

OPUS-RS solution : 018697_14_226_A3.14O OP1408203536061

opus <opus@ngs.noaa.gov>

Sat 8/16/2014 9:41 AM

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

FILE: 018697_14_226_A3.14O OP1408203536061

6024

6024 ***** WARNING *****

6024 The Network Quality Indicator for the rover solution

6024 is less than 1.0. This is often a warning sign that

6024 one or more of the baselines involving your station were

6024 weakly determined. You should check other quality indicators,

6024 such as standard errors. If possible, corroborate

6024 this position with a solution involving a different time period.

6024 ***** WARNING *****

6024

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: August 16, 2014

RINEX FILE: 0186227a.14o

TIME: 15:41:44 UTC

SOFTWARE: rsgps 1.37 RS90.prl 1.99.2 START: 2014/08/15 00:00:00

EPHEMERIS: igr18054.eph [rapid] STOP: 2014/08/15 01:58:15

NAV FILE: brdc2260.14n OBS USED: 4700 / 6110 : 77%

ANT NAME: CHCX90D-OPUS NONE QUALITY IND. 21.96/ 0.48

ARP HEIGHT: 1.80000 NORMALIZED RMS: 0.419

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2014.61929)

X: -1375282.290(m) 0.005(m) -1375283.165(m) 0.005(m)

Y: -4035056.784(m) 0.009(m) -4035055.561(m) 0.009(m)

Z: 4729510.914(m) 0.011(m) 4729510.905(m) 0.011(m)

LAT: 48 9 39.86924 0.008(m) 48 9 39.89016 0.008(m)

E LON: 251 10 45.02344 0.005(m) 251 10 44.96428 0.005(m)

W LON: 108 49 14.97656 0.005(m) 108 49 15.03572 0.005(m)

EL HGT: 898.011(m) 0.012(m) 897.421(m) 0.012(m)

ORTHO HGT: 913.600(m) 0.015(m) [NAVD88 (Computed using GEOID12A)]

UTM COORDINATES STATE PLANE COORDINATES

| | UTM (Zone 12) | SPC (2500 MT) |
|-----------------------|---------------|----------------|
| Northing (Y) [meters] | 5336499.659 | 434817.334 |
| Easting (X) [meters] | 662045.599 | 650504.434 |
| Convergence [degrees] | 1.62388564 | 0.49681803 |
| Point Scale | 0.99992265 | 0.99959428 |
| Combined Factor | 0.99978194 | 0.99945361 |

US NATIONAL GRID DESIGNATOR: 12UXU6204536499(NAD 83)

BASE STATIONS USED

| PID | DESIGNATION | LATITUDE | LONGITUDE | DISTANCE(m) |
|--------|---------------------------------|-------------|--------------|-------------|
| DG9749 | MTMS MONTANA STATE UNI CORS ARP | N483227.426 | W1094111.858 | 76835.1 |
| DL7731 | P053 WHITEWATERMT2007 CORS ARP | N484333.865 | W1074331.456 | 102554.8 |
| DM7133 | MTLW LEWISTOWN CORS ARP | N470314.929 | W1092633.764 | 131673.5 |
| DI3425 | P052 LRRNCHJRDNMT2006 CORS ARP | N472229.026 | W1070107.185 | 160924.8 |
| DI2257 | P049 ARMINGTON_MT2006 CORS ARP | N472059.850 | W1105422.382 | 180515.6 |

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 | -1425435.578 | -3984013.202 | 4757493.869 |
| p053 | -1283559.257 | -4015770.319 | 4771131.604 |
| mtlw | -1449333.487 | -4105829.824 | 4646773.491 |
| p052 | -1266648.339 | -4138194.585 | 4670709.521 |
| p049 | -1545099.834 | -4044895.872 | 4669084.577 |
| 0186 | -1375283.165 | -4035055.561 | 4729510.905 |

