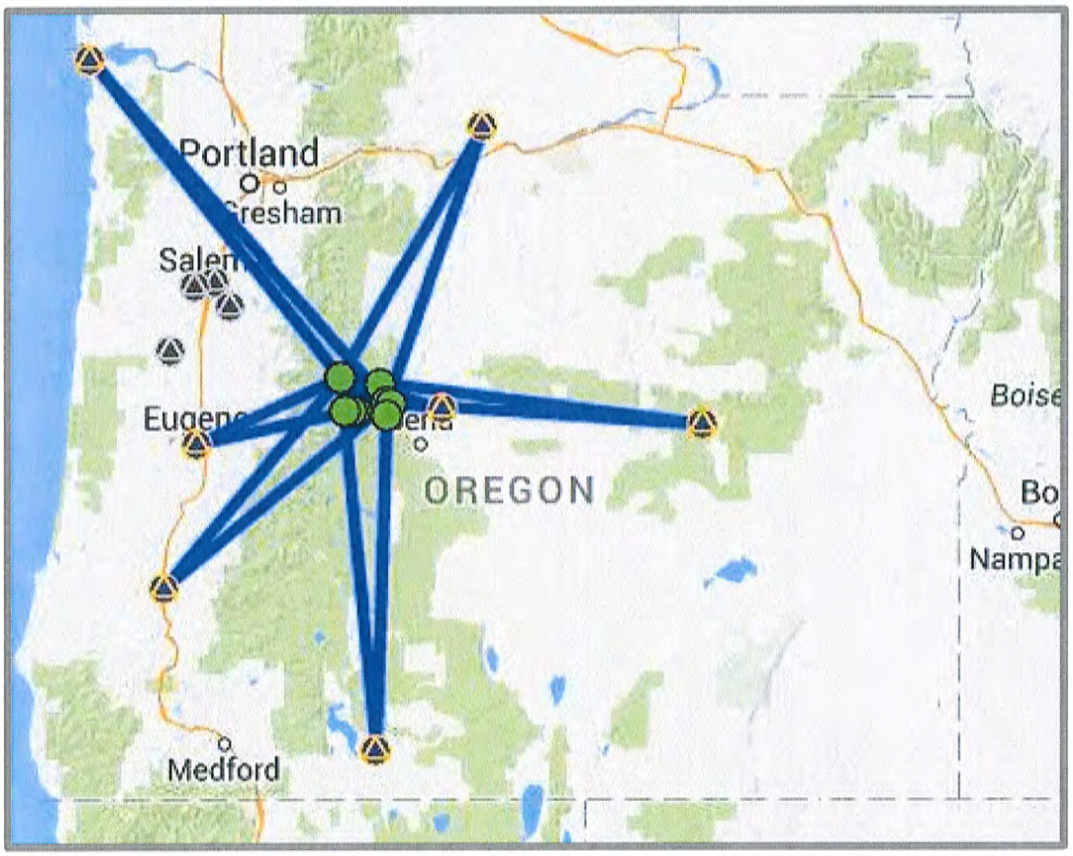
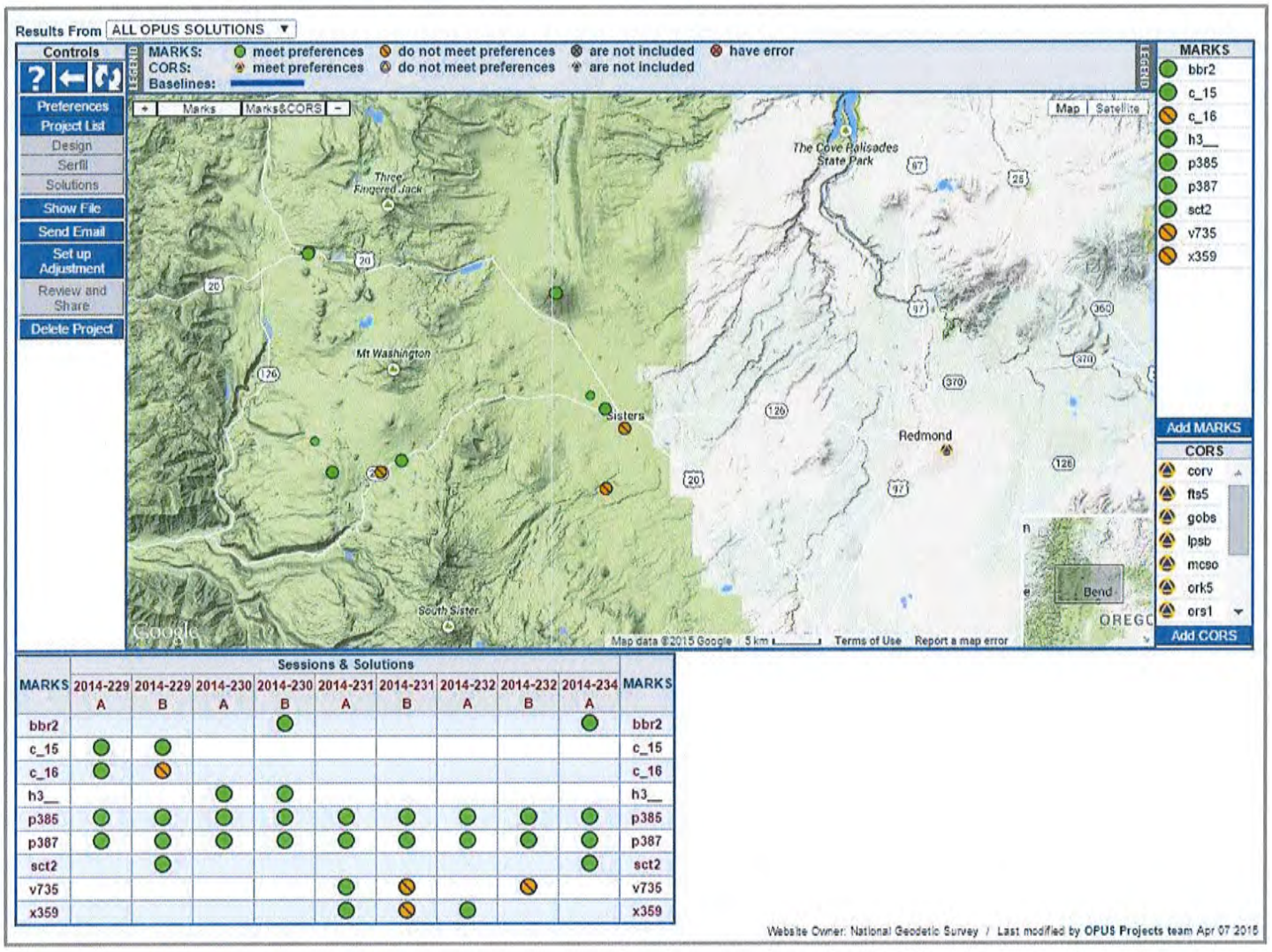
OPUS PROJECTS (OP) BASIC TRAINING HANDOUT

OREGON CASCADE VOLCANO PROJECT



OPUS PROJECTS TRAINER: Mark L. Armstrong, PLS, Geodesist

The 'snip' below represents the beginning state of your OP basic training project. All data has been uploaded for you and you have been assigned a **Project ID** and **Manager Keyword**. Using your **registered email address** you will now have access to your training project. This handout contains the general information you need to process the baselines and adjust the project.



The challenge of this project is to determine the State Plane Coordinate in NAD 83(2011)2010.00 and the orthometric height in NAVD88 (using GEOID12A) for the two peaks, Black Butte (mark "bbr2") and Scott Mtn. (mark "sct2") at 95% certainty. Each person can then compare their results with the rest of the class.

CORS SELECTED TO USE IN THE PROJECT

FTS5
GOBS
LPSB
ORK5
ORS1
REDM
RSBG

While any CORS are available to be added to the project these CORS have already been added. The CORS listed are considered to be of good quality and in locations around the State designed to provide short and long baseline solutions ideal for tropo de-correlation and for geographically represented repeatable coordinates.

BASE LINE PROCESSING METHODOLOGIES

SESSION	HUB	MASK (Degrees)
229A	P385	15
229B	P387	20
230A	P385	15
230B	P387	15
231A	P385	20
231B	P387	20
232A	P387	20
232B	P387	20
234A	P385	15

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.7
1        National Geodetic Survey,   Retrieval Date = APRIL 20, 2015
 QD1000 ***********************************************************************
 QD1000  DESIGNATION -  C 15
 QD1000  PID         -  QD1000
 QD1000  STATE/COUNTY-  OR/LANE
 QD1000  COUNTRY     -  US
 QD1000  USGS QUAD   -  MT WASHINGTON (1988)
 QD1000
 QD1000                         *CURRENT SURVEY CONTROL
 QD1000 ______________________________________________________________________
 QD1000* NAD 83(1986) POSITION- 44 15 03.46   (N) 121 49 39.16   (W)    HD_HELD1
 QD1000* NAVD 88 ORTHO HEIGHT -  1584.252 (meters)     5197.67  (feet) POSTED
 QD1000 ______________________________________________________________________
 QD1000  GEOID HEIGHT    -        -20.89  (meters)                       GEOID12B
 QD1000  DYNAMIC HEIGHT  -       1583.54  (meters)     5195.3   (feet) COMP
 QD1000  MODELED GRAVITY -    980,110.3   (mgal)                         NAVD 88
 QD1000
 QD1000  VERT ORDER      -  * POSTED, SEE BELOW
 QD1000
 QD1000.The horizontal coordinates were determined by differentially corrected
 QD1000.hand held GPS observations or other comparable positioning techniques
 QD1000.and have an estimated accuracy of +/- 3 meters.
 QD1000.
 QD1000.The orthometric height was determined by differential leveling
 QD1000.and adjusted by the NATIONAL GEODETIC SURVEY in 1992.
 QD1000
 QD1000.* This is a POSTED BENCH MARK height.
 QD1000
 QD1000.The dynamic height is computed by dividing the NAVD 88
 QD1000.geopotential number by the normal gravity value computed on the
 QD1000.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 QD1000.degrees latitude (g = 980.6199 gals.).
 QD1000
 QD1000.The modeled gravity was interpolated from observed gravity values.
 QD1000
 QD1000;                    North         East     Units  Estimated Accuracy
 QD1000;SPC OR S      -   287,930.5   1,393,969.2     MT  (+/- 3 meters HH1 GPS)
 QD1000
 QD1000                          SUPERSEDED SURVEY CONTROL
 QD1000
 QD1000  NGVD 29 (??/??/92) 1582.983  (m)          5193.50   (f) ADJ UNCH    1 2
 QD1000
 QD1000.Superseded values are not recommended for survey control.
 QD1000
 QD1000.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 QD1000.See file dsdata.txt to determine how the superseded data were derived.
 QD1000
```

```
QD1000_U.S. NATIONAL GRID SPATIAL ADDRESS: 10TEQ9360300415(NAD 83)
QD1000
QD1000_MARKER: DD = SURVEY DISK
QD1000_SETTING: 66 = SET IN ROCK OUTCROP
QD1000_SP_SET: LAVA ROCK OUTCROP
QD1000_STAMPING: C 15 26
QD1000_MARK LOGO: USFS
QD1000_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD
QD1000+STABILITY: POSITION/ELEVATION WELL
QD1000
QD1000  HISTORY     - Date     Condition        Report By
QD1000  HISTORY     - UNK      MONUMENTED       USFS
QD1000  HISTORY     - 1943     GOOD             CGS
QD1000
QD1000                          STATION DESCRIPTION
QD1000
QD1000'DESCRIBED BY COAST AND GEODETIC SURVEY 1943
QD1000'1.5 MI SW FROM MCKENZIE PASS.
QD1000'ABOUT 1.5 MILES SOUTHWEST ALONG U.S. HIGHWAY 28 FROM MCKENZIE PASS,
QD1000'DESCHUTES COUNTY, SET IN THE TOP OF A LAVA ROCK OUTCROP AT A SMALL
QD1000'PARKING SPACE, 23.0 FEET SOUTH OF THE CENTER LINE OF THE HIGHWAY, 2.0
QD1000'FEET NORTHEAST OF A WHITE REFERENCE POST.  STAMPING C 15 26.

*** retrieval complete.
Elapsed Time = 00:00:01
```

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.7
1         National Geodetic Survey,   Retrieval Date = APRIL 20, 2015
 QD0998 ***********************************************************************
 QD0998  DESIGNATION -  C 16
 QD0998  PID         -  QD0998
 QD0998  STATE/COUNTY-  OR/LANE
 QD0998  COUNTRY     -  US
 QD0998  USGS QUAD   -  NORTH SISTER (1988)
 QD0998
 QD0998                         *CURRENT SURVEY CONTROL
 QD0998  ______________________________________________________________________
 QD0998* NAD 83(1986) POSITION- 44 14 25.97   (N) 121 51 15.99   (W)    HD_HELD1
 QD0998* NAVD 88 ORTHO HEIGHT -  1536.204 (meters)     5040.03   (feet) POSTED
 QD0998  ______________________________________________________________________
 QD0998  GEOID HEIGHT    -        -20.94  (meters)                       GEOID12B
 QD0998  DYNAMIC HEIGHT  -       1535.53  (meters)     5037.8    (feet) COMP
 QD0998  MODELED GRAVITY -    980,125.2   (mgal)                         NAVD 88
 QD0998
 QD0998  VERT ORDER      -  * POSTED, SEE BELOW
 QD0998
 QD0998.The horizontal coordinates were determined by differentially corrected
 QD0998.hand held GPS observations or other comparable positioning techniques
 QD0998.and have an estimated accuracy of +/- 3 meters.
 QD0998.
 QD0998.The orthometric height was determined by differential leveling
 QD0998.and adjusted by the NATIONAL GEODETIC SURVEY in 1992.
 QD0998
 QD0998.* This is a POSTED BENCH MARK height.
 QD0998
 QD0998.Photographs are available for this station.
 QD0998
 QD0998.The dynamic height is computed by dividing the NAVD 88
 QD0998.geopotential number by the normal gravity value computed on the
 QD0998.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 QD0998.degrees latitude (g = 980.6199 gals.).
 QD0998
 QD0998.The modeled gravity was interpolated from observed gravity values.
 QD0998
 QD0998;                  North         East     Units  Estimated Accuracy
 QD0998;SPC OR S     -   286,807.8   1,391,802.4     MT  (+/- 3 meters HH1 GPS)
 QD0998
 QD0998                          SUPERSEDED SURVEY CONTROL
 QD0998
 QD0998  NGVD 29 (??/??/92) 1534.956  (m)          5035.93   (f) ADJ UNCH    1 2
 QD0998
 QD0998.Superseded values are not recommended for survey control.
 QD0998
 QD0998.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
```

```
QD0998.See file dsdata.txt to determine how the superseded data were derived.
QD0998
QD0998_U.S. NATIONAL GRID SPATIAL ADDRESS: 10TEP9147299228(NAD 83)
QD0998
QD0998_MARKER: DD = SURVEY DISK
QD0998_SETTING: 80 = SET IN A BOULDER
QD0998_SP_SET: LAVA BOULDER
QD0998_STAMPING: 16 26
QD0998_MARK LOGO: USFS
QD0998_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
QD0998+STABILITY: SURFACE MOTION
QD0998
QD0998  HISTORY      - Date      Condition         Report By
QD0998  HISTORY      - UNK       MONUMENTED        USFS
QD0998  HISTORY      - 1943      GOOD              CGS
QD0998
QD0998                            STATION DESCRIPTION
QD0998
QD0998'DESCRIBED BY COAST AND GEODETIC SURVEY 1943
QD0998'3.15 MI SW FROM MCKENZIE PASS.
QD0998'ABOUT 3.15 MILES SOUTHWEST ALONG U.S. HIGHWAY 28 FROM MCKENZIE PASS,
QD0998'DESCHUTES COUNTY, 46.0 FEET NORTHWEST OF THE CENTER LINE OF THE
QD0998'HIGHWAY, SET IN THE TOP OF A LARGE LAVA BOULDER, 9.0 FEET NORTHWEST OF
QD0998'A WHITE REFERENCE POST.  STAMPING 16 26.

*** retrieval complete.
Elapsed Time = 00:00:01
```

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.7
1         National Geodetic Survey,   Retrieval Date = APRIL 20, 2015
 QD1145 ***********************************************************************
 QD1145  DESIGNATION -  H 3
 QD1145  PID         -  QD1145
 QD1145  STATE/COUNTY-  OR/LINN
 QD1145  COUNTRY     -  US
 QD1145  USGS QUAD   -  SANTIAM JUNCTION (1988)
 QD1145
 QD1145                         *CURRENT SURVEY CONTROL
 QD1145 ______________________________________________________________________
 QD1145* NAD 83(1986) POSITION- 44 26 10.65   (N) 121 56 38.17   (W)    HD_HELD1
 QD1145* NAVD 88 ORTHO HEIGHT -  1139.847 (meters)     3739.65  (feet) ADJUSTED
 QD1145 ______________________________________________________________________
 QD1145  GEOID HEIGHT    -        -21.37  (meters)                       GEOID12B
 QD1145  DYNAMIC HEIGHT  -       1139.442 (meters)     3738.32  (feet) COMP
 QD1145  MODELED GRAVITY -    980,223.2   (mgal)                         NAVD 88
 QD1145
 QD1145  VERT ORDER      -  FIRST     CLASS II
 QD1145
 QD1145.The horizontal coordinates were determined by differentially corrected
 QD1145.hand held GPS observations or other comparable positioning techniques
 QD1145.and have an estimated accuracy of +/- 3 meters.
 QD1145.
 QD1145.The orthometric height was determined by differential leveling and
 QD1145.adjusted by the NATIONAL GEODETIC SURVEY
 QD1145.in June 1991.
 QD1145
 QD1145.The dynamic height is computed by dividing the NAVD 88
 QD1145.geopotential number by the normal gravity value computed on the
 QD1145.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 QD1145.degrees latitude (g = 980.6199 gals.).
 QD1145
 QD1145.The modeled gravity was interpolated from observed gravity values.
 QD1145
 QD1145;                    North         East     Units  Estimated Accuracy
 QD1145;SPC OR N     -    86,550.5   2,385,048.3     MT  (+/- 3 meters HH1 GPS)
 QD1145
 QD1145                         SUPERSEDED SURVEY CONTROL
 QD1145
 QD1145  NGVD 29 (??/??/92) 1138.651  (m)          3735.72   (f) ADJ UNCH    1 2
 QD1145
 QD1145.Superseded values are not recommended for survey control.
 QD1145
 QD1145.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 QD1145.See file dsdata.txt to determine how the superseded data were derived.
 QD1145
 QD1145_U.S. NATIONAL GRID SPATIAL ADDRESS: 10TEQ8404620874(NAD 83)
```

```
QD1145
QD1145_MARKER: DD = SURVEY DISK
QD1145_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
QD1145_SP_SET: SET IN TOP OF CONCRETE MONUMENT
QD1145_STAMPING: 3736 23 H 3 1934
QD1145_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
QD1145+STABILITY: SURFACE MOTION
QD1145
QD1145  HISTORY     - Date     Condition        Report By
QD1145  HISTORY     - 1934     MONUMENTED       BPR
QD1145  HISTORY     - 1963     GOOD             CGS
QD1145
QD1145                          STATION DESCRIPTION
QD1145
QD1145'DESCRIBED BY COAST AND GEODETIC SURVEY 1963
QD1145'0.35 MI SW FROM SANTIAM JUNCTION.
QD1145'0.35 MILE SOUTHWEST ALONG U.S. HIGHWAY 20 FROM THE MOBIL SERVICE
QD1145'STATION AND STORE AT SANTIAM JUNCTION, 110 FEET WEST OF A STOP SIGN,
QD1145'68 FEET NORTHWEST OF THE CENTER OF U.S. HIGHWAY 20 AND 1 FOOT SOUTH OF
QD1145'A WOODEN WITNESS POST.  THE MONUMENT PROJECTS 8 INCHES.

