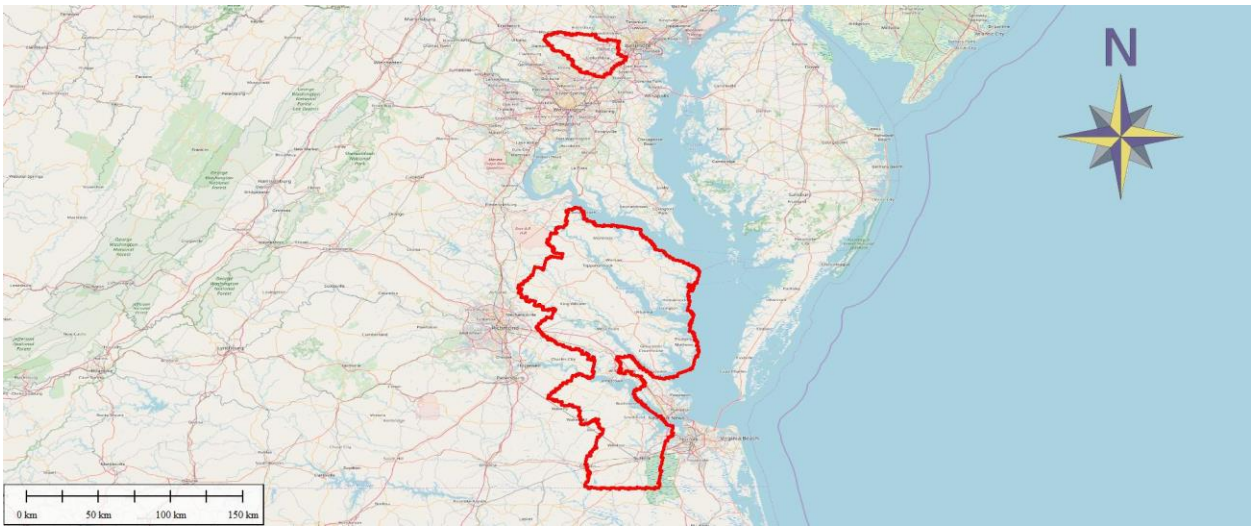
REPORT OF LIDAR SURVEY
United States Geological Survey
Ground Control Report
Southern Virginia



Performed by:

TerraSurv

For:

Fugro Geospatial

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USGS MARYLND QL1 LIDAR

INTRODUCTION

Terrasurv, Inc of Pittsburgh, PA was tasked by Fugro Geospatial with performing a control survey in support of LiDAR data collection covering several discrete areas in southeastern Virginia. The project consisted of two parts: 15 ground control points (GCP) and 120 quality control (QC: NVA/VVA/VVAF). The map in figure 1 shows the location of the Ground Control (GCP) and figure 2 shows the location of the QC points. The control symbology for figures 1 and 2 are listed in table 1. Also shown are the Continuously Operating Reference Station

Table 1 - Map Symbology and Control Quantity

Type	Symbol	VA Quantity
Ground Control (GCP)	Green Dot	15
Non-Vegetated (NVA)	Red Dot	67
Vegetated (VVA)	Red X	14
Woods (VVA-F)	Yellow X	39
CORS	Black Dot	12

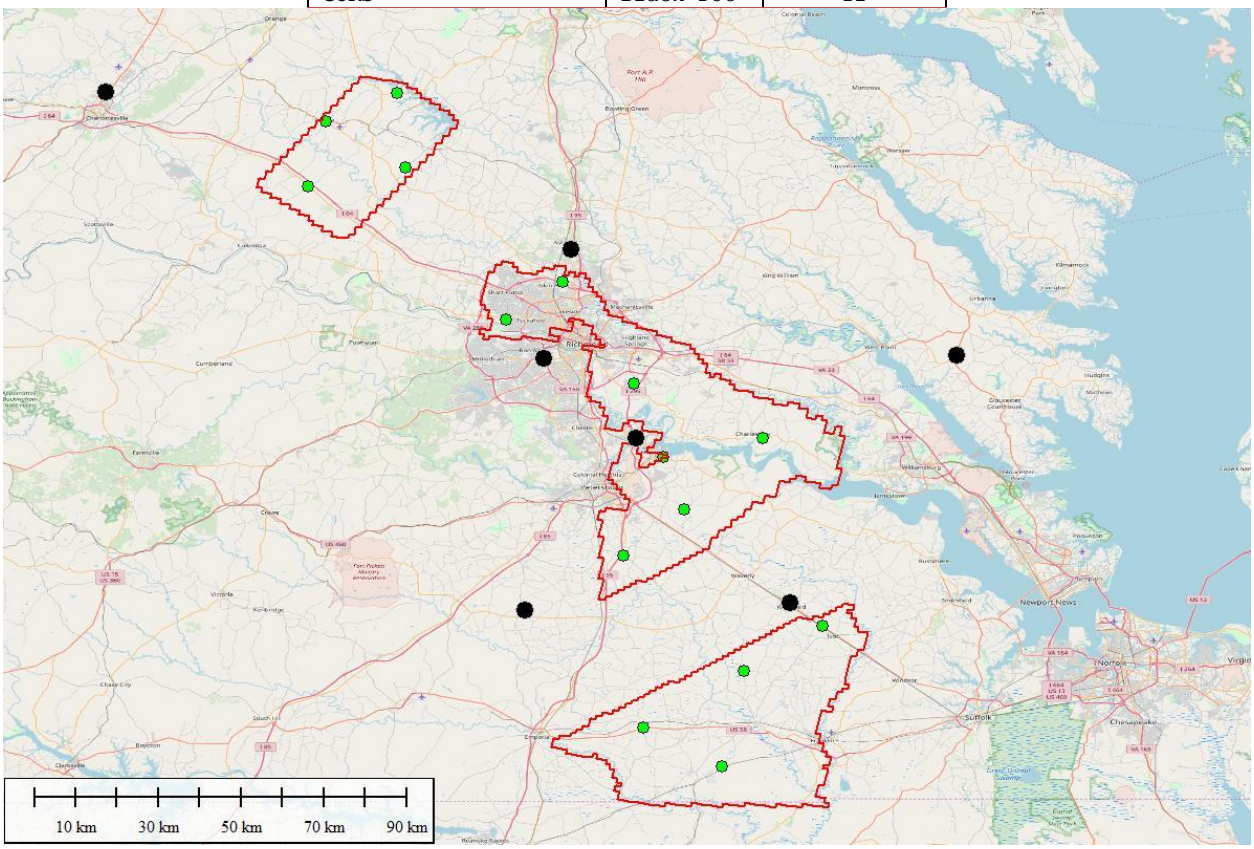

Figure 1 – GCP stations and CORS

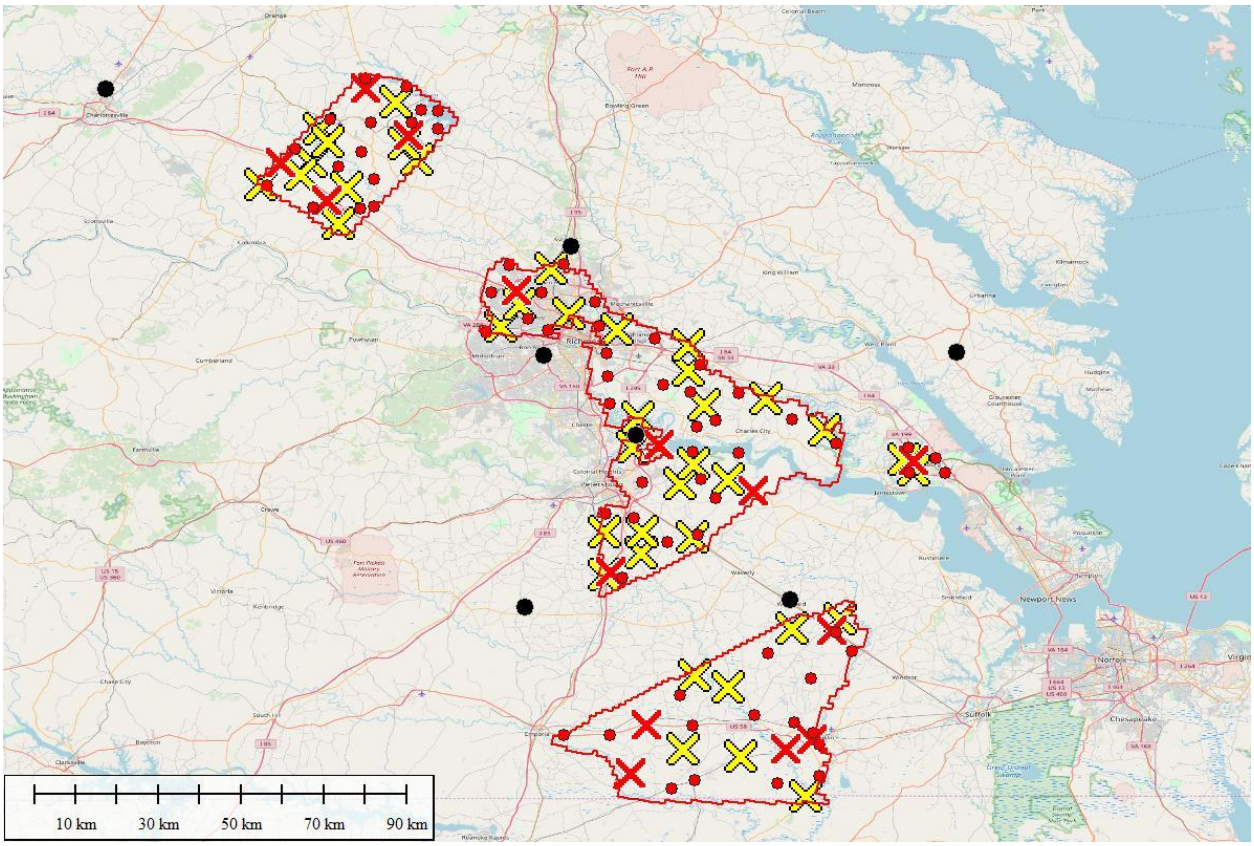

Figure 2 – Checkpoints and CORS

CONTROL

The National Spatial Reference System (NSRS) was used to provide control for the network. The Keynet real time network (RTN) was utilized, with a total of 12 CORS from the Keynet system being used. The horizontal datum was the North American Datum of 1983 – NAD83 (2011), epoch 2010.0. The vertical datum was the North American Vertical Datum of 1988 (NAVD88), realized with the GEOID12B geoid model from the National Geodetic Survey (NGS).