Covariance matrix of the stations:

| | | | | | | | | | |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1 | 2.1550E-07 | 4.0200E-07 | -5.3140E-07 | -4.0130E-09 | -9.3350E-08 | 1.1780E-07 | -3.0510E-09 | -1.0430E-07 | 1.4040E-07 |
| | -4.7600E-09 | -8.9400E-08 | 1.2220E-07 | -3.6740E-09 | -1.1510E-07 | 1.5110E-07 | 3.6830E-08 | -3.5800E-09 | 4.9250E-09 |
| 2 | 4.0200E-07 | 1.2480E-06 | -1.4410E-06 | -9.2790E-08 | -2.8940E-07 | 4.3050E-07 | -1.0860E-07 | -2.4920E-07 | 3.2660E-07 |
| | -8.9070E-08 | -3.0990E-07 | 4.0680E-07 | -1.1100E-07 | -1.9950E-07 | 2.7650E-07 | 4.7350E-09 | 7.1860E-08 | -1.6650E-08 |
| 3 | -5.3140E-07 | -1.4410E-06 | 2.0540E-06 | 1.4300E-07 | 3.9390E-07 | -5.1190E-07 | 1.2720E-07 | 3.3920E-07 | -4.3440E-07 |
| | 1.3890E-07 | 3.8230E-07 | -4.9190E-07 | 1.2230E-07 | 3.2590E-07 | -4.1600E-07 | 6.8570E-09 | -5.5300E-09 | 3.8780E-08 |
| 4 | -4.0130E-09 | -9.2790E-08 | 1.4300E-07 | 2.0150E-07 | 3.8410E-07 | -4.8410E-07 | -5.3530E-09 | -1.0120E-07 | 1.1430E-07 |
| | 2.1890E-08 | -1.1060E-07 | 1.2890E-07 | -1.4440E-08 | -7.8940E-08 | 9.7010E-08 | 4.9360E-08 | 1.4850E-08 | -5.2510E-09 |
| 5 | -9.3350E-08 | -2.8940E-07 | 3.9390E-07 | 3.8410E-07 | 1.3680E-06 | -1.6400E-06 | -9.4350E-08 | -2.8830E-07 | 4.1150E-07 |
| | -1.0980E-07 | -2.9750E-07 | 4.2340E-07 | -8.8010E-08 | -2.9190E-07 | 4.1000E-07 | -8.1800E-10 | 8.5000E-09 | 4.1730E-08 |
| 6 | 1.1780E-07 | 4.3050E-07 | -5.1190E-07 | -4.8410E-07 | -1.6400E-06 | 2.3750E-06 | 1.0880E-07 | 3.9260E-07 | -5.5030E-07 |