*** retrieval complete.
Elapsed Time = 00:00:01
```

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.7
1        National Geodetic Survey,   Retrieval Date = APRIL 20, 2015
 QD1339 ***********************************************************************
 QD1339  DESIGNATION -  V 735
 QD1339  PID         -  QD1339
 QD1339  STATE/COUNTY-  OR/DESCHUTES
 QD1339  COUNTRY     -  US
 QD1339  USGS QUAD   -  SISTERS (1988)
 QD1339
 QD1339                         *CURRENT SURVEY CONTROL
 QD1339  ______________________________________________________________________
 QD1339* NAD 83(1986) POSITION- 44 16 46.28   (N) 121 33 00.87   (W)    HD_HELD1
 QD1339* NAVD 88 ORTHO HEIGHT -   980.511 (meters)     3216.89  (feet) ADJUSTED
 QD1339  ______________________________________________________________________
 QD1339  GEOID HEIGHT    -        -21.35  (meters)                      GEOID12B
 QD1339  DYNAMIC HEIGHT  -        980.159 (meters)     3215.74  (feet) COMP
 QD1339  MODELED GRAVITY -    980,226.6   (mgal)                        NAVD 88
 QD1339
 QD1339  VERT ORDER      -  FIRST     CLASS II
 QD1339
 QD1339.The horizontal coordinates were determined by differentially corrected
 QD1339.hand held GPS observations or other comparable positioning techniques
 QD1339.and have an estimated accuracy of +/- 3 meters.
 QD1339.
 QD1339.The orthometric height was determined by differential leveling and
 QD1339.adjusted by the NATIONAL GEODETIC SURVEY
 QD1339.in June 1991.
 QD1339
 QD1339.The dynamic height is computed by dividing the NAVD 88
 QD1339.geopotential number by the normal gravity value computed on the
 QD1339.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 QD1339.degrees latitude (g = 980.6199 gals.).
 QD1339
 QD1339.The modeled gravity was interpolated from observed gravity values.
 QD1339
 QD1339;                    North         East     Units  Estimated Accuracy
 QD1339;SPC OR S     -   290,789.7   1,416,155.8     MT  (+/- 3 meters HH1 GPS)
 QD1339
 QD1339                          SUPERSEDED SURVEY CONTROL
 QD1339
 QD1339.No superseded survey control is available for this station.
 QD1339
 QD1339_U.S. NATIONAL GRID SPATIAL ADDRESS: 10TFQ1568603941(NAD 83)
 QD1339
 QD1339_MARKER: I = METAL ROD
 QD1339_SETTING: 15 = METAL ROD DRIVEN INTO GROUND. SEE TEXT FOR ADDITIONAL
 QD1339+WITH SETTING: INFORMATION.
 QD1339_SP_SET: SHALLOW-SET METAL ROD
```

```
QD1339_STAMPING: V 735 1987
QD1339_MARK LOGO: NGS
QD1339_PROJECTION: FLUSH
QD1339_STABILITY: B = PROBABLY HOLD POSITION/ELEVATION WELL
QD1339_ROD/PIPE-DEPTH: 1.7  meters
QD1339
QD1339  HISTORY      - Date      Condition         Report By
QD1339  HISTORY      - 1987      MONUMENTED        NGS
QD1339
QD1339                            STATION DESCRIPTION
QD1339
QD1339'DESCRIBED BY NATIONAL GEODETIC SURVEY 1987
QD1339'1.4 KM (0.85 MI) SOUTH FROM SISTERS.
QD1339'0.1 KM (0.05 MI) WEST ALONG U.S. HIGHWAY 20 FROM ITS JUNCTION WITH FIR
QD1339'STREET IN SISTERS, THENCE 1.3 KM (0.80 MI) SOUTH ALONG ELM STREET
QD1339'(COUNTY ROAD 16), 14.5 M (47.6 FT) WEST OF THE CENTERLINE OF THE
QD1339'COUNTY ROAD, AND 7.4 M (24.3 FT) SOUTH OF THE CENTER OF A DIRT DRIVE
QD1339'LEADING WEST. NOTE--ACCESS TO DATUM POINT IS HAD THROUGH A 5-INCH
QD1339'LOGO CAP.
QD1339'THE MARK IS 0.2 METERS  E FROM  A WITNESS POST
QD1339'THE MARK IS ABOVE LEVEL WITH THE ROAD.

*** retrieval complete.
Elapsed Time = 00:00:01
```

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.7
1        National Geodetic Survey,   Retrieval Date = APRIL 20, 2015
 QD1039 ***********************************************************************
 QD1039  DESIGNATION -  X 359
 QD1039  PID         -  QD1039
 QD1039  STATE/COUNTY-  OR/DESCHUTES
 QD1039  COUNTRY     -  US
 QD1039  USGS QUAD   -  THREE CREEK BUTTE (1988)
 QD1039
 QD1039                          *CURRENT SURVEY CONTROL
 QD1039  ______________________________________________________________________
 QD1039* NAD 83(1986) POSITION- 44 13 33.91    (N) 121 34 23.11    (W)    HD_HELD1
 QD1039* NAVD 88 ORTHO HEIGHT -  1166.384 (meters)      3826.71   (feet) ADJUSTED
 QD1039  ______________________________________________________________________
 QD1039  GEOID HEIGHT    -        -21.13  (meters)                        GEOID12B
 QD1039  DYNAMIC HEIGHT  -       1165.940 (meters)      3825.25   (feet) COMP
 QD1039  MODELED GRAVITY -    980,197.7   (mgal)                          NAVD 88
 QD1039
 QD1039  VERT ORDER      -  SECOND    CLASS 0
 QD1039
 QD1039.The horizontal coordinates were determined by differentially corrected
 QD1039.hand held GPS observations or other comparable positioning techniques
 QD1039.and have an estimated accuracy of +/- 3 meters.
 QD1039.
 QD1039.The orthometric height was determined by differential leveling and
 QD1039.adjusted by the NATIONAL GEODETIC SURVEY
 QD1039.in June 1991.
 QD1039
 QD1039.Photographs are available for this station.
 QD1039
 QD1039.The dynamic height is computed by dividing the NAVD 88
 QD1039.geopotential number by the normal gravity value computed on the
 QD1039.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 QD1039.degrees latitude (g = 980.6199 gals.).
 QD1039
 QD1039.The modeled gravity was interpolated from observed gravity values.
 QD1039
 QD1039;                    North         East     Units  Estimated Accuracy
 QD1039;SPC OR S     -   284,875.2   1,414,256.1     MT  (+/- 3 meters HH1 GPS)
 QD1039
 QD1039                          SUPERSEDED SURVEY CONTROL
 QD1039
 QD1039  NGVD 29 (??/??/92) 1165.202  (m)          3822.83    (f) ADJ UNCH    2 0
 QD1039
 QD1039.Superseded values are not recommended for survey control.
 QD1039
 QD1039.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 QD1039.See file dsdata.txt to determine how the superseded data were derived.
```

```
QD1039
QD1039_U.S. NATIONAL GRID SPATIAL ADDRESS: 10TFP1396697974(NAD 83)
QD1039
QD1039_MARKER: DB = BENCH MARK DISK
QD1039_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
QD1039_SP_SET: SET IN TOP OF CONCRETE MONUMENT
QD1039_STAMPING: X 359 1942
QD1039_MARK LOGO: CGS
QD1039_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
QD1039+STABILITY: SURFACE MOTION
QD1039
QD1039  HISTORY     - Date     Condition        Report By
QD1039  HISTORY     - 1942     MONUMENTED       CGS
QD1039
QD1039                          STATION DESCRIPTION
QD1039
QD1039'DESCRIBED BY COAST AND GEODETIC SURVEY 1942
QD1039'5.6 MI S FROM SISTERS.
QD1039'5.6 MILE SOUTH OF POST OFFICE ALONG ELK LAKE ROAD, 3.0 MILES NORTH OF
QD1039'BLACK PINE SPRING, 100 FEET SOUTHWEST OF HILL WHERE ROAD BREAKS OVER
QD1039'TO GO INTO CANYON, 34 FEET WEST OF CENTER LINE OF ROAD.  WITNESS POST
QD1039'SET.