STATIONS

Table 2 lists the stations established in this survey, including the GCP, NVA, VVA, and VVA-F. Not listed are the temporary base stations established to enable survey of VVA-F points in wooded areas.

Table 2 - Station List

Station Name	GPSID	USGS Quadrangle	Description
F01BASE	19080XJ	CARSON	Base for Woods checkpoint
F02BASE	19080XF	DISPUTANTA SOUTH	Base for Woods checkpoint
F03BASE	19080XE	DISPUTANTA NORTH	Base for Woods checkpoint
F04BASE	19080XB	HOPEWELL	Base for Woods checkpoint
F05BASE	19080XH	PETERSBURG	Base for Woods checkpoint
F06BASE	19080XI	TEMPLETON	Base for Woods checkpoint
F07BASE	19080XG	PRINCE GEORGE	Base for Woods checkpoint

Station Name	GPSID	USGS Quadrangle	Description
F08BASE	19080XC	WESTOVER	Base for Woods checkpoint
F09BASE	19080XW	ROXBURY	Base for Woods checkpoint
F10BASE	19080XX	QUINTON	Base for Woods checkpoint
F11BASE	19080WC	GLEN ALLEN	Base for Woods checkpoint
F12BASE	19080XZ	BON AIR	Base for Woods checkpoint
F13BASE	19080WA	RICHMOND	Base for Woods checkpoint
F15BASE	19080XU	PROVIDENCE FORGE	Base for Woods checkpoint
F16BASE	19080XA	HOPEWELL	Base for Woods checkpoint
F17BASE	19080XV	ROXBURY	Base for Woods checkpoint
F18BASE	19080WB	SEVEN PINES	Base for Woods checkpoint
F19BASE	19080XY	GLEN ALLEN	Base for Woods checkpoint
F20BASE	19080XD	DISPUTANTA NORTH	Base for Woods checkpoint
F21BASE	19080XP	IVOR	Base for Woods checkpoint
F21BASE	19080XT	BRANDON	Base for Woods checkpoint
F22BASE	19080XQ	IVOR	Base for Woods checkpoint
F23BASE	19080XN	SEBRELL	Base for Woods checkpoint
F24BASE	19080XL	RIVERDALE	Base for Woods checkpoint
F25BASE	19080XO	SEBRELL	Base for Woods checkpoint
F26BASE	19080XK	COURTLAND	Base for Woods checkpoint
F27BASE	19080XM	CAPRON	Base for Woods checkpoint
F28BASE	19080XR	WILLIAMSBURG	Base for Woods checkpoint
F29BASE	19080XS	WILLIAMSBURG	Base for Woods checkpoint
F30BASE	19080WQ	ZION CROSSROADS	Base for Woods checkpoint
F31BASE	19080WE	FERNCLIFF	Base for Woods checkpoint
F32BASE	19080WO	SOUTH ANNA	Base for Woods checkpoint
F33BASE	19080WN	BUCKNER	Base for Woods checkpoint
F34BASE	19080WL	LAKE ANNA WEST	Base for Woods checkpoint
F35BASE	19080WG	LOUISA	Base for Woods checkpoint
F36BASE	19080WM	BUCKNER	Base for Woods checkpoint
F37BASE	19080WF	PENDLETON	Base for Woods checkpoint
F38BASE	19080WD	SOUTH ANNA	Base for Woods checkpoint
F39BASE	19080WP	FERNCLIFF	Base for Woods checkpoint
GCP01	19080AA	LOUISA	BARE=center of gravel drive to Woodfolk Building northeast of Woodfolk Ave
GCP02	19080AB	BON AIR	BARE=center of Colony Bluff Drive cul-de-sac
GCP03	19080AC	YELLOW TAVERN	BARE=centerline of Forest Trace Court on the south side of Forest Trace Lane
GCP04	19080AD	TEMPLETON	BARE=asphalt centerline of an entrance drive to an old wash site
GCP05	19080AE	BOYKINS	BARE=center of a field access on the south side of General Thomas Highway
GCP06	19080AF	DISPUTANTA NORTH	BARE=centerline intersection of Centennial Road and Easy Street
GCP07	19080AG	HOPEWELL	BARE=dirt centerline of a drive to a vacant lot on the north side of E Randolph Road
GCP08	19080AH	CHARLES CITY	BARE=centerline of Weyanoke Road and south edge of John Tyler Memorial Highway
GCP09	19080AI	DUTCH GAP	BARE=north turn lane along Doran Road just before Danrett Lane
GCP10	19080AJ	FERNCLIFF	BARE=gravel area on the south side of Broad Street Road and north of the intersection with Shannon Hill Road
GCP11	19080AK	LAKE ANNA WEST	BARE=center of a gravel drive to The Bark Park and on the south side of New Bridge Road
GCP12	19080AL	BUCKNER	BARE=southwest part of a dirt drive to the north of Buckner Road
GCP13	19080AM	DREWRYVILLE	BARE=asphalt on the east side of Arringdale Road and on the north side of US58
GCP14	19080AN	VICKSVILLE	BARE=centerline of a gravel road to the east of Cabin Point Road
GCP15	19080AO	IVOR	BARE=centerline of a dirt drive to the south of Bell Road
NVA01	19080AP	MIDLOTHIAN	BARE=asphalt center of the Riverdowns North Terrace cul-de-sac
NVA02	19080AQ	BON AIR	BARE=asphalt center of the South Wilton Road cul-de-sac
NVA03	19080AR	BON AIR	BARE=asphalt center of Greentree Court cul-de-sac

Station Name	GPSID	USGS Quadrangle	Description
NVA04	19080AS	HYLAS	BARE=asphalt center of the Storrow Drive cul-de-sac
NVA05	19080AT	GLEN ALLEN	BARE=asphalt center of Ashmont Lane cul-de-sac
NVA06	19080AU	YELLOW TAVERN	BARE=asphalt centerline of Chiltern Hills Court and on the southwest edge of Cedarlea Parkway
NVA07	19080AV	RICHMOND	BARE=asphalt center of Sterling Forest Parkway cul-de-sac
NVA08	19080AW	RICHMOND	BARE=asphalt center of Dillyn Court cul-de-sac
NVA09	19080AX	SEVEN PINES	BARE=asphalt center of Seven Bridges Way cul-de-sac
NVA10	19080AY	RICHMOND	BARE=asphalt center of Art Avenue cul-de-sac
NVA11	19080AZ	ROXBURY	BARE=asphalt center of the Scandia Road cul-de-sac
NVA12	19080BA	DREWRYS BLUFF	BARE=asphalt center of First Landing Court cul-de-sac
NVA13	19080BB	DREWRYS BLUFF	BARE=asphalt centerline of a parking lot for a bathhouse at a boat ramp and marina
NVA14	19080BC	DUTCH GAP	BARE=asphalt center of a cul-de-sac for Virgil Lane
NVA15	19080BD	PROVIDENCE FORGE	BARE=asphalt center of the Charles City Village Drive cul-de-sac
NVA16	19080BE	BRANDON	BARE=asphalt center of the cul-de-sac at the end of Eagles Nest Road
NVA17	19080BF	PETERSBURG	BARE=asphalt center of the Fairway Drive cul-de-sac
NVA18	19080BG	DISPUTANTA NORTH	BARE=asphalt cul-de-sac for Lancaster Farms Drive
NVA19	19080BH	TEMPLETON	BARE=east side of a gravel cul-de-sac on the south side of Crestview Lane
NVA20	19080BI	GLEN ALLEN	BARE=asphalt center of the Maple Creek Court cul-de-sac
NVA21	19080BJ	DISPUTANTA SOUTH	BARE=center of Centerville Road and north of the intersection with Webb Road and Alden Road
NVA22	19080BK	TEMPLETON	BARE=center of an asphalt cul-de-sac for Graham Lane
NVA23	19080BL	WESTOVER	BARE=center north end of the eastern parking lot for a church on the north side of Church Lane
NVA24	19080BM	PRINCE GEORGE	BARE=asphalt northwest part of a dead-end road on the northeast side of Bull Hill Road
NVA25	19080BN	WESTOVER	BARE=asphalt center of a cul-de-sac on Mari Bank Drive
NVA26	19080BO	BRANDON	BARE=northeast of the intersection of Liberty Church Road and The Glebe Lane
NVA27	19080BP	ADAMS GROVE	BARE=south side of a gravel area along Airport Drive west of the Airport Office
NVA28	19080BQ	MARGARETTSVILLE	BARE=gravel C/L of a drive to Calvary Church on the south side of Broad Street
NVA29	19080BR	FRANKLIN	BARE=center of an asphalt apron on the south side of Bank Street
NVA30	19080BS	FRANKLIN	BARE=center of cul-de-sac at west end of Carrie Drive
NVA31	19080BT	FRANKLIN	BARE=asphalt cul-de-sac for Nancy's Place
NVA32	19080BU	CAPRON	BARE=center of a gravel area on the north side of Pinopolis Road and south side of Old Lamb Road
NVA33	19080BV	ZUNI	BARE=east side of New Road and north of Seacock Chapel Road in a parking lot for Tucker Swamp Baptist Church
NVA34	19080BW	IVOR	BARE=south side of Broadwater Road and the entrance drive to Dollar Store
NVA35	19080BX	SEDLEY	BARE=centerline of Unity Road and the west edge of Mission Church Road
NVA36	19080BY	RIVERDALE	BARE=center of E Thomas Street cul-de-sac
NVA37	19080BZ	COURTLAND	BARE=centerline intersection of Woodland Park Circle and High Street
NVA38	19080CA	SUNBEAM	BARE=center of the intersection of Sandy Ridge Road and Sunbeam Road
NVA39	19080CB	BOYKINS	BARE=asphalt parking lot for a church on the east side of Main Street
NVA40	19080CC	ADAMS GROVE	BARE=asphalt intersection of Hicks Grove Road and Adams Ford Road
NVA41	19080CD	WILLIAMSBURG	BARE=center of a cul-de-sac on Patriot Lane in an apartment complex
NVA42	19080CE	ROXBURY	BARE=dirt centerline of a drive to the south of Fuqua Farms Drive
NVA43	19080CF	WESTOVER	BARE=asphalt centerline of W Run Road and east edge of Kimages Road
NVA44	19080CG	PRINCE GEORGE	BARE=asphalt center of the Cobblewood Drive cul-de-sac

