

OPUS-RS solution : 018697_14_239_A2.14O OP1409695701528

opus <opus@ngs.noaa.gov>

Tue 9/2/2014 4:15 PM

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

FILE: 018697_14_239_A2.14O OP1409695701528

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
RINEX FILE: 0186239v.14oDATE: September 02, 2014
TIME: 22:15:31 UTCSOFTWARE: rsgps 1.37 RS94.prl 1.99.2 START: 2014/08/27 21:54:00
EPHEMERIS: igr18073.eph [rapid] STOP: 2014/08/27 22:56:30
NAV FILE: brdc2390.14n OBS USED: 5456 / 5456 : 100%
ANT NAME: CHCX90D-OPUS NONE QUALITY IND. 35.19/ 32.62
ARP HEIGHT: 1.8000 NORMALIZED RMS: 0.275

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2014.65461)

X: -1311001.225(m) 0.009(m) -1311002.086(m) 0.009(m)
Y: -4266505.477(m) 0.029(m) -4266504.226(m) 0.029(m)
Z: 4542449.240(m) 0.031(m) 4542449.202(m) 0.031(m)LAT: 45 41 43.28701 0.006(m) 45 41 43.30801 0.006(m)
E LON: 252 55 8.34135 0.004(m) 252 55 8.28633 0.004(m)
W LON: 107 4 51.65865 0.004(m) 107 4 51.71367 0.004(m)
EL HGT: 1100.877(m) 0.043(m) 1100.191(m) 0.043(m)
ORTHO HGT: 1115.591(m) 0.044(m) [NAVD88 (Computed using GEOID12A)]

UTM COORDINATES STATE PLANE COORDINATES

UTM (Zone 13) SPC (2500 MT)

Northing (Y) [meters] 5062306.615 163539.244
Easting (X) [meters] 337980.868 788313.000
Convergence [degrees] -1.48957315 1.76949675
Point Scale 0.99992273 0.99965385
Combined Factor 0.99975018 0.99948135

US NATIONAL GRID DESIGNATOR: 13TCL3798062306(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DI3062	BIL5 BILLINGS 5 CORS ARP	N455816.237	W1075947.298	77463.6
DM7161	WYSH SHERIDAN CORS ARP	N444801.769	W1070035.715	99626.1
DL7728	P051 BILLINGSAPMT2005 CORS ARP	N454823.741	W1083246.070	114685.5
DI3425	P052 LRRNCHJRDNMT2006 CORS ARP	N472229.026	W1070107.185	186765.4
DJ8992	P033 TENSLEEPTRWY2005 CORS ARP	N435710.415	W1072315.121	195178.7
DL7758	P722 YNPBASSRCHMT2005 CORS ARP	N452725.985	W1093415.586	196166.5
DI2260	P054 TEREKALAKAMT2006 CORS ARP	N455046.833	W1042629.062	206016.9
DM7133	MTLW LEWISTOWN CORS ARP	N470314.929	W1092633.764	236295.2

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	-1372156.888	-4223945.773	4563650.212
wysh	-1326396.428	-4335757.894	4472504.207
p051	-1416839.102	-4223178.939	4551064.069
p052	-1266648.336	-4138194.559	4670709.489
p033	-1374663.820	-4389900.542	4405280.419
p722	-1501537.061	-4223566.622	4524171.144
p054	-1110122.545	-4310701.938	4554151.780
mtlw	-1449333.480	-4105829.822	4646773.502
0186	-1311002.086	-4266504.226	4542449.202

Covariance matrix of the stations:

1	4.2330E-07	1.0620E-06	-1.1730E-06	-4.1870E-08	-1.4840E-07	1.6570E-07	-4.3050E-08	-1.5560E-07	1.7140E-07
	-4.2960E-08	-1.5200E-07	1.6590E-07	-4.2010E-08	-1.4970E-07	1.6790E-07	-4.3490E-08	-1.5880E-07	1.7480E-07
	-4.0850E-08	-1.3680E-07	1.5280E-07	-4.4050E-08	-1.6030E-07	1.7480E-07	1.1960E-08	-3.8850E-09	5.9720E-09
2	1.0620E-06	3.1520E-06	-3.3750E-06	-1.5220E-07	-4.4080E-07	4.7500E-07	-1.4980E-07	-4.0500E-07	4.5370E-07
	-1.6200E-07	-4.7370E-07	5.5420E-07	-1.4490E-07	-4.1040E-07	4.3220E-07	-1.4130E-07	-3.6470E-07	4.0670E-07
	-1.6120E-07	-5.3980E-07	5.9410E-07	-1.5020E-07	-3.9250E-07	4.5910E-07	1.0260E-08	6.0080E-08	-4.5440E-08
3	-1.1730E-06	-3.3750E-06	3.7920E-06	1.6290E-07	4.7170E-07	-5.0120E-07	1.6460E-07	4.5910E-07	-4.9870E-07
	1.8650E-07	5.4500E-07	-6.1240E-07	1.5290E-07	4.3680E-07	-4.5780E-07	1.5510E-07	4.2280E-07	-4.5680E-07
	1.8000E-07	5.7160E-07	-6.1790E-07	1.7120E-07	4.6840E-07	-5.2250E-07	-4.5240E-09	-3.2060E-08	4.8520E-08
4	-4.1870E-08	-1.5220E-07	1.6290E-07	4.0670E-07	1.0520E-06	-1.1260E-06	-4.1860E-08	-1.4730E-07	1.5670E-07
	-4.2350E-08	-1.6400E-07	1.8640E-07	-3.6420E-08	-1.4020E-07	1.3700E-07	-4.0840E-08	-1.3620E-07	1.4290E-07
	-3.3730E-08	-1.6370E-07	1.7290E-07	-4.4520E-08	-1.4820E-07	1.6680E-07	1.7930E-08	2.2390E-09	-8.1620E-09
5	-1.4840E-07	-4.4080E-07	4.7170E-07	1.0520E-06	3.2480E-06	-3.3440E-06	-1.4580E-07	-4.3670E-07	4.6720E-07
	-1.5820E-07	-4.6450E-07	4.9510E-07	-1.4650E-07	-4.3140E-07	4.6790E-07	-1.4090E-07	-4.2900E-07	4.5920E-07
	-1.6670E-07	-4.7910E-07	5.1600E-07	-1.4550E-07	-4.4110E-07	4.6750E-07	-1.9390E-08	-3.8280E-08	4.5010E-08