*** retrieval complete.
Elapsed Time = 00:00:07
```

Shared Solution

PID: CS4129
Designation: BLACK BUTTE 2 RM 2
Stamping:
Stability:
Setting:
Mark Condition: G
Description: Mark PID CS4129
Designation: BLACK BUTTE 2 RM 2 found in good condition.
Primary station Black Butte 2 (QD1848) has been destroyed. RM No. 1 has been destroyed as well (only the disk stem remains). RM No. 2 (CS4129) observed this survey. Located at the crest of the summit of Black Butte in a boulder and ~4 m right of the trail. Mark is suitable for GNSS observation. From the Black Butte trail head hike 2 miles up the trail to the summit.
Stamping: No. 2 1958
Ref Mark Disk
80= In a boulder
Observed: 2014-08-22T16:23:00Z See Also 1958
Source: OPUS - page5 1209.04

Close-up View

REF_FRAME:	EPOCH:	SOURCE:	UNITS:	SET PROFILE	DETAILS
NAD_83(2011)	2010.0000	NAVD88 (Computed using GEOID12A)	m		

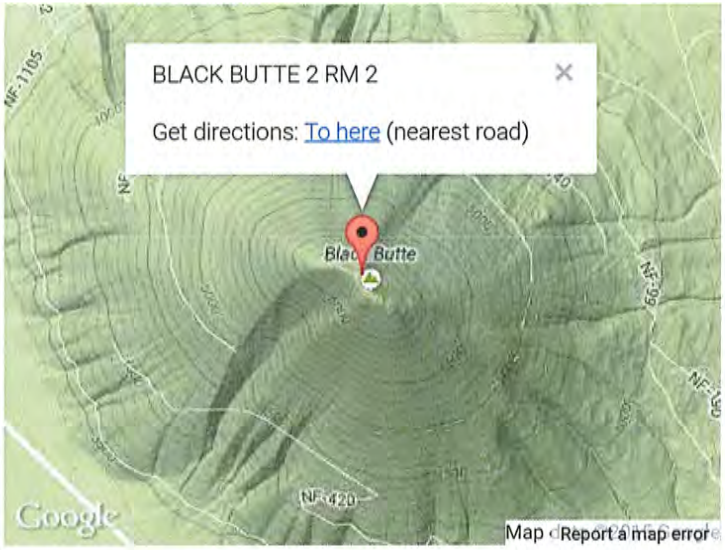
LAT:	44° 23' 59.13599"	± 0.004 m
LON:	-121° 38' 7.31330"	± 0.013 m
ELL HT:	1941.081	± 0.010 m
X:	-2394864.740	± 0.009 m
Y:	-3887418.653	± 0.011 m
Z:	4441294.727	± 0.009 m
ORTHO HT:	1962.457	± 0.023 m

	UTM 10	SPC 3601(OR N)
NORTHING:	4917180.404m	82099.444m
EASTING:	608671.369m	2409554.795m
CONVERGENCE:	0.95487425°	-0.80518484°
POINT SCALE:	0.99974523	0.99998394
COMBINED FACTOR:	0.99944104	0.99967968

CONTRIBUTED BY

mark.l.armstrong
National Geodetic Survey

Horizon View



The numerical values for this position solution have satisfied the quality control criteria of the National Geodetic Survey. The contributor has verified that the information submitted is accurate and complete.

Shared Solution

PID: QD1000
Designation: C 15
Stamping: C 15 26
Stability: Most reliable; expected to hold position well
Setting: In rock outcrop or ledge
Mark Condition: G
Description: Mark found in good condition and is suitable for GNSS occupation. Disk is in protruding boulder in a lava flow ~5 m south of edge of pavement of hwy. 242 (Old McKenzie Hwy). Mark appears undisturbed.
Observed: 2014-08-17T13:57:00Z See Also 1943
Source: OPUS - page5 1209.04

Close-up View

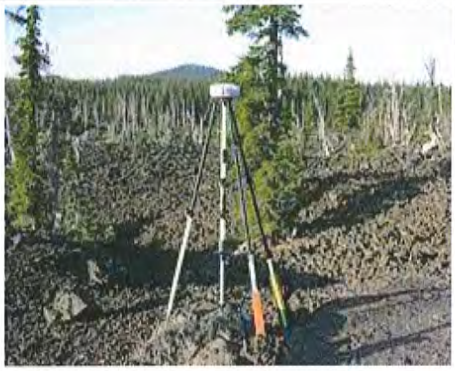
REF_FRAME:	EPOCH:	SOURCE:	UNITS:	SET PROFILE	DETAILS
NAD_83(2011)	2010.0000	NAVD88 (Computed using GEOID12A)	m		

LAT:	44° 15' 3.48104"	± 0.017 m
LON:	-121° 49' 39.06537"	± 0.002 m
ELL HT:	1563.288	± 0.007 m
X:	-2413840.092	± 0.006 m
Y:	-3888953.749	± 0.006 m
Z:	4429199.582	± 0.016 m
ORTHO HT:	1584.177	± 0.018 m

	UTM 10	SPC 3602(OR S)
NORTHING:	4900416.176m	287931.148m
EASTING:	593605.724m	1393971.312m
CONVERGENCE:	0.81822002°	-0.90821805°
POINT SCALE:	0.99970776	1.00007349
COMBINED FACTOR:	0.99946277	0.99982841

CONTRIBUTED BY

mark.l.armstrong
National Geodetic Survey



Horizon View

The numerical values for this position solution have satisfied the quality control criteria of the National Geodetic Survey. The contributor has verified that the information submitted is accurate and complete.

Shared Solution

PID: QD0998
Designation: C 16
Stamping: 16 26
Stability: May hold commonly subject to ground movement
Setting: In a boulder
Mark Condition: G
Description: Mark was found in good condition and suitable for GNSS occupation. Mark is located ~7 m north of hwy. 242 (Old McKenzie Hwy.) Mark is located in large lava flow ledge (not a boulder as orig described in IDB datasheet). Mark is level and appears undisturbed.
Observed: 2014-08-17T13:49:00Z See Also 1943
Source: OPUS - page5 1209.04

Close-up View

REF_FRAME:	EPOCH:	SOURCE:	UNITS:	SET PROFILE	DETAILS
NAD_83(2011)	2010.0000	NAVD88 (Computed using GEOID12A)	m		

LAT:	44° 14' 25.90598"	± 0.012 m
LON:	-121° 51' 15.89655"	± 0.014 m
ELL HT:	1515.190	± 0.037 m
X:	-2416074.497	± 0.023 m
Y:	-3888478.392	± 0.014 m
Z:	4428335.005	± 0.028 m
ORTHO HT:	1536.125	± 0.065 m

	UTM 10	SPC 3602(OR S)
NORTHING:	4899226.531m	286805.830m
EASTING:	591474.511m	1391804.437m
CONVERGENCE:	0.79929738°	-0.92661993°
POINT SCALE:	0.99970291	1.00007005
COMBINED FACTOR:	0.99946545	0.99983251

CONTRIBUTED BY

mark.l.armstrong
National Geodetic Survey


Horizon View

The numerical values for this position solution have satisfied the quality control criteria of the National Geodetic Survey. The contributor has verified that the information submitted is accurate and complete.

Shared Solution

PID: QD1145
Designation: H 3
Stamping: 3736 23 H 3 1934
Stability: May hold commonly subject to ground movement
Setting: Set in top of concrete monument
Mark Condition: G
Description: Mark found in good condition and suitable for GNSS occupation. Mark is located at Santiam Junction in the "Y" intersection of Hwy. 126 and Hwy. 20. On the north side of Hwy. 126 at the edge of small trees. A USBM sign is 0.3 m north of the mark.
Observed: 2014-08-18T14:00:00Z See Also 1963
Source: OPUS - page5 1209.04

Close-up View

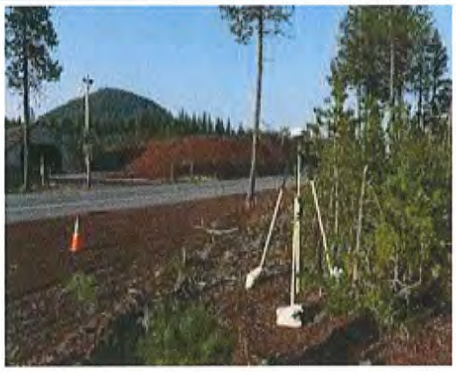
REF_FRAME:	EPOCH:	SOURCE:	UNITS:	SET PROFILE	DETAILS
NAD_83(2011)	2010.0000	NAVD88 (Computed using GEOID12A)	m		

LAT:	44° 26' 10.65449"	± 0.005 m
LON:	-121° 56' 38.16599"	± 0.008 m
ELL HT:	1118.458	± 0.017 m
X:	-2413951.359	± 0.012 m
Y:	-3871554.501	± 0.006 m
Z:	4443619.226	± 0.014 m
ORTHO HT:	1139.832	± 0.033 m

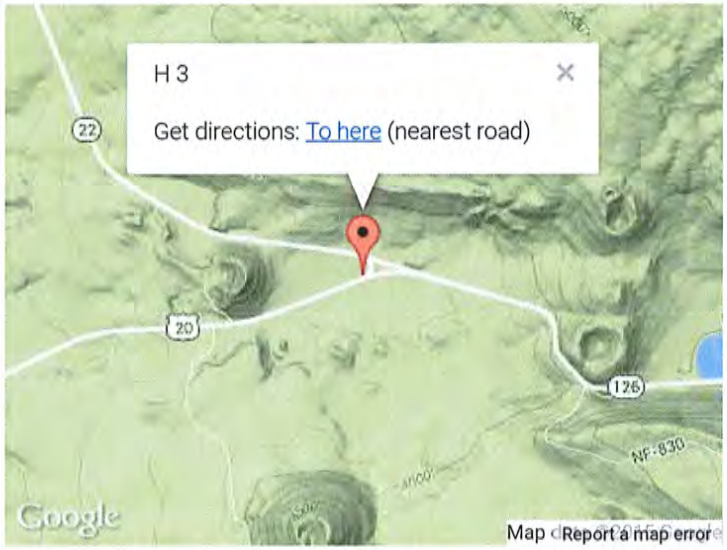
	UTM 10	**SPC** 3601(OR N)
NORTHING:	4920875.106m	86550.648m
EASTING:	584046.262m	2385048.424m
CONVERGENCE:	0.73941089°	-1.02401851°
POINT SCALE:	0.99968687	0.99997566
COMBINED FACTOR:	0.99951158	0.99980032

CONTRIBUTED BY

mark.l.armstrong
National Geodetic Survey



Horizon View



The numerical values for this position solution have satisfied the quality control criteria of the National Geodetic Survey. The contributor has verified that the information submitted is accurate and complete.

Shared Solution

PID: BBCL16
Designation: P385
Stamping: NONE
Stability: Most reliable; expected to hold position well
Setting: Unspecified setting
Description: P385 (santiamjctor2007) is a UNAVCO Plate Boundary Observatory active station that provides a data stream to the ORGN real-time network. For more information on this station see the following link:

http://pboweb.unavco.org/shared/scripts/stations/?checkkey=P385

Observed: 2011-07-05T00:00:00Z See Also Original
Source: OPUS - page5 1209.04

Close-up View

REF_FRAME:	EPOCH:	SOURCE:	UNITS:	SET PROFILE	DETAILS
NAD_83(2011)	2010.0000	NAVD88 (Computed using GEOID12A)	m		

LAT:	44° 26' 5.43915"	± 0.001 m
LON:	-121° 56' 44.94369"	± 0.002 m
ELL HT:	1121.229	± 0.006 m
X:	-2414139.265	± 0.003 m
Y:	-3871572.509	± 0.004 m
Z:	4443506.199	± 0.004 m
ORTHO HT:	1142.610	± 0.018 m

	UTM 10	SPC 3601(OR N)
NORTHING:	4920712.257m	86392.377m
EASTING:	583898.501m	2384895.678m
CONVERGENCE:	0.73807353°	-1.02535369°
POINT SCALE:	0.99968656	0.99997598
COMBINED FACTOR:	0.99951084	0.99980021

CONTRIBUTED BY

mark.l.armstrong
National Geodetic Survey

Horizon View

The numerical values for this position solution have satisfied the quality control criteria of the National Geodetic Survey. The contributor has verified that the information submitted is accurate and complete.

Shared Solution

PID: BBCL34
Designation: P387
Stamping: NONE
Stability: Most reliable; expected to hold position well
Setting: Unspecified setting
Description: P387 (sistershslor2006) is a UNAVCO Plate Boundary Observatory active station that provides a data stream to the ORGN real-time network. For more information please see the following link:

http://pboweb.unavco.org/shared/scripts/stations/?checkkey=P387

Observed: 2011-07-05T00:00:00Z See Also Original
Source: OPUS - page5 1209.04

Close-up View

REF_FRAME:	EPOCH:	SOURCE:	UNITS:	SET PROFILE	DETAILS
NAD_83(2011)	2010.0000	NAVD88 (Computed using GEOID12A)	m		

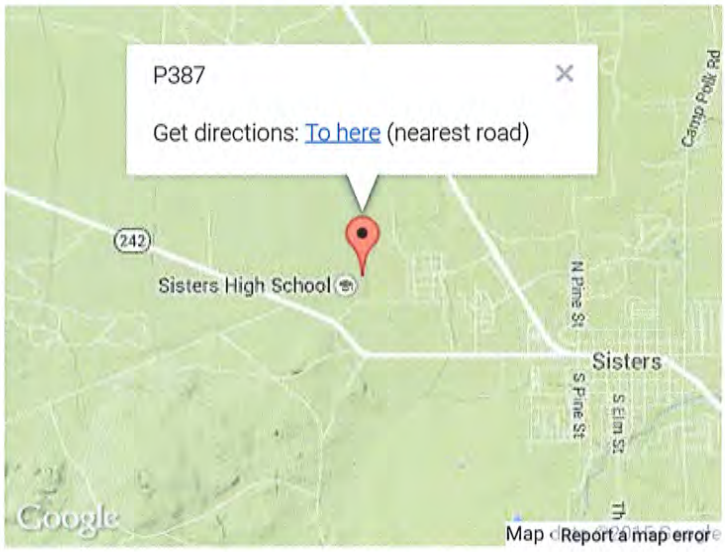
LAT:	44° 17' 48.30676"	± 0.002 m
LON:	-121° 34' 28.05875"	± 0.001 m
ELL HT:	963.037	± 0.005 m
X:	-2394555.309	± 0.002 m
Y:	-3896184.427	± 0.005 m
Z:	4432423.991	± 0.003 m
ORTHO HT:	984.400	± 0.017 m

UTM	10	**SPC** 3602(OR S)
NORTHING:	4905821.374m	292728.804m
EASTING:	613720.456m	1414247.006m
CONVERGENCE:	0.99566689°	-0.73508950°
POINT SCALE:	0.99975905	1.00008900
COMBINED FACTOR:	0.99960811	0.99993801

CONTRIBUTED BY

mark.l.armstrong
National Geodetic Survey

Horizon View



The numerical values for this position solution have satisfied the quality control criteria of the National Geodetic Survey. The contributor has verified that the information submitted is accurate and complete.

Shared Solution

PID: QD1869
Designation: SCOTT 2
Stamping:
Stability: May hold commonly subject to ground movement
Setting: In a boulder
Mark Condition: G
Description: Mark found in good condition and suitable for GNSS occupation. RM numbers 1 and 2 also found in fair condition as well. To reach mark hike 4 miles to the summit of Scott Mtn. Park at the trail head at the end of the gravel road at Scott Lake. Access is north off of hwy. 242. See sign on hwy. for Scott Lake turn off. Set up is fixed height 0.180 m spike mount.
Observed: 2014-08-22T16:33:00Z See Also 1958
Source: OPUS - page5 1209.04

Close-up View

REF_FRAME:	EPOCH:	SOURCE:	UNITS:	SET PROFILE	DETAILS
NAD_83(2011)	2010.0000	NAVD88 (Computed using GEOID12A)	m		

LAT:	44° 14' 25.93494" ± 0.008 m	
LON:	-121° 54' 54.46719" ± 0.008 m	
ELL HT:	1843.853 ± 0.012 m	
X:	-2420317.755 ± 0.007 m	
Y:	-3886115.327 ± 0.006 m	
Z:	4428564.944 ± 0.012 m	
ORTHO HT:	1864.964 ± 0.025 m	

	UTM 10	**SPC** 3602(OR S)
NORTHING:	4899161.581m	286886.919m
EASTING:	586626.485m	1386954.847m
CONVERGENCE:	0.75693065°	-0.96815730°
POINT SCALE:	0.99969229	1.00007005
COMBINED FACTOR:	0.99940335	0.99978100

CONTRIBUTED BY

mark.l.armstrong
National Geodetic Survey


Horizon View

The numerical values for this position solution have satisfied the quality control criteria of the National Geodetic Survey. The contributor has verified that the information submitted is accurate and complete.

Shared Solution

PID: QD1339
Designation: V 735
Stamping: V 735 1987
Stability: Monument will probably hold position well
Setting: A metal rod driven into ground. Describe below.
Mark Condition: G
Description: Mark found in good condition and suitable for GNSS observations. Mark is located 14.5 m west of the center line of NF Road 16 (also called Elm St and Three Creeks Rd.). Mark is in SW corner of intersection with ranch gravel road and a fiberglass marker post is 0.6 meter west of the mark.
Observed: 2014-08-19T13:58:00Z See Also 2012-10-04
Source: OPUS - page5 1209.04

Close-up View

REF_FRAME:	EPOCH:	SOURCE:	UNITS:	SET PROFILE	DETAILS
NAD_83(2011)	2010.0000	NAVD88 (Computed using GEOID12A)	m		

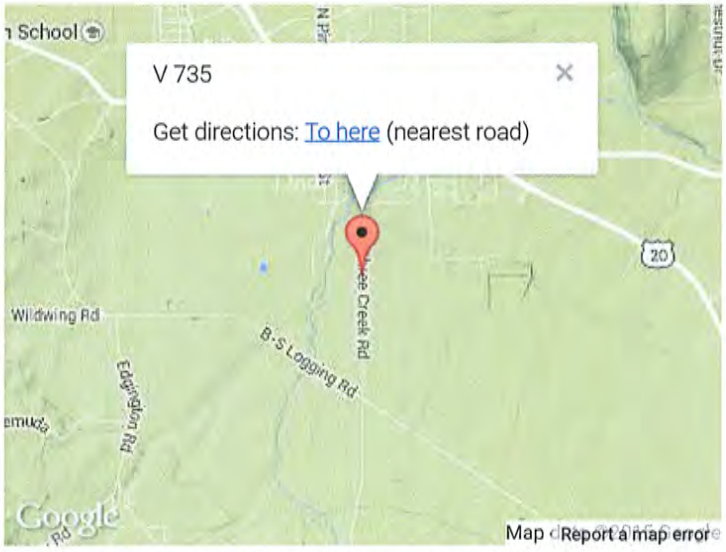
LAT:	44° 16' 46.11582"	± 0.009 m
LON:	-121° 33' 0.64424"	± 0.014 m
ELL HT:	959.120	± 0.028 m
X:	-2393603.890	± 0.011 m
Y:	-3898338.920	± 0.017 m
Z:	4431046.934	± 0.023 m
ORTHO HT:	980.469	± 0.050 m

	UTM 10	SPC 3602(OR S)
NORTHING:	4903936.487m	290784.618m
EASTING:	615691.427m	1416160.768m
CONVERGENCE:	1.01231733°	-0.71847716°
POINT SCALE:	0.99976461	1.00008307
COMBINED FACTOR:	0.99961428	0.99993269

CONTRIBUTED BY

mark.l.armstrong
National Geodetic Survey

Horizon View



The numerical values for this position solution have satisfied the quality control criteria of the National Geodetic Survey. The contributor has verified that the information submitted is accurate and complete.

Shared Solution

PID: QD1039
Designation: X 359
Stamping: X 359 1942
Stability: May hold commonly subject to ground movement
Setting: Set in top of concrete monument
Mark Condition: G
Description: Mark found in fair condition, with cracks in concrete monument holding the disk. Appears to be undisturbed and is suitable for GNSS observation. Mark is ~11 m west of the centerline of FS Road 16 and ~2 m higher that the road.
Observed: 2014-08-20T13:57:00Z See Also 2012-10-22
Source: OPUS - page5 1209.04

Close-up View

REF_FRAME:	EPOCH:	SOURCE:	UNITS:	SET PROFILE	DETAILS
NAD_83(2011)	2010.0000	NAVD88 (Computed using GEOID12A)	m		

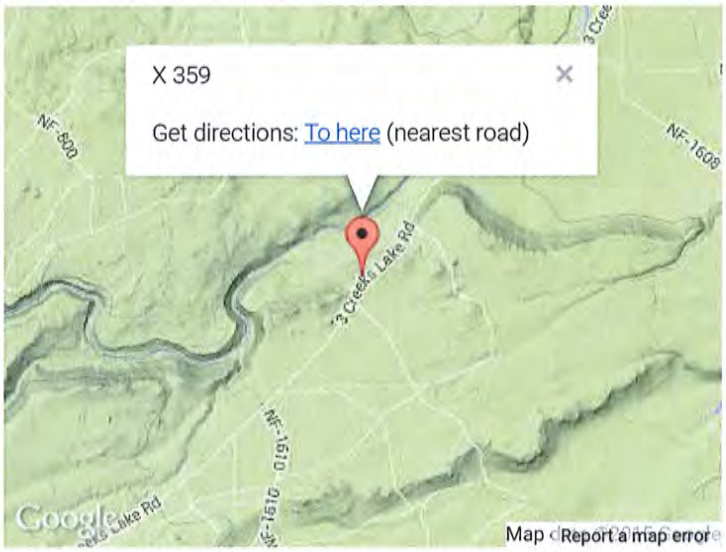
LAT:	44° 13' 33.91415" ± 0.002 m	
LON:	-121° 34' 23.10725" ± 0.006 m	
ELL HT:	1145.238 ± 0.015 m	
X:	-2397399.937 ± 0.008 m	
Y:	-3901022.848 ± 0.012 m	
Z:	4426926.868 ± 0.008 m	
ORTHO HT:	1166.365 ± 0.029 m	

	UTM 10	SPC 3602(OR S)
NORTHING:	4897974.291m	284875.372m
EASTING:	613966.635m	1414256.156m
CONVERGENCE:	0.99536753°	-0.73414851°
POINT SCALE:	0.99975974	1.00006534
COMBINED FACTOR:	0.99958024	0.99988579

CONTRIBUTED BY

mark.l.armstrong
National Geodetic Survey


Horizon View



The numerical values for this position solution have satisfied the quality control criteria of the National Geodetic Survey. The contributor has verified that the information submitted is accurate and complete.

NGS OPUS-PROJECTS NETWORK ADJUSTMENT REPORT

All coordinate accuracies reported here are 1 times the formal uncertainties from the solution. For additional information: geodesy.noaa.gov/OPUS/Using_OPUS-Projects.html#accuracy

These positions were computed without any knowledge by the National Geodetic Survey regarding the equipment or field operating procedures used.

SUBMITTED BY: william.stone
SOLUTION FILE NAME: network-final min con geometric.sum
SOLUTION SOFTWARE: GPSCOM(1210.24)
SOLUTION DATE: 2015-06-07T12:47:49 UTC
STANDARD ERROR OF UNIT WEIGHT: 0.615
TOTAL NUMBER OF OBSERVATIONS: 1274293
TOTAL NUMBER OF MARKS: 16
NUMBER OF CONSTRAINED MARKS: 1

START TIME: 2014-08-17T00:00:00 GPS
STOP TIME: 2014-08-22T23:59:30 GPS
FREQUENCY: L1-ONLY TO ION-FREE [BY BASELINE LENGTH]
OBSERVATION INTERVAL: 30 s
ELEVATION CUTOFF: MIXED
TROPO INTERVAL: 1800 s [STEP-OFFSET PARAMETERIZATION]
DD CORRELATIONS: ON

INCLUDED SOLUTION	RMS	SOFTWARE	RUN DATE
1) 2014-229 A	1.2 cm	page5(1404.11)	2015-06-05T16:31 UTC
2) 2014-229 B	1.2 cm	page5(1404.11)	2015-06-05T16:35 UTC
3) 2014-230 A	1.1 cm	page5(1404.11)	2015-06-05T16:35 UTC
4) 2014-230 B	1.1 cm	page5(1404.11)	2015-06-05T16:39 UTC
5) 2014-231 A	1.2 cm	page5(1404.11)	2015-06-05T16:40 UTC
6) 2014-231 B	1.2 cm	page5(1404.11)	2015-06-05T16:44 UTC
7) 2014-232 A	1.2 cm	page5(1404.11)	2015-06-05T16:46 UTC
8) 2014-232 B	1.2 cm	page5(1404.11)	2015-06-05T16:50 UTC
9) 2014-234 A	1.1 cm	page5(1404.11)	2015-06-05T16:50 UTC

BASELINE	LENGTH	RMS	OBS	OMITTED	FIXED	IN SOLUTION(S)
h3__-p385	0.220 km	0.5 cm	3902	4.5%	90.9%	3
v735-p387	2.728 km	1.2 cm	3750	10.6%	88.5%	6, 8
x359-p387	7.856 km	1.4 cm	5055	9.5%	89.7%	6, 7
bbr2-p387	12.475 km	1.1 cm	2553	1.5%	100.0%	4
p387-c_15	20.847 km	2.3 cm	2588	0.7%	100.0%	2
sct2-p385	21.746 km	1.7 cm	2802	13.8%	94.4%	9
p385-c_15	22.514 km	1.2 cm	4006	3.5%	100.0%	1
c_16-p385	22.797 km	1.8 cm	2898	21.2%	89.7%	1
c_16-p387	23.220 km	1.9 cm	1502	17.3%	90.9%	2
bbr2-p385	25.050 km	1.2 cm	3709	0.9%	94.7%	9
sct2-p387	27.928 km	1.9 cm	1861	2.7%	92.3%	2
h3__-p387	33.289 km	1.5 cm	2098	3.1%	100.0%	4
p387-p385	33.348 km	1.2 cm	155315	1.4%	96.4%	1, 2, 3,...
redm-p387	34.307 km	1.1 cm	83137	1.0%	98.2%	2, 4, 6,...
v735-p385	35.964 km	1.7 cm	2994	10.6%	87.0%	5
x359-p385	37.715 km	1.8 cm	3439	4.3%	86.4%	5
redm-p385	66.544 km	1.1 cm	72716	0.5%	98.2%	1, 3, 5, 9
lpsb-p385	100.864 km	1.0 cm	71170	1.5%	98.4%	1, 3, 5, 9
lpsb-p387	124.247 km	1.2 cm	81460	1.3%	99.0%	2, 4, 6,...

```
 rsbg-p385    175.215 km      1.2 cm    71892     0.5%    97.3%    1, 3, 5, 9
 gobs-p385    179.630 km      1.1 cm    72196     0.4%    96.8%    1, 3, 5, 9
 gobs-p387    181.535 km      1.2 cm    82461     0.7%    93.2%    2, 4, 6,...
 rsbg-p387    185.940 km      1.2 cm    81248     0.9%    97.5%    2, 4, 6,...
 ors1-p387    201.554 km      1.1 cm    81781     1.1%    98.6%    2, 4, 6,...
 ork5-p387    223.240 km      1.2 cm    82090     1.1%    98.6%    2, 4, 6,...
 ors1-p385    232.369 km      1.1 cm    71322     0.9%    97.7%    1, 3, 5, 9
 ork5-p385    239.505 km      1.2 cm    71624     1.1%    98.1%    1, 3, 5, 9
 fts5-p385    252.064 km      1.1 cm    71515     0.3%    99.1%    1, 3, 5, 9
 fts5-p387    282.683 km      1.2 cm    81209     0.8%    94.5%    2, 4, 6,...