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1.6660E-07 3.6690E-07 -5.1610E-07 9.2490E-08 4.5000E-07 -5.9660E-07 1.3480E-08 7.4760E-08 -4.1170E-08
 7 -3.0510E-09 -1.0860E-07 1.2720E-07 -5.3530E-09 -9.4350E-08 1.0880E-07 2.1790E-07 4.1070E-07 -4.9810E-07
-6.1470E-09 -8.8540E-08 1.1390E-07 -3.1120E-09 -1.1940E-07 1.4870E-07 3.3950E-08 -1.2030E-08 4.8360E-09
 8 -1.0430E-07 -2.4920E-07 3.3920E-07 -1.0120E-07 -2.8830E-07 3.9260E-07 4.1070E-07 1.2620E-06 -1.4020E-06
-9.9650E-08 -3.0040E-07 3.8180E-07 -1.0490E-07 -2.2460E-07 2.8950E-07 -5.2440E-09 4.0130E-08 -1.2560E-08
 9 1.4040E-07 3.2660E-07 -4.3440E-07 1.1430E-07 4.1150E-07 -5.5030E-07 -4.9810E-07 -1.4020E-06 1.9200E-06
9.7630E-08 4.1410E-07 -4.6390E-07 1.4470E-07 2.4990E-07 -2.7210E-07 -4.5100E-09 -3.0290E-08 7.8070E-08
10 -4.7600E-09 -8.9070E-08 1.3890E-07 2.1890E-08 -1.0980E-07 1.6660E-07 -6.1470E-09 -9.9650E-08 9.7630E-08
2.0680E-07 3.6630E-07 -4.7600E-07 -1.8090E-08 -6.7230E-08 7.1870E-08 5.3590E-08 2.2080E-08 -1.8030E-08
11 -8.9400E-08 -3.0990E-07 3.8230E-07 -1.1060E-07 -2.9750E-07 3.6690E-07 -8.8540E-08 -3.0040E-07 4.1410E-
07 3.6630E-07 1.4330E-06 -1.5960E-06 -7.9490E-08 -3.2520E-07 4.3250E-07 -1.3110E-09 -8.3710E-09 2.8500E-08
12 1.2220E-07 4.0680E-07 -4.9190E-07 1.2890E-07 4.2340E-07 -5.1610E-07 1.1390E-07 3.8180E-07 -4.6390E-07
-4.7600E-07 -1.5960E-06 2.1360E-06 1.1230E-07 3.8330E-07 -4.6320E-07 -7.5030E-09 3.5190E-08 2.0480E-08
13 -3.6740E-09 -1.1100E-07 1.2230E-07 -1.4440E-08 -8.8010E-08 9.2490E-08 -3.1120E-09 -1.0490E-07 1.4470E-07
-1.8090E-08 -7.9490E-08 1.1230E-07 2.3970E-07 3.8270E-07 -4.7060E-07 2.6160E-08 -2.1540E-08 1.3970E-08
14 -1.1510E-07 -1.9950E-07 3.2590E-07 -7.8940E-08 -2.9190E-07 4.5000E-07 -1.1940E-07 -2.2460E-07 2.4990E-07
-6.7230E-08 -3.2520E-07 3.8330E-07 3.8270E-07 1.2410E-06 -1.4090E-06 2.7830E-09 8.8140E-08 -4.1040E-08
15 1.5110E-07 2.7650E-07 -4.1600E-07 9.7010E-08 4.1000E-07 -5.9660E-07 1.4870E-07 2.8950E-07 -2.7210E-07
7.1870E-08 4.3250E-07 -4.6320E-07 -4.7060E-07 -1.4090E-06 1.9470E-06 -8.5570E-09 -7.4620E-08 1.0410E-07
16 3.6830E-08 4.7350E-09 6.8570E-09 4.9360E-08 -8.1800E-10 1.3480E-08 3.3950E-08 -5.2440E-09 -4.5100E-09
5.3590E-08 -1.3110E-09 -7.5030E-09 2.6160E-08 2.7830E-09 -8.5570E-09 1.4190E-06 3.4390E-06 -4.0560E-06
17 -3.5800E-09 7.1860E-08 -5.5300E-09 1.4850E-08 8.5000E-09 7.4760E-08 -1.2030E-08 4.0130E-08 -3.0290E-08
2.2080E-08 -8.3710E-09 3.5190E-08 -2.1540E-08 8.8140E-08 -7.4620E-08 3.4390E-06 1.1650E-05 -1.2730E-05
18 4.9250E-09 -1.6650E-08 3.8780E-08 -5.2510E-09 4.1730E-08 -4.1170E-08 4.8360E-09 -1.2560E-08 7.8070E-08
-1.8030E-08 2.8500E-08 2.0480E-08 1.3970E-08 -4.1040E-08 1.0410E-07 -4.0560E-06 -1.2730E-05 1.6100E-05

```

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

```

0.0000014190 0.0000034390 -0.0000040560
0.0000034390 0.0000116500 -0.0000127300
-0.0000040560 -0.0000127300 0.0000161000

```

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