Station Name	GPSID	USGS Quadrangle	Description
NVA45	19080CH	CHARLES CITY	BARE=asphalt cul-de-sac at the end of Flowerdew Hundred Road and a dirt private road
NVA46	19080CI	WILLIAMSBURG	BARE=asphalt center of the Starboard Court cul-de-sac
NVA47	19080CJ	WILLIAMSBURG	BARE=asphalt center of Pewter Court cul-de-sac
NVA48	19080CK	WILLIAMSBURG	BARE=asphalt center of the Old Colony Lane cul-de-sac
NVA49	19080CL	VICKSVILLE	BARE=gravel centerline of an access drive to Smitfield Farms and on the north side of Berlin Dory Road
NVA50	19080CM	DISPUTANTA NORTH	BARE=gravel Chatham Road on the west side of Heritage Road
NVA51	19080CN	ZION CROSSROADS	BARE=asphalt centerline of Venable Road and east side of Cedar Lane Road (Hwy 659)
NVA52	19080CO	CALEDONIA	BARE=centerline of a dirt drive to the south of Hickory Hill Road
NVA53	19080CP	SOUTH ANNA	BARE=asphalt parking lot for a funeral home on the south side of Cross Country Road
NVA54	19080CQ	MINERAL	BARE=asphalt drive to Food Lion and north of entrance to Hardees
NVA55	19080CR	LAKE ANNA WEST	BARE=asphalt center of the Pooh Court cul-de-sac and to the west of Bear Court
NVA56	19080CS	LAKE ANNA WEST	BARE=asphalt center line of Point Road on the north side of Moody town Road
NVA57	19080CT	SOUTH ANNA	BARE=dirt center of Boundary Run Road cul-de-sac
NVA58	19080CU	MINERAL	BARE=gravel area at the north end of Alblemarle Avenue
NVA59	19080CV	LAKE ANNA WEST	BARE=northwest quadrant of the intersection of Fairview Drive and Elk Creek Landing
NVA60	19080CW	PENDLETON	BARE=asphalt center of Breezywood Lane cul-de-sac
NVA61	19080CX	MINERAL	BARE=center of the Stonewall Court cul-de-sac
NVA62	19080CY	LAKE ANNA WEST	BARE=gravel parking lot to the west of Lake Anna Plaza and on the north side of New Bridge Road
NVA63	19080CZ	PENDLETON	BARE=gravel centerline of a pull off on the east side of Harts Mill Road
NVA64	19080DA	FERNCLIFF	BAE=dirt drive on the west side of Old Mountain Road
NVA65	19080DB	PENDLETON	BARE=center end of Smith Family Road
NVA66	19080DC	LAKE ANNA WEST	BARE=asphalt center of the Elk Court cul-de-sac
NVA67	19080DD	SEBRELL	BARE=centerline Everett Road and on the east side of Brandy Pond Road
VVA01	19080ER	HOPEWELL	BRUSH=on the west side of Water Street and opposite entrance drive to some storage tanks
VVA02	19080ES	SAVEDGE	BRUSH=north shoulder of Morning Star Road just east of a cemetery
VVA03	19080ET	DREWRYVILLE	GRASS=uncut on the north side of US58 and west of a gravel lot
VVA04	19080EU	FRANKLIN	BRUSH=high grass on north side of Stewart Drive
VVA05	19080EV	IVOR	GRASS=field on the south side of General Mahone Blvd and east side of a truck drive to Midway
VVA06	19080EW	COURTLAND	BRUSH=north side of General Thomas Highway and south side of the boat ramp parking lot
VVA07	19080EX	MARGARETTSVILLE	GRASS=island at the intersection of Little Texas Road and Whitehead Road
VVA08	19080EY	WILLIAMSBURG	GRASS=on the east side of a parking lot
VVA09	19080EZ	CARSON	BRUSH=on the north side of Rowanty Road and east side of Carson Ruritan Road
VVA10	19080FA	GLEN ALLEN	BRUSH=on the north side of the parking lot for WAWA on north side of US250
VVA11	19080FB	SOUTH ANNA	BRUSH=south side of US250 and west side of 3 Chopt Road and opposite Diamores Food Mart & Gas
VVA12	19080FC	FERNCLIFF	GRASS=north side of 3 Notch Road and east side of Holland Creek Road
VVA13	19080FD	MINERAL	GRASS=field on the west side of a gravel parking lot for the Mt Pleasant Church
VVA14	19080FE	BUCKNER	GRASS=south side of Fredericks Hall Road and north side of Woodley Lane
VVAF01	19080DE	CARSON	WOODS=east side of SR604 and the south side of a parking lot for a church
VVAF02	19080DF	DISPUTANTA SOUTH	WOODS=on the north side of Fireside Drive

Station Name	GPSID	USGS Quadrangle	Description
VVAF03	19080DG	DISPUTANTA NORTH	WOODS=stand of pines on the north side of Old Stage Road and south end of a gravel parking lot for a church
VVAF04	19080DH	HOPEWELL	WOODS=on the north side of Riverfront Drive and opposite #4206
VVAF05	19080DI	PETERSBURG	WOODS=on the north side of Old Keswick Lane
VVAF06	19080DJ	TEMPLETON	WOODS=on the south side of Tatum Road and the west side of a gated dirt road
VVAF07	19080DK	PRINCE GEORGE	WOODS=on the north side of Thweatt Drive and just east from the intersection with Prince George Drive
VVAF08	19080DL	WESTOVER	WOODS=on the south side of James River Road and north side of a gravel parking for Embassy of Reconciliation
VVAF09	19080DM	ROXBURY	WOODS=north side of a church parking lot and east side of Elko Road
VVAF10	19080DN	QUINTON	WOODS=north side of the Sparks Terrace cul-de-sac
VVAF11	19080DO	GLEN ALLEN	WOODS=on the west side of Greenwood Road and east side of Vasko Trail
VVAF12	19080DP	BON AIR	WOODS=east side of Middle Quarter Lane and just north of the intersection with Middle Quarter Court
VVAF13	19080DQ	RICHMOND	WOODS=Byrant Park on the south side of Youngs Pond Lane and south side of Jordans Branch Lane
VVAF14	19080DR	BRANDON	WOODS=north side of Old Neck Road
VVAF15	19080DS	PROVIDENCE FORGE	WOODS=trees on the east side of Courthouse Road and north side of Sturgeon Point Road
VVAF16	19080DT	HOPEWELL	WOODS=stand of pines on the north side of a cul-de-sac of Shallow Cove
VVAF17	19080DU	ROXBURY	WOODS=north side of Cattail Road and east of Native Lane
VVAF18	19080DV	SEVEN PINES	WOODS=north side of Seasons Lane
VVAF19	19080DW	GLEN ALLEN	WOODS=in the center of an island of a parking area in Deep Run Park
VVAF20	19080DX	DISPUTANTA NORTH	WOODS=on the north side of Baybranch Crossing and opposite the intersection with Woodcliff Lane and south side of fire break
VVAF21	19080DY	IVOR	WOODS=on the north side of Warrique Road and east from the intersection with Protors Bridge Road
VVAF22	19080DZ	IVOR	WOODS=on the northwest of Kellos Mill Road
VVAF23	19080EA	SEBRELL	WOODS=on the east side of Mill Neck Road and north of a dirt track to the northeast
VVAF24	19080EB	RIVERDALE	WOODS=north side of Riverdale Drive
VVAF25	19080EC	SEBRELL	WOODS=north side of Barn Tavern Road and west of Plank Road
VVAF26	19080ED	COURTLAND	WOODS=north side of T709 and the west side of a cotton field
VVAF27	19080EE	CAPRON	WOODS=north side of Peter Edwards Road and west side of Clarksbury Road
VVAF28	19080EF	WILLIAMSBURG	WOODS=center of Jones Mill Drive loop and west side of Holly Hills Drive
VVAF29	19080EG	WILLIAMSBURG	WOODS=on the south side of Center Street and north side of Casey Blvd
VVAF30	19080EH	ZION CROSSROADS	WOODS=south side of Venable Creek Lane and just south of the cul-de-sac
VVAF31	19080EI	FERNCLIFF	WOODS=east side of Roundabout Road and opposite the intersection with Old Mountain Road
VVAF32	19080EJ	SOUTH ANNA	WOODS=north side of Rolling Path Road and opposite a dirt drive to the south
VVAF33	19080EK	BUCKNER	WOODS=north side of The Church of Christ on the south side of Buckner Road
VVAF34	19080EL	LAKE ANNA WEST	WOODS=southwest quadrant of the intersection of Henslet Road and Fisher Drive
VVAF35	19080EM	LOUISA	WOODS=north side of Yanceyville Road and opposite a new growth clear cut
VVAF36	19080EN	BUCKNER	WOODS=north side of Cedar Hill Road and opposite an intersection with a dirt road
VVAF37	19080EO	PENDLETON	WOODS=east side of Yanceyville Road and opposite a clear cut

Station Name	GPSID	USGS Quadrangle	Description
VVAF38	19080EP	SOUTH ANNA	WOODS=on the east side of Forest Grove Road and north side of a high voltage power line right of way
VVAF39	19080EQ	FERNCLIFF	WOODS=north side of Duval Road and northeast of a power line ROW

The stations were not permanently marked.