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
UNCONSTRAINED MARKS
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

MARK:      bbr2 (bbr2    1)

REF FRAME:         NAD_83(2011) (2010.0000)                 IGS08 (2014.6362)
X:                -2394864.734 m    0.001 m          -2394865.600 m    0.001 m
Y:                -3887418.648 m    0.001 m          -3887417.431 m    0.001 m
Z:                 4441294.725 m    0.001 m           4441294.733 m    0.001 m
LAT:            44 23 59.13611      0.000 m       44 23 59.14950      0.000 m
E LON:         238 21 52.68681      0.000 m      238 21 52.62468      0.000 m
W LON:         121 38 07.31319      0.000 m      121 38 07.37532      0.000 m
EL HGT:              1941.074 m    0.001 m             1940.664 m    0.001 m
ORTHO HGT:           1962.450 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                 UTM COORDINATES    STATE PLANE COORDINATES
                  UTM (Zone 10)         SPC (3601 OR N)
NORTHING (Y)       4917180.407 m          82099.447 m
EASTING (X)         608671.371 m        2409554.797 m
CONVERGENCE         0.95487428 deg      -0.80518482 deg
POINT SCALE         0.99974523           0.99998394
COMBINED FACTOR     0.99944104           0.99967968

US NATIONAL GRID DESIGNATOR: 10TFQ0867117180 (NAD 83)

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MARK:      c_15 (c_15    1)

REF FRAME:         NAD_83(2011) (2010.0000)                 IGS08 (2014.6268)
X:                -2413840.092 m    0.001 m          -2413840.953 m    0.001 m
Y:                -3888953.740 m    0.001 m          -3888952.521 m    0.001 m
Z:                 4429199.572 m    0.001 m           4429199.583 m    0.001 m
LAT:            44 15 03.48098      0.000 m       44 15 03.49438      0.000 m
E LON:         238 10 20.93441      0.000 m      238 10 20.87247      0.000 m
W LON:         121 49 39.06559      0.000 m      121 49 39.12753      0.000 m
EL HGT:              1563.275 m    0.001 m             1562.866 m    0.001 m
ORTHO HGT:           1584.164 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                 UTM COORDINATES    STATE PLANE COORDINATES
                  UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)       4900416.174 m          287931.147 m
EASTING (X)         593605.719 m        1393971.307 m
CONVERGENCE         0.81821998 deg      -0.90821809 deg
POINT SCALE         0.99970776           1.00007349
COMBINED FACTOR     0.99946277           0.99982841

US NATIONAL GRID DESIGNATOR: 10TEQ9360500416 (NAD 83)
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MARK: c_16 (c_16 1)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6267)	
X:	-2416074.541 m	0.001 m	-2416075.402 m	0.001 m
Y:	-3888478.425 m	0.001 m	-3888477.206 m	0.001 m
Z:	4428335.039 m	0.001 m	4428335.050 m	0.001 m
LAT:	44 14 25.90561	0.000 m	44 14 25.91901	0.000 m
E LON:	238 08 44.10255	0.000 m	238 08 44.04060	0.000 m
W LON:	121 51 15.89745	0.000 m	121 51 15.95940	0.000 m
EL HGT:	1515.251 m	0.002 m	1514.842 m	0.002 m
ORTHO HGT:	1536.186 m	0.015 m	(H = h - N WHERE N = GEOID12A HGT)	

	UTM COORDINATES (Zone 10)	STATE PLANE COORDINATES (SPC (3602 OR S))
NORTHING (Y)	4899226.519 m	286805.818 m
EASTING (X)	591474.491 m	1391804.417 m
CONVERGENCE	0.79929720 deg	-0.92662010 deg
POINT SCALE	0.99970291	1.00007005
COMBINED FACTOR	0.99946544	0.99983250

US NATIONAL GRID DESIGNATOR: 10TEP9147499226 (NAD 83)

++

MARK: fts5 (fts5 a 2)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6312)	
X:	-2469884.456 m	0.000 m	-2469885.297 m	0.000 m
Y:	-3667816.258 m	0.000 m	-3667815.079 m	0.000 m
Z:	4581028.317 m	0.000 m	4581028.373 m	0.000 m
LAT:	46 12 17.58171	0.000 m	46 12 17.59486	0.000 m
E LON:	236 02 38.12167	0.000 m	236 02 38.05842	0.000 m
W LON:	123 57 21.87833	0.000 m	123 57 21.94158	0.000 m
EL HGT:	-13.456 m	0.000 m	-13.768 m	0.000 m
ORTHO HGT:	10.431 m	0.015 m	(H = h - N WHERE N = GEOID12A HGT)	

	UTM COORDINATES (Zone 10)	STATE PLANE COORDINATES (SPC (3601 OR N))
NORTHING (Y)	5117256.114 m	287773.425 m
EASTING (X)	426242.582 m	2233336.431 m
CONVERGENCE	-0.69014596 deg	-2.45100170 deg
POINT SCALE	0.99966687	1.00005858
COMBINED FACTOR	0.99966898	1.00006069

US NATIONAL GRID DESIGNATOR: 10TDS2624217256 (NAD 83)

++

MARK: gobs (gobs a 5)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6312)	
X:	-2280400.264 m	0.000 m	-2280401.135 m	0.000 m
Y:	-3823182.589 m	0.000 m	-3823181.382 m	0.000 m
Z:	4553230.216 m	0.000 m	4553230.225 m	0.000 m
LAT:	45 50 19.73099	0.000 m	45 50 19.74490	0.000 m
E LON:	239 11 07.22427	0.000 m	239 11 07.16098	0.000 m
W LON:	120 48 52.77573	0.000 m	120 48 52.83902	0.000 m

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EL HGT:               621.875 m    0.000 m             621.470 m    0.000 m
ORTHO HGT:            642.686 m    0.017 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (4602 WA S)
NORTHING (Y)      5078461.190 m          56233.373 m
EASTING (X)        669705.473 m         475554.819 m
CONVERGENCE        1.56809788 deg      -0.22856764 deg
POINT SCALE        0.99995407           0.99999876
COMBINED FACTOR    0.99985659           0.99990128

US NATIONAL GRID DESIGNATOR: 10TFR6970578461 (NAD 83)

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MARK:      h3__ (h3__    1)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6295)
X:               -2413951.362 m    0.001 m         -2413952.223 m    0.001 m
Y:               -3871554.499 m    0.001 m         -3871553.282 m    0.001 m
Z:                4443619.229 m    0.001 m          4443619.242 m    0.001 m
LAT:           44 26 10.65457      0.000 m       44 26 10.66797      0.000 m
E LON:        238 03 21.83385      0.000 m      238 03 21.77171      0.000 m
W LON:        121 56 38.16615      0.000 m      121 56 38.22829      0.000 m
EL HGT:            1118.460 m    0.001 m             1118.057 m    0.001 m
ORTHO HGT:         1139.834 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3601 OR N)
NORTHING (Y)      4920875.108 m          86550.650 m
EASTING (X)        584046.258 m        2385048.421 m
CONVERGENCE        0.73941086 deg      -1.02401854 deg
POINT SCALE        0.99968687           0.99997566
COMBINED FACTOR    0.99951158           0.99980032

US NATIONAL GRID DESIGNATOR: 10TEQ8404620875 (NAD 83)

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MARK:      lpsb (lpsb a  1)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6312)
X:               -2506818.083 m    0.000 m         -2506818.940 m    0.000 m
Y:               -3846908.510 m    0.000 m         -3846907.289 m    0.000 m
Z:                4412266.230 m    0.000 m          4412266.252 m    0.000 m
LAT:           44 03 04.40891      0.000 m       44 03 04.42193      0.000 m
E LON:        236 54 35.75147      0.000 m      236 54 35.68924      0.000 m
W LON:        123 05 24.24853      0.000 m      123 05 24.31076      0.000 m
EL HGT:            118.089 m    0.000 m             117.705 m    0.000 m
ORTHO HGT:         141.364 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4877566.224 m          268104.846 m
EASTING (X)        492785.011 m        1292469.539 m
CONVERGENCE       -0.06262514 deg      -1.77198890 deg
POINT SCALE        0.99960064           1.00001342
COMBINED FACTOR    0.99958213           0.99999490

US NATIONAL GRID DESIGNATOR: 10TDP9278577566 (NAD 83)
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MARK: ork5 (ork5 a 1)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6312)	
X:	-2481437.756 m	0.000 m	-2481438.626 m	0.000 m
Y:	-4022606.895 m	0.000 m	-4022605.647 m	0.000 m
Z:	4270236.714 m	0.000 m	4270236.698 m	0.000 m
LAT:	42 17 19.71876	0.000 m	42 17 19.73157	0.000 m
E LON:	238 19 50.45860	0.000 m	238 19 50.39770	0.000 m
W LON:	121 40 09.54140	0.000 m	121 40 09.60230	0.000 m
EL HGT:	1258.815 m	0.000 m	1258.356 m	0.000 m
ORTHO HGT:	1281.283 m	0.015 m	(H = h - N WHERE N = GEOID12A HGT)	

	UTM COORDINATES (Zone 10)	STATE PLANE COORDINATES (SPC (3602 OR S))
NORTHING (Y)	4682700.639 m	69784.405 m
EASTING (X)	609705.218 m	1403562.521 m
CONVERGENCE	0.89546313 deg	-0.79998518 deg
POINT SCALE	0.99974808	1.00001151
COMBINED FACTOR	0.99955074	0.99981412

US NATIONAL GRID DESIGNATOR: 10TFM0970582700 (NAD 83)

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MARK: ors1 (ors1 a 1)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6312)	
X:	-2226385.014 m	0.000 m	-2226385.884 m	0.000 m
Y:	-4006811.866 m	0.000 m	-4006810.638 m	0.000 m
Z:	4422203.069 m	0.000 m	4422203.056 m	0.000 m
LAT:	44 09 51.27394	0.000 m	44 09 51.28832	0.000 m
E LON:	240 56 28.53972	0.000 m	240 56 28.47867	0.000 m
W LON:	119 03 31.46028	0.000 m	119 03 31.52133	0.000 m
EL HGT:	1438.099 m	0.000 m	1437.623 m	0.000 m
ORTHO HGT:	1456.356 m	0.015 m	(H = h - N WHERE N = GEOID12A HGT)	

	UTM COORDINATES (Zone 11)	STATE PLANE COORDINATES (SPC (3601 OR N))
NORTHING (Y)	4892175.994 m	56321.675 m
EASTING (X)	335397.355 m	2615277.981 m
CONVERGENCE	-1.43468059 deg	1.02212217 deg
POINT SCALE	0.99993323	1.00004685
COMBINED FACTOR	0.99970780	0.99982139

US NATIONAL GRID DESIGNATOR: 11TLJ3539792175 (NAD 83)

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MARK: p385 (p385 1)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6315)	
X:	-2414139.270 m	0.000 m	-2414140.131 m	0.000 m
Y:	-3871572.510 m	0.000 m	-3871571.294 m	0.000 m
Z:	4443506.200 m	0.000 m	4443506.214 m	0.000 m
LAT:	44 26 05.43910	0.000 m	44 26 05.45249	0.000 m
E LON:	238 03 15.05614	0.000 m	238 03 14.99402	0.000 m
W LON:	121 56 44.94386	0.000 m	121 56 45.00598	0.000 m

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EL HGT:              1121.233 m    0.000 m             1120.830 m    0.000 m
ORTHO HGT:           1142.614 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3601 OR N)
NORTHING (Y)      4920712.255 m          86392.375 m
EASTING (X)        583898.498 m        2384895.674 m
CONVERGENCE        0.73807349 deg      -1.02535372 deg
POINT SCALE        0.99968656           0.99997598
COMBINED FACTOR    0.99951084           0.99980021

US NATIONAL GRID DESIGNATOR: 10TEQ8389820712 (NAD 83)

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MARK:      p387 (p387    1)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6310)
X:                -2394555.310 m    0.000 m         -2394556.175 m    0.000 m
Y:                -3896184.423 m    0.000 m         -3896183.204 m    0.000 m
Z:                 4432423.989 m    0.000 m          4432423.996 m    0.000 m
LAT:           44 17 48.30677      0.000 m       44 17 48.32018      0.000 m
E LON:        238 25 31.94112      0.000 m      238 25 31.87908      0.000 m
W LON:        121 34 28.05888      0.000 m      121 34 28.12092      0.000 m
EL HGT:              963.033 m    0.000 m              962.619 m    0.000 m
ORTHO HGT:           984.396 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4905821.374 m          292728.805 m
EASTING (X)        613720.453 m        1414247.003 m
CONVERGENCE        0.99566686 deg      -0.73508952 deg
POINT SCALE        0.99975905           1.00008900
COMBINED FACTOR    0.99960811           0.99993801

US NATIONAL GRID DESIGNATOR: 10TFQ1372005821 (NAD 83)

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MARK:      rsbg (rsbg a  1)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6312)
X:                -2559295.129 m    0.000 m         -2559295.989 m    0.000 m
Y:                -3887370.497 m    0.000 m         -3887369.265 m    0.000 m
Z:                 4346652.907 m    0.000 m          4346652.926 m    0.000 m
LAT:           43 14 06.04988      0.000 m       43 14 06.06267      0.000 m
E LON:        236 38 26.27215      0.000 m      236 38 26.21029      0.000 m
W LON:        123 21 33.72785      0.000 m      123 21 33.78971      0.000 m
EL HGT:              135.623 m    0.000 m              135.231 m    0.000 m
ORTHO HGT:           159.324 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4786975.907 m          178180.060 m
EASTING (X)        470820.310 m        1267804.317 m
CONVERGENCE       -0.24616668 deg      -1.95622965 deg
POINT SCALE        0.99961047           0.99989528
COMBINED FACTOR    0.99958921           0.99987401

US NATIONAL GRID DESIGNATOR: 10TDN7082086975 (NAD 83)
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MARK: sct2 (sct2 1)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6352)	
X:	-2420317.758 m	0.001 m	-2420318.618 m	0.001 m
Y:	-3886115.315 m	0.001 m	-3886114.095 m	0.001 m
Z:	4428564.938 m	0.001 m	4428564.949 m	0.001 m
LAT:	44 14 25.93499	0.000 m	44 14 25.94837	0.000 m
E LON:	238 05 05.53241	0.000 m	238 05 05.47046	0.000 m
W LON:	121 54 54.46759	0.000 m	121 54 54.52954	0.000 m
EL HGT:	1843.842 m	0.002 m	1843.434 m	0.002 m
ORTHO HGT:	1864.953 m	0.015 m	(H = h - N WHERE N = GEOID12A HGT)	

	UTM COORDINATES UTM (Zone 10)	STATE PLANE COORDINATES SPC (3602 OR S)
NORTHING (Y)	4899161.583 m	286886.921 m
EASTING (X)	586626.476 m	1386954.838 m
CONVERGENCE	0.75693058 deg	-0.96815738 deg
POINT SCALE	0.99969229	1.00007005
COMBINED FACTOR	0.99940335	0.99978100

US NATIONAL GRID DESIGNATOR: 10TEP8662699161 (NAD 83)

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MARK: v735 (v735 1)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6332)	
X:	-2393603.897 m	0.001 m	-2393604.762 m	0.001 m
Y:	-3898338.928 m	0.001 m	-3898337.709 m	0.001 m
Z:	4431046.952 m	0.001 m	4431046.959 m	0.001 m
LAT:	44 16 46.11600	0.000 m	44 16 46.12942	0.000 m
E LON:	238 26 59.35568	0.000 m	238 26 59.29367	0.000 m
W LON:	121 33 00.64432	0.000 m	121 33 00.70633	0.000 m
EL HGT:	959.140 m	0.002 m	958.725 m	0.002 m
ORTHO HGT:	980.489 m	0.015 m	(H = h - N WHERE N = GEOID12A HGT)	

	UTM COORDINATES UTM (Zone 10)	STATE PLANE COORDINATES SPC (3602 OR S)
NORTHING (Y)	4903936.493 m	290784.623 m
EASTING (X)	615691.425 m	1416160.766 m
CONVERGENCE	1.01231731 deg	-0.71847718 deg
POINT SCALE	0.99976461	1.00008307
COMBINED FACTOR	0.99961427	0.99993269

US NATIONAL GRID DESIGNATOR: 10TFQ1569103936 (NAD 83)

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MARK: x359 (x359 1)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6331)	
X:	-2397399.936 m	0.001 m	-2397400.800 m	0.001 m
Y:	-3901022.847 m	0.001 m	-3901021.627 m	0.001 m
Z:	4426926.871 m	0.001 m	4426926.878 m	0.001 m
LAT:	44 13 33.91425	0.000 m	44 13 33.92768	0.000 m
E LON:	238 25 36.89276	0.000 m	238 25 36.83080	0.000 m
W LON:	121 34 23.10724	0.000 m	121 34 23.16920	0.000 m

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EL HGT:              1145.239 m    0.002 m             1144.823 m    0.002 m
ORTHO HGT:           1166.366 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4897974.295 m         284875.375 m
EASTING (X)        613966.635 m        1414256.156 m
CONVERGENCE        0.99536753 deg      -0.73414851 deg
POINT SCALE        0.99975974           1.00006534
COMBINED FACTOR    0.99958024           0.99988579

US NATIONAL GRID DESIGNATOR: 10TFP1396697974 (NAD 83)


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CONSTRAINED MARKS
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MARK:      redm (redm a  4)
CONSTRAIN: 3-D TIGHT
ADJUST  X:   -0.000m (0.000m)   Y:   -0.000m (0.000m)   Z:    0.000m (0.000m)
ADJUST  N:    0.000m (0.000m)   E:   -0.000m (0.000m)   H:    0.000m (0.000m)

REF FRAME:        NAD_83(2011) (2010.0000)                 IGS08 (2014.6312)
X:               -2366948.785 m    0.000 m         -2366949.653 m    0.000 m
Y:               -3916334.857 m    0.000 m         -3916333.634 m    0.000 m
Z:                4429451.022 m    0.000 m          4429451.020 m    0.000 m
LAT:           44 15 35.14666      0.000 m       44 15 35.16014      0.000 m
E LON:        238 51 07.68489      0.000 m      238 51 07.62290      0.000 m
W LON:        121 08 52.31511      0.000 m      121 08 52.37710      0.000 m
EL HGT:               920.266 m    0.000 m              919.836 m    0.000 m
ORTHO HGT:            941.389 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4902392.827 m         288268.366 m
EASTING (X)        647844.557 m        1448261.000 m
CONVERGENCE        1.29286133 deg      -0.44323534 deg
POINT SCALE        0.99986882           1.00007642
COMBINED FACTOR    0.99972456           0.99993213

US NATIONAL GRID DESIGNATOR: 10TFQ4784402392 (NAD 83)
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NGS OPUS-PROJECTS NETWORK ADJUSTMENT REPORT

All coordinate accuracies reported here are 1 times the formal uncertainties from the solution. For additional information: geodesy.noaa.gov/OPUS/Using_OPUS-Projects.html#accuracy

These positions were computed without any knowledge by the National Geodetic Survey regarding the equipment or field operating procedures used.

SUBMITTED BY: william.stone
SOLUTION FILE NAME: network-final full con geometric.sum
SOLUTION SOFTWARE: GPSCOM(1210.24)
SOLUTION DATE: 2015-06-07T15:00:05 UTC
STANDARD ERROR OF UNIT WEIGHT: 0.615
TOTAL NUMBER OF OBSERVATIONS: 1274293
TOTAL NUMBER OF MARKS: 16
NUMBER OF CONSTRAINED MARKS: 7

START TIME: 2014-08-17T00:00:00 GPS
STOP TIME: 2014-08-22T23:59:30 GPS
FREQUENCY: L1-ONLY TO ION-FREE [BY BASELINE LENGTH]
OBSERVATION INTERVAL: 30 s
ELEVATION CUTOFF: MIXED
TROPO INTERVAL: 1800 s [STEP-OFFSET PARAMETERIZATION]
DD CORRELATIONS: ON

INCLUDED SOLUTION	RMS	SOFTWARE	RUN DATE
1) 2014-229 A	1.2 cm	page5(1404.11)	2015-06-05T16:31 UTC
2) 2014-229 B	1.2 cm	page5(1404.11)	2015-06-05T16:35 UTC
3) 2014-230 A	1.1 cm	page5(1404.11)	2015-06-05T16:35 UTC
4) 2014-230 B	1.1 cm	page5(1404.11)	2015-06-05T16:39 UTC
5) 2014-231 A	1.2 cm	page5(1404.11)	2015-06-05T16:40 UTC
6) 2014-231 B	1.2 cm	page5(1404.11)	2015-06-05T16:44 UTC
7) 2014-232 A	1.2 cm	page5(1404.11)	2015-06-05T16:46 UTC
8) 2014-232 B	1.2 cm	page5(1404.11)	2015-06-05T16:50 UTC
9) 2014-234 A	1.1 cm	page5(1404.11)	2015-06-05T16:50 UTC

BASELINE	LENGTH	RMS	OBS	OMITTED	FIXED	IN SOLUTION(S)
h3__-p385	0.220 km	0.5 cm	3902	4.5%	90.9%	3
v735-p387	2.728 km	1.2 cm	3750	10.6%	88.5%	6, 8
x359-p387	7.856 km	1.4 cm	5055	9.5%	89.7%	6, 7
bbr2-p387	12.475 km	1.1 cm	2553	1.5%	100.0%	4
p387-c_15	20.847 km	2.3 cm	2588	0.7%	100.0%	2
sct2-p385	21.746 km	1.7 cm	2802	13.8%	94.4%	9
p385-c_15	22.514 km	1.2 cm	4006	3.5%	100.0%	1
c_16-p385	22.797 km	1.8 cm	2898	21.2%	89.7%	1
c_16-p387	23.220 km	1.9 cm	1502	17.3%	90.9%	2
bbr2-p385	25.050 km	1.2 cm	3709	0.9%	94.7%	9
sct2-p387	27.928 km	1.9 cm	1861	2.7%	92.3%	2
h3__-p387	33.289 km	1.5 cm	2098	3.1%	100.0%	4
p387-p385	33.348 km	1.2 cm	155315	1.4%	96.4%	1, 2, 3,...
redm-p387	34.307 km	1.1 cm	83137	1.0%	98.2%	2, 4, 6,...
v735-p385	35.964 km	1.7 cm	2994	10.6%	87.0%	5
x359-p385	37.715 km	1.8 cm	3439	4.3%	86.4%	5
redm-p385	66.544 km	1.1 cm	72716	0.5%	98.2%	1, 3, 5, 9
lpsb-p385	100.864 km	1.0 cm	71170	1.5%	98.4%	1, 3, 5, 9
lpsb-p387	124.247 km	1.2 cm	81460	1.3%	99.0%	2, 4, 6,...

