

OPUS-RS solution : 018697_14_242_A0.14O OP1409698230261

opus <opus@ngs.noaa.gov>

Tue 9/2/2014 4:56 PM

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

FILE: 018697_14_242_A0.14O OP1409698230261

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: 0186242a.14o TIME: 22:56:30 UTC

SOFTWARE: rsgps 1.37 RS53.prl 1.99.2 START: 2014/08/30 00:12:00
 EPHEMERIS: igr18075.eph [rapid] STOP: 2014/08/30 01:52:30
 NAV FILE: brdc2410.14n OBS USED: 8344 / 9200 : 91%
 ANT NAME: CHCX90D-OPUS NONE QUALITY IND. 3.13/ 57.23
 ARP HEIGHT: 1.8000 NORMALIZED RMS: 0.265

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2014.66039)

X: -1308942.766(m) 0.006(m) -1308943.627(m) 0.006(m)
 Y: -4259791.299(m) 0.012(m) -4259790.048(m) 0.012(m)
 Z: 4549219.854(m) 0.015(m) 4549219.817(m) 0.015(m)

LAT: 45 46 59.18902 0.006(m) 45 46 59.21007 0.006(m)
 E LON: 252 55 8.13530 0.005(m) 252 55 8.08020 0.005(m)
 W LON: 107 4 51.86470 0.005(m) 107 4 51.91980 0.005(m)
 EL HGT: 1048.519(m) 0.019(m) 1047.835(m) 0.019(m)
 ORTHO HGT: 1063.320(m) 0.021(m) [NAVD88 (Computed using GEOID12A)]

UTM COORDINATES STATE PLANE COORDINATES

UTM (Zone 13) SPC (2500 MT)

Northing (Y) [meters] 5072055.815 173284.060
 Easting (X) [meters] 338230.122 788007.498
 Convergence [degrees] -1.49183805 1.76945488
 Point Scale 0.99992173 0.99962032
 Combined Factor 0.99975739 0.99945603

US NATIONAL GRID DESIGNATOR: 13TCL3823072055(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DI3062	BIL5 BILLINGS 5 CORS ARP	N455816.237	W1075947.298	74087.5
DM7161	WYSH SHERIDAN CORS ARP	N444801.769	W1070035.715	109366.3
DL7728	P051 BILLINGSAPMT2005 CORS ARP	N454823.741	W1083246.070	113952.7
DG9745	MTEI ENGINC CORS ARP	N454447.035	W1083600.736	118260.3
DI3425	P052 LRRNCHJRDNMT2006 CORS ARP	N472229.026	W1070107.185	177014.4
DL7758	P722 YNPBASSRCHMT2005 CORS ARP	N452725.985	W1093415.586	197564.7
DI2260	P054 TEREKALAKAMT2006 CORS ARP	N455046.833	W1042629.062	205295.3
DM7133	MTLW LEWISTOWN CORS ARP	N470314.929	W1092633.764	230064.7

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	-4223945.793	4563650.237
wysh	-1326396.425	-4335757.874	4472504.188
p051	-1416839.101	-4223178.947	4551064.082
mtei	-1422329.053	-4226311.551	4546317.415
p052	-1266648.344	-4138194.576	4670709.504
p722	-1501537.051	-4223566.609	4524171.128
p054	-1110122.549	-4310701.938	4554151.767
mtlw	-1449333.481	-4105829.828	4646773.502
0186	-1308943.627	-4259790.048	4549219.817

Covariance matrix of the stations:

1	1.3750E-07	3.4860E-07	-3.3550E-07	-5.7700E-10	-4.4970E-08	4.4240E-08	-2.0540E-09	-5.1980E-08	5.0000E-08
-2.1090E-09	-5.2180E-08	5.0220E-08	-8.4420E-10	-4.6670E-08	4.4000E-08	-3.4130E-09	-5.6770E-08	5.4560E-08	1.5040E-10
-3.7940E-08	3.7130E-08	-3.6580E-09	-5.8110E-08	5.5440E-08	1.4100E-08	-2.3630E-09	2.6740E-09	2	3.4860E-07
1.3340E-06	-1.2630E-06	-4.6890E-08	-1.6230E-07	1.7030E-07	-5.0180E-08	-1.7350E-07	1.8060E-07	-5.0180E-08	-1.7330E-07
1.8040E-07	-5.0210E-08	-1.7830E-07	1.8690E-07	-5.1420E-08	-1.7540E-07	1.8200E-07	-4.5970E-08	-1.6190E-07	1.7100E-07
-5.3580E-08	-1.8460E-07	1.9230E-07	-4.0240E-09	1.1780E-08	4.3710E-09	3	-3.3550E-07	-1.2630E-06	1.3200E-06
4.2320E-08	1.6140E-07	-1.5060E-07	4.8310E-08	1.8000E-07	-1.6920E-07	4.8220E-08	1.7940E-07	-1.6850E-07	5.0360E-08
1.9610E-07	-1.8900E-07	4.9360E-08	1.7960E-07	-1.6790E-07	4.1490E-08	1.6560E-07	-1.5650E-07	5.5370E-08	2.0150E-07
-1.9330E-07	2.6890E-09	9.6160E-10	1.5510E-08	4	-5.7700E-10	-4.6890E-08	4.2320E-08	1.2760E-07	3.1210E-07
-3.0380E-07	-5.5170E-09	-5.0090E-08	4.3800E-08	-5.8740E-09	-4.9890E-08	4.2850E-08	6.4870E-09	-4.8530E-08	6.2650E-08
-1.4130E-08	-5.2940E-08	4.2970E-08	3.3180E-08	9.1250E-10	-8.6610E-09	-1.6280E-08	-6.4560E-08	7.7720E-08	2.6770E-08
2.0390E-08	-2.5580E-08	5	-4.4970E-08	-1.6230E-07	1.6140E-07	3.1210E-07	1.2390E-06	-1.1500E-06	-5.2920E-08
-1.6510E-07	1.6110E-07	-5.3420E-08	-1.6420E-07	1.5900E-07	-3.5030E-08	-1.7630E-07	2.0900E-07	-6.6360E-08	-1.6440E-07
1.5400E-07	1.2390E-08	-8.9820E-08	8.3570E-08	-7.2070E-08	-1.9190E-07	2.2200E-07	1.9210E-08	5.0800E-08	-4.7320E-08

6 4.4240E-08 1.7030E-07 -1.5060E-07 -3.0380E-07 -1.1500E-06 1.2140E-06 5.7870E-08 1.7290E-07 -1.4800E-07
5.8680E-08 1.7120E-07 -1.4380E-07 2.7720E-08 2.0000E-07 -2.4160E-07 8.0610E-08 1.6710E-07 -1.3100E-07
-5.7750E-08 4.7620E-08 -1.6450E-08 9.2360E-08 2.1990E-07 -2.5760E-07 -3.5400E-08 -6.5860E-08 9.8990E-08

7 -2.0540E-09 -5.0180E-08 4.8310E-08 -5.5170E-09 -5.2920E-08 5.7870E-08 1.4890E-07 3.6660E-07 -3.5010E-07
-1.0090E-09 -5.2650E-08 5.1580E-08 -3.8710E-09 -4.6000E-08 3.6290E-08 2.4880E-10 -5.7660E-08 5.7340E-08
-1.2150E-08 -5.1920E-08 5.2690E-08 6.0140E-10 -5.5560E-08 4.6200E-08 8.6360E-09 -1.2490E-08 1.4120E-08

8 -5.1980E-08 -1.7350E-07 1.8000E-07 -5.0090E-08 -1.6510E-07 1.7290E-07 3.6660E-07 1.3450E-06 -1.2670E-06
-5.2280E-08 -1.7420E-07 1.8050E-07 -5.3200E-08 -1.8000E-07 1.8660E-07 -5.2930E-08 -1.7570E-07 1.8160E-07
-5.0460E-08 -1.6670E-07 1.7500E-07 -5.5090E-08 -1.8460E-07 1.9030E-07 -8.5530E-09 3.1630E-09 1.2860E-08

9 5.0000E-08 1.8060E-07 -1.6920E-07 4.3800E-08 1.6110E-07 -1.4800E-07 -3.5010E-07 -1.2670E-06 1.3170E-06
5.0870E-08 1.8000E-07 -1.6790E-07 5.2370E-08 1.9800E-07 -1.9150E-07 5.2390E-08 1.7940E-07 -1.6630E-07
4.1490E-08 1.6510E-07 -1.5460E-07 5.8630E-08 2.0230E-07 -1.9450E-07 5.6660E-09 7.0560E-09 9.1060E-09