6 1.6570E-07 4.7500E-07 -5.0120E-07 -1.1260E-06 -3.3440E-06 3.6510E-06 1.6040E-07 4.3810E-07 -4.5730E-07
1.8370E-07 5.7620E-07 -6.6150E-07 1.3680E-07 4.1090E-07 -3.7270E-07 1.4720E-07 3.6550E-07 -3.7130E-07
1.5990E-07 6.3800E-07 -6.6310E-07 1.7160E-07 4.3910E-07 -4.9970E-07 -1.8070E-08 -3.4190E-08 7.2810E-08
7 -4.3050E-08 -1.4980E-07 1.6460E-07 -4.1860E-08 -1.4580E-07 1.6040E-07 4.2360E-07 1.0380E-06 -1.1420E-06
-4.3730E-08 -1.5200E-07 1.6780E-07 -4.1480E-08 -1.4460E-07 1.5890E-07 -4.3170E-08 -1.5020E-07 1.6460E-07
-4.0830E-08 -1.4150E-07 1.5650E-07 -4.4460E-08 -1.5400E-07 1.6940E-07 8.3510E-09 -1.1770E-08 1.3660E-08
8 -1.5560E-07 -4.0500E-07 4.5910E-07 -1.4730E-07 -4.3670E-07 4.3810E-07 1.0380E-06 3.0600E-06 -3.2620E-06
-1.6490E-07 -4.9840E-07 6.2590E-07 -1.3300E-07 -3.6880E-07 3.3590E-07 -1.3610E-07 -2.6770E-07 2.9620E-07
-1.4590E-07 -6.3010E-07 6.8030E-07 -1.5450E-07 -3.2810E-07 4.2620E-07 2.6580E-08 9.5020E-08 -8.9910E-08
9 1.7140E-07 4.5370E-07 -4.9870E-07 1.5670E-07 4.6720E-07 -4.5730E-07 -1.1420E-06 -3.2620E-06 3.6530E-06
1.8960E-07 5.7500E-07 -6.9930E-07 1.3840E-07 3.8720E-07 -3.4230E-07 1.4870E-07 3.0670E-07 -3.2450E-07
1.6090E-07 6.8020E-07 -7.2170E-07 1.7620E-07 3.9150E-07 -4.8380E-07 -2.6010E-08 -7.9020E-08 1.0560E-07
10 -4.2960E-08 -1.6200E-07 1.8650E-07 -4.2350E-08 -1.5820E-07 1.8370E-07 -4.3730E-08 -1.6490E-07 1.8960E-07
4.2440E-07 1.1220E-06 -1.2960E-06 -4.3090E-08 -1.6080E-07 1.8690E-07 -4.4800E-08 -1.6900E-07 1.9380E-07
-3.8490E-08 -1.3950E-07 1.6390E-07 -4.4200E-08 -1.6770E-07 1.9150E-07 8.5630E-09 -2.2140E-08 3.3850E-08
11 -1.5200E-07 -4.7370E-07 5.4500E-07 -1.6400E-07 -4.6450E-07 5.7620E-07 -1.5200E-07 -4.9840E-07 5.7500E-07
1.1220E-06 3.5110E-06 -3.9870E-06 -1.6990E-07 -5.0150E-07 6.3800E-07 -1.5430E-07 -5.4710E-07 6.3410E-07
-1.8620E-07 -3.8860E-07 4.7140E-07 -1.4420E-07 -5.1210E-07 5.4690E-07 -5.4780E-08 -1.2760E-07 1.8970E-07
12 1.6590E-07 5.5420E-07 -6.1240E-07 1.8640E-07 4.9510E-07 -6.6150E-07 1.6780E-07 6.2590E-07 -6.9930E-07
-1.2960E-06 -3.9870E-06 4.7980E-06 2.0180E-07 5.9450E-07 -8.2920E-07 1.7870E-07 7.6840E-07 -8.7190E-07
2.3780E-07 2.5740E-07 -3.3990E-07 1.5900E-07 6.9350E-07 -6.5840E-07 1.1950E-07 2.9780E-07 -3.5480E-07
13 -4.2010E-08 -1.4490E-07 1.5290E-07 -3.6420E-08 -1.4650E-07 1.3680E-07 -4.1480E-08 -1.3300E-07 1.3840E-07
-4.3090E-08 -1.6990E-07 2.0180E-07 4.0200E-07 1.0190E-06 -1.0830E-06 -3.8820E-08 -1.0820E-07 1.0810E-07
-2.9470E-08 -1.8630E-07 1.9140E-07 -4.5400E-08 -1.2990E-07 1.5370E-07 2.5740E-08 2.3500E-08 -3.5920E-08
14 -1.4970E-07 -4.1040E-07 4.3680E-07 -1.4020E-07 -4.3140E-07 4.1090E-07 -1.4460E-07 -3.6880E-07 3.8720E-07
-1.6080E-07 -5.0150E-07 5.9450E-07 1.0190E-06 3.0810E-06 -3.1650E-06 -1.3130E-07 -2.8690E-07 2.8990E-07