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 rsbg-p385    175.215 km      1.2 cm    71892     0.5%    97.3%    1, 3, 5, 9
 gobs-p385    179.630 km      1.1 cm    72196     0.4%    96.8%    1, 3, 5, 9
 gobs-p387    181.535 km      1.2 cm    82461     0.7%    93.2%    2, 4, 6,...
 rsbg-p387    185.940 km      1.2 cm    81248     0.9%    97.5%    2, 4, 6,...
 ors1-p387    201.554 km      1.1 cm    81781     1.1%    98.6%    2, 4, 6,...
 ork5-p387    223.240 km      1.2 cm    82090     1.1%    98.6%    2, 4, 6,...
 ors1-p385    232.369 km      1.1 cm    71322     0.9%    97.7%    1, 3, 5, 9
 ork5-p385    239.505 km      1.2 cm    71624     1.1%    98.1%    1, 3, 5, 9
 fts5-p385    252.064 km      1.1 cm    71515     0.3%    99.1%    1, 3, 5, 9
 fts5-p387    282.683 km      1.2 cm    81209     0.8%    94.5%    2, 4, 6,...

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UNCONSTRAINED MARKS
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MARK:      bbr2 (bbr2    1)

REF FRAME:         NAD_83(2011) (2010.0000)                 IGS08 (2014.6362)
X:                -2394864.744 m    0.001 m          -2394865.609 m    0.001 m
Y:                -3887418.649 m    0.002 m          -3887417.431 m    0.002 m
Z:                 4441294.731 m    0.002 m           4441294.739 m    0.002 m
LAT:            44 23 59.13611      0.001 m       44 23 59.14951      0.001 m
E LON:         238 21 52.68645      0.001 m      238 21 52.62432      0.001 m
W LON:         121 38 07.31355      0.001 m      121 38 07.37568      0.001 m
EL HGT:              1941.082 m     0.002 m             1940.672 m    0.002 m
ORTHO HGT:           1962.458 m     0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                 UTM COORDINATES    STATE PLANE COORDINATES
                  UTM (Zone 10)         SPC (3601 OR N)
NORTHING (Y)       4917180.407 m          82099.447 m
EASTING (X)         608671.363 m        2409554.789 m
CONVERGENCE         0.95487421 deg      -0.80518489 deg
POINT SCALE         0.99974523           0.99998394
COMBINED FACTOR     0.99944104           0.99967968

US NATIONAL GRID DESIGNATOR: 10TFQ0867117180 (NAD 83)

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MARK:      c_15 (c_15    1)

REF FRAME:         NAD_83(2011) (2010.0000)                 IGS08 (2014.6268)
X:                -2413840.102 m    0.001 m          -2413840.963 m    0.001 m
Y:                -3888953.740 m    0.002 m          -3888952.521 m    0.002 m
Z:                 4429199.578 m    0.002 m           4429199.589 m    0.002 m
LAT:            44 15 03.48100      0.001 m       44 15 03.49440      0.001 m
E LON:         238 10 20.93403      0.001 m      238 10 20.87211      0.001 m
W LON:         121 49 39.06597      0.001 m      121 49 39.12789      0.001 m
EL HGT:              1563.283 m     0.002 m             1562.874 m    0.002 m
ORTHO HGT:           1584.172 m     0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                 UTM COORDINATES    STATE PLANE COORDINATES
                  UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)       4900416.175 m          287931.147 m
EASTING (X)         593605.710 m        1393971.299 m
CONVERGENCE         0.81821991 deg      -0.90821816 deg
POINT SCALE         0.99970776           1.00007349
COMBINED FACTOR     0.99946277           0.99982841

US NATIONAL GRID DESIGNATOR: 10TEQ9360500416 (NAD 83)
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MARK: c_16 (c_16 1)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6267)	
X:	-2416074.551 m	0.001 m	-2416075.412 m	0.001 m
Y:	-3888478.425 m	0.002 m	-3888477.206 m	0.002 m
Z:	4428335.045 m	0.002 m	4428335.056 m	0.002 m
LAT:	44 14 25.90563	0.001 m	44 14 25.91903	0.001 m
E LON:	238 08 44.10217	0.001 m	238 08 44.04024	0.001 m
W LON:	121 51 15.89783	0.001 m	121 51 15.95976	0.001 m
EL HGT:	1515.259 m	0.002 m	1514.850 m	0.002 m
ORTHO HGT:	1536.194 m	0.015 m	(H = h - N WHERE N = GEOID12A HGT)	

	UTM COORDINATES UTM (Zone 10)	STATE PLANE COORDINATES SPC (3602 OR S)
NORTHING (Y)	4899226.520 m	286805.819 m
EASTING (X)	591474.482 m	1391804.408 m
CONVERGENCE	0.79929713 deg	-0.92662018 deg
POINT SCALE	0.99970291	1.00007005
COMBINED FACTOR	0.99946544	0.99983250

US NATIONAL GRID DESIGNATOR: 10TEP9147499226 (NAD 83)

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MARK: h3__ (h3__ 1)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6295)	
X:	-2413951.372 m	0.001 m	-2413952.232 m	0.001 m
Y:	-3871554.499 m	0.002 m	-3871553.282 m	0.002 m
Z:	4443619.235 m	0.002 m	4443619.248 m	0.002 m
LAT:	44 26 10.65458	0.001 m	44 26 10.66798	0.001 m
E LON:	238 03 21.83346	0.001 m	238 03 21.77134	0.001 m
W LON:	121 56 38.16654	0.001 m	121 56 38.22866	0.001 m
EL HGT:	1118.468 m	0.002 m	1118.065 m	0.002 m
ORTHO HGT:	1139.842 m	0.015 m	(H = h - N WHERE N = GEOID12A HGT)	

	UTM COORDINATES UTM (Zone 10)	STATE PLANE COORDINATES SPC (3601 OR N)
NORTHING (Y)	4920875.109 m	86550.651 m
EASTING (X)	584046.250 m	2385048.412 m
CONVERGENCE	0.73941079 deg	-1.02401862 deg
POINT SCALE	0.99968687	0.99997566
COMBINED FACTOR	0.99951158	0.99980032

US NATIONAL GRID DESIGNATOR: 10TEQ8404620875 (NAD 83)

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MARK: p385 (p385 1)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6315)	
X:	-2414139.279 m	0.001 m	-2414140.140 m	0.001 m
Y:	-3871572.511 m	0.001 m	-3871571.294 m	0.001 m
Z:	4443506.206 m	0.001 m	4443506.220 m	0.001 m
LAT:	44 26 05.43911	0.001 m	44 26 05.45251	0.001 m
E LON:	238 03 15.05582	0.001 m	238 03 14.99367	0.001 m
W LON:	121 56 44.94418	0.001 m	121 56 45.00633	0.001 m

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EL HGT:              1121.241 m    0.001 m             1120.838 m    0.001 m
ORTHO HGT:           1142.622 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3601 OR N)
NORTHING (Y)      4920712.255 m          86392.376 m
EASTING (X)        583898.490 m        2384895.667 m
CONVERGENCE        0.73807343 deg      -1.02535379 deg
POINT SCALE        0.99968656           0.99997598
COMBINED FACTOR    0.99951084           0.99980021

US NATIONAL GRID DESIGNATOR: 10TEQ8389820712 (NAD 83)

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MARK:      p387 (p387    1)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6310)
X:               -2394555.320 m    0.001 m         -2394556.185 m    0.001 m
Y:               -3896184.423 m    0.001 m         -3896183.204 m    0.001 m
Z:                4432423.994 m    0.001 m          4432424.002 m    0.001 m
LAT:           44 17 48.30677      0.001 m       44 17 48.32020      0.001 m
E LON:        238 25 31.94073      0.001 m      238 25 31.87872      0.001 m
W LON:        121 34 28.05927      0.001 m      121 34 28.12128      0.001 m
EL HGT:              963.040 m    0.001 m              962.627 m    0.001 m
ORTHO HGT:           984.403 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4905821.374 m          292728.805 m
EASTING (X)        613720.445 m        1414246.994 m
CONVERGENCE        0.99566679 deg      -0.73508959 deg
POINT SCALE        0.99975905           1.00008900
COMBINED FACTOR    0.99960810           0.99993800

US NATIONAL GRID DESIGNATOR: 10TFQ1372005821 (NAD 83)

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MARK:      sct2 (sct2    1)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6352)
X:               -2420317.767 m    0.001 m         -2420318.628 m    0.001 m
Y:               -3886115.315 m    0.002 m         -3886114.096 m    0.002 m
Z:                4428564.943 m    0.002 m          4428564.955 m    0.002 m
LAT:           44 14 25.93500      0.001 m       44 14 25.94838      0.001 m
E LON:        238 05 05.53207      0.001 m      238 05 05.47010      0.001 m
W LON:        121 54 54.46793      0.001 m      121 54 54.52990      0.001 m
EL HGT:              1843.849 m    0.002 m             1843.442 m    0.002 m
ORTHO HGT:           1864.960 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4899161.583 m          286886.921 m
EASTING (X)        586626.468 m        1386954.831 m
CONVERGENCE        0.75693051 deg      -0.96815744 deg
POINT SCALE        0.99969229           1.00007005
COMBINED FACTOR    0.99940335           0.99978100

US NATIONAL GRID DESIGNATOR: 10TEP8662699161 (NAD 83)
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MARK:      v735 (v735    1)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6332)
X:               -2393603.907 m    0.001 m         -2393604.772 m    0.001 m
Y:               -3898338.929 m    0.002 m         -3898337.709 m    0.002 m
Z:                4431046.958 m    0.002 m          4431046.965 m    0.002 m
LAT:           44 16 46.11600      0.001 m       44 16 46.12944      0.001 m
E LON:        238 26 59.35532      0.001 m      238 26 59.29332      0.001 m
W LON:        121 33 00.64468      0.001 m      121 33 00.70668      0.001 m
EL HGT:             959.149 m    0.002 m              958.733 m    0.002 m
ORTHO HGT:          980.498 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4903936.492 m          290784.623 m
EASTING (X)        615691.417 m         1416160.758 m
CONVERGENCE        1.01231724 deg       -0.71847724 deg
POINT SCALE        0.99976461            1.00008307
COMBINED FACTOR    0.99961427            0.99993269

US NATIONAL GRID DESIGNATOR: 10TFQ1569103936 (NAD 83)

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MARK:      x359 (x359    1)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6331)
X:               -2397399.945 m    0.001 m         -2397400.810 m    0.001 m
Y:               -3901022.847 m    0.002 m         -3901021.627 m    0.002 m
Z:                4426926.877 m    0.002 m          4426926.884 m    0.002 m
LAT:           44 13 33.91429      0.001 m       44 13 33.92770      0.001 m
E LON:        238 25 36.89242      0.001 m      238 25 36.83044      0.001 m
W LON:        121 34 23.10758      0.001 m      121 34 23.16956      0.001 m
EL HGT:            1145.247 m    0.002 m             1144.831 m    0.002 m
ORTHO HGT:         1166.374 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4897974.295 m          284875.376 m
EASTING (X)        613966.628 m         1414256.149 m
CONVERGENCE        0.99536747 deg       -0.73414857 deg
POINT SCALE        0.99975974            1.00006534
COMBINED FACTOR    0.99958024            0.99988578

US NATIONAL GRID DESIGNATOR: 10TFP1396697974 (NAD 83)


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CONSTRAINED MARKS
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MARK:      fts5 (fts5 a  2)
CONSTRAIN: 3-D NORMAL
ADJUST  X:   -0.005m (0.001m)   Y:    0.006m (0.001m)   Z:   -0.003m (0.001m)
ADJUST  N:   -0.000m (0.001m)   E:   -0.007m (0.001m)   H:   -0.004m (0.001m)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6312)
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X:              -2469884.465 m    0.001 m         -2469885.306 m    0.001 m
Y:              -3667816.259 m    0.001 m         -3667815.079 m    0.001 m
Z:               4581028.323 m    0.001 m          4581028.379 m    0.001 m
LAT:          46 12 17.58171      0.001 m       46 12 17.59485      0.001 m
E LON:       236 02 38.12135      0.001 m      236 02 38.05806      0.001 m
W LON:       123 57 21.87865      0.001 m      123 57 21.94194      0.001 m
EL HGT:             -13.448 m    0.001 m              -13.760 m    0.001 m
ORTHO HGT:           10.439 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3601 OR N)
NORTHING (Y)      5117256.114 m         287773.425 m
EASTING (X)        426242.575 m        2233336.425 m
CONVERGENCE       -0.69014603 deg      -2.45100177 deg
POINT SCALE        0.99966687           1.00005858
COMBINED FACTOR    0.99966898           1.00006069

US NATIONAL GRID DESIGNATOR: 10TDS2624217256 (NAD 83)

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MARK:      gobs (gobs a  5)
CONSTRAIN: 3-D NORMAL
ADJUST  X:   -0.009m (0.001m)   Y:   -0.004m (0.001m)   Z:    0.003m (0.001m)
ADJUST  N:   -0.003m (0.001m)   E:   -0.006m (0.001m)   H:    0.007m (0.001m)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6312)
X:              -2280400.273 m    0.001 m         -2280401.144 m    0.001 m
Y:              -3823182.589 m    0.001 m         -3823181.383 m    0.001 m
Z:               4553230.222 m    0.001 m          4553230.231 m    0.001 m
LAT:          45 50 19.73102      0.001 m       45 50 19.74491      0.001 m
E LON:       239 11 07.22391      0.001 m      239 11 07.16061      0.001 m
W LON:       120 48 52.77609      0.001 m      120 48 52.83939      0.001 m
EL HGT:              621.882 m    0.001 m              621.478 m    0.001 m
ORTHO HGT:           642.693 m    0.017 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (4602 WA S)
NORTHING (Y)      5078461.190 m          56233.374 m
EASTING (X)        669705.465 m         475554.811 m
CONVERGENCE        1.56809781 deg      -0.22856771 deg
POINT SCALE        0.99995407           0.99999876
COMBINED FACTOR    0.99985659           0.99990128

US NATIONAL GRID DESIGNATOR: 10TFR6970578461 (NAD 83)

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MARK:      lpsb (lpsb a  1)
CONSTRAIN: 3-D NORMAL
ADJUST  X:   -0.012m (0.001m)   Y:   -0.001m (0.001m)   Z:    0.001m (0.001m)
ADJUST  N:   -0.005m (0.001m)   E:   -0.009m (0.001m)   H:    0.006m (0.001m)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6312)
X:              -2506818.093 m    0.001 m         -2506818.950 m    0.001 m
Y:              -3846908.510 m    0.001 m         -3846907.289 m    0.001 m
Z:               4412266.235 m    0.001 m          4412266.258 m    0.001 m
LAT:          44 03 04.40891      0.001 m       44 03 04.42194      0.001 m
E LON:       236 54 35.75109      0.001 m      236 54 35.68889      0.001 m
W LON:       123 05 24.24891      0.001 m      123 05 24.31111      0.001 m
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EL HGT:               118.096 m    0.001 m             117.713 m    0.001 m
ORTHO HGT:            141.371 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4877566.223 m         268104.846 m
EASTING (X)        492785.002 m        1292469.530 m
CONVERGENCE       -0.06262521 deg      -1.77198897 deg
POINT SCALE        0.99960064           1.00001342
COMBINED FACTOR    0.99958213           0.99999490

US NATIONAL GRID DESIGNATOR: 10TDP9278577566 (NAD 83)

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MARK:      ork5 (ork5 a  1)
CONSTRAIN: 3-D NORMAL
ADJUST  X:    0.007m (0.001m)   Y:    0.023m (0.001m)   Z:   -0.007m (0.001m)
ADJUST  N:    0.011m (0.001m)   E:   -0.006m (0.001m)   H:   -0.022m (0.001m)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6312)
X:               -2481437.765 m    0.001 m         -2481438.636 m    0.001 m
Y:               -4022606.895 m    0.001 m         -4022605.648 m    0.001 m
Z:                4270236.720 m    0.001 m          4270236.704 m    0.001 m
LAT:           42 17 19.71880      0.001 m       42 17 19.73160      0.001 m
E LON:        238 19 50.45827      0.001 m      238 19 50.39735      0.001 m
W LON:        121 40 09.54173      0.001 m      121 40 09.60265      0.001 m
EL HGT:              1258.822 m    0.001 m             1258.365 m    0.001 m
ORTHO HGT:           1281.290 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4682700.640 m           69784.406 m
EASTING (X)        609705.210 m        1403562.513 m
CONVERGENCE        0.89546307 deg      -0.79998524 deg
POINT SCALE        0.99974808           1.00001151
COMBINED FACTOR    0.99955074           0.99981412

US NATIONAL GRID DESIGNATOR: 10TFM0970582700 (NAD 83)

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MARK:      ors1 (ors1 a  1)
CONSTRAIN: 3-D NORMAL
ADJUST  X:    0.001m (0.001m)   Y:    0.009m (0.001m)   Z:   -0.009m (0.001m)
ADJUST  N:   -0.000m (0.001m)   E:   -0.003m (0.001m)   H:   -0.013m (0.001m)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6312)
X:               -2226385.024 m    0.001 m         -2226385.893 m    0.001 m
Y:               -4006811.866 m    0.001 m         -4006810.638 m    0.001 m
Z:                4422203.075 m    0.001 m          4422203.062 m    0.001 m
LAT:           44 09 51.27397      0.001 m       44 09 51.28834      0.001 m
E LON:        240 56 28.53933      0.001 m      240 56 28.47830      0.001 m
W LON:        119 03 31.46067      0.001 m      119 03 31.52170      0.001 m
EL HGT:              1438.107 m    0.001 m             1437.631 m    0.001 m
ORTHO HGT:           1456.364 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 11)         SPC (3601 OR N)
NORTHING (Y)      4892175.995 m           56321.675 m
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EASTING (X)        335397.346 m        2615277.972 m
CONVERGENCE       -1.43468067 deg       1.02212209 deg
POINT SCALE        0.99993323           1.00004685
COMBINED FACTOR    0.99970780           0.99982139

US NATIONAL GRID DESIGNATOR: 11TLJ3539792175 (NAD 83)

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MARK:      redm (redm a  4)
CONSTRAIN: 3-D NORMAL
ADJUST  X:   -0.010m (0.001m)   Y:   -0.000m (0.001m)   Z:    0.006m (0.001m)
ADJUST  N:    0.001m (0.001m)   E:   -0.008m (0.001m)   H:    0.008m (0.001m)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6312)
X:               -2366948.795 m    0.001 m         -2366949.662 m    0.001 m
Y:               -3916334.858 m    0.001 m         -3916333.634 m    0.001 m
Z:                4429451.028 m    0.001 m          4429451.026 m    0.001 m
LAT:           44 15 35.14666      0.001 m       44 15 35.16016      0.001 m
E LON:        238 51 07.68453      0.001 m      238 51 07.62253      0.001 m
W LON:        121 08 52.31547      0.001 m      121 08 52.37747      0.001 m
EL HGT:             920.274 m      0.001 m              919.844 m    0.001 m
ORTHO HGT:          941.397 m      0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4902392.827 m         288268.366 m
EASTING (X)        647844.549 m        1448260.992 m
CONVERGENCE        1.29286126 deg      -0.44323541 deg
POINT SCALE        0.99986882           1.00007642
COMBINED FACTOR    0.99972456           0.99993213

US NATIONAL GRID DESIGNATOR: 10TFQ4784402392 (NAD 83)

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MARK:      rsbg (rsbg a  1)
CONSTRAIN: 3-D NORMAL
ADJUST  X:   -0.011m (0.001m)   Y:   -0.007m (0.001m)   Z:    0.003m (0.001m)
ADJUST  N:   -0.006m (0.001m)   E:   -0.006m (0.001m)   H:    0.010m (0.001m)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6312)
X:               -2559295.138 m    0.001 m         -2559295.998 m    0.001 m
Y:               -3887370.498 m    0.001 m         -3887369.265 m    0.001 m
Z:                4346652.913 m    0.001 m          4346652.932 m    0.001 m
LAT:           43 14 06.04989      0.001 m       43 14 06.06269      0.001 m
E LON:        236 38 26.27184      0.001 m      236 38 26.20995      0.001 m
W LON:        123 21 33.72816      0.001 m      123 21 33.79005      0.001 m
EL HGT:             135.632 m      0.001 m              135.239 m    0.001 m
ORTHO HGT:          159.333 m      0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4786975.907 m         178180.060 m
EASTING (X)        470820.303 m        1267804.310 m
CONVERGENCE       -0.24616674 deg      -1.95622971 deg
POINT SCALE        0.99961047           0.99989528
COMBINED FACTOR    0.99958921           0.99987401

US NATIONAL GRID DESIGNATOR: 10TDN7082086975 (NAD 83)
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NGS OPUS-PROJECTS NETWORK ADJUSTMENT REPORT

All coordinate accuracies reported here are 1 times the formal uncertainties from the solution. For additional information: geodesy.noaa.gov/OPUS/Using_OPUS-Projects.html#accuracy

These positions were computed without any knowledge by the National Geodetic Survey regarding the equipment or field operating procedures used.