10 -2.1090E-09 -5.0180E-08 4.8220E-08 -5.8740E-09 -5.3420E-08 5.8680E-08 -1.0090E-09 -5.2280E-08 5.0870E-08
08 1.4990E-07 3.6740E-07 -3.4960E-07 -4.1050E-09 -4.5930E-08 3.5630E-08 4.9930E-10 -5.7660E-08 5.7370E-08
-1.3030E-08 -5.2870E-08 5.3650E-08 8.8390E-10 -5.5350E-08 4.5420E-08 8.2610E-09 -1.3080E-08 1.4690E-08

11 -5.2180E-08 -1.7330E-07 1.7940E-07 -4.9890E-08 -1.6420E-07 1.7120E-07 -5.2650E-08 -1.7420E-07 1.8000E-07
3.6740E-07 1.3420E-06 -1.2620E-06 -5.3220E-08 -1.8010E-07 1.8690E-07 -5.3480E-08 -1.7540E-07 1.8070E-07
-4.9610E-08 -1.6540E-07 1.7320E-07 -5.5740E-08 -1.8470E-07 1.9060E-07 -8.3620E-09 3.9750E-09 1.1520E-08

12 5.0220E-08 1.8040E-07 -1.6850E-07 4.2850E-08 1.5900E-07 -1.4380E-07 5.1580E-08 1.8050E-07 -1.6790E-07
-3.4960E-07 -1.2620E-06 1.3100E-06 5.1980E-08 1.9840E-07 -1.9330E-07 5.3700E-08 1.7900E-07 -1.6490E-07
3.8580E-08 1.6160E-07 -1.5010E-07 6.0150E-08 2.0290E-07 -1.9650E-07 4.6930E-09 4.7820E-09 1.2160E-08

13 -8.4420E-10 -5.0210E-08 5.0360E-08 6.4870E-09 -3.5030E-08 2.7720E-08 -3.8710E-09 -5.3200E-08 5.2370E-08
-4.1050E-09 -5.3220E-08 5.1980E-08 1.2820E-07 3.3090E-07 -3.2710E-07 -9.3080E-09 -5.7200E-08 5.4220E-08
1.8450E-08 -1.8540E-08 1.7440E-08 -1.0240E-08 -6.3080E-08 7.2640E-08 2.1160E-08 7.9470E-09 -7.0440E-09

14 -4.6670E-08 -1.7830E-07 1.9610E-07 -4.8530E-08 -1.7630E-07 2.0000E-07 -4.6000E-08 -1.8000E-07 1.9800E-07
-4.5930E-08 -1.8010E-07 1.9840E-07 3.3090E-07 1.3900E-06 -1.3930E-06 -4.5120E-08 -1.8410E-07 2.0260E-07
-5.4090E-08 -1.7850E-07 1.9940E-07 -4.5690E-08 -1.8670E-07 1.9830E-07 -6.6070E-09 -6.8650E-09 3.5080E-08

15 4.4000E-08 1.8690E-07 -1.8900E-07 6.2650E-08 2.0900E-07 -2.4160E-07 3.6290E-08 1.8660E-07 -1.9150E-07
3.5630E-08 1.8690E-07 -1.9330E-07 -3.2710E-07 -1.3930E-06 1.5560E-06 2.3420E-08 1.9170E-07 -2.0260E-07
1.0130E-07 2.4170E-07 -2.5360E-07 2.5000E-08 1.9110E-07 -1.5870E-07 2.4790E-08 5.7320E-08 -6.0940E-08

16 -3.4130E-09 -5.1420E-08 4.9360E-08 -1.4130E-08 -6.6360E-08 8.0610E-08 2.4880E-10 -5.2930E-08 5.2390E-08
4.9930E-10 -5.3480E-08 5.3700E-08 -9.3080E-09 -4.5120E-08 2.3420E-08 1.7710E-07 3.9560E-07 -3.6830E-07
-3.3080E-08 -7.5600E-08 7.8780E-08 7.4010E-09 -5.1310E-08 3.0530E-08 -2.3710E-10 -2.7330E-08 3.0590E-08