```

0.0000003835 -0.0000001186 0.0000004673
-0.0000001186 0.0000009299 0.0000003158
0.0000004673 0.0000003158 0.0000278555

```

Horizontal network accuracy = 0.00204 meters.

Vertical network accuracy = 0.01035 meters.

| | | Vectors | | |
|------|------|-------------|-------------|------------|
| To | From | X | Y | Z |
| mtms | 0186 | -50152.413 | 51042.359 | 27982.964 |
| p053 | 0186 | 91723.908 | 19285.243 | 41620.698 |
| mtlw | 0186 | -74050.322 | -70774.263 | -82737.414 |
| p052 | 0186 | 108634.826 | -103139.024 | -58801.384 |
| p049 | 0186 | -169816.670 | -9840.311 | -60426.328 |

Covariance matrix of the 5 vectors

```

1 1.5608E-06 3.8398E-06 -4.5992E-06 1.3288E-06 3.3500E-06 -3.9566E-06 1.3452E-06 3.3435E-06 -3.9160E-06
1.3238E-06 3.3545E-06 -3.9312E-06 1.3523E-06 3.3247E-06 -3.9013E-06

```

2 3.8398E-06 1.2754E-05 -1.4149E-05 3.3266E-06 1.1280E-05 -1.2358E-05 3.3377E-06 1.1289E-05 -1.2356E-05
 3.3231E-06 1.1277E-05 -1.2342E-05 3.3448E-06 1.1290E-05 -1.2362E-05
 3 -4.5992E-06 -1.4149E-05 1.8076E-05 -3.9146E-06 -1.2372E-05 1.5590E-05 -3.9405E-06 -1.2373E-05 1.5549E-05
 -3.9059E-06 -1.2371E-05 1.5549E-05 -3.9545E-06 -1.2358E-05 1.5541E-05
 4 1.3288E-06 3.3266E-06 -3.9146E-06 1.5218E-06 3.8091E-06 -4.5483E-06 1.3303E-06 3.3282E-06 -3.9319E-06
 1.3379E-06 3.3149E-06 -3.9143E-06 1.3290E-06 3.3424E-06 -3.9452E-06
 5 3.3500E-06 1.1280E-05 -1.2372E-05 3.8091E-06 1.3001E-05 -1.4486E-05 3.3575E-06 1.1313E-05 -1.2330E-05
 3.3079E-06 1.1352E-05 -1.2384E-05 3.3733E-06 1.1261E-05 -1.2287E-05
 6 -3.9566E-06 -1.2358E-05 1.5590E-05 -4.5483E-06 -1.4486E-05 1.8557E-05 -3.9655E-06 -1.2400E-05 1.5513E-05
 -3.8848E-06 -1.2466E-05 1.5605E-05 -3.9910E-06 -1.2314E-05 1.5440E-05
 7 1.3452E-06 3.3377E-06 -3.9405E-06 1.3303E-06 3.3575E-06 -3.9655E-06 1.5690E-06 3.8670E-06 -4.5544E-06
 1.3253E-06 3.3638E-06 -3.9394E-06 1.3558E-06 3.3288E-06 -3.9036E-06
 8 3.3435E-06 1.1289E-05 -1.2373E-05 3.3282E-06 1.1313E-05 -1.2400E-05 3.8670E-06 1.2832E-05 -1.4089E-05
 3.3225E-06 1.1318E-05 -1.2371E-05 3.3609E-06 1.1297E-05 -1.2353E-05
 9 -3.9160E-06 -1.2356E-05 1.5549E-05 -3.9319E-06 -1.2330E-05 1.5513E-05 -4.5544E-06 -1.4089E-05 1.7864E-05
 -3.9358E-06 -1.2314E-05 1.5538E-05 -3.9208E-06 -1.2409E-05 1.5646E-05
 10 1.3238E-06 3.3231E-06 -3.9059E-06 1.3379E-06 3.3079E-06 -3.8848E-06 1.3253E-06 3.3225E-06 -3.9358E-06