-1.4140E-07 -6.0840E-07 6.3220E-07 -1.5060E-07 -3.4850E-07 4.1440E-07 2.5510E-08 7.5640E-08 -9.5010E-08
15 1.6790E-07 4.3220E-07 -4.5780E-07 1.3700E-07 4.6790E-07 -3.7270E-07 1.5890E-07 3.3590E-07 -3.4230E-07
1.8690E-07 6.3800E-07 -8.2920E-07 -1.0830E-06 -3.1650E-06 3.5240E-06 1.3280E-07 1.4530E-07 -1.1430E-07
1.1840E-07 8.4720E-07 -8.5760E-07 1.7970E-07 2.9610E-07 -4.2650E-07 -9.1200E-08 -2.1510E-07 2.8940E-07
16 -4.3490E-08 -1.4130E-07 1.5510E-07 -4.0840E-08 -1.4090E-07 1.4720E-07 -4.3170E-08 -1.3610E-07 1.4870E-07
-4.4800E-08 -1.5430E-07 1.7870E-07 -3.8820E-08 -1.3130E-07 1.3280E-07 4.1980E-07 9.9820E-07 -1.0900E-06
-3.8360E-08 -1.5870E-07 1.7160E-07 -4.5260E-08 -1.3600E-07 1.5670E-07 1.3760E-08 6.4220E-09 -8.4590E-09
17 -1.5880E-07 -3.6470E-07 4.2280E-07 -1.3620E-07 -4.2900E-07 3.6550E-07 -1.5020E-07 -2.6770E-07 3.0670E-07
-1.6900E-07 -5.4710E-07 7.6840E-07 -1.0820E-07 -2.8690E-07 1.4530E-07 9.9820E-07 3.0300E-06 -3.2210E-06
-1.1310E-07 -8.0800E-07 8.5010E-07 -1.6200E-07 -2.0080E-07 3.6220E-07 8.6760E-08 2.5050E-07 -2.7110E-07
18 1.7480E-07 4.0670E-07 -4.5680E-07 1.4290E-07 4.5920E-07 -3.7130E-07 1.6460E-07 2.9620E-07 -3.2450E-07
1.9380E-07 6.3410E-07 -8.7190E-07 1.0810E-07 2.8990E-07 -1.1430E-07 -1.0900E-06 -3.2210E-06 3.5990E-06
1.2060E-07 8.9410E-07 -9.2620E-07 1.8490E-07 2.4000E-07 -4.0900E-07 -9.9140E-08 -2.6560E-07 3.2290E-07
19 -4.0850E-08 -1.6120E-07 1.8000E-07 -3.3730E-08 -1.6670E-07 1.5990E-07 -4.0830E-08 -1.4590E-07 1.6090E-07
-3.8490E-08 -1.8620E-07 2.3780E-07 -2.9470E-08 -1.4140E-07 1.1840E-07 -3.8360E-08 -1.1310E-07 1.2060E-07
3.9170E-07 1.0520E-06 -1.1570E-06 -4.5030E-08 -1.3700E-07 1.7850E-07 3.6650E-08 2.7880E-08 -3.3670E-08
20 -1.3680E-07 -5.3980E-07 5.7160E-07 -1.6370E-07 -4.7910E-07 6.3800E-07 -1.4150E-07 -6.3010E-07 6.8020E-07
-1.3950E-07 -3.8860E-07 2.5740E-07 -1.8630E-07 -6.0840E-07 8.4720E-07 -1.5870E-07 -8.0800E-07 8.9410E-07
1.0520E-06 4.2760E-06 -4.5080E-06 -1.2700E-07 -6.9810E-07 6.1960E-07 -1.2080E-07 -3.4230E-07 4.0290E-07
21 1.5280E-07 5.9410E-07 -6.1790E-07 1.7290E-07 5.1600E-07 -6.6310E-07 1.5650E-07 6.8030E-07 -7.2170E-07
1.6390E-07 4.7140E-07 -3.3990E-07 1.9140E-07 6.3220E-07 -8.5760E-07 1.7160E-07 8.5010E-07 -9.2620E-07
-1.1570E-06 -4.5080E-06 4.9350E-06 1.4910E-07 7.6540E-07 -6.8360E-07 1.1930E-07 3.5900E-07 -3.8810E-07
22 -4.4050E-08 -1.5020E-07 1.7120E-07 -4.4520E-08 -1.4550E-07 1.7160E-07 -4.4460E-08 -1.5450E-07 1.7620E-07
-4.4200E-08 -1.4420E-07 1.5900E-07 -4.5400E-08 -1.5060E-07 1.7970E-07 -4.5260E-08 -1.6200E-07 1.8490E-07
-4.5030E-08 -1.2700E-07 1.4910E-07 4.3780E-07 1.0340E-06 -1.1910E-06 2.1390E-09 -2.2160E-08 3.2480E-08