17 -5.6770E-08 -1.7540E-07 1.7960E-07 -5.2940E-08 -1.6440E-07 1.6710E-07 -5.7660E-08 -1.7570E-07 1.7940E-07
-5.7660E-08 -1.7540E-07 1.7900E-07 -5.7200E-08 -1.8410E-07 1.9170E-07 3.9560E-07 1.3520E-06 -1.2600E-06
-5.0150E-08 -1.6530E-07 1.7040E-07 -6.1760E-08 -1.8630E-07 1.9280E-07 -1.1390E-08 4.1050E-09 8.9740E-09

18 5.4560E-08 1.8200E-07 -1.6790E-07 4.2970E-08 1.5400E-07 -1.3100E-07 5.7340E-08 1.8160E-07 -1.6630E-07
5.7370E-08 1.8070E-07 -1.6490E-07 5.4220E-08 2.0260E-07 -2.0260E-07 -3.6830E-07 -1.2600E-06 1.2990E-06
3.1600E-08 1.5260E-07 -1.3750E-07 6.8950E-08 2.0600E-07 -2.0410E-07 4.7140E-09 -8.5180E-10 2.1040E-08

19 1.5040E-10 -4.5970E-08 4.1490E-08 3.3180E-08 1.2390E-08 -5.7750E-08 -1.2150E-08 -5.0460E-08 4.1490E-08
-1.3030E-08 -4.9610E-08 3.8580E-08 1.8450E-08 -5.4090E-08 1.0130E-07 -3.3080E-08 -5.0150E-08 3.1600E-08
1.6910E-07 3.1660E-07 -3.1990E-07 -3.8000E-08 -7.7700E-08 1.2230E-07 4.8350E-08 5.8710E-08 -6.8940E-08

20 -3.7940E-08 -1.6190E-07 1.6560E-07 9.1250E-10 -8.9820E-08 4.7620E-08 -5.1920E-08 -1.6670E-07 1.6510E-07
-5.2870E-08 -1.6540E-07 1.6160E-07 -1.8540E-08 -1.7850E-07 2.4170E-07 -7.5600E-08 -1.6530E-07 1.5260E-07
3.1660E-07 1.2570E-06 -1.1980E-06 -8.3040E-08 -2.0410E-07 2.6340E-07 4.2470E-08 8.0130E-08 -7.6080E-08

21 3.7130E-08 1.7100E-07 -1.5650E-07 -8.6610E-09 8.3570E-08 -1.6450E-08 5.2690E-08 1.7500E-07 -1.5460E-07
5.3650E-08 1.7320E-07 -1.5010E-07 1.7440E-08 1.9940E-07 -2.5360E-07 7.8780E-08 1.7040E-07 -1.3750E-07
-3.1990E-07 -1.1980E-06 1.2700E-06 9.0670E-08 2.2530E-07 -2.7520E-07 -4.7080E-08 -7.3420E-08 1.0250E-07

22 -3.6580E-09 -5.3580E-08 5.5370E-08 -1.6280E-08 -7.2070E-08 9.2360E-08 6.0140E-10 -5.5090E-08 5.8630E-08
08 8.8390E-10 -5.5740E-08 6.0150E-08 -1.0240E-08 -4.5690E-08 2.5000E-08 7.4010E-09 -6.1760E-08 6.8950E-08
-3.8000E-08 -8.3040E-08 9.0670E-08 1.8450E-07 4.2660E-07 -4.5080E-07 -2.1680E-09 -3.2300E-08 3.9860E-08