 1.5186E-06 3.7845E-06 -4.5065E-06 1.3212E-06 3.3469E-06 -3.9575E-06
 11 3.3545E-06 1.1277E-05 -1.2371E-05 3.3149E-06 1.1352E-05 -1.2466E-05 3.3638E-06 1.1318E-05 -1.2314E-05
 3.7845E-06 1.3100E-05 -1.4390E-05 3.3824E-06 1.1245E-05 -1.2251E-05
 12 -3.9312E-06 -1.2342E-05 1.5549E-05 -3.9143E-06 -1.2384E-05 1.5605E-05 -3.9394E-06 -1.2371E-05 1.5538E-05
 -4.5065E-06 -1.4390E-05 1.8195E-05 -3.9502E-06 -1.2341E-05 1.5512E-05
 13 1.3523E-06 3.3448E-06 -3.9545E-06 1.3290E-06 3.3733E-06 -3.9910E-06 1.3558E-06 3.3609E-06 -3.9208E-06
 1.3212E-06 3.3824E-06 -3.9502E-06 1.6064E-06 3.8405E-06 -4.5320E-06
 14 3.3247E-06 1.1290E-05 -1.2358E-05 3.3424E-06 1.1261E-05 -1.2314E-05 3.3288E-06 1.1297E-05 -1.2409E-05
 3.3469E-06 1.1245E-05 -1.2341E-05 3.8405E-06 1.2715E-05 -1.4023E-05
 15 -3.9013E-06 -1.2362E-05 1.5541E-05 -3.9452E-06 -1.2287E-05 1.5440E-05 -3.9036E-06 -1.2353E-05 1.5646E-05
 -3.9575E-06 -1.2251E-05 1.5512E-05 -4.5320E-06 -1.4023E-05 1.7839E-05

Correlation matrix of the 5 vectors

1 1.0000E+00 8.6061E-01 -8.6585E-01 8.6219E-01 7.4368E-01 -7.3517E-01 8.5958E-01 7.4711E-01 -7.4161E-01
 8.5985E-01 7.4185E-01 -7.3769E-01 8.5405E-01 7.4631E-01 -7.3934E-01
 2 8.6061E-01 1.0000E+00 -9.3183E-01 7.5509E-01 8.7600E-01 -8.0325E-01 7.4612E-01 8.8242E-01 -8.1861E-01
 7.5508E-01 8.7241E-01 -8.1016E-01 7.3896E-01 8.8661E-01 -8.1957E-01
 3 -8.6585E-01 -9.3183E-01 1.0000E+00 -7.4637E-01 -8.0706E-01 8.5123E-01 -7.3992E-01 -8.1239E-01 8.6527E-01
 -7.4549E-01 -8.0391E-01 8.5736E-01 -7.3386E-01 -8.1512E-01 8.6545E-01
 4 8.6219E-01 7.5509E-01 -7.4637E-01 1.0000E+00 8.5636E-01 -8.5589E-01 8.6094E-01 7.5316E-01 -7.5412E-01
 8.8011E-01 7.4243E-01 -7.4389E-01 8.5004E-01 7.5986E-01 -7.5720E-01
 5 7.4368E-01 8.7600E-01 -8.0706E-01 8.5636E-01 1.0000E+00 -9.3265E-01 7.4339E-01 8.7589E-01 -8.0907E-01
 7.4447E-01 8.6989E-01 -8.0515E-01 7.3816E-01 8.7590E-01 -8.0682E-01
 6 -7.3517E-01 -8.0325E-01 8.5123E-01 -8.5589E-01 -9.3265E-01 1.0000E+00 -7.3490E-01 -8.0354E-01 8.5201E-01
 -7.3180E-01 -7.9956E-01 8.4922E-01 -7.3096E-01 -8.0164E-01 8.4863E-01
 7 8.5958E-01 7.4612E-01 -7.3992E-01 8.6094E-01 7.4339E-01 -7.3490E-01 1.0000E+00 8.6182E-01 -8.6027E-01
 8.5858E-01 7.4197E-01 -7.3730E-01 8.5399E-01 7.4530E-01 -7.3785E-01
 8 7.4711E-01 8.8242E-01 -8.1239E-01 7.5316E-01 8.7589E-01 -8.0354E-01 8.6182E-01 1.0000E+00 -9.3058E-01