METHODOLOGY

The field survey was done by using two Trimble R10 dual frequency, multi-constellation GNSS receivers in a real time (RTK/VRS) mode. Corrections were obtained from the KeyNetGPS VRS network with corrections delivered over the cellular network. These corrections are applied in real time, and used by the rover receivers to converge to a cm level solution. Each station was occupied once for 3 minutes (180 epochs), then re-initialized and occupied a second time immediately after the first occupation. The solutions are stored as vectors from the nearest physical CORS. The woods checkpoints were located by establishing a temporary base nearby using the KeyNetGPS network and then using the second R10 as a rover with corrections delivered over a radio link. Table 3 summarizes the VRS/RTK occupations (precisions in meters):

Table 3 – VRS/RTK Occupation Summary

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
PRS238661576032	19080AJ	12/16/2019 20:58:51	21:01:50	0.008	0.015	14	1.5
PRS238661576032	19080AJ	12/16/2019 21:02:19	21:05:19	0.008	0.015	14	1.5
PRS599743925248	19080AL	12/16/2019 21:34:05	21:37:04	0.006	0.010	12	1.8
PRS599743925248	19080AL	12/16/2019 21:40:14	21:43:13	0.010	0.014	14	1.4
PRS599743925248	19080AK	12/16/2019 22:06:17	22:09:16	0.007	0.010	14	1.4
PRS599743925248	19080AK	12/16/2019 22:10:46	22:13:45	0.011	0.016	14	1.4
PRS238661576032	19080AA	12/16/2019 22:34:02	22:37:01	0.010	0.015	14	1.5
PRS238661576032	19080AA	12/16/2019 22:38:39	22:41:38	0.011	0.016	15	1.5
PRS19983870467	19080XA	12/17/2019 14:03:18	14:06:17	0.007	0.010	12	1.5
19080XA	19080DT	12/17/2019 14:13:51	14:21:02	0.007	0.014	12	2.5
19080XA	19080DT	12/17/2019 14:22:05	14:25:27	0.008	0.014	14	1.9
PRS19983870467	19080XA	12/17/2019 14:27:17	14:30:16	0.005	0.010	11	1.7
PRS19983870467	19080XB	12/17/2019 14:50:32	14:53:41	0.009	0.021	8	3.5
19080XB	19080DH	12/17/2019 14:58:21	15:01:38	0.005	0.010	18	1.5
19080XB	19080DH	12/17/2019 15:02:00	15:05:00	0.005	0.009	16	1.5
PRS19983870467	19080ER	12/17/2019 15:26:52	15:33:08	0.026	0.025	11	2.0
PRS19983870467	19080ER	12/17/2019 15:33:47	15:36:46	0.007	0.013	12	1.9
PRS19983870467	19080AG	12/17/2019 15:47:06	15:50:05	0.007	0.013	12	1.8
PRS19983870467	19080AG	12/17/2019 15:50:46	15:53:45	0.007	0.013	10	1.9
PRS19983870467	19080BN	12/17/2019 16:03:17	16:06:16	0.005	0.008	13	1.5
PRS19983870467	19080BN	12/17/2019 16:06:43	16:09:42	0.006	0.012	12	1.6
PRS19983870467	19080XC	12/17/2019 16:23:06	16:26:05	0.007	0.013	10	2.2
19080XC	19080DL	12/17/2019 16:31:30	16:34:29	0.011	0.021	11	2.8
19080XC	19080DL	12/17/2019 16:35:28	16:39:43	0.011	0.020	11	2.4
PRS19983870467	19080CH	12/17/2019 16:53:28	16:56:27	0.016	0.023	12	1.6
PRS19983870467	19080CH	12/17/2019 16:57:35	17:00:34	0.012	0.017	11	1.6
PRS19983870467	19080XD	12/17/2019 17:13:39	17:16:38	0.020	0.029	11	1.8
19080XD	19080DX	12/17/2019 17:22:15	17:25:14	0.013	0.018	12	2.3
19080XD	19080DX	12/17/2019 17:26:00	17:29:03	0.014	0.021	10	2.4
PRS19983870467	19080ES	12/17/2019 17:45:24	17:48:23	0.007	0.013	11	2.2
PRS19983870467	19080ES	12/17/2019 17:49:06	17:52:05	0.009	0.017	11	2.2
PRS19983870467	19080BG	12/17/2019 18:03:02	18:06:01	0.008	0.017	10	2.9
PRS19983870467	19080BG	12/17/2019 18:08:23	18:11:25	0.010	0.025	10	2.9
PRS19983870467	19080BG	12/17/2019 18:11:54	18:15:26	0.015	0.034	10	2.8

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
PRS19983870467	19080CM	12/17/2019 18:28:26	18:31:25	0.012	0.020	14	1.3
PRS19983870467	19080CM	12/17/2019 18:31:57	18:34:56	0.009	0.015	13	1.5
PRS19983870467	19080XE	12/17/2019 18:46:06	18:49:09	0.005	0.008	12	1.6
19080XE	19080DG	12/17/2019 18:55:34	18:58:33	0.010	0.021	12	2.4
19080XE	19080DG	12/17/2019 19:02:54	19:06:52	0.011	0.022	12	2.2
19080XE	19080DG	12/17/2019 19:08:00	19:12:41	0.017	0.036	10	2.3
PRS19983870467	19080BM	12/17/2019 19:30:35	19:33:34	0.005	0.008	12	1.6
PRS19983870467	19080BM	12/17/2019 19:35:28	19:38:27	0.005	0.008	11	1.8
PRS19983870467	19080AF	12/17/2019 19:57:55	20:00:57	0.016	0.027	10	2.5
PRS19983870467	19080AF	12/17/2019 20:01:37	20:04:36	0.013	0.025	10	2.5
PRS19983870467	19080AF	12/17/2019 20:05:09	20:08:08	0.010	0.017	7	2.6
PRS686197981555	19080BJ	12/17/2019 20:20:08	20:23:44	0.007	0.013	12	1.7
PRS686197981555	19080BJ	12/17/2019 20:25:09	20:28:08	0.009	0.016	12	1.8
PRS686197981555	19080XF	12/17/2019 20:38:12	20:41:25	0.008	0.014	10	2.2
19080XF	19080DF	12/17/2019 20:44:04	20:47:03	0.009	0.014	12	2.0
19080XF	19080DF	12/17/2019 20:48:20	20:51:19	0.009	0.014	15	1.7
PRS19983870467	19080BK	12/17/2019 21:05:55	21:10:28	0.007	0.012	12	1.9
PRS19983870467	19080BK	12/17/2019 21:10:51	21:14:16	0.012	0.020	12	1.8
PRS19983870467	19080XG	12/17/2019 21:24:56	21:28:04	0.018	0.028	10	2.1
19080XG	19080DK	12/17/2019 21:30:42	21:34:49	0.007	0.012	10	1.8
19080XG	19080DK	12/17/2019 21:36:18	21:39:36	0.010	0.017	16	1.6
PRS19983870467	19080CG	12/17/2019 21:50:26	21:54:12	0.008	0.011	12	1.6
PRS19983870467	19080CG	12/17/2019 21:54:28	21:57:33	0.006	0.009	13	1.4
PRS19983870467	19080BF	12/17/2019 22:13:53	22:17:17	0.007	0.010	14	1.5
PRS19983870467	19080BF	12/17/2019 22:17:39	22:21:14	0.006	0.009	14	1.5
PRS19983870467	19080XH	12/18/2019 12:05:05	12:08:42	0.007	0.015	9	2.9
19080XH	19080DI	12/18/2019 12:21:06	12:32:38	0.007	0.010	11	2.6
19080XH	19080DI	12/18/2019 12:33:33	12:37:34	0.008	0.010	11	2.1
PRS839721317909	19080AD	12/18/2019 13:10:25	13:14:27	0.005	0.008	12	1.5
PRS839721317909	19080AD	12/18/2019 13:14:46	13:18:06	0.006	0.009	11	1.8
PRS839721317909	19080XI	12/18/2019 13:28:07	13:31:16	0.006	0.011	12	1.8
19080XI	19080DJ	12/18/2019 13:34:41	13:41:48	0.006	0.008	14	1.7
19080XI	19080DJ	12/18/2019 13:43:45	13:46:44	0.007	0.010	13	1.9
19080XI	19080DJ	12/18/2019 13:49:21	13:52:20	0.008	0.013	15	1.6
PRS839721317909	19080BH	12/18/2019 14:04:30	14:07:43	0.005	0.009	13	1.4
PRS839721317909	19080BH	12/18/2019 14:08:00	14:10:59	0.006	0.009	12	1.4
PRS19983870467	19080EZ	12/18/2019 14:20:01	14:23:00	0.016	0.027	10	2.0
PRS19983870467	19080EZ	12/18/2019 14:24:17	14:32:45	0.027	0.029	9	2.1
PRS19983870467	19080XJ	12/18/2019 14:37:28	14:40:27	0.008	0.014	11	2.0
PRS19983870467	19080XJ	12/18/2019 14:41:00	14:43:59	0.012	0.022	11	1.8
19080XJ	19080DE	12/18/2019 14:46:58	14:49:57	0.006	0.011	16	1.5
19080XJ	19080DE	12/18/2019 14:50:25	14:53:24	0.005	0.010	19	1.3
PRS686197981555	19080BP	12/18/2019 15:32:52	15:37:25	0.006	0.011	12	1.9
PRS686197981555	19080BP	12/18/2019 15:37:45	15:40:44	0.010	0.019	12	1.9
PRS686197981555	19080BP	12/18/2019 15:41:23	15:44:22	0.012	0.023	12	1.9
PRS686197981555	19080CC	12/18/2019 15:53:56	15:56:55	0.007	0.016	11	2.8
PRS686197981555	19080CC	12/18/2019 15:57:47	16:00:46	0.007	0.016	11	2.8
PRS686197981555	19080AM	12/18/2019 16:09:58	16:13:51	0.015	0.029	10	1.8
PRS686197981555	19080AM	12/18/2019 16:14:17	16:21:41	0.009	0.018	12	1.6
PRS686197981555	19080ET	12/18/2019 16:25:40	16:29:40	0.006	0.009	14	1.5
PRS686197981555	19080ET	12/18/2019 16:30:00	16:34:56	0.006	0.009	14	1.5
PRS452855538306	19080EX	12/18/2019 16:52:38	16:55:37	0.009	0.013	14	1.5
PRS452855538306	19080EX	12/18/2019 16:56:48	16:59:47	0.008	0.012	15	1.5
PRS452855538306	19080BQ	12/18/2019 17:14:02	17:17:01	0.011	0.015	14	1.5
PRS452855538306	19080BQ	12/18/2019 17:17:18	17:20:17	0.006	0.009	14	1.5
PRS452855538306	19080CB	12/18/2019 17:28:00	17:30:59	0.008	0.012	14	1.5
PRS452855538306	19080CB	12/18/2019 17:31:27	17:34:26	0.007	0.010	14	1.5
PRS452855538306	19080CB	12/18/2019 17:35:08	17:38:07	0.008	0.013	13	1.7
PRS452855538306	19080AE	12/18/2019 17:48:22	17:51:21	0.015	0.028	14	1.3
PRS452855538306	19080AE	12/18/2019 17:52:32	17:55:31	0.014	0.027	13	1.5
PRS452855538306	19080AE	12/18/2019 17:56:03	17:59:02	0.008	0.015	11	1.9
PRS686197981555	19080XK	12/18/2019 18:11:27	18:14:26	0.009	0.019	10	2.7
PRS686197981555	19080XK	12/18/2019 18:14:54	18:17:53	0.010	0.026	10	2.7
PRS686197981555	19080XK	12/18/2019 18:18:21	18:21:20	0.009	0.028	10	2.6

