17 9227362 8 18 -8735314 8 19 8130273
D 8 20 9119327 8 21 -8709488 9 10 -7870247 9 11 -8823710 9 12 9252142
D 9 13 -7932536 9 14 -8768334 9 15 9248147 9 16 -7978157 9 17 -8795713
D 9 18 9157625 9 19 -7976346 9 20 -8701505 9 21 9131375 10 11 8711319
D 10 12 -8566225 10 13 9075191 10 14 7997388 10 15 -7862716 10 16 9064838
D 10 17 7984563 10 18 -7853018 10 19 8993878 10 20 7960754 10 21 -7836534
D 11 12 -9526102 11 13 8066403 11 14 9197604 11 15 -8849506 11 16 8142551

D 11 17 9243709 11 18 -8734109 11 19 8172408 11 20 9114818 11 21 -8704583
D 12 13 -7934650 12 14 -8775895 12 15 9278363 12 16 -8008425 12 17 -8819143
D 12 18 9159476 12 19 -8036019 12 20 -8696702 12 21 9128469 13 14 8786434
D 13 15 -8608850 13 16 9154772 13 17 8052861 13 18 -7892450 13 19 9125848
D 13 20 8003928 13 21 -7879964 14 15 -9513693 14 16 8066900 14 17 9177450
D 14 18 -8716501 14 19 8041678 14 20 9109164 14 21 -8700740 15 16 -8001587
D 15 17 -8814579 15 18 9161478 15 19 -8025506 15 20 -8707526 15 21 9139354
D 16 17 8763768 16 18 -8582456 16 19 9271534 16 20 7997653 16 21 -7874354
D 17 18 -9510687 17 19 8116790 17 20 9107201 17 21 -8698286 18 19 -7853750
D 18 20 -8668863 18 21 9094106 19 20 8575532 19 21 -8433116 20 21 -9543077

ITRF position of 0338 as determined by individual baselines

	X	Y	Z
bil5	-1331405.224	-4267436.916	4535698.462
wysh	-1331405.238	-4267436.930	4535698.477
p051	-1331405.234	-4267436.920	4535698.460
p722	-1331405.232	-4267436.916	4535698.465
p033	-1331405.232	-4267436.923	4535698.458
p052	-1331405.224	-4267436.921	4535698.461
p054	-1331405.227	-4267436.924	4535698.460

Residuals of position determined by individual baselines from the final position

	X	Y	Z	East	North	Up
bil5	0.003	-0.004	0.011	0.004	0.006	0.010
wysh	-0.011	-0.018	0.026	-0.005	0.004	0.033
p051	-0.007	-0.008	0.009	-0.004	-0.001	0.013
p722	-0.005	-0.004	0.013	-0.004	0.006	0.013
p033	-0.005	-0.011	0.007	-0.001	-0.004	0.013
p052	0.003	-0.009	0.010	0.006	0.002	0.012
p054	0.001	-0.012	0.008	0.004	-0.002	0.014

STATE PLANE COORDINATES - International Foot
SPC (2500 MT)

Northing (Y) [feet]	502998.350
Easting (X) [feet]	2524277.595
Convergence [degrees]	1.58920961
Point Scale	0.99968934
Combined Factor	0.99951468

** 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: 1128.340 (m) [PROTOTYPE (Computed using USGG2012,GRS80,IGS08)]

dop from interpolation is 0.379
scatter (mean square distance from rover) is 25379.334
average edop for rover is 0.650
average ndop for rover is 1.100
average hdop for rover is 1.278
average vdop for rover is 2.370
average gdop for rover is 3.110

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.