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23 -5.8110E-08 -1.8460E-07 2.0150E-07 -6.4560E-08 -1.9190E-07 2.1990E-07 -5.5560E-08 -1.8460E-07 2.0230E-07
-5.5350E-08 -1.8470E-07 2.0290E-07 -6.3080E-08 -1.8670E-07 1.9110E-07 -5.1310E-08 -1.8630E-07 2.0600E-07
-7.7700E-08 -2.0410E-07 2.2530E-07 4.2660E-07 1.4480E-06 -1.4490E-06 -2.2500E-08 -2.2040E-08 5.0300E-08
24 5.5440E-08 1.9230E-07 -1.9330E-07 7.7720E-08 2.2200E-07 -2.5760E-07 4.6200E-08 1.9030E-07 -1.9450E-07
4.5420E-08 1.9060E-07 -1.9650E-07 7.2640E-08 1.9830E-07 -1.5870E-07 3.0530E-08 1.9280E-07 -2.0410E-07
1.2230E-07 2.6340E-07 -2.7520E-07 -4.5080E-07 -1.4490E-06 1.6050E-06 3.9730E-08 6.9980E-08 -7.3200E-08
25 1.4100E-08 -4.0240E-09 2.6890E-09 2.6770E-08 1.9210E-08 -3.5400E-08 8.6360E-09 -8.5530E-09 5.6660E-09
8.2610E-09 -8.3620E-09 4.6930E-09 2.1160E-08 -6.6070E-09 2.4790E-08 -2.3710E-10 -1.1390E-08 4.7140E-09
4.8350E-08 4.2470E-08 -4.7080E-08 -2.1680E-09 -2.2500E-08 3.9730E-08 1.2800E-06 3.7890E-06 -3.6170E-06
26 -2.3630E-09 1.1780E-08 9.6160E-10 2.0390E-08 5.0800E-08 -6.5860E-08 -1.2490E-08 3.1630E-09 7.0560E-09
-1.3080E-08 3.9750E-09 4.7820E-09 7.9470E-09 -6.8650E-09 5.7320E-08 -2.7330E-08 4.1050E-09 -8.5180E-10
5.8710E-08 8.0130E-08 -7.3420E-08 -3.2300E-08 -2.2040E-08 6.9980E-08 3.7890E-06 1.5240E-05 -1.4470E-05
27 2.6740E-09 4.3710E-09 1.5510E-08 -2.5580E-08 -4.7320E-08 9.8990E-08 1.4120E-08 1.2860E-08 9.1060E-09
1.4690E-08 1.1520E-08 1.2160E-08 -7.0440E-09 3.5080E-08 -6.0940E-08 3.0590E-08 8.9740E-09 2.1040E-08
-6.8940E-08 -7.6080E-08 1.0250E-07 3.9860E-08 5.0300E-08 -7.3200E-08 -3.6170E-06 -1.4470E-05 1.4780E-05

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

```

0.0000012800  0.0000037890  -0.0000036170
0.0000037890  0.0000152400  -0.0000144700
-0.0000036170 -0.0000144700  0.0000147800

```

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

```

0.0000003567  -0.0000000055  0.0000011152
-0.0000000055  0.0000005949  -0.0000009986
0.0000011152  -0.0000009986  0.0000303483

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Horizontal network accuracy = 0.00170 meters.

Vertical network accuracy = 0.01080 meters.

		Vectors		
To	From	X	Y	Z
bil5	0186	-63213.266	35844.255	14430.420
wysh	0186	-17452.797	-75967.826	-76715.629
p051	0186	-107895.474	36611.101	1844.265
mtei	0186	-113385.426	33478.497	-2902.402
p052	0186	42295.283	121595.472	121489.687
p722	0186	-192593.424	36223.439	-25048.689
p054	0186	198821.079	-50911.891	4931.950
mtlw	0186	-140389.853	153960.220	97553.685

Covariance matrix of the 8 vectors

```

1 1.3893E-06 4.1440E-06 -3.9579E-06 1.2386E-06 3.7272E-06 -3.5400E-06 1.2552E-06 3.7479E-06 -3.5753E-06
1.2555E-06 3.7475E-06 -3.5741E-06 1.2439E-06 3.7513E-06 -3.6005E-06 1.2627E-06 3.7460E-06 -3.5698E-06
1.2177E-06 3.7110E-06 -3.5355E-06 1.2644E-06 3.7558E-06 -3.6040E-06
2 4.1440E-06 1.6550E-05 -1.5738E-05 3.7257E-06 1.5015E-05 -1.4238E-05 3.7553E-06 1.5052E-05 -1.4301E-05
3.7559E-06 1.5051E-05 -1.4299E-05 3.7349E-06 1.5057E-05 -1.4345E-05 3.7689E-06 1.5049E-05 -1.4292E-05
3.6883E-06 1.4986E-05 -1.4230E-05 3.7717E-06 1.5066E-05 -1.4352E-05
3 -3.9579E-06 -1.5738E-05 1.6069E-05 -3.5518E-06 -1.4262E-05 1.4515E-05 -3.5855E-06 -1.4304E-05 1.4586E-05
-3.5862E-06 -1.4303E-05 1.4584E-05 -3.5623E-06 -1.4310E-05 1.4636E-05 -3.6009E-06 -1.4300E-05 1.4576E-05
-3.5093E-06 -1.4229E-05 1.4505E-05 -3.6042E-06 -1.4320E-05 1.4644E-05