 7.5266E-01 8.7295E-01 -8.0962E-01 7.4026E-01 8.8445E-01 -8.1650E-01
 9 -7.4161E-01 -8.1861E-01 8.6527E-01 -7.5412E-01 -8.0907E-01 8.5201E-01 -8.6027E-01 -9.3058E-01 1.0000E+00
 -7.5566E-01 -8.0498E-01 8.6182E-01 -7.3191E-01 -8.2336E-01 8.7645E-01
 10 8.5985E-01 7.5508E-01 -7.4549E-01 8.8011E-01 7.4447E-01 -7.3180E-01 8.5858E-01 7.5266E-01 -7.5566E-01
 1.0000E+00 8.4851E-01 -8.5730E-01 8.4588E-01 7.6167E-01 -7.6036E-01
 11 7.4185E-01 8.7241E-01 -8.0391E-01 7.4243E-01 8.6989E-01 -7.9956E-01 7.4197E-01 8.7295E-01 -8.0498E-01

8.4851E-01 1.0000E+00 -9.3206E-01 7.3733E-01 8.7132E-01 -8.0144E-01
 12 -7.3769E-01 -8.1016E-01 8.5736E-01 -7.4389E-01 -8.0515E-01 8.4922E-01 -7.3730E-01 -8.0962E-01 8.6182E-01
 -8.5730E-01 -9.3206E-01 1.0000E+00 -7.3066E-01 -8.1136E-01 8.6102E-01
 13 8.5405E-01 7.3896E-01 -7.3386E-01 8.5004E-01 7.3816E-01 -7.3096E-01 8.5399E-01 7.4026E-01 -7.3191E-01
 8.4588E-01 7.3733E-01 -7.3066E-01 1.0000E+00 8.4978E-01 -8.4661E-01
 14 7.4631E-01 8.8661E-01 -8.1512E-01 7.5986E-01 8.7590E-01 -8.0164E-01 7.4530E-01 8.8445E-01 -8.2336E-01
 7.6167E-01 8.7132E-01 -8.1136E-01 8.4978E-01 1.0000E+00 -9.3114E-01
 15 -7.3934E-01 -8.1957E-01 8.6545E-01 -7.5720E-01 -8.0682E-01 8.4863E-01 -7.3785E-01 -8.1650E-01 8.7645E-01
 -7.6036E-01 -8.0144E-01 8.6102E-01 -8.4661E-01 -9.3114E-01 1.0000E+00

G-FILE for the vectors

Axx2014 8152014 815
 B201408150000201408150100 5 rsgps 1.37IGS
 lant_info.003 NGS
 C00060001 -501524134 12 510423588 35 279829636 42
 C00060002 917239081 12 192852425 36 416206981 43
 C00060003 -740503223 12 -707742628 35 -827374141 42
 C00060004 1086348260 12 -1031390237 36 -588013844 42
 C00060005 -1698166697 12 -98403109 35 -604263283 42
 D 1 2 8606102 1 3 -8658545 1 4 8621910 1 5 7436754 1 6 -7351663
 D 1 7 8595797 1 8 7471064 1 9 -7416132 1 10 8598549 1 11 7418499
 D 1 12 -7376865 1 13 8540460 1 14 7463103 1 15 -7393392 2 3 -9318280
 D 2 4 7550921 2 5 8759957 2 6 -8032461 2 7 7461174 2 8 8824242
 D 2 9 -8186126 2 10 7550797 2 11 8724072 2 12 -8101620 2 13 7389561
 D 2 14 8866083 2 15 -8195699 3 4 -7463725 3 5 -8070596 3 6 8512271
 D 3 7 -7399163 3 8 -8123919 3 9 8652694 3 10 -7454922 3 11 -8039062
 D 3 12 8573635 3 13 -7338612 3 14 -8151205 3 15 8654521 4 5 8563561
 D 4 6 -8558902 4 7 8609427 4 8 7531646 4 9 -7541247 4 10 8801083
 D 4 11 7424342 4 12 -7438866 4 13 8500372 4 14 7598582 4 15 -7571959