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
PRS686197981555	19080XK	12/18/2019 18:22:42	18:27:01	0.010	0.022	10	2.6
PRS686197981555	19080XK	12/18/2019 18:29:56	18:32:55	0.006	0.011	11	1.6
19080XK	19080ED	12/18/2019 18:37:09	18:42:08	0.022	0.032	7	3.1
19080XK	19080ED	12/18/2019 18:44:58	18:49:57	0.015	0.029	10	3.5
PRS452855538306	19080CA	12/18/2019 19:05:45	19:08:44	0.014	0.021	12	1.5
PRS452855538306	19080CA	12/18/2019 19:09:09	19:12:08	0.014	0.020	12	1.5
PRS452855538306	19080XL	12/18/2019 19:24:12	19:27:11	0.016	0.023	12	1.8
PRS452855538306	19080XL	12/18/2019 19:27:41	19:30:40	0.008	0.012	12	1.8
19080XL	19080EB	12/18/2019 19:33:58	19:36:57	0.010	0.016	13	2.1
19080XL	19080EB	12/18/2019 19:37:46	19:40:45	0.007	0.011	14	1.8
PRS452855538306	19080BY	12/18/2019 19:49:53	19:52:52	0.008	0.014	14	1.4
PRS452855538306	19080BY	12/18/2019 19:53:14	19:56:13	0.006	0.009	14	1.3
PRS686197981555	19080BR	12/18/2019 20:07:01	20:10:00	0.010	0.018	13	1.6
PRS686197981555	19080BR	12/18/2019 20:11:13	20:14:12	0.005	0.010	13	1.6
PRS686197981555	19080EW	12/18/2019 20:27:11	20:30:10	0.006	0.012	14	1.5
PRS686197981555	19080EW	12/18/2019 20:31:20	20:34:19	0.006	0.012	14	1.5
PRS686197981555	19080EU	12/18/2019 20:44:57	20:47:56	0.009	0.017	14	1.6
PRS686197981555	19080EU	12/18/2019 20:48:27	20:51:26	0.005	0.010	14	1.6
PRS686197981555	19080BS	12/18/2019 20:57:55	21:00:54	0.008	0.013	14	1.6
PRS686197981555	19080BS	12/18/2019 21:01:40	21:04:39	0.006	0.009	14	1.6
PRS686197981555	19080BT	12/18/2019 21:18:42	21:21:41	0.007	0.010	14	1.5
PRS686197981555	19080BT	12/18/2019 21:22:47	21:25:46	0.006	0.009	14	1.5
PRS686197981555	19080BZ	12/18/2019 21:40:57	21:43:09	0.008	0.011	15	1.3
PRS686197981555	19080BZ	12/18/2019 21:45:38	21:48:37	0.006	0.009	13	1.5
PRS686197981555	19080XM	12/18/2019 22:05:59	22:08:58	0.008	0.012	15	1.3
19080XM	19080EE	12/18/2019 22:14:21	22:19:20	0.006	0.009	17	2.1
19080XM	19080EE	12/18/2019 22:21:29	22:24:57	0.005	0.009	17	1.4
PRS686197981555	19080XM	12/18/2019 22:27:44	22:30:43	0.009	0.014	15	1.5
PRS686197981555	19080BU	12/18/2019 22:38:29	22:41:28	0.008	0.013	16	1.5
PRS686197981555	19080BU	12/18/2019 22:41:53	22:44:52	0.006	0.010	15	1.6
PRS686197981555	19080DD	12/19/2019 12:25:06	12:28:05	0.009	0.015	12	1.4
PRS686197981555	19080DD	12/19/2019 12:28:53	12:31:52	0.014	0.024	10	1.8
PRS686197981555	19080XN	12/19/2019 12:45:03	12:48:02	0.007	0.012	9	2.0
PRS686197981555	19080XN	12/19/2019 12:48:24	12:51:23	0.007	0.012	9	2.9
19080XN	19080EA	12/19/2019 12:54:34	12:57:33	0.009	0.022	12	2.8
19080XN	19080EA	12/19/2019 12:57:59	13:00:58	0.005	0.009	11	3.6
PRS686197981555	19080XO	12/19/2019 13:15:55	13:18:54	0.008	0.013	10	2.0
PRS686197981555	19080XO	12/19/2019 13:19:17	13:22:16	0.008	0.013	10	2.1
19080XO	19080EC	12/19/2019 13:24:52	13:27:51	0.008	0.013	13	1.9
19080XO	19080EC	12/19/2019 13:28:10	13:31:09	0.005	0.009	13	2.3
PRS686197981555	19080AN	12/19/2019 13:42:39	13:45:38	0.016	0.021	11	2.0
PRS686197981555	19080AN	12/19/2019 13:46:38	13:49:03	0.015	0.026	9	2.8
PRS686197981555	19080CL	12/19/2019 14:00:52	14:03:51	0.004	0.008	13	1.4
PRS686197981555	19080CL	12/19/2019 14:04:36	14:05:01	0.006	0.011	14	1.3
PRS686197981555	19080BX	12/19/2019 14:20:40	14:23:39	0.005	0.009	14	1.5
PRS686197981555	19080BX	12/19/2019 14:24:46	14:27:45	0.006	0.010	14	1.5
PRS686197981555	19080BV	12/19/2019 14:39:19	14:42:18	0.006	0.010	14	1.5
PRS686197981555	19080BV	12/19/2019 14:43:14	14:46:13	0.006	0.010	14	1.5
PRS686197981555	19080BW	12/19/2019 14:54:51	14:57:50	0.006	0.010	13	1.7
PRS686197981555	19080BW	12/19/2019 14:58:15	15:01:14	0.004	0.009	12	2.0
PRS686197981555	19080EV	12/19/2019 15:05:08	15:08:07	0.007	0.013	13	1.7
PRS686197981555	19080EV	12/19/2019 15:08:33	15:11:32	0.008	0.015	13	1.7
PRS686197981555	19080XP	12/19/2019 15:20:55	15:23:54	0.007	0.014	10	2.1
PRS686197981555	19080XP	12/19/2019 15:24:55	15:27:54	0.010	0.020	10	2.9
19080XP	19080DY	12/19/2019 15:33:49	15:40:20	0.010	0.029	10	5.1
19080XP	19080DY	12/19/2019 15:40:52	15:45:51	0.011	0.028	11	4.1
19080XP	19080DY	12/19/2019 15:46:28	15:49:27	0.010	0.024	13	4.0
19080XP	19080DY	12/19/2019 15:53:44	15:56:43	0.022	0.033	12	3.4
PRS686197981555	19080AO	12/19/2019 16:08:24	16:11:23	0.006	0.011	12	1.6
PRS686197981555	19080AO	12/19/2019 16:11:48	16:14:47	0.006	0.011	12	1.6
PRS686197981555	19080XQ	12/19/2019 16:27:46	16:30:45	0.007	0.010	12	1.6
PRS686197981555	19080XQ	12/19/2019 16:31:12	16:34:11	0.006	0.008	13	1.5
19080XQ	19080DZ	12/19/2019 16:39:21	16:43:22	0.007	0.011	14	2.0
19080XQ	19080DZ	12/19/2019 16:44:30	16:48:02	0.008	0.010	16	1.5