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4 1.2386E-06 3.7257E-06 -3.5518E-06 1.3541E-06 4.0615E-06 -3.8598E-06 1.2391E-06 3.7271E-06 -3.5533E-06
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17 3.7460E-06 1.5049E-05 -1.4300E-05 3.7271E-06 1.5021E-05 -1.4246E-05 3.7552E-06 1.5057E-05 -1.4307E-05
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1.3524E-06 4.0044E-06 -3.8209E-06 1.1958E-06 3.6751E-06 -3.4655E-06

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-3.6260E-06 -1.4361E-05 1.4645E-05 -3.5770E-06 -1.4377E-05 1.4755E-05 -3.6568E-06 -1.4356E-05 1.4628E-05
-3.4655E-06 -1.4201E-05 1.4476E-05 -4.1474E-06 -1.6039E-05 1.6531E-05

Correlation matrix of the 8 vectors

1 1.0000E+00 8.6420E-01 -8.3766E-01 9.0302E-01 7.8138E-01 -7.5568E-01 8.9631E-01 7.8094E-01 -7.5647E-01
8.9598E-01 7.8097E-01 -7.5653E-01 9.0298E-01 7.8011E-01 -7.5296E-01 8.8735E-01 7.8042E-01 -7.5629E-01
8.8836E-01 7.7894E-01 -7.5353E-01 8.8512E-01 7.7898E-01 -7.5202E-01
2 8.6420E-01 1.0000E+00 -9.6507E-01 7.8703E-01 9.1201E-01 -8.8060E-01 7.7693E-01 9.0866E-01 -8.7666E-01
7.7657E-01 9.0875E-01 -8.7689E-01 7.8553E-01 9.0720E-01 -8.6917E-01 7.6736E-01 9.0835E-01 -8.7723E-01
7.7960E-01 9.1139E-01 -8.7872E-01 7.6498E-01 9.0533E-01 -8.6767E-01
3 -8.3766E-01 -9.6507E-01 1.0000E+00 -7.6144E-01 -8.7917E-01 9.1106E-01 -7.5283E-01 -8.7636E-01 9.0745E-01
-7.5250E-01 -8.7644E-01 9.0767E-01 -7.6038E-01 -8.7502E-01 9.0002E-01 -7.4405E-01 -8.7601E-01 9.0797E-01
-7.5278E-01 -8.7823E-01 9.0906E-01 -7.4187E-01 -8.7331E-01 8.9851E-01
4 9.0302E-01 7.8703E-01 -7.6144E-01 1.0000E+00 8.6247E-01 -8.3459E-01 8.9623E-01 7.8664E-01 -7.6153E-01
8.9569E-01 7.8675E-01 -7.6183E-01 9.1073E-01 7.8502E-01 -7.5276E-01 8.8218E-01 7.8651E-01 -7.6249E-01 9.1489E-01
7.9244E-01 -7.6706E-01 8.7863E-01 7.8291E-01 -7.5106E-01
5 7.8138E-01 9.1201E-01 -8.7917E-01 8.6247E-01 1.0000E+00 -9.6411E-01 7.7562E-01 9.1159E-01 -8.7929E-01
7.7516E-01 9.1172E-01 -8.7964E-01 7.8797E-01 9.0974E-01 -8.6925E-01 7.6359E-01 9.1143E-01 -8.8039E-01 7.9118E-01
9.1821E-01 -8.8557E-01 7.6050E-01 9.0731E-01 -8.6729E-01
6 -7.5568E-01 -8.8060E-01 9.1106E-01 -8.3459E-01 -9.6411E-01 1.0000E+00 -7.4921E-01 -8.8021E-01 9.1135E-01
-7.4870E-01 -8.8035E-01 9.1179E-01 -7.6359E-01 -8.7819E-01 8.9933E-01 -7.3600E-01 -8.8019E-01 9.1285E-01
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8.9352E-01 7.7677E-01 -7.5264E-01 8.9757E-01 7.7615E-01 -7.5096E-01 8.8667E-01 7.7613E-01 -7.5211E-01 8.7636E-01
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8 7.8094E-01 9.0866E-01 -8.7636E-01 7.8664E-01 9.1159E-01 -8.8021E-01 8.6336E-01 1.0000E+00 -9.6509E-01
7.7641E-01 9.0844E-01 -8.7665E-01 7.8519E-01 9.0684E-01 -8.6896E-01 7.6732E-01 9.0808E-01 -8.7703E-01
7.7895E-01 9.1084E-01 -8.7825E-01 7.6494E-01 9.0508E-01 -8.6756E-01
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-7.5234E-01 -8.7651E-01 9.0783E-01 -7.6035E-01 -8.7501E-01 8.9999E-01 -7.4382E-01 -8.7613E-01 9.0819E-01
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7.7920E-01 9.1100E-01 -8.7840E-01 7.6488E-01 9.0515E-01 -8.6759E-01
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-8.3648E-01 -9.6509E-01 1.0000E+00 -7.6054E-01 -8.7520E-01 9.0006E-01 -7.4365E-01 -8.7637E-01 9.0846E-01
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 7.7625E-01 9.0896E-01 -8.7640E-01 7.6495E-01 9.0378E-01 -8.6672E-01
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 18 -7.5629E-01 -8.7723E-01 9.0797E-01 -7.6249E-01 -8.8039E-01 9.1285E-01 -7.5211E-01 -8.7703E-01 9.0819E-01
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 7.7257E-01 9.0592E-01 -8.7343E-01 8.6140E-01 1.0000E+00 -9.6440E-01
 24 -7.5202E-01 -8.6767E-01 8.9851E-01 -7.5106E-01 -8.6729E-01 8.9709E-01 -7.5033E-01 -8.6756E-01 8.9855E-01
 -7.5014E-01 -8.6759E-01 8.9861E-01 -7.5277E-01 -8.6672E-01 8.9456E-01 -7.4495E-01 -8.6704E-01 8.9840E-01
 -7.3292E-01 -8.6410E-01 8.9440E-01 -8.4165E-01 -9.6440E-01 1.0000E+00