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23 -1.6030E-07 -3.9250E-07 4.6840E-07 -1.4820E-07 -4.4110E-07 4.3910E-07 -1.5400E-07 -3.2810E-07 3.9150E-07
-1.6770E-07 -5.1210E-07 6.9350E-07 -1.2990E-07 -3.4850E-07 2.9610E-07 -1.3600E-07 -2.0080E-07 2.4000E-07
-1.3700E-07 -6.9810E-07 7.6540E-07 1.0340E-06 3.0460E-06 -3.2950E-06 4.6170E-08 1.5240E-07 -1.3690E-07
24 1.7480E-07 4.5910E-07 -5.2250E-07 1.6680E-07 4.6750E-07 -4.9970E-07 1.6940E-07 4.2620E-07 -4.8380E-07
1.9150E-07 5.4690E-07 -6.5840E-07 1.5370E-07 4.1440E-07 -4.2650E-07 1.5670E-07 3.6220E-07 -4.0900E-07
1.7850E-07 6.1960E-07 -6.8360E-07 -1.1910E-06 -3.2950E-06 3.8090E-06 -2.6590E-11 -3.1000E-08 2.8990E-08
25 1.1960E-08 1.0260E-08 -4.5240E-09 1.7930E-08 -1.9390E-08 -1.8070E-08 8.3510E-09 2.6580E-08 -2.6010E-08
8.5630E-09 -5.4780E-08 1.1950E-07 2.5740E-08 2.5510E-08 -9.1200E-08 1.3760E-08 8.6760E-08 -9.9140E-08
3.6650E-08 -1.2080E-07 1.1930E-07 2.1390E-09 4.6170E-08 -2.6590E-11 4.2660E-06 1.1450E-05 -1.2530E-05
26 -3.8850E-09 6.0080E-08 -3.2060E-08 2.2390E-09 -3.8280E-08 -3.4190E-08 -1.1770E-08 9.5020E-08 -7.9020E-08
-2.2140E-08 -1.2760E-07 2.9780E-07 2.3500E-08 7.5640E-08 -2.1510E-07 6.4220E-09 2.5050E-07 -2.6560E-07
2.7880E-08 -3.4230E-07 3.5900E-07 -2.2160E-08 1.5240E-07 -3.1000E-08 1.1450E-05 3.4930E-05 -3.7220E-05
27 5.9720E-09 -4.5440E-08 4.8520E-08 -8.1620E-09 4.5010E-08 7.2810E-08 1.3660E-08 -8.9910E-08 1.0560E-07
3.3850E-08 1.8970E-07 -3.5480E-07 -3.5920E-08 -9.5010E-08 2.8940E-07 -8.4590E-09 -2.7110E-07 3.2290E-07
-3.3670E-08 4.0290E-07 -3.8810E-07 3.2480E-08 -1.3690E-07 2.8990E-08 -1.2530E-05 -3.7220E-05 4.1220E-05