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
PRS311039777991	19080CK	12/19/2019 18:04:37	18:07:36	0.011	0.021	13	1.5
PRS311039777991	19080CK	12/19/2019 18:08:50	18:11:49	0.012	0.024	12	1.6
PRS311039777991	19080XR	12/19/2019 18:19:44	18:22:43	0.012	0.026	11	2.0
PRS311039777991	19080XR	12/19/2019 18:23:14	18:26:13	0.016	0.032	12	1.7
19080XR	19080EF	12/19/2019 18:31:59	18:34:58	0.017	0.034	13	2.0
19080XR	19080EF	12/19/2019 18:36:45	18:39:44	0.009	0.020	14	2.0
19080XR	19080EF	12/19/2019 18:43:31	18:46:30	0.007	0.016	14	2.0
PRS311039777991	19080CJ	12/19/2019 19:02:14	19:05:13	0.008	0.012	13	1.6
PRS311039777991	19080CJ	12/19/2019 19:05:51	19:08:50	0.009	0.014	13	1.6
PRS311039777991	19080CI	12/19/2019 19:19:41	19:22:40	0.009	0.014	12	1.5
PRS311039777991	19080CI	12/19/2019 19:23:29	19:26:28	0.015	0.023	11	1.7
PRS311039777991	19080CD	12/19/2019 19:42:16	19:45:15	0.013	0.021	13	1.5
PRS311039777991	19080CD	12/19/2019 19:46:42	19:49:41	0.013	0.020	14	1.4
PRS311039777991	19080CD	12/19/2019 19:50:31	19:53:30	0.010	0.015	12	1.5
PRS311039777991	19080EY	12/19/2019 20:07:56	20:10:56	0.012	0.020	14	1.3
PRS311039777991	19080EY	12/19/2019 20:11:39	20:14:38	0.006	0.010	14	1.4
PRS311039777991	19080XS	12/19/2019 20:22:32	20:25:31	0.009	0.016	13	1.5
PRS311039777991	19080XS	12/19/2019 20:27:39	20:30:01	0.006	0.010	13	1.6
19080XS	19080EG	12/19/2019 20:34:27	20:37:26	0.008	0.013	16	1.4
19080XS	19080EG	12/19/2019 20:38:15	20:41:14	0.004	0.007	18	1.3
PRS311039777991	19080BE	12/19/2019 21:09:41	21:12:40	0.012	0.020	13	1.7
PRS311039777991	19080BE	12/19/2019 21:13:12	21:16:11	0.011	0.020	13	1.7
PRS311039777991	19080XT	12/19/2019 21:25:57	21:29:55	0.016	0.023	14	1.7
PRS311039777991	19080XT	12/19/2019 21:30:49	21:33:48	0.008	0.012	13	1.7
PRS311039777991	19080XT	12/19/2019 21:34:15	21:37:14	0.010	0.014	12	1.9
19080XT	19080DR	12/19/2019 21:40:16	21:43:15	0.019	0.027	16	1.7
19080XT	19080DR	12/19/2019 21:43:51	21:46:50	0.008	0.011	14	1.9
PRS19983870467	19080BO	12/19/2019 21:56:51	21:59:50	0.012	0.018	14	1.4
PRS19983870467	19080BO	12/19/2019 22:00:32	22:03:31	0.011	0.016	13	1.5
PRS19983870467	19080AH	12/19/2019 22:13:28	22:16:27	0.007	0.010	15	1.4
PRS19983870467	19080AH	12/19/2019 22:17:05	22:20:04	0.006	0.009	15	1.4
PRS19983870467	19080XU	12/19/2019 22:32:50	22:35:49	0.009	0.015	13	1.7
PRS19983870467	19080XU	12/19/2019 22:36:44	22:39:43	0.015	0.027	14	1.7
19080XU	19080DS	12/19/2019 22:43:16	22:46:15	0.007	0.011	20	1.4
19080XU	19080DS	12/19/2019 22:46:43	22:49:42	0.005	0.009	21	1.4
PRS19983870467	19080AI	12/20/2019 12:44:50	12:47:49	0.007	0.010	11	1.8
PRS19983870467	19080AI	12/20/2019 12:49:19	12:52:18	0.006	0.008	11	1.7
PRS19983870467	19080BC	12/20/2019 13:02:27	13:05:26	0.008	0.011	12	1.5
PRS19983870467	19080BC	12/20/2019 13:06:57	13:09:56	0.005	0.008	10	2.0
PRS19983870467	19080CE	12/20/2019 13:18:56	13:21:55	0.005	0.008	11	1.7
PRS19983870467	19080CE	12/20/2019 13:22:36	13:25:35	0.008	0.012	12	1.7
PRS19983870467	19080XV	12/20/2019 13:35:58	13:38:57	0.005	0.009	10	2.2
PRS19983870467	19080XV	12/20/2019 13:39:37	13:42:36	0.008	0.015	10	1.8
19080XV	19080DU	12/20/2019 13:45:36	13:48:35	0.023	0.029	11	2.6
19080XV	19080DU	12/20/2019 13:54:33	13:57:32	0.025	0.021	12	2.5
PRS19983870467	19080CF	12/20/2019 14:09:11	14:10:15	0.015	0.025	11	1.6
PRS19983870467	19080CF	12/20/2019 14:11:30	14:14:45	0.010	0.037	8	3.5
PRS19983870467	19080BL	12/20/2019 14:22:06	14:25:05	0.009	0.015	13	1.6
PRS19983870467	19080BL	12/20/2019 14:26:26	14:29:25	0.006	0.011	13	1.6
PRS19983870467	19080BD	12/20/2019 14:43:23	14:46:23	0.010	0.018	13	1.6
PRS19983870467	19080BD	12/20/2019 14:47:37	14:50:36	0.006	0.011	14	1.4
PRS19983870467	19080XW	12/20/2019 15:09:06	15:12:05	0.010	0.019	11	2.2
PRS19983870467	19080XW	12/20/2019 15:12:33	15:15:32	0.006	0.012	12	2.0
19080XW	19080DM	12/20/2019 15:19:59	15:22:58	0.006	0.011	16	1.7
19080XW	19080DM	12/20/2019 15:23:58	15:26:57	0.005	0.009	13	2.0
JRE5	19080AZ	12/20/2019 15:33:59	15:36:58	0.007	0.013	11	2.2
JRE5	19080AZ	12/20/2019 15:38:21	15:41:20	0.011	0.028	10	4.9
JRE5	19080XX	12/20/2019 16:01:31	16:04:30	0.008	0.013	11	1.9
JRE5	19080XX	12/20/2019 16:05:07	16:08:06	0.011	0.017	12	1.7
19080XX	19080DN	12/20/2019 16:12:08	16:15:07	0.009	0.017	15	2.4
19080XX	19080DN	12/20/2019 16:16:27	16:19:26	0.006	0.011	15	2.2
PRS599743925248	19080AC	12/20/2019 16:47:46	16:50:45	0.009	0.014	12	1.8
PRS599743925248	19080AC	12/20/2019 16:51:38	16:54:38	0.004	0.007	13	1.8
PRS430030182734	19080AB	12/20/2019 17:16:29	17:19:28	0.007	0.012	12	1.9

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
PRS430030182734	19080AB	12/20/2019 17:20:02	17:23:01	0.007	0.012	11	2.1
PRS599743925248	19080BI	01/15/2020 12:22:29	12:25:28	0.006	0.010	12	1.7
PRS599743925248	19080BI	01/15/2020 12:26:03	12:29:02	0.004	0.007	12	1.7
PRS599743925248	19080FA	01/15/2020 12:44:23	12:47:22	0.007	0.012	13	1.5
PRS599743925248	19080FA	01/15/2020 12:47:54	12:50:53	0.006	0.010	12	1.7
PRS430030182734	19080AS	01/15/2020 13:04:51	13:07:50	0.009	0.016	11	1.7
PRS430030182734	19080AS	01/15/2020 13:08:29	13:11:28	0.005	0.009	12	1.6
PRS430030182734	19080XY	01/15/2020 13:32:08	13:37:41	0.005	0.010	10	2.2
PRS430030182734	19080XY	01/15/2020 13:38:09	13:41:08	0.005	0.009	10	2.2
DP06	19080DW	01/15/2020 13:46:58	13:52:03	0.007	0.016	9	4.1
DP06	19080DW	01/15/2020 13:52:47	13:57:17	0.012	0.031	8	6.4
DP06	19080DW	01/15/2020 13:59:29	14:01:07	0.018	0.046	9	2.4
PRS430030182734	19080XZ	01/15/2020 14:18:52	14:21:51	0.004	0.010	9	3.5
PRS430030182734	19080XZ	01/15/2020 14:22:31	14:28:39	0.004	0.009	9	3.2
19080XZ	19080DP	01/15/2020 14:53:21	14:56:20	0.005	0.008	16	1.5
19080XZ	19080DP	01/15/2020 14:56:55	15:00:03	0.005	0.008	17	1.4
PRS430030182734	19080AP	01/15/2020 15:24:44	15:27:43	0.004	0.007	14	1.4
PRS430030182734	19080AP	01/15/2020 15:28:26	15:31:25	0.005	0.008	13	1.6
PRS430030182734	19080AR	01/15/2020 15:50:02	15:53:01	0.004	0.007	12	1.9
PRS430030182734	19080AR	01/15/2020 15:53:46	15:56:45	0.003	0.007	11	2.6
PRS430030182734	19080AQ	01/15/2020 16:08:56	16:11:55	0.003	0.006	13	1.5
PRS430030182734	19080AQ	01/15/2020 16:12:16	16:15:15	0.003	0.005	12	1.9
PRS430030182734	19080WA	01/15/2020 16:36:39	16:39:38	0.007	0.011	14	1.4
PRS430030182734	19080WA	01/15/2020 16:40:01	16:43:00	0.007	0.011	7	2.2
19080WA	19080DQ	01/15/2020 16:45:56	16:52:37	0.004	0.007	17	1.6
19080WA	19080DQ	01/15/2020 16:53:06	16:56:21	0.005	0.011	8	1.7
PRS430030182734	19080AW	01/15/2020 17:15:00	17:17:59	0.007	0.010	13	1.4
PRS430030182734	19080AW	01/15/2020 17:19:04	17:22:04	0.007	0.010	14	1.5
PRS430030182734	19080WB	01/15/2020 17:46:42	17:49:41	0.005	0.008	13	1.6
PRS430030182734	19080WB	01/15/2020 17:50:30	17:53:29	0.006	0.009	14	1.5
19080WB	19080DV	01/15/2020 17:57:17	18:01:15	0.005	0.008	16	1.5
19080WB	19080DV	01/15/2020 18:02:02	18:05:05	0.006	0.009	13	2.3
PRS430030182734	19080AY	01/15/2020 18:19:19	18:20:27	0.005	0.008	15	1.3
PRS430030182734	19080AY	01/15/2020 18:23:03	18:26:02	0.004	0.007	15	1.4
PRS430030182734	19080BA	01/15/2020 18:37:23	18:40:22	0.004	0.007	15	1.5
PRS430030182734	19080BA	01/15/2020 18:41:03	18:44:02	0.007	0.012	14	1.5
PRS19983870467	19080BB	01/15/2020 18:53:00	18:55:59	0.004	0.007	15	1.5
PRS19983870467	19080BB	01/15/2020 18:57:48	19:00:47	0.004	0.006	14	1.5
PRS430030182734	19080AX	01/15/2020 19:24:07	19:27:07	0.005	0.008	14	1.5
PRS430030182734	19080AX	01/15/2020 19:27:42	19:30:41	0.006	0.009	14	1.5
PRS599743925248	19080AV	01/15/2020 19:52:05	19:55:05	0.007	0.010	13	1.7
PRS599743925248	19080AV	01/15/2020 19:56:18	19:59:17	0.009	0.012	13	1.7
PRS599743925248	19080AU	01/15/2020 20:17:10	20:20:09	0.004	0.005	16	1.3
PRS599743925248	19080AU	01/15/2020 20:21:54	20:24:54	0.003	0.005	15	1.3
PRS599743925248	19080WC	01/15/2020 20:36:26	20:39:25	0.004	0.006	14	1.6
PRS599743925248	19080WC	01/15/2020 20:39:46	20:42:45	0.005	0.007	14	1.6
19080WC	19080DO	01/15/2020 20:46:21	20:51:12	0.006	0.011	18	1.8
19080WC	19080DO	01/15/2020 20:51:35	20:54:35	0.007	0.013	18	1.8
PRS599743925248	19080AT	01/15/2020 21:13:52	21:16:51	0.005	0.012	13	1.5
PRS599743925248	19080AT	01/15/2020 21:18:07	21:21:06	0.005	0.011	14	1.4
PRS599743925248	19080WD	01/15/2020 22:09:41	22:12:55	0.007	0.018	12	2.2
PRS599743925248	19080WD	01/15/2020 22:13:37	22:16:36	0.007	0.018	12	2.2
19080WD	19080EP	01/15/2020 22:19:13	22:22:13	0.006	0.014	17	2.0
19080WD	19080EP	01/15/2020 22:22:37	22:25:37	0.004	0.009	16	2.0
PRS238661576032	19080CO	01/15/2020 22:34:16	22:37:15	0.009	0.019	12	1.8
PRS238661576032	19080CO	01/15/2020 22:39:36	22:42:35	0.006	0.011	14	1.6
PRS238661576032	19080DA	01/16/2020 12:30:48	12:35:20	0.015	0.027	13	1.7
PRS238661576032	19080DA	01/16/2020 12:36:04	12:39:03	0.011	0.019	14	1.6
PRS238661576032	19080WE	01/16/2020 12:50:31	12:55:01	0.012	0.022	12	1.8
PRS238661576032	19080WE	01/16/2020 12:55:25	12:58:27	0.011	0.024	13	1.7
19080WE	19080EI	01/16/2020 13:02:35	13:06:56	0.007	0.014	16	2.3
19080WE	19080EI	01/16/2020 13:07:19	13:10:19	0.007	0.015	15	2.6
19080WE	19080EI	01/16/2020 13:10:43	13:13:42	0.006	0.012	16	2.4
PRS238661576032	19080WF	01/16/2020 13:27:05	13:30:04	0.006	0.012	13	1.7