SUBMITTED BY: william.stone
SOLUTION FILE NAME: network-final min con vert.sum
SOLUTION SOFTWARE: GPSCOM(1210.24)
SOLUTION DATE: 2015-06-07T15:03:36 UTC
STANDARD ERROR OF UNIT WEIGHT: 0.615
TOTAL NUMBER OF OBSERVATIONS: 1274293
TOTAL NUMBER OF MARKS: 16
NUMBER OF CONSTRAINED MARKS: 2

START TIME: 2014-08-17T00:00:00 GPS
STOP TIME: 2014-08-22T23:59:30 GPS
FREQUENCY: L1-ONLY TO ION-FREE [BY BASELINE LENGTH]
OBSERVATION INTERVAL: 30 s
ELEVATION CUTOFF: MIXED
TROPO INTERVAL: 1800 s [STEP-OFFSET PARAMETERIZATION]
DD CORRELATIONS: ON

INCLUDED SOLUTION	RMS	SOFTWARE	RUN DATE
1) 2014-229 A	1.2 cm	page5(1404.11)	2015-06-05T16:31 UTC
2) 2014-229 B	1.2 cm	page5(1404.11)	2015-06-05T16:35 UTC
3) 2014-230 A	1.1 cm	page5(1404.11)	2015-06-05T16:35 UTC
4) 2014-230 B	1.1 cm	page5(1404.11)	2015-06-05T16:39 UTC
5) 2014-231 A	1.2 cm	page5(1404.11)	2015-06-05T16:40 UTC
6) 2014-231 B	1.2 cm	page5(1404.11)	2015-06-05T16:44 UTC
7) 2014-232 A	1.2 cm	page5(1404.11)	2015-06-05T16:46 UTC
8) 2014-232 B	1.2 cm	page5(1404.11)	2015-06-05T16:50 UTC
9) 2014-234 A	1.1 cm	page5(1404.11)	2015-06-05T16:50 UTC

BASELINE	LENGTH	RMS	OBS	OMITTED	FIXED	IN SOLUTION(S)
h3__-p385	0.220 km	0.5 cm	3902	4.5%	90.9%	3
v735-p387	2.728 km	1.2 cm	3750	10.6%	88.5%	6, 8
x359-p387	7.856 km	1.4 cm	5055	9.5%	89.7%	6, 7
bbr2-p387	12.475 km	1.1 cm	2553	1.5%	100.0%	4
p387-c_15	20.847 km	2.3 cm	2588	0.7%	100.0%	2
sct2-p385	21.746 km	1.7 cm	2802	13.8%	94.4%	9
p385-c_15	22.514 km	1.2 cm	4006	3.5%	100.0%	1
c_16-p385	22.797 km	1.8 cm	2898	21.2%	89.7%	1
c_16-p387	23.220 km	1.9 cm	1502	17.3%	90.9%	2
bbr2-p385	25.050 km	1.2 cm	3709	0.9%	94.7%	9
sct2-p387	27.928 km	1.9 cm	1861	2.7%	92.3%	2
h3__-p387	33.289 km	1.5 cm	2098	3.1%	100.0%	4
p387-p385	33.348 km	1.2 cm	155315	1.4%	96.4%	1, 2, 3,...
redm-p387	34.307 km	1.1 cm	83137	1.0%	98.2%	2, 4, 6,...
v735-p385	35.964 km	1.7 cm	2994	10.6%	87.0%	5
x359-p385	37.715 km	1.8 cm	3439	4.3%	86.4%	5
redm-p385	66.544 km	1.1 cm	72716	0.5%	98.2%	1, 3, 5, 9
lpsb-p385	100.864 km	1.0 cm	71170	1.5%	98.4%	1, 3, 5, 9
lpsb-p387	124.247 km	1.2 cm	81460	1.3%	99.0%	2, 4, 6,...

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 rsbg-p385    175.215 km      1.2 cm    71892     0.5%    97.3%    1, 3, 5, 9
 gobs-p385    179.630 km      1.1 cm    72196     0.4%    96.8%    1, 3, 5, 9
 gobs-p387    181.535 km      1.2 cm    82461     0.7%    93.2%    2, 4, 6,...
 rsbg-p387    185.940 km      1.2 cm    81248     0.9%    97.5%    2, 4, 6,...
 ors1-p387    201.554 km      1.1 cm    81781     1.1%    98.6%    2, 4, 6,...
 ork5-p387    223.240 km      1.2 cm    82090     1.1%    98.6%    2, 4, 6,...
 ors1-p385    232.369 km      1.1 cm    71322     0.9%    97.7%    1, 3, 5, 9
 ork5-p385    239.505 km      1.2 cm    71624     1.1%    98.1%    1, 3, 5, 9
 fts5-p385    252.064 km      1.1 cm    71515     0.3%    99.1%    1, 3, 5, 9
 fts5-p387    282.683 km      1.2 cm    81209     0.8%    94.5%    2, 4, 6,...

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UNCONSTRAINED MARKS
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MARK:      bbr2 (bbr2    1)

REF FRAME:         NAD_83(2011) (2010.0000)                 IGS08 (2014.6362)
X:                -2394864.742 m    0.001 m          -2394865.607 m    0.001 m
Y:                -3887418.661 m    0.001 m          -3887417.443 m    0.001 m
Z:                 4441294.739 m    0.002 m           4441294.748 m    0.002 m
LAT:            44 23 59.13609      0.000 m       44 23 59.14950      0.000 m
E LON:         238 21 52.68681      0.000 m      238 21 52.62469      0.000 m
W LON:         121 38 07.31319      0.000 m      121 38 07.37531      0.000 m
EL HGT:              1941.095 m    0.002 m             1940.684 m    0.002 m
ORTHO HGT:           1962.471 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                 UTM COORDINATES    STATE PLANE COORDINATES
                  UTM (Zone 10)         SPC (3601 OR N)
NORTHING (Y)       4917180.407 m          82099.447 m
EASTING (X)         608671.371 m        2409554.797 m
CONVERGENCE         0.95487428 deg      -0.80518482 deg
POINT SCALE         0.99974523           0.99998394
COMBINED FACTOR     0.99944104           0.99967968

US NATIONAL GRID DESIGNATOR: 10TFQ0867117180 (NAD 83)

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MARK:      c_15 (c_15    1)

REF FRAME:         NAD_83(2011) (2010.0000)                 IGS08 (2014.6268)
X:                -2413840.100 m    0.001 m          -2413840.961 m    0.001 m
Y:                -3888953.753 m    0.001 m          -3888952.533 m    0.001 m
Z:                 4429199.586 m    0.002 m           4429199.598 m    0.002 m
LAT:            44 15 03.48096      0.000 m       44 15 03.49439      0.000 m
E LON:         238 10 20.93441      0.000 m      238 10 20.87248      0.000 m
W LON:         121 49 39.06559      0.000 m      121 49 39.12752      0.000 m
EL HGT:              1563.296 m    0.002 m             1562.887 m    0.002 m
ORTHO HGT:           1584.185 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                 UTM COORDINATES    STATE PLANE COORDINATES
                  UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)       4900416.173 m          287931.146 m
EASTING (X)         593605.719 m        1393971.307 m
CONVERGENCE         0.81821998 deg      -0.90821809 deg
POINT SCALE         0.99970776           1.00007349
COMBINED FACTOR     0.99946277           0.99982841

US NATIONAL GRID DESIGNATOR: 10TEQ9360500416 (NAD 83)
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MARK: c_16 (c_16 1)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6267)	
X:	-2416074.549 m	0.001 m	-2416075.410 m	0.001 m
Y:	-3888478.438 m	0.002 m	-3888477.218 m	0.002 m
Z:	4428335.054 m	0.002 m	4428335.065 m	0.002 m
LAT:	44 14 25.90561	0.000 m	44 14 25.91901	0.000 m
E LON:	238 08 44.10255	0.000 m	238 08 44.04061	0.000 m
W LON:	121 51 15.89745	0.000 m	121 51 15.95939	0.000 m
EL HGT:	1515.272 m	0.003 m	1514.863 m	0.003 m
ORTHO HGT:	1536.207 m	0.015 m	(H = h - N WHERE N = GEOID12A HGT)	

	UTM COORDINATES (Zone 10)	STATE PLANE COORDINATES SPC (3602 OR S)
NORTHING (Y)	4899226.520 m	286805.819 m
EASTING (X)	591474.491 m	1391804.417 m
CONVERGENCE	0.79929720 deg	-0.92662010 deg
POINT SCALE	0.99970291	1.00007005
COMBINED FACTOR	0.99946544	0.99983249

US NATIONAL GRID DESIGNATOR: 10TEP9147499226 (NAD 83)

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MARK: fts5 (fts5 a 2)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6312)	
X:	-2469884.463 m	0.001 m	-2469885.304 m	0.001 m
Y:	-3667816.271 m	0.001 m	-3667815.091 m	0.001 m
Z:	4581028.331 m	0.001 m	4581028.387 m	0.001 m
LAT:	46 12 17.58168	0.000 m	46 12 17.59483	0.000 m
E LON:	236 02 38.12174	0.000 m	236 02 38.05846	0.000 m
W LON:	123 57 21.87826	0.000 m	123 57 21.94154	0.000 m
EL HGT:	-13.436 m	0.002 m	-13.747 m	0.002 m
ORTHO HGT:	10.451 m	0.015 m	(H = h - N WHERE N = GEOID12A HGT)	

	UTM COORDINATES (Zone 10)	STATE PLANE COORDINATES SPC (3601 OR N)
NORTHING (Y)	5117256.113 m	287773.424 m
EASTING (X)	426242.583 m	2233336.433 m
CONVERGENCE	-0.69014595 deg	-2.45100169 deg
POINT SCALE	0.99966687	1.00005858
COMBINED FACTOR	0.99966898	1.00006069

US NATIONAL GRID DESIGNATOR: 10TDS2624217256 (NAD 83)

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MARK: gobs (gobs a 5)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6312)	
X:	-2280400.272 m	0.001 m	-2280401.143 m	0.001 m
Y:	-3823182.602 m	0.001 m	-3823181.395 m	0.001 m
Z:	4553230.230 m	0.001 m	4553230.239 m	0.001 m
LAT:	45 50 19.73096	0.000 m	45 50 19.74488	0.000 m
E LON:	239 11 07.22426	0.000 m	239 11 07.16098	0.000 m
W LON:	120 48 52.77574	0.000 m	120 48 52.83902	0.000 m

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EL HGT:               621.895 m    0.002 m             621.491 m    0.002 m
ORTHO HGT:            642.706 m    0.017 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (4602 WA S)
NORTHING (Y)      5078461.189 m          56233.372 m
EASTING (X)        669705.473 m         475554.819 m
CONVERGENCE        1.56809788 deg      -0.22856764 deg
POINT SCALE        0.99995407           0.99999876
COMBINED FACTOR    0.99985659           0.99990127

US NATIONAL GRID DESIGNATOR: 10TFR6970578461 (NAD 83)

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MARK:      h3__ (h3__    1)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6295)
X:               -2413951.369 m    0.001 m         -2413952.230 m    0.001 m
Y:               -3871554.511 m    0.001 m         -3871553.294 m    0.001 m
Z:                4443619.243 m    0.002 m          4443619.257 m    0.002 m
LAT:           44 26 10.65457      0.000 m       44 26 10.66797      0.000 m
E LON:        238 03 21.83386      0.000 m      238 03 21.77172      0.000 m
W LON:        121 56 38.16614      0.000 m      121 56 38.22828      0.000 m
EL HGT:           1118.480 m    0.002 m             1118.078 m    0.002 m
ORTHO HGT:        1139.854 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3601 OR N)
NORTHING (Y)      4920875.109 m          86550.650 m
EASTING (X)        584046.258 m        2385048.421 m
CONVERGENCE        0.73941086 deg      -1.02401854 deg
POINT SCALE        0.99968687           0.99997566
COMBINED FACTOR    0.99951158           0.99980032

US NATIONAL GRID DESIGNATOR: 10TEQ8404620875 (NAD 83)

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MARK:      lpsb (lpsb a  1)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6312)
X:               -2506818.091 m    0.001 m         -2506818.948 m    0.001 m
Y:               -3846908.523 m    0.001 m         -3846907.301 m    0.001 m
Z:                4412266.244 m    0.001 m          4412266.266 m    0.001 m
LAT:           44 03 04.40890      0.000 m       44 03 04.42193      0.000 m
E LON:        236 54 35.75149      0.000 m      236 54 35.68927      0.000 m
W LON:        123 05 24.24851      0.000 m      123 05 24.31073      0.000 m
EL HGT:           118.110 m    0.002 m             117.726 m    0.002 m
ORTHO HGT:        141.385 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4877566.223 m          268104.845 m
EASTING (X)        492785.011 m        1292469.539 m
CONVERGENCE       -0.06262513 deg      -1.77198889 deg
POINT SCALE        0.99960064           1.00001342
COMBINED FACTOR    0.99958213           0.99999490

US NATIONAL GRID DESIGNATOR: 10TDP9278577566 (NAD 83)
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MARK: ork5 (ork5 a 1)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6312)	
X:	-2481437.763 m	0.001 m	-2481438.634 m	0.001 m
Y:	-4022606.907 m	0.001 m	-4022605.660 m	0.001 m
Z:	4270236.728 m	0.001 m	4270236.712 m	0.001 m
LAT:	42 17 19.71880	0.000 m	42 17 19.73160	0.000 m
E LON:	238 19 50.45862	0.000 m	238 19 50.39771	0.000 m
W LON:	121 40 09.54138	0.000 m	121 40 09.60229	0.000 m
EL HGT:	1258.835 m	0.002 m	1258.377 m	0.002 m
ORTHO HGT:	1281.303 m	0.015 m	(H = h - N WHERE N = GEOID12A HGT)	

	UTM COORDINATES UTM (Zone 10)	STATE PLANE COORDINATES SPC (3602 OR S)
NORTHING (Y)	4682700.640 m	69784.406 m
EASTING (X)	609705.218 m	1403562.521 m
CONVERGENCE	0.89546314 deg	-0.79998517 deg
POINT SCALE	0.99974808	1.00001151
COMBINED FACTOR	0.99955074	0.99981412

US NATIONAL GRID DESIGNATOR: 10TFM0970582700 (NAD 83)

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MARK: ors1 (ors1 a 1)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6312)	
X:	-2226385.022 m	0.001 m	-2226385.891 m	0.001 m
Y:	-4006811.878 m	0.001 m	-4006810.651 m	0.001 m
Z:	4422203.083 m	0.001 m	4422203.070 m	0.001 m
LAT:	44 09 51.27394	0.000 m	44 09 51.28832	0.000 m
E LON:	240 56 28.53967	0.000 m	240 56 28.47864	0.000 m
W LON:	119 03 31.46033	0.000 m	119 03 31.52136	0.000 m
EL HGT:	1438.119 m	0.002 m	1437.644 m	0.002 m
ORTHO HGT:	1456.376 m	0.015 m	(H = h - N WHERE N = GEOID12A HGT)	

	UTM COORDINATES UTM (Zone 11)	STATE PLANE COORDINATES SPC (3601 OR N)
NORTHING (Y)	4892175.994 m	56321.675 m
EASTING (X)	335397.353 m	2615277.979 m
CONVERGENCE	-1.43468060 deg	1.02212216 deg
POINT SCALE	0.99993323	1.00004685
COMBINED FACTOR	0.99970780	0.99982139

US NATIONAL GRID DESIGNATOR: 11TLJ3539792175 (NAD 83)

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MARK: p385 (p385 1)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6315)	
X:	-2414139.277 m	0.001 m	-2414140.138 m	0.001 m
Y:	-3871572.523 m	0.001 m	-3871571.306 m	0.001 m
Z:	4443506.215 m	0.001 m	4443506.228 m	0.001 m
LAT:	44 26 05.43911	0.000 m	44 26 05.45249	0.000 m
E LON:	238 03 15.05618	0.000 m	238 03 14.99403	0.000 m
W LON:	121 56 44.94382	0.000 m	121 56 45.00597	0.000 m

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EL HGT:              1121.254 m    0.002 m             1120.851 m    0.002 m
ORTHO HGT:           1142.635 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3601 OR N)
NORTHING (Y)      4920712.255 m          86392.375 m
EASTING (X)        583898.499 m        2384895.675 m
CONVERGENCE        0.73807350 deg      -1.02535371 deg
POINT SCALE        0.99968656           0.99997598
COMBINED FACTOR    0.99951084           0.99980021