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

```

0.0000042660 0.0000114500 -0.0000125300
0.0000114500 0.0000349300 -0.0000372200
-0.0000125300 -0.0000372200 0.0000412200

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

```

0.0000004819 -0.0000001154 -0.0000013515
-0.0000001154 0.0000006925 0.0000005635
-0.0000013515 0.0000005635 0.0000792416

```

Horizontal network accuracy = 0.00189 meters.

Vertical network accuracy = 0.01745 meters.

		Vectors		
To	From	X	Y	Z
bil5	0186	-61154.802	42558.453	21201.010
wysh	0186	-15394.342	-69253.669	-69944.996
p051	0186	-105837.016	43325.287	8614.867
p052	0186	44353.750	128309.667	128260.286
p033	0186	-63661.734	-123396.316	-137168.783
p722	0186	-190534.974	42937.604	-18278.059
p054	0186	200879.541	-44197.713	11702.578
mtlw	0186	-138331.394	160674.404	104324.300

Covariance matrix of the 8 vectors

```

1 4.6654E-06 1.2506E-05 -1.3704E-05 4.1942E-06 1.1325E-05 -1.2352E-05 4.2026E-06 1.1272E-05 -1.2339E-05
4.2025E-06 1.1357E-05 -1.2490E-05 4.1863E-06 1.1279E-05 -1.2277E-05 4.1968E-06 1.1208E-05 -1.2262E-05
4.1765E-06 1.1438E-05 -1.2502E-05 4.2079E-06 1.1247E-05 -1.2361E-05
2 1.2506E-05 3.7962E-05 -4.0517E-05 1.1285E-05 3.4467E-05 -3.6665E-05 1.1302E-05 3.4370E-05 -3.6642E-05
1.1300E-05 3.4524E-05 -3.6918E-05 1.1271E-05 3.4384E-05 -3.6527E-05 1.1292E-05 3.4255E-05 -3.6502E-05
1.1251E-05 3.4672E-05 -3.6939E-05 1.1312E-05 3.4325E-05 -3.6684E-05
3 -1.3704E-05 -4.0517E-05 4.4915E-05 -1.2354E-05 -3.6761E-05 4.0597E-05 -1.2375E-05 -3.6639E-05 4.0567E-05
-1.2373E-05 -3.6833E-05 4.0914E-05 -1.2337E-05 -3.6656E-05 4.0424E-05 -1.2362E-05 -3.6494E-05 4.0392E-05
-1.2312E-05 -3.7019E-05 4.0942E-05 -1.2387E-05 -3.6583E-05 4.0620E-05

```

4 4.1942E-06 1.1285E-05 -1.2354E-05 4.6368E-06 1.2519E-05 -1.3630E-05 4.1979E-06 1.1274E-05 -1.2339E-05
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1.1453E-05 3.5011E-05 -3.7663E-05 1.1361E-05 3.4588E-05 -3.6561E-05 1.1406E-05 3.4214E-05 -3.6463E-05
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-1.2372E-05 -3.6832E-05 4.0887E-05 -1.2340E-05 -3.6680E-05 4.0475E-05 -1.2365E-05 -3.6556E-05 4.0459E-05
-1.2318E-05 -3.6972E-05 4.0896E-05 -1.3753E-05 -4.0347E-05 4.4971E-05

Correlation matrix of the 8 vectors

1 1.0000E+00 9.3970E-01 -9.4672E-01 9.0178E-01 8.4771E-01 -8.5511E-01 9.0009E-01 8.4879E-01 -8.5478E-01
9.0003E-01 8.4523E-01 -8.4590E-01 9.0205E-01 8.4864E-01 -8.5527E-01 9.0025E-01 8.4785E-01 -8.5416E-01
9.0309E-01 8.3843E-01 -8.4493E-01 8.9865E-01 8.4841E-01 -8.5339E-01
2 9.3970E-01 1.0000E+00 -9.8124E-01 8.5061E-01 9.0447E-01 -8.8983E-01 8.4855E-01 9.0732E-01 -8.8989E-01
8.4838E-01 9.0076E-01 -8.7656E-01 8.5142E-01 9.0697E-01 -8.9208E-01 8.4915E-01 9.0838E-01 -8.9139E-01
8.5283E-01 8.9099E-01 -8.7516E-01 8.4689E-01 9.0768E-01 -8.8786E-01
3 -9.4672E-01 -9.8124E-01 1.0000E+00 -8.5608E-01 -8.8686E-01 9.0579E-01 -8.5416E-01 -8.8920E-01 9.0576E-01
-8.5401E-01 -8.8349E-01 8.9308E-01 -8.5673E-01 -8.8892E-01 9.0763E-01 -8.5463E-01 -8.8971E-01 9.0681E-01
-8.5800E-01 -8.7457E-01 8.9174E-01 -8.5258E-01 -8.8935E-01 9.0381E-01
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9.0164E-01 8.4647E-01 -8.4614E-01 9.0474E-01 8.5151E-01 -8.5907E-01 9.0230E-01 8.5171E-01 -8.5803E-01 9.0612E-