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
PRS238661576032	19080WF	01/16/2020 13:30:51	13:33:50	0.006	0.012	13	1.7
19080WF	19080EO	01/16/2020 13:39:55	13:46:09	0.006	0.014	15	2.1
19080WF	19080EO	01/16/2020 13:46:42	13:54:49	0.015	0.038	10	5.2
PRS238661576032	19080WG	01/16/2020 14:04:45	14:07:48	0.017	0.038	13	2.4
PRS238661576032	19080WG	01/16/2020 14:08:29	14:11:28	0.013	0.027	13	2.4
19080WG	19080EM	01/16/2020 14:15:06	14:18:26	0.009	0.021	14	2.4
19080WG	19080EM	01/16/2020 14:20:50	14:25:26	0.006	0.015	14	2.6
PRS238661576032	19080CQ	01/16/2020 14:32:30	14:35:29	0.009	0.014	14	1.7
PRS238661576032	19080CQ	01/16/2020 14:36:00	14:38:59	0.011	0.017	14	1.7
PRS599743925248	19080CU	01/16/2020 14:52:45	14:55:44	0.011	0.014	14	1.5
PRS599743925248	19080CU	01/16/2020 14:56:37	14:59:36	0.009	0.012	15	1.5
PRS599743925248	19080WL	01/16/2020 15:13:37	15:16:36	0.019	0.026	12	1.9
PRS599743925248	19080WL	01/16/2020 15:19:04	15:22:03	0.024	0.025	12	1.9
19080WL	19080EL	01/16/2020 15:26:54	15:30:29	0.014	0.019	13	2.1
19080WL	19080EL	01/16/2020 15:30:53	15:33:54	0.014	0.019	13	2.1
PRS238661576032	19080FD	01/16/2020 15:50:40	15:53:39	0.009	0.016	14	1.4
PRS238661576032	19080FD	01/16/2020 15:54:19	15:57:18	0.008	0.014	14	1.4
PRS336142062249	19080CX	01/16/2020 16:04:49	16:07:48	0.012	0.023	14	1.4
PRS336142062249	19080CX	01/16/2020 16:08:33	16:11:32	0.007	0.014	14	1.4
PRS336142062249	19080CX	01/16/2020 16:13:56	16:16:55	0.011	0.021	14	1.4
PRS599743925248	19080CY	01/16/2020 16:36:46	16:39:45	0.011	0.020	14	1.5
PRS599743925248	19080CY	01/16/2020 16:40:36	16:43:35	0.015	0.029	14	1.5
PRS599743925248	19080CV	01/16/2020 16:53:04	16:56:03	0.008	0.012	15	1.3
PRS599743925248	19080CV	01/16/2020 16:56:34	16:59:33	0.012	0.019	15	1.3
PRS599743925248	19080CR	01/16/2020 17:05:20	17:08:19	0.006	0.009	15	1.3
PRS599743925248	19080CR	01/16/2020 17:09:22	17:12:21	0.008	0.012	15	1.3
PRS599743925248	19080CS	01/16/2020 17:26:44	17:29:43	0.008	0.012	13	1.6
PRS599743925248	19080CS	01/16/2020 17:30:48	17:33:47	0.007	0.012	13	1.6
PRS599743925248	19080DC	01/16/2020 17:44:32	17:47:31	0.007	0.011	14	1.5
PRS599743925248	19080DC	01/16/2020 17:48:03	17:51:02	0.007	0.012	15	1.4
PRS599743925248	19080FE	01/16/2020 18:02:45	18:05:44	0.010	0.017	11	2.4
PRS599743925248	19080FE	01/16/2020 18:07:23	18:10:22	0.008	0.019	11	2.4
PRS599743925248	19080WM	01/16/2020 18:19:44	18:22:43	0.011	0.025	13	1.6
PRS599743925248	19080WM	01/16/2020 18:23:09	18:26:08	0.009	0.017	13	1.6
19080WM	19080EN	01/16/2020 18:29:42	18:32:42	0.011	0.016	15	1.8
19080WM	19080EN	01/16/2020 18:33:09	18:35:55	0.010	0.016	13	1.9
PRS599743925248	19080WN	01/16/2020 18:54:51	18:57:50	0.011	0.020	14	1.5
PRS599743925248	19080WN	01/16/2020 18:59:45	19:02:44	0.009	0.015	14	1.5
19080WN	19080EK	01/16/2020 19:07:03	19:15:01	0.017	0.034	11	7.5
19080WN	19080EK	01/16/2020 19:16:09	19:18:39	0.016	0.023	12	2.5
PRS599743925248	19080CW	01/16/2020 19:33:50	19:36:49	0.007	0.012	13	1.4
PRS599743925248	19080CW	01/16/2020 19:40:59	19:43:58	0.010	0.016	14	1.3
PRS599743925248	19080DB	01/16/2020 19:52:50	19:55:49	0.012	0.018	14	1.4
PRS599743925248	19080DB	01/16/2020 19:56:53	19:59:52	0.006	0.009	14	1.4
PRS599743925248	19080WO	01/16/2020 20:13:11	20:16:13	0.016	0.028	14	1.5
PRS599743925248	19080WO	01/16/2020 20:17:23	20:23:40	0.011	0.018	13	1.8
19080WO	19080EJ	01/16/2020 20:27:48	20:30:27	0.009	0.016	14	2.1
19080WO	19080EJ	01/16/2020 20:31:01	20:34:04	0.017	0.033	15	2.0
PRS599743925248	19080CZ	01/16/2020 20:47:11	20:50:10	0.010	0.017	13	1.9
PRS599743925248	19080CZ	01/16/2020 20:50:45	20:53:04	0.009	0.017	13	1.9
PRS599743925248	19080CP	01/16/2020 21:08:29	21:11:28	0.007	0.015	14	1.5
PRS599743925248	19080CP	01/16/2020 21:13:58	21:16:57	0.006	0.013	14	1.5
PRS599743925248	19080CP	01/16/2020 21:17:22	21:20:21	0.007	0.014	14	1.5
PRS599743925248	19080CT	01/16/2020 21:29:08	21:33:31	0.008	0.023	6	3.7
PRS599743925248	19080CT	01/16/2020 21:35:00	21:37:59	0.011	0.032	11	2.6
PRS599743925248	19080FB	01/16/2020 21:53:25	21:56:25	0.008	0.019	13	2.1
PRS599743925248	19080FB	01/16/2020 21:59:58	22:02:57	0.011	0.027	13	2.2
PRS238661576032	19080WP	01/16/2020 22:19:08	22:22:07	0.009	0.018	13	1.8
PRS238661576032	19080WP	01/16/2020 22:22:36	22:25:35	0.008	0.015	14	1.5
19080WP	19080EQ	01/16/2020 22:28:19	22:31:41	0.006	0.014	17	2.5
19080WP	19080EQ	01/16/2020 22:32:38	22:35:42	0.007	0.016	20	2.3
PRS238661576032	19080FC	01/17/2020 12:24:20	12:27:19	0.006	0.011	14	1.6
PRS238661576032	19080FC	01/17/2020 12:27:56	12:30:55	0.010	0.018	14	1.6
PRS238661576032	19080CN	01/17/2020 12:41:20	12:44:19	0.008	0.013	15	1.4

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
PRS238661576032	19080CN	01/17/2020 12:44:58	12:47:57	0.007	0.013	16	1.3
PRS238661576032	19080WQ	01/17/2020 13:01:35	13:04:34	0.015	0.027	14	1.6
PRS238661576032	19080WQ	01/17/2020 13:05:12	13:08:11	0.006	0.012	13	1.6
19080WQ	19080EH	01/17/2020 13:10:55	13:15:07	0.004	0.007	19	1.4
19080WQ	19080EH	01/17/2020 13:15:35	13:18:37	0.003	0.005	18	1.3

As mentioned, each station was occupied twice (at least) in succession. The Earth Centered Earth Fixed (ECEF) vector differences were rotated into a local horizon system (N, E, Up) for analysis, as summarized in table 4.

Table 4 - Repeat Baseline Analysis (meters)

To	Delta North	Delta East	Delta Horiz	Delta Up	Length
19080AA	0.005	-0.006	0.008	0.008	42402
19080AB	0.007	-0.003	0.008	-0.007	11861
19080AC	0.002	0.000	0.002	0.013	7953
19080AD	-0.003	0.000	0.003	0.005	23008
19080AE	-0.007	-0.004	0.008	-0.043	39525
19080AE	-0.006	-0.006	0.009	-0.063	39525
19080AE	0.001	-0.002	0.003	-0.020	39525
19080AF	-0.039	-0.005	0.039	0.005	19568
19080AF	-0.020	0.002	0.020	0.003	19568
19080AF	0.019	0.007	0.020	-0.002	19568
19080AG	0.004	0.000	0.004	-0.004	7015
19080AH	-0.001	-0.001	0.002	-0.009	24558
19080AI	-0.005	0.012	0.013	0.001	13046
19080AJ	-0.007	-0.002	0.008	-0.004	44784
19080AK	0.005	-0.006	0.008	0.015	50287
19080AL	-0.010	-0.005	0.012	-0.012	37255
19080AM	0.003	-0.019	0.020	0.000	41330
19080AN	-0.002	0.004	0.005	-0.013	18780
19080AO	0.001	0.000	0.001	-0.007	8446
19080AP	-0.003	-0.004	0.005	-0.008	12278
19080AQ	0.004	-0.003	0.005	-0.006	6192
19080AR	0.000	0.000	0.001	-0.014	9224
19080AS	0.005	0.003	0.006	0.004	18024
19080AT	0.004	0.004	0.006	-0.005	12540
19080AU	-0.001	-0.007	0.007	-0.011	4407
19080AV	0.003	0.003	0.004	0.006	14066
19080AW	-0.003	0.001	0.003	-0.027	12764
19080AX	-0.001	-0.001	0.001	0.012	21789
19080AY	-0.007	0.008	0.010	-0.027	12106
19080AZ	0.000	-0.008	0.008	0.011	20883
19080BA	-0.001	0.000	0.001	0.002	13350
19080BB	0.002	0.000	0.002	0.009	8993
19080BC	0.003	0.006	0.007	-0.029	13277
19080BD	-0.005	-0.004	0.006	0.001	22211
19080BE	0.001	0.005	0.005	-0.013	31996
19080BF	0.001	-0.001	0.002	0.005	19803
19080BG	-0.009	0.009	0.013	0.032	21628
19080BG	0.004	0.014	0.014	0.007	21628
19080BG	0.013	0.005	0.014	-0.025	21628
19080BH	0.008	0.007	0.011	0.012	20047
19080BI	0.002	0.003	0.004	0.009	12475