US NATIONAL GRID DESIGNATOR: 10TEQ8389820712 (NAD 83)

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MARK:      p387 (p387    1)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6310)
X:               -2394555.318 m    0.001 m         -2394556.183 m    0.001 m
Y:               -3896184.436 m    0.001 m         -3896183.217 m    0.001 m
Z:                4432424.003 m    0.001 m          4432424.010 m    0.001 m
LAT:           44 17 48.30675      0.000 m       44 17 48.32018      0.000 m
E LON:        238 25 31.94112      0.000 m      238 25 31.87909      0.000 m
W LON:        121 34 28.05888      0.000 m      121 34 28.12091      0.000 m
EL HGT:              963.054 m    0.002 m              962.639 m    0.002 m
ORTHO HGT:           984.417 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4905821.374 m          292728.804 m
EASTING (X)        613720.453 m        1414247.003 m
CONVERGENCE        0.99566686 deg      -0.73508952 deg
POINT SCALE        0.99975905           1.00008900
COMBINED FACTOR    0.99960810           0.99993800

US NATIONAL GRID DESIGNATOR: 10TFQ1372005821 (NAD 83)

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MARK:      rsbg (rsbg a  1)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6312)
X:               -2559295.136 m    0.001 m         -2559295.996 m    0.001 m
Y:               -3887370.510 m    0.001 m         -3887369.277 m    0.001 m
Z:                4346652.922 m    0.001 m          4346652.940 m    0.001 m
LAT:           43 14 06.04991      0.000 m       43 14 06.06269      0.000 m
E LON:        236 38 26.27220      0.000 m      236 38 26.21033      0.000 m
W LON:        123 21 33.72780      0.000 m      123 21 33.78967      0.000 m
EL HGT:              135.644 m    0.002 m              135.251 m    0.002 m
ORTHO HGT:           159.345 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4786975.908 m          178180.060 m
EASTING (X)        470820.311 m        1267804.318 m
CONVERGENCE       -0.24616667 deg      -1.95622964 deg
POINT SCALE        0.99961047           0.99989528
COMBINED FACTOR    0.99958921           0.99987401

US NATIONAL GRID DESIGNATOR: 10TDN7082086975 (NAD 83)
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MARK:      sct2 (sct2    1)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6352)
X:               -2420317.765 m    0.001 m         -2420318.626 m    0.001 m
Y:               -3886115.327 m    0.002 m         -3886114.108 m    0.002 m
Z:                4428564.952 m    0.002 m          4428564.963 m    0.002 m
LAT:           44 14 25.93500      0.000 m       44 14 25.94836      0.000 m
E LON:        238 05 05.53243      0.000 m      238 05 05.47047      0.000 m
W LON:        121 54 54.46757      0.000 m      121 54 54.52953      0.000 m
EL HGT:             1843.862 m    0.003 m             1843.455 m    0.003 m
ORTHO HGT:          1864.973 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4899161.583 m         286886.921 m
EASTING (X)        586626.476 m        1386954.839 m
CONVERGENCE        0.75693058 deg      -0.96815737 deg
POINT SCALE        0.99969229           1.00007005
COMBINED FACTOR    0.99940334           0.99978099

US NATIONAL GRID DESIGNATOR: 10TEP8662699161 (NAD 83)

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MARK:      x359 (x359    1)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6331)
X:               -2397399.943 m    0.001 m         -2397400.808 m    0.001 m
Y:               -3901022.859 m    0.001 m         -3901021.639 m    0.001 m
Z:                4426926.886 m    0.002 m          4426926.892 m    0.002 m
LAT:           44 13 33.91429      0.000 m       44 13 33.92768      0.000 m
E LON:        238 25 36.89278      0.000 m      238 25 36.83081      0.000 m
W LON:        121 34 23.10722      0.000 m      121 34 23.16919      0.000 m
EL HGT:             1145.260 m    0.002 m             1144.844 m    0.002 m
ORTHO HGT:          1166.387 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4897974.296 m         284875.376 m
EASTING (X)        613966.636 m        1414256.157 m
CONVERGENCE        0.99536754 deg      -0.73414850 deg
POINT SCALE        0.99975974           1.00006534
COMBINED FACTOR    0.99958024           0.99988578

US NATIONAL GRID DESIGNATOR: 10TFP1396697974 (NAD 83)


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CONSTRAINED MARKS
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MARK:      redm (redm a  4)
CONSTRAIN: HOR-ONLY TIGHT
ADJUST  X:   -0.008m (0.001m)   Y:   -0.013m (0.001m)   Z:    0.015m (0.001m)
ADJUST  N:    0.000m (0.000m)   E:   -0.000m (0.000m)   H:    0.021m (0.002m)

REF FRAME:        NAD_83(2011) (2010.0000)                IGS08 (2014.6312)
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X:               -2366948.793 m    0.001 m         -2366949.660 m    0.001 m
Y:               -3916334.870 m    0.001 m         -3916333.646 m    0.001 m
Z:                4429451.037 m    0.001 m          4429451.035 m    0.001 m
LAT:           44 15 35.14666      0.000 m       44 15 35.16014      0.000 m
E LON:        238 51 07.68489      0.000 m      238 51 07.62290      0.000 m
W LON:        121 08 52.31511      0.000 m      121 08 52.37710      0.000 m
EL HGT:              920.287 m    0.002 m              919.857 m    0.002 m
ORTHO HGT:           941.410 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4902392.827 m         288268.366 m
EASTING (X)        647844.557 m        1448261.000 m
CONVERGENCE       1.29286133 deg      -0.44323534 deg
POINT SCALE       0.99986882           1.00007642
COMBINED FACTOR   0.99972456           0.99993213

US NATIONAL GRID DESIGNATOR: 10TFQ4784402392 (NAD 83)

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MARK:      v735 (v735    1)
CONSTRAIN: VER-ONLY TIGHT
ADJUST  X:   -0.016m (0.000m)   Y:   -0.019m (0.000m)   Z:    0.030m (0.000m)
ADJUST  N:    0.004m (0.000m)   E:   -0.004m (0.000m)   H:    0.039m (0.000m)

REF FRAME:        NAD_83(2011) (2010.0000)                 IGS08 (2014.6332)
X:               -2393603.905 m    0.000 m         -2393604.770 m    0.000 m
Y:               -3898338.942 m    0.000 m         -3898337.722 m    0.000 m
Z:                4431046.967 m    0.000 m          4431046.974 m    0.000 m
LAT:           44 16 46.11598      0.000 m       44 16 46.12942      0.000 m
E LON:        238 26 59.35571      0.000 m      238 26 59.29368      0.000 m
W LON:        121 33 00.64429      0.000 m      121 33 00.70632      0.000 m
EL HGT:              959.162 m    0.000 m              958.747 m    0.000 m
ORTHO HGT:           980.511 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4903936.492 m         290784.623 m
EASTING (X)        615691.425 m        1416160.767 m
CONVERGENCE       1.01231732 deg      -0.71847717 deg
POINT SCALE       0.99976461           1.00008307
COMBINED FACTOR   0.99961427           0.99993268

US NATIONAL GRID DESIGNATOR: 10TFQ1569103936 (NAD 83)
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NGS OPUS-PROJECTS NETWORK ADJUSTMENT REPORT

All coordinate accuracies reported here are 1 times the formal uncertainties from the solution. For additional information: geodesy.noaa.gov/OPUS/Using_OPUS-Projects.html#accuracy

These positions were computed without any knowledge by the National Geodetic Survey regarding the equipment or field operating procedures used.

SUBMITTED BY: william.stone
SOLUTION FILE NAME: network-final full con vert.sum
SOLUTION SOFTWARE: GPSCOM(1210.24)
SOLUTION DATE: 2015-06-08T12:46:36 UTC
STANDARD ERROR OF UNIT WEIGHT: 0.615
TOTAL NUMBER OF OBSERVATIONS: 1274293
TOTAL NUMBER OF MARKS: 16
NUMBER OF CONSTRAINED MARKS: 5

START TIME: 2014-08-17T00:00:00 GPS
STOP TIME: 2014-08-22T23:59:30 GPS
FREQUENCY: L1-ONLY TO ION-FREE [BY BASELINE LENGTH]
OBSERVATION INTERVAL: 30 s
ELEVATION CUTOFF: MIXED
TROPO INTERVAL: 1800 s [STEP-OFFSET PARAMETERIZATION]
DD CORRELATIONS: ON

INCLUDED SOLUTION	RMS	SOFTWARE	RUN DATE
1) 2014-229 A	1.2 cm	page5(1404.11)	2015-06-05T16:31 UTC
2) 2014-229 B	1.2 cm	page5(1404.11)	2015-06-05T16:35 UTC
3) 2014-230 A	1.1 cm	page5(1404.11)	2015-06-05T16:35 UTC
4) 2014-230 B	1.1 cm	page5(1404.11)	2015-06-05T16:39 UTC
5) 2014-231 A	1.2 cm	page5(1404.11)	2015-06-05T16:40 UTC
6) 2014-231 B	1.2 cm	page5(1404.11)	2015-06-05T16:44 UTC
7) 2014-232 A	1.2 cm	page5(1404.11)	2015-06-05T16:46 UTC
8) 2014-232 B	1.2 cm	page5(1404.11)	2015-06-05T16:50 UTC
9) 2014-234 A	1.1 cm	page5(1404.11)	2015-06-05T16:50 UTC

BASELINE	LENGTH	RMS	OBS	OMITTED	FIXED	IN SOLUTION(S)
h3__-p385	0.220 km	0.5 cm	3902	4.5%	90.9%	3
v735-p387	2.728 km	1.2 cm	3750	10.6%	88.5%	6, 8
x359-p387	7.856 km	1.4 cm	5055	9.5%	89.7%	6, 7
bbr2-p387	12.475 km	1.1 cm	2553	1.5%	100.0%	4
p387-c_15	20.847 km	2.3 cm	2588	0.7%	100.0%	2
sct2-p385	21.746 km	1.7 cm	2802	13.8%	94.4%	9
p385-c_15	22.514 km	1.2 cm	4006	3.5%	100.0%	1
c_16-p385	22.797 km	1.8 cm	2898	21.2%	89.7%	1
c_16-p387	23.220 km	1.9 cm	1502	17.3%	90.9%	2
bbr2-p385	25.050 km	1.2 cm	3709	0.9%	94.7%	9
sct2-p387	27.928 km	1.9 cm	1861	2.7%	92.3%	2
h3__-p387	33.289 km	1.5 cm	2098	3.1%	100.0%	4
p387-p385	33.348 km	1.2 cm	155315	1.4%	96.4%	1, 2, 3,...
redm-p387	34.307 km	1.1 cm	83137	1.0%	98.2%	2, 4, 6,...
v735-p385	35.964 km	1.7 cm	2994	10.6%	87.0%	5
x359-p385	37.715 km	1.8 cm	3439	4.3%	86.4%	5
redm-p385	66.544 km	1.1 cm	72716	0.5%	98.2%	1, 3, 5, 9
lpsb-p385	100.864 km	1.0 cm	71170	1.5%	98.4%	1, 3, 5, 9
lpsb-p387	124.247 km	1.2 cm	81460	1.3%	99.0%	2, 4, 6,...

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 rsbg-p385    175.215 km      1.2 cm    71892     0.5%    97.3%    1, 3, 5, 9
 gobs-p385    179.630 km      1.1 cm    72196     0.4%    96.8%    1, 3, 5, 9
 gobs-p387    181.535 km      1.2 cm    82461     0.7%    93.2%    2, 4, 6,...
 rsbg-p387    185.940 km      1.2 cm    81248     0.9%    97.5%    2, 4, 6,...
 ors1-p387    201.554 km      1.1 cm    81781     1.1%    98.6%    2, 4, 6,...
 ork5-p387    223.240 km      1.2 cm    82090     1.1%    98.6%    2, 4, 6,...
 ors1-p385    232.369 km      1.1 cm    71322     0.9%    97.7%    1, 3, 5, 9
 ork5-p385    239.505 km      1.2 cm    71624     1.1%    98.1%    1, 3, 5, 9
 fts5-p385    252.064 km      1.1 cm    71515     0.3%    99.1%    1, 3, 5, 9
 fts5-p387    282.683 km      1.2 cm    81209     0.8%    94.5%    2, 4, 6,...

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UNCONSTRAINED MARKS
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MARK:      bbr2 (bbr2    1)

REF FRAME:         NAD_83(2011) (2010.0000)                 IGS08 (2014.6362)
X:                -2394864.740 m    0.001 m         -2394865.606 m    0.001 m
Y:                -3887418.659 m    0.001 m         -3887417.441 m    0.001 m
Z:                 4441294.737 m    0.001 m          4441294.745 m    0.001 m
LAT:           44 23 59.13610      0.000 m       44 23 59.14950      0.000 m
E LON:        238 21 52.68684      0.000 m      238 21 52.62469      0.000 m
W LON:        121 38 07.31316      0.000 m      121 38 07.37531      0.000 m
EL HGT:             1941.091 m    0.002 m            1940.680 m    0.002 m
ORTHO HGT:          1962.467 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3601 OR N)
NORTHING (Y)      4917180.407 m          82099.447 m
EASTING (X)        608671.372 m        2409554.798 m
CONVERGENCE        0.95487428 deg      -0.80518482 deg
POINT SCALE        0.99974523           0.99998394
COMBINED FACTOR    0.99944104           0.99967968

US NATIONAL GRID DESIGNATOR: 10TFQ0867117180 (NAD 83)

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MARK:      c_15 (c_15    1)

REF FRAME:         NAD_83(2011) (2010.0000)                 IGS08 (2014.6268)
X:                -2413840.099 m    0.001 m         -2413840.959 m    0.001 m
Y:                -3888953.750 m    0.001 m         -3888952.531 m    0.001 m
Z:                 4429199.584 m    0.001 m          4429199.595 m    0.001 m
LAT:           44 15 03.48098      0.000 m       44 15 03.49439      0.000 m
E LON:        238 10 20.93438      0.000 m      238 10 20.87248      0.000 m
W LON:        121 49 39.06562      0.000 m      121 49 39.12752      0.000 m
EL HGT:             1563.292 m    0.002 m            1562.883 m    0.002 m
ORTHO HGT:          1584.181 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4900416.174 m          287931.147 m
EASTING (X)        593605.718 m        1393971.306 m
CONVERGENCE        0.81821998 deg      -0.90821809 deg
POINT SCALE        0.99970776           1.00007349
COMBINED FACTOR    0.99946277           0.99982841

US NATIONAL GRID DESIGNATOR: 10TEQ9360500416 (NAD 83)
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MARK: fts5 (fts5 a 2)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6312)	
X:	-2469884.462 m	0.000 m	-2469885.303 m	0.000 m
Y:	-3667816.269 m	0.001 m	-3667815.089 m	0.001 m
Z:	4581028.328 m	0.001 m	4581028.384 m	0.001 m
LAT:	46 12 17.58166	0.000 m	46 12 17.59483	0.000 m
E LON:	236 02 38.12173	0.000 m	236 02 38.05845	0.000 m
W LON:	123 57 21.87827	0.000 m	123 57 21.94155	0.000 m
EL HGT:	-13.440 m	0.001 m	-13.751 m	0.001 m
ORTHO HGT:	10.447 m	0.015 m	(H = h - N WHERE N = GEOID12A HGT)	

	UTM COORDINATES	STATE PLANE COORDINATES
	UTM (Zone 10)	SPC (3601 OR N)
NORTHING (Y)	5117256.113 m	287773.424 m
EASTING (X)	426242.583 m	2233336.433 m
CONVERGENCE	-0.69014595 deg	-2.45100169 deg
POINT SCALE	0.99966687	1.00005858
COMBINED FACTOR	0.99966898	1.00006069

US NATIONAL GRID DESIGNATOR: 10TDS2624217256 (NAD 83)

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MARK: gobs (gobs a 5)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6312)	
X:	-2280400.270 m	0.000 m	-2280401.141 m	0.000 m
Y:	-3823182.599 m	0.001 m	-3823181.393 m	0.001 m
Z:	4553230.228 m	0.001 m	4553230.236 m	0.001 m
LAT:	45 50 19.73099	0.000 m	45 50 19.74488	0.000 m
E LON:	239 11 07.22427	0.000 m	239 11 07.16097	0.000 m
W LON:	120 48 52.77573	0.000 m	120 48 52.83903	0.000 m
EL HGT:	621.891 m	0.001 m	621.487 m	0.001 m
ORTHO HGT:	642.702 m	0.017 m	(H = h - N WHERE N = GEOID12A HGT)	

	UTM COORDINATES	STATE PLANE COORDINATES
	UTM (Zone 10)	SPC (4602 WA S)
NORTHING (Y)	5078461.190 m	56233.373 m
EASTING (X)	669705.473 m	475554.819 m
CONVERGENCE	1.56809788 deg	-0.22856764 deg
POINT SCALE	0.99995407	0.99999876
COMBINED FACTOR	0.99985659	0.99990127

US NATIONAL GRID DESIGNATOR: 10TFR6970578461 (NAD 83)

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MARK: lpsb (lpsb a 1)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6312)	
X:	-2506818.089 m	0.000 m	-2506818.947 m	0.000 m
Y:	-3846908.520 m	0.001 m	-3846907.299 m	0.001 m
Z:	4412266.241 m	0.001 m	4412266.264 m	0.001 m
LAT:	44 03 04.40891	0.000 m	44 03 04.42193	0.000 m
E LON:	236 54 35.75149	0.000 m	236 54 35.68927	0.000 m
W LON:	123 05 24.24851	0.000 m	123 05 24.31073	0.000 m

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EL HGT:               118.105 m    0.001 m              117.722 m    0.001 m
ORTHO HGT:            141.380 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4877566.223 m         268104.845 m
EASTING (X)        492785.011 m        1292469.539 m
CONVERGENCE       -0.06262513 deg      -1.77198889 deg
POINT SCALE        0.99960064           1.00001342
COMBINED FACTOR    0.99958213           0.99999490

US NATIONAL GRID DESIGNATOR: 10TDP9278577566 (NAD 83)

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MARK:      ork5 (ork5 a  1)

REF FRAME:        NAD_83(2011) (2010.0000)                 IGS08 (2014.6312)
X:                -2481437.762 m    0.000 m         -2481438.632 m    0.000 m
Y:                -4022606.905 m    0.001 m         -4022605.658 m    0.001 m
Z:                 4270236.725 m    0.001 m          4270236.710 m    0.001 m
LAT:           42 17 19.71877      0.000 m       42 17 19.73159      0.000 m
E LON:        238 19 50.45861      0.000 m      238 19 50.39771      0.000 m
W LON:        121 40 09.54139      0.000 m      121 40 09.60229      0.000 m
EL HGT:              1258.831 m    0.001 m             1258.373 m    0.001 m
ORTHO HGT:           1281.299 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4682700.639 m           69784.405 m
EASTING (X)        609705.218 m        1403562.521 m
CONVERGENCE        0.89546313 deg      -0.79998518 deg
POINT SCALE        0.99974808           1.00001151
COMBINED FACTOR    0.99955074           0.99981412

US NATIONAL GRID DESIGNATOR: 10TFM0970582700 (NAD 83)

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MARK:      ors1 (ors1 a  1)