G-FILE for the vectors

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 C00090006 -1925934237 12 362234392 40 -250486894 40
 C00090007 1988210786 11 -509118905 40 49319497 39
 C00090008 -1403898533 12 1539602196 40 975536846 40
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D 1 12 -7565277 1 13 9029832 1 14 7801146 1 15 -7529627 1 16 8873503
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D 18 24 8984034 19 20 8519308 19 21 -8254004 19 22 8484492 19 23 7725746
 D 19 24 -7329211 20 21 -9645415 20 22 7544629 20 23 9059216 20 24 -8641042
 D 21 22 -7294576 21 23 -8734272 21 24 8944017 22 23 8614041 22 24 -8416536
 D 23 24 -9643953

ITRF position of 0186 as determined by individual baselines

	X	Y	Z
bil5	-1308943.619	-4259790.037	4549219.805
wysh	-1308943.635	-4259790.065	4549219.846
p051	-1308943.630	-4259790.051	4549219.819
mtei	-1308943.626	-4259790.061	4549219.812
p052	-1308943.625	-4259790.056	4549219.820
p722	-1308943.635	-4259790.060	4549219.836
p054	-1308943.624	-4259790.062	4549219.830
mtlw	-1308943.628	-4259790.052	4549219.829

Residuals of position determined by individual baselines from the final position

	X	Y	Z	East	North	Up
bil5	0.009	0.010	-0.012	0.005	0.000	-0.018
wysh	-0.008	-0.018	0.028	-0.002	0.006	0.034
p051	-0.003	-0.003	0.002	-0.002	-0.001	0.004
mtei	0.001	-0.013	-0.005	0.005	-0.012	0.005
p052	0.002	-0.009	0.003	0.005	-0.003	0.007
p722	-0.008	-0.012	0.019	-0.004	0.003	0.023
p054	0.003	-0.014	0.013	0.007	0.000	0.018
mtlw	-0.001	-0.004	0.012	0.001	0.005	0.012

STATE PLANE COORDINATES - International Foot
 SPC (2500 MT)

Northing (Y) [feet]	568517.257
Easting (X) [feet]	2585326.437
Convergence [degrees]	1.76945488
Point Scale	0.99962032
Combined Factor	0.99945603

** 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: 1062.453 (m) [PROTOTYPE (Computed using USGG2012,GRS80,IGS08)]

dop from interpolation is 0.403
 scatter (mean square distance from rover) is 26226.495

average edop for rover is 0.670
average ndop for rover is 1.010
average hdop for rover is 1.212
average vdop for rover is 2.340
average gdop for rover is 3.060

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.