 D 5 6 -9326462 5 7 7433886 5 8 8758894 5 9 -8090678 5 10 7444652
 D 5 11 8698949 5 12 -8051544 5 13 7381567 5 14 8758967 5 15 -8068235
 D 6 7 -7349035 6 8 -8035391 6 9 8520099 6 10 -7317990 6 11 -7995588
 D 6 12 8492156 6 13 -7309629 6 14 -8016374 6 15 8486328 7 8 8618208
 D 7 9 -8602694 7 10 8585832 7 11 7419718 7 12 -7373025 7 13 8539903
 D 7 14 7452962 7 15 -7378510 8 9 -9305813 8 10 7526611 8 11 8729501
 D 8 12 -8096168 8 13 7402639 8 14 8844472 8 15 -8165035 9 10 -7556559
 D 9 11 -8049779 9 12 8618235 9 13 -7319113 9 14 -8233560 9 15 8764463
 D 10 11 8485083 10 12 -8573045 10 13 8458760 10 14 7616679 10 15 -7603582
 D 11 12 -9320593 11 13 7373343 11 14 8713163 11 15 -8014396 12 13 -7306591
 D 12 14 -8113629 12 15 8610227 13 14 8497777 13 15 -8466115 14 15 -9311405

ITRF position of 0186 as determined by individual baselines

| | X | Y | Z |
|------|--------------|--------------|-------------|
| mtms | -1375283.169 | -4035055.571 | 4729510.909 |
| p053 | -1375283.166 | -4035055.569 | 4729510.913 |
| mtlw | -1375283.156 | -4035055.556 | 4729510.918 |
| p052 | -1375283.169 | -4035055.549 | 4729510.891 |
| p049 | -1375283.167 | -4035055.561 | 4729510.903 |

Residuals of position determined by individual baselines from the final position

| | X | Y | Z | East | North | Up |
|------|--------|--------|--------|--------|--------|--------|
| mtms | -0.005 | -0.010 | 0.004 | -0.001 | -0.006 | 0.010 |
| p053 | -0.001 | -0.008 | 0.008 | 0.002 | -0.000 | 0.011 |
| mtlw | 0.009 | 0.005 | 0.013 | 0.006 | 0.015 | 0.005 |
| p052 | -0.004 | 0.013 | -0.014 | -0.008 | -0.002 | -0.018 |
| p049 | -0.002 | 0.001 | -0.002 | -0.003 | -0.001 | -0.001 |

STATE PLANE COORDINATES - International Foot

SPC (2500 MT)

| | |
|-----------------------|-------------|
| Northing (Y) [feet] | 1426566.056 |
| Easting (X) [feet] | 2134200.899 |
| Convergence [degrees] | 0.49681803 |
| Point Scale | 0.99959428 |
| Combined Factor | 0.99945361 |

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

| | |
|--|-----------|
| dop from interpolation is | 0.501 |
| scatter (mean square distance from rover) is | 18446.491 |
| average edop for rover is | 0.690 |
| average ndop for rover is | 1.150 |
| average hdop for rover is | 1.341 |
| average vdop for rover is | 2.150 |
| average gdop for rover is | 2.910 |

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.