REF FRAME:        NAD_83(2011) (2010.0000)                 IGS08 (2014.6312)
X:                -2226385.020 m    0.000 m         -2226385.890 m    0.000 m
Y:                -4006811.876 m    0.001 m         -4006810.648 m    0.001 m
Z:                 4422203.081 m    0.001 m          4422203.067 m    0.001 m
LAT:           44 09 51.27396      0.000 m       44 09 51.28832      0.000 m
E LON:        240 56 28.53970      0.000 m      240 56 28.47865      0.000 m
W LON:        119 03 31.46030      0.000 m      119 03 31.52135      0.000 m
EL HGT:              1438.116 m    0.001 m             1437.640 m    0.001 m
ORTHO HGT:           1456.373 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 11)         SPC (3601 OR N)
NORTHING (Y)      4892175.995 m           56321.675 m
EASTING (X)        335397.354 m        2615277.980 m
CONVERGENCE       -1.43468059 deg       1.02212217 deg
POINT SCALE        0.99993323           1.00004685
COMBINED FACTOR    0.99970780           0.99982139

US NATIONAL GRID DESIGNATOR: 11TLJ3539792175 (NAD 83)
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MARK: p385 (p385 1)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6315)	
X:	-2414139.276 m	0.000 m	-2414140.137 m	0.000 m
Y:	-3871572.521 m	0.001 m	-3871571.304 m	0.001 m
Z:	4443506.212 m	0.001 m	4443506.225 m	0.001 m
LAT:	44 26 05.43909	0.000 m	44 26 05.45249	0.000 m
E LON:	238 03 15.05617	0.000 m	238 03 14.99403	0.000 m
W LON:	121 56 44.94383	0.000 m	121 56 45.00597	0.000 m
EL HGT:	1121.250 m	0.001 m	1120.847 m	0.001 m
ORTHO HGT:	1142.631 m	0.015 m	(H = h - N WHERE N = GEOID12A HGT)	

	UTM COORDINATES	STATE PLANE COORDINATES
	UTM (Zone 10)	SPC (3601 OR N)
NORTHING (Y)	4920712.255 m	86392.375 m
EASTING (X)	583898.498 m	2384895.675 m
CONVERGENCE	0.73807350 deg	-1.02535372 deg
POINT SCALE	0.99968656	0.99997598
COMBINED FACTOR	0.99951084	0.99980021

US NATIONAL GRID DESIGNATOR: 10TEQ8389820712 (NAD 83)

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MARK: p387 (p387 1)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6310)	
X:	-2394555.316 m	0.000 m	-2394556.181 m	0.000 m
Y:	-3896184.433 m	0.001 m	-3896183.214 m	0.001 m
Z:	4432424.000 m	0.001 m	4432424.008 m	0.001 m
LAT:	44 17 48.30677	0.000 m	44 17 48.32018	0.000 m
E LON:	238 25 31.94112	0.000 m	238 25 31.87908	0.000 m
W LON:	121 34 28.05888	0.000 m	121 34 28.12092	0.000 m
EL HGT:	963.049 m	0.001 m	962.636 m	0.001 m
ORTHO HGT:	984.412 m	0.015 m	(H = h - N WHERE N = GEOID12A HGT)	

	UTM COORDINATES	STATE PLANE COORDINATES
	UTM (Zone 10)	SPC (3602 OR S)
NORTHING (Y)	4905821.374 m	292728.805 m
EASTING (X)	613720.454 m	1414247.003 m
CONVERGENCE	0.99566686 deg	-0.73508952 deg
POINT SCALE	0.99975905	1.00008900
COMBINED FACTOR	0.99960810	0.99993800

US NATIONAL GRID DESIGNATOR: 10TFQ1372005821 (NAD 83)

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MARK: rsbg (rsbg a 1)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6312)	
X:	-2559295.135 m	0.000 m	-2559295.995 m	0.000 m
Y:	-3887370.508 m	0.001 m	-3887369.275 m	0.001 m
Z:	4346652.919 m	0.001 m	4346652.937 m	0.001 m
LAT:	43 14 06.04989	0.000 m	43 14 06.06269	0.000 m
E LON:	236 38 26.27219	0.000 m	236 38 26.21032	0.000 m
W LON:	123 21 33.72781	0.000 m	123 21 33.78968	0.000 m

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EL HGT:               135.641 m    0.001 m              135.248 m    0.001 m
ORTHO HGT:            159.342 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4786975.907 m         178180.060 m
EASTING (X)        470820.311 m        1267804.318 m
CONVERGENCE       -0.24616667 deg      -1.95622964 deg
POINT SCALE        0.99961047           0.99989528
COMBINED FACTOR    0.99958921           0.99987401

US NATIONAL GRID DESIGNATOR: 10TDN7082086975 (NAD 83)

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MARK:      sct2 (sct2    1)

REF FRAME:        NAD_83(2011) (2010.0000)                 IGS08 (2014.6352)
X:               -2420317.764 m    0.001 m         -2420318.625 m    0.001 m
Y:               -3886115.325 m    0.001 m         -3886114.106 m    0.001 m
Z:                4428564.949 m    0.001 m          4428564.961 m    0.001 m
LAT:           44 14 25.93498      0.000 m       44 14 25.94836      0.000 m
E LON:        238 05 05.53242      0.000 m      238 05 05.47047      0.000 m
W LON:        121 54 54.46758      0.000 m      121 54 54.52953      0.000 m
EL HGT:           1843.858 m    0.002 m             1843.451 m    0.002 m
ORTHO HGT:        1864.969 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4899161.583 m         286886.921 m
EASTING (X)        586626.476 m        1386954.838 m
CONVERGENCE        0.75693058 deg      -0.96815738 deg
POINT SCALE        0.99969229           1.00007005
COMBINED FACTOR    0.99940334           0.99978100

US NATIONAL GRID DESIGNATOR: 10TEP8662699161 (NAD 83)


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CONSTRAINED MARKS
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MARK:      c_16 (c_16    1)
CONSTRAIN: VER-ONLY TIGHT
ADJUST  X:   -0.041m (0.000m)   Y:   -0.042m (0.000m)   Z:    0.043m (0.000m)
ADJUST  N:   -0.009m (0.000m)   E:   -0.013m (0.000m)   H:    0.071m (0.000m)

REF FRAME:        NAD_83(2011) (2010.0000)                 IGS08 (2014.6267)
X:               -2416074.548 m    0.000 m         -2416075.409 m    0.000 m
Y:               -3888478.436 m    0.000 m         -3888477.217 m    0.000 m
Z:                4428335.052 m    0.000 m          4428335.063 m    0.000 m
LAT:           44 14 25.90562      0.000 m       44 14 25.91901      0.000 m
E LON:        238 08 44.10254      0.000 m      238 08 44.04061      0.000 m
W LON:        121 51 15.89746      0.000 m      121 51 15.95939      0.000 m
EL HGT:           1515.269 m    0.000 m             1514.861 m    0.000 m
ORTHO HGT:        1536.204 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                UTM COORDINATES    STATE PLANE COORDINATES
                 UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)      4899226.520 m         286805.819 m
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EASTING (X)          591474.491 m          1391804.416 m
CONVERGENCE          0.79929720 deg        -0.92662010 deg
POINT SCALE          0.99970291             1.00007005
COMBINED FACTOR      0.99946544             0.99983249

US NATIONAL GRID DESIGNATOR: 10TEP9147499226 (NAD 83)

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MARK:       h3__ (h3__     1)
CONSTRAIN: VER-ONLY TIGHT
ADJUST  X:    -0.005m (0.000m)    Y:    -0.013m (0.000m)    Z:     0.018m (0.000m)
ADJUST  N:     0.003m (0.000m)    E:     0.002m (0.000m)    H:     0.023m (0.000m)

REF FRAME:          NAD_83(2011) (2010.0000)                  IGS08 (2014.6295)
X:                 -2413951.367 m    0.000 m          -2413952.228 m    0.000 m
Y:                 -3871554.506 m    0.000 m          -3871553.289 m    0.000 m
Z:                  4443619.238 m    0.000 m           4443619.251 m    0.000 m
LAT:             44 26 10.65458      0.000 m        44 26 10.66797      0.000 m
E LON:          238 03 21.83382      0.000 m       238 03 21.77171      0.000 m
W LON:          121 56 38.16618      0.000 m       121 56 38.22829      0.000 m
EL HGT:               1118.473 m    0.000 m             1118.070 m    0.000 m
ORTHO HGT:            1139.847 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                 UTM COORDINATES    STATE PLANE COORDINATES
                  UTM (Zone 10)         SPC (3601 OR N)
NORTHING (Y)       4920875.109 m          86550.650 m
EASTING (X)         584046.257 m        2385048.420 m
CONVERGENCE         0.73941086 deg      -1.02401855 deg
POINT SCALE         0.99968687           0.99997566
COMBINED FACTOR     0.99951158           0.99980032

US NATIONAL GRID DESIGNATOR: 10TEQ8404620875 (NAD 83)

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MARK:       redm (redm a  4)
CONSTRAIN: HOR-ONLY TIGHT
ADJUST  X:    -0.006m (0.000m)    Y:    -0.010m (0.001m)    Z:     0.012m (0.001m)
ADJUST  N:     0.000m (0.000m)    E:    -0.000m (0.000m)    H:     0.017m (0.001m)

REF FRAME:          NAD_83(2011) (2010.0000)                  IGS08 (2014.6312)
X:                 -2366948.791 m    0.000 m          -2366949.659 m    0.000 m
Y:                 -3916334.868 m    0.001 m          -3916333.644 m    0.001 m
Z:                  4429451.034 m    0.001 m           4429451.032 m    0.001 m
LAT:             44 15 35.14666      0.000 m        44 15 35.16014      0.000 m
E LON:          238 51 07.68492      0.000 m       238 51 07.62290      0.000 m
W LON:          121 08 52.31508      0.000 m       121 08 52.37710      0.000 m
EL HGT:               920.283 m    0.001 m             919.853 m    0.001 m
ORTHO HGT:            941.406 m    0.015 m  (H = h - N WHERE N = GEOID12A HGT)

                 UTM COORDINATES    STATE PLANE COORDINATES
                  UTM (Zone 10)         SPC (3602 OR S)
NORTHING (Y)       4902392.827 m          288268.366 m
EASTING (X)         647844.558 m        1448261.000 m
CONVERGENCE         1.29286133 deg      -0.44323534 deg
POINT SCALE         0.99986882           1.00007642
COMBINED FACTOR     0.99972456           0.99993213

US NATIONAL GRID DESIGNATOR: 10TFQ4784402392 (NAD 83)
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MARK: v735 (v735 1)
CONSTRAIN: VER-ONLY TIGHT
ADJUST X: -0.016m (0.000m) Y: -0.019m (0.000m) Z: 0.030m (0.000m)
ADJUST N: 0.004m (0.000m) E: -0.004m (0.000m) H: 0.039m (0.000m)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6332)	
X:	-2393603.905 m	0.000 m	-2393604.770 m	0.000 m
Y:	-3898338.942 m	0.000 m	-3898337.722 m	0.000 m
Z:	4431046.967 m	0.000 m	4431046.974 m	0.000 m
LAT:	44 16 46.11598	0.000 m	44 16 46.12942	0.000 m
E LON:	238 26 59.35571	0.000 m	238 26 59.29368	0.000 m
W LON:	121 33 00.64429	0.000 m	121 33 00.70632	0.000 m
EL HGT:	959.162 m	0.000 m	958.747 m	0.000 m
ORTHO HGT:	980.511 m	0.015 m	(H = h - N WHERE N = GEOID12A HGT)	

	UTM COORDINATES (Zone 10)	STATE PLANE COORDINATES (3602 OR S)
NORTHING (Y)	4903936.492 m	290784.623 m
EASTING (X)	615691.425 m	1416160.767 m
CONVERGENCE	1.01231732 deg	-0.71847717 deg
POINT SCALE	0.99976461	1.00008307
COMBINED FACTOR	0.99961427	0.99993268

US NATIONAL GRID DESIGNATOR: 10TFQ1569103936 (NAD 83)

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MARK: x359 (x359 1)
CONSTRAIN: VER-ONLY TIGHT
ADJUST X: -0.010m (0.000m) Y: -0.026m (0.000m) Z: 0.038m (0.000m)
ADJUST N: 0.008m (0.000m) E: 0.005m (0.000m) H: 0.046m (0.000m)

REF FRAME:	NAD_83(2011) (2010.0000)		IGS08 (2014.6331)	
X:	-2397399.943 m	0.000 m	-2397400.807 m	0.000 m
Y:	-3901022.858 m	0.000 m	-3901021.638 m	0.000 m
Z:	4426926.884 m	0.000 m	4426926.891 m	0.000 m
LAT:	44 13 33.91426	0.000 m	44 13 33.92768	0.000 m
E LON:	238 25 36.89275	0.000 m	238 25 36.83081	0.000 m
W LON:	121 34 23.10725	0.000 m	121 34 23.16919	0.000 m
EL HGT:	1145.258 m	0.000 m	1144.842 m	0.000 m
ORTHO HGT:	1166.385 m	0.015 m	(H = h - N WHERE N = GEOID12A HGT)	

	UTM COORDINATES (Zone 10)	STATE PLANE COORDINATES (3602 OR S)
NORTHING (Y)	4897974.295 m	284875.376 m
EASTING (X)	613966.635 m	1414256.156 m
CONVERGENCE	0.99536753 deg	-0.73414851 deg
POINT SCALE	0.99975974	1.00006534
COMBINED FACTOR	0.99958024	0.99988578

US NATIONAL GRID DESIGNATOR: 10TFP1396697974 (NAD 83)

Cascade Volcano OPUS Projects Basic Training Project (btcv-c)

Final Coordinate Results

NAD83(2011) epoch 2010.00 / NAVD88

6/8/2015

Adjustment Series		1			2			3			4		
Mark		Min. Constr. Geom. (T)			Fully Constr. Geom. (N)			Min. Constr. Vert. (T)			Fully Constr. Vert (T)		
bbr2	NSRS	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)
		44 23 59.13611	121 38 07.31319	1941.074	44 23 59.13611	121 38 07.31355	1941.082	44 23 59.13609	121 38 07.31319	1941.095	44 23 59.13610	121 38 07.31316	1941.091
	SPCS	North	East	Ortho Height (H)	North	East	Ortho Height (H)	North	East	Ortho Height (H)	North	East	Ortho Height (H)
		82099.447	2409554.797	1962.450	82099.447	2409554.789	1962.458	82099.447	2409554.797	1962.471	82099.447	2409554.798	1962.467
	Delta				0	-0.008	0.008						-0.004
													None
c_15	NSRS	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)
		44 15 03.48098	121 49 39.06559	1563.275	44 15 03.48100	121 49 39.06597	1563.283	44 15 03.48096	121 49 39.06559	1563.296	44 15 03.48098	121 49 39.06562	1563.292
	SPCS	North	East	Ortho Height (H)	North	East	Ortho Height (H)	North	East	Ortho Height (H)	North	East	Ortho Height (H)
		287931.147	1393971.307	1584.164	287931.147	1393971.299	1584.172	287931.146	1393971.307	1584.185	287931.147	1393971.306	1584.181
	Delta				0	-0.008	0.008						-0.004
	IDB												1584.252
c_16	NSRS	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)
		44 14 25.90561	121 51 15.89745	1515.251	44 14 25.90563	121 51 15.89783	1515.259	44 14 25.90561	121 51 15.89745	1515.272	44 14 25.90562	121 51 15.89746	1515.269
	SPCS	North	East	Ortho Height (H)	North	East	Ortho Height (H)	North	East	Ortho Height (H)	North	East	Ortho Height (H)
		286805.818	1391804.417	1536.186	286805.819	1391804.408	1536.194	286805.819	1391804.417	1536.207	286805.819	1391804.416	1536.204
					0.001	-0.009	0.008						-0.003
	IDB												1536.204
h3__	NSRS	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)
		44 26 10.65457	121 56 38.16615	1118.460	44 26 10.65458	121 56 38.16654	1118.468	44 26 10.65457	121 56 38.16614	1118.480	44 26 10.65458	121 56 38.16618	1118.473
	SPCS	North	East	Ortho Height (H)	North	East	Ortho Height (H)	North	East	Ortho Height (H)	North	East	Ortho Height (H)
		86550.65	2385048.421	1139.834	86550.651	2385048.412	1139.842	86550.650	2385048.421	1139.854	86550.650	2385048.420	1139.847
					0.001	-0.009	0.008						-0.007
	IDB												1139.847
p385	NSRS	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)
		44 26 05.43910	121 56 44.94386	1121.233	44 26 05.43911	121 56 44.94418	1121.241	44 26 05.43911	121 56 44.94382	1121.254	44 26 05.43909	121 56 44.94383	1121.250
	SPCS	North	East	Ortho Height (H)	North	East	Ortho Height (H)	North	East	Ortho Height (H)	North	East	Ortho Height (H)
		86392.375	2384895.674	1142.614	86392.376	2384895.667	1142.622	86392.375	2384895.675	1142.635	86392.375	2384895.675	1142.631
					0.001	-0.007	0.008						-0.004
													None
p387	NSRS	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)
		44 17 48.30677	121 34 28.05888	963.033	44 17 48.30677	121 34 28.05927	963.040	44 17 48.30675	121 34 28.05888	963.054	44 17 48.30677	121 34 28.05888	963.049
	SPCS	North	East	Ortho Height (H)	North	East	Ortho Height (H)	North	East	Ortho Height (H)	North	East	Ortho Height (H)
		292728.805	1414247.003	984.396	292728.805	1414246.994	984.403	292728.801	1414246.96	984.417	292728.805	1414247.003	984.412
					0	-0.009	0.007						-0.005
													None
sct2	NSRS	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)
		44 14 25.93499	121 54 54.46759	1843.842	44 14 25.93500	121 54 54.46793	1843.849	44 14 25.93500	121 54 54.46757	1843.862	44 14 25.93498	121 54 54.46758	1843.858
	SPCS	North	East	Ortho Height (H)	North	East	Ortho Height (H)	North	East	Ortho Height (H)	North	East	Ortho Height (H)
		286886.921	1386954.838	1864.953	286886.921	1386954.831	1864.960	286886.921	1386954.839	1864.973	286886.921	1386954.838	1864.969
					0	-0.007	0.007						-0.004
	IDB												None
v735	NSRS	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)
		44 16 46.11600	121 33 00.64432	959.140	44 16 46.11600	121 33 00.64468	959.149	44 16 46.11598	121 33 00.64429	959.162	44 16 46.11598	121 33 00.64429	959.162
	SPCS	North	East	Ortho Height (H)	North	East	Ortho Height (H)	North	East	Ortho Height (H)	North	East	Ortho Height (H)
		290784.623	1416160.766	980.489	290784.623	1416160.758	980.498	290784.623	1416160.767	980.511	290784.623	1416160.767	980.511
					0	-0.008	0.009						0.000
	IDB												980.511
55 x359	NSRS	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)	Lat	Long (W)	Height (h)
		44 13 33.91425	121 34 23.10724	1145.239	44 13 33.91429	121 34 23.10758	1145.247	44 13 33.91429	121 34 23.10722	1145.260	44 13 33.91426	121 34 23.10725	1145.258
	SPCS	North	East	Ortho Height (H)	North	East	Ortho Height (H)	North	East	Ortho Height (H)	North	East	Ortho Height (H)
		284875.375	1414256.156	1166.366	284875.376	1414256.149	1166.374	284875.376	1414256.157	1166.387	284875.376	1414256.156	1166.385
					0.001	-0.007	0.008						-0.002
	IDB												1166.384