01 8.3858E-01 -8.4521E-01 9.0003E-01 8.5147E-01 -8.5559E-01
5 8.4771E-01 9.0447E-01 -8.8686E-01 9.3999E-01 1.0000E+00 -9.8093E-01 8.4781E-01 9.0559E-01 -8.8834E-01
8.4763E-01 9.0011E-01 -8.7673E-01 8.5027E-01 9.0553E-01 -8.8999E-01 8.4815E-01 9.0580E-01 -8.8889E-01 8.5139E-
01 8.9165E-01 -8.7578E-01 8.4621E-01 9.0551E-01 -8.8643E-01
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-8.5507E-01 -8.8456E-01 8.9336E-01 -8.5872E-01 -8.9138E-01 9.1092E-01 -8.5605E-01 -8.9294E-01 9.1011E-01
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 8.5433E-01 8.9003E-01 -8.7426E-01 8.4686E-01 9.0966E-01 -8.8893E-01
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 24 -8.5339E-01 -8.8786E-01 9.0381E-01 -8.5559E-01 -8.8643E-01 9.0569E-01 -8.5361E-01 -8.8947E-01 9.0596E-01
 -8.5344E-01 -8.8292E-01 8.9194E-01 -8.5645E-01 -8.8893E-01 9.0820E-01 -8.5430E-01 -8.9066E-01 9.0776E-01
 -8.5788E-01 -8.7292E-01 8.9018E-01 -9.4606E-01 -9.8026E-01 1.0000E+00

G-FILE for the vectors

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 C00090004 443537503 21 1283096671 62 1282602864 68
 C00090005 -636617336 21 -1233963160 61 -1371687830 66
 C00090006 -1905349744 21 429376038 61 -182780588 66
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 C00090008 -1383313937 21 1606744037 61 1043242998 67
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D 18 24 9077589 19 20 9313627 19 21 -9389550 19 22 9010206 19 23 8552237
 D 19 24 -8578782 20 21 -9820183 20 22 8374295 20 23 8879603 20 24 -8729207
 D 21 22 -8438908 21 23 -8722775 21 24 8901812 22 23 9364532 22 24 -9460597
 D 23 24 -9802598

ITRF position of 0186 as determined by individual baselines

	X	Y	Z
bil5	-1311002.088	-4266504.252	4542449.231
wysh	-1311002.097	-4266504.233	4542449.227
p051	-1311002.095	-4266504.255	4542449.235
p052	-1311002.099	-4266504.267	4542449.241
p033	-1311002.091	-4266504.248	4542449.225
p722	-1311002.090	-4266504.239	4542449.225
p054	-1311002.093	-4266504.251	4542449.217
mtlw	-1311002.095	-4266504.262	4542449.243

Residuals of position determined by individual baselines from the final position

	X	Y	Z	East	North	Up
bil5	-0.002	-0.026	0.028	0.006	0.002	0.038
wysh	-0.010	-0.007	0.025	-0.008	0.010	0.025
p051	-0.009	-0.029	0.033	-0.000	0.001	0.045
p052	-0.013	-0.041	0.038	-0.001	-0.004	0.058
p033	-0.005	-0.022	0.023	0.002	-0.000	0.032
p722	-0.004	-0.014	0.022	0.000	0.005	0.026
p054	-0.007	-0.025	0.015	0.001	-0.008	0.029
mtlw	-0.009	-0.036	0.041	0.002	0.002	0.055

STATE PLANE COORDINATES - International Foot
 SPC (2500 MT)

Northing (Y) [feet]	536546.076
Easting (X) [feet]	2586328.740
Convergence [degrees]	1.76949675
Point Scale	0.99965385
Combined Factor	0.99948135

** 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: 1114.733 (m) [PROTOTYPE (Computed using USGG2012,GRS80,IGS08)]

dop from interpolation is 0.379
 scatter (mean square distance from rover) is 29844.299

average edop for rover is 0.830
average ndop for rover is 1.020
average hdop for rover is 1.315
average vdop for rover is 2.930
average gdop for rover is 3.860

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.