To	Delta North	Delta East	Delta Horiz	Delta Up	Length
19080BJ	0.005	-0.007	0.008	0.008	23694
19080BK	0.007	0.005	0.008	0.006	26536
19080BL	0.001	0.000	0.001	0.007	15904
19080BM	-0.018	0.005	0.018	0.006	12347
19080BN	0.001	-0.007	0.007	-0.010	11628
19080BO	0.006	-0.010	0.012	-0.019	30253
19080BP	0.016	0.007	0.018	-0.054	54615
19080BP	0.008	0.009	0.012	-0.072	54615
19080BP	-0.008	0.002	0.009	-0.018	54615
19080BQ	0.002	-0.008	0.009	0.004	38154
19080BR	0.002	-0.003	0.004	0.022	35171
19080BS	-0.004	-0.006	0.008	0.000	32395
19080BT	0.001	0.004	0.004	0.009	29526
19080BU	-0.003	-0.004	0.005	0.012	35713
19080BV	0.009	0.010	0.014	-0.005	17226
19080BW	0.010	0.001	0.010	-0.001	11814
19080BX	-0.005	0.001	0.006	-0.032	19381
19080BY	0.007	0.001	0.007	0.007	35878
19080BZ	-0.004	0.008	0.009	0.026	28658
19080CA	0.001	0.002	0.002	0.001	33199
19080CB	-0.008	-0.009	0.012	0.030	37604
19080CB	-0.012	-0.001	0.012	0.016	37604
19080CB	-0.004	0.008	0.009	-0.014	37604
19080CC	-0.002	0.000	0.002	-0.006	47715
19080CD	0.002	0.007	0.008	0.040	24824
19080CD	-0.005	-0.004	0.007	0.041	24824
19080CD	-0.008	-0.011	0.013	0.001	24824
19080CE	0.000	0.000	0.000	0.021	14744
19080CF	-0.002	-0.009	0.009	0.021	11967
19080CG	0.002	0.010	0.010	-0.007	20105
19080CH	0.009	-0.004	0.010	-0.007	19853
19080CI	-0.010	0.006	0.011	0.021	25770
19080CJ	-0.004	0.002	0.004	0.026	29161
19080CK	0.000	-0.005	0.005	0.009	30454
19080CL	0.006	0.000	0.006	-0.023	13577
19080CM	-0.004	0.002	0.005	-0.004	16571
19080CN	-0.001	-0.004	0.004	-0.018	38487
19080CO	0.010	-0.018	0.021	-0.002	48637
19080CP	0.001	0.010	0.010	0.046	39059
19080CP	-0.001	0.005	0.005	0.022	39059
19080CP	-0.002	-0.005	0.006	-0.024	39059
19080CQ	-0.001	-0.009	0.009	0.003	43285
19080CR	-0.001	0.010	0.010	-0.004	41472
19080CS	-0.004	-0.015	0.016	0.000	38156
19080CT	0.007	0.013	0.015	0.014	41450
19080CU	-0.004	-0.003	0.005	0.006	48532
19080CV	-0.003	0.005	0.006	0.020	43600
19080CW	0.006	-0.001	0.006	0.006	46194
19080CX	0.007	-0.001	0.007	-0.033	47520
19080CX	0.001	-0.002	0.003	0.009	47520
19080CX	-0.006	-0.001	0.006	0.042	47520
19080CY	0.000	-0.008	0.008	-0.024	49125
19080CZ	-0.005	-0.016	0.017	0.017	42295
19080DA	0.003	0.008	0.009	0.019	38953

To	Delta North	Delta East	Delta Horiz	Delta Up	Length
19080DB	0.002	-0.006	0.007	0.012	48515
19080DC	-0.003	0.001	0.003	-0.005	42634
19080DD	-0.008	0.000	0.008	-0.008	31284
19080DE	-0.002	0.006	0.006	-0.027	19
19080DF	-0.004	0.003	0.005	-0.003	18
19080DG	-0.275	-0.094	0.290	0.874	31
19080DG	-0.296	-0.115	0.318	0.870	31
19080DG	-0.021	-0.021	0.030	-0.004	31
19080DH	0.001	0.005	0.005	-0.017	17
19080DI	-0.005	-0.023	0.024	-0.012	19
19080DJ	0.016	-0.007	0.017	-0.044	26
19080DJ	0.007	-0.002	0.007	-0.011	26
19080DJ	-0.009	0.005	0.011	0.033	26
19080DK	0.010	0.010	0.015	-0.021	18
19080DL	0.006	-0.002	0.006	-0.008	32
19080DM	-0.004	-0.002	0.004	0.013	32
19080DN	-0.006	0.002	0.007	0.007	14
19080DO	-0.012	-0.005	0.013	0.020	35
19080DP	0.004	-0.007	0.008	0.015	22
19080DQ	0.008	-0.009	0.012	-0.009	34
19080DR	0.002	-0.013	0.014	0.015	13
19080DS	0.029	-0.029	0.041	0.026	22
19080DT	0.005	0.006	0.007	0.025	22
19080DU	-0.033	-0.011	0.035	0.039	16
19080DV	-0.018	0.010	0.020	0.004	25
19080DW	-0.035	-0.013	0.037	0.070	14072
19080DW	-0.013	-0.020	0.024	0.028	14072
19080DW	0.022	-0.008	0.024	-0.042	14072
19080DX	-0.012	0.013	0.018	0.005	17
19080DY	0.009	0.029	0.030	-0.050	16
19080DY	-0.007	-0.013	0.015	0.099	16
19080DY	0.001	-0.029	0.029	0.024	16
19080DY	-0.016	-0.041	0.044	0.149	16
19080DY	-0.008	-0.058	0.058	0.074	16
19080DY	0.008	-0.016	0.018	-0.075	16
19080DZ	0.004	-0.010	0.011	0.002	37
19080EA	-0.011	0.006	0.013	-0.034	22
19080EB	0.009	-0.008	0.012	-0.039	9
19080EC	-0.002	-0.003	0.004	0.000	17
19080ED	-0.006	-0.023	0.024	0.022	58
19080EE	0.008	0.003	0.008	-0.016	31
19080EF	0.040	-0.009	0.041	0.057	49
19080EF	0.046	-0.012	0.047	0.052	49
19080EF	0.005	-0.002	0.006	-0.005	49
19080EG	-0.004	0.000	0.004	-0.003	56
19080EH	0.000	0.002	0.002	-0.005	16
19080EI	-0.006	-0.009	0.011	-0.042	34
19080EI	0.004	-0.007	0.009	-0.039	34
19080EI	0.010	0.001	0.010	0.003	34
19080EJ	0.004	0.011	0.012	0.028	21
19080EK	0.017	-0.014	0.022	0.020	59
19080EL	0.003	-0.006	0.007	0.003	25
19080EM	0.010	-0.016	0.019	-0.010	24
19080EN	0.000	-0.001	0.001	0.005	22

To	Delta North	Delta East	Delta Horiz	Delta Up	Length
19080EO	-0.005	0.015	0.016	0.032	36
19080EP	0.011	-0.002	0.011	-0.006	21
19080EQ	-0.010	-0.003	0.010	0.019	25
19080ER	0.007	-0.007	0.010	0.007	5601
19080ES	0.008	0.012	0.015	-0.027	26238
19080ET	0.004	0.011	0.011	-0.020	40870
19080EU	-0.009	0.007	0.011	0.005	33819
19080EV	0.001	-0.004	0.004	-0.012	10777
19080EW	0.004	0.008	0.009	-0.007	35907
19080EX	-0.002	-0.015	0.015	0.006	45886
19080EY	-0.014	-0.002	0.014	0.033	27298
19080EZ	-0.015	0.006	0.016	0.013	33369
19080FA	0.000	-0.003	0.003	-0.013	14988
19080FB	0.001	0.005	0.005	-0.022	47905
19080FC	0.002	0.002	0.003	-0.006	37753
19080FD	0.004	-0.003	0.005	-0.003	48290
19080FE	0.001	-0.004	0.004	-0.011	41367
19080WA	-0.005	0.000	0.005	0.011	10963
19080WB	0.000	0.007	0.007	0.002	15421
19080WC	0.001	0.002	0.002	0.003	6370
19080WD	-0.014	-0.001	0.014	-0.012	46354
19080WE	0.001	-0.005	0.005	-0.004	42726
19080WF	-0.002	0.006	0.006	-0.002	44167
19080WG	0.005	0.006	0.008	-0.021	42267
19080WL	0.013	0.019	0.023	0.008	48374
19080WM	-0.010	0.000	0.010	0.018	41057
19080WN	-0.010	-0.004	0.011	-0.003	36977
19080WO	0.009	-0.014	0.016	-0.016	45052
19080WP	-0.003	-0.002	0.004	0.010	42537
19080WQ	0.003	0.008	0.009	0.026	37295
19080XA	-0.008	-0.005	0.009	-0.001	4382
19080XJ	-0.005	-0.001	0.005	0.026	34170
19080XK	-0.008	-0.002	0.008	0.030	39295
19080XK	-0.008	0.000	0.008	0.058	39295
19080XK	-0.008	0.003	0.009	0.081	39295
19080XK	-0.008	0.007	0.011	0.059	39295
19080XK	0.001	0.001	0.002	0.028	39295
19080XK	0.000	0.005	0.005	0.052	39295
19080XK	0.000	0.009	0.009	0.030	39295
19080XK	-0.001	0.004	0.004	0.023	39295
19080XK	0.000	0.007	0.007	0.001	39295
19080XK	0.000	0.004	0.004	-0.022	39295
19080XL	-0.011	-0.010	0.015	0.008	30550
19080XM	0.005	-0.002	0.006	0.003	40948
19080XN	0.011	-0.007	0.013	0.006	25869
19080XO	-0.007	-0.005	0.008	0.025	24245
19080XP	0.001	0.002	0.002	-0.003	10718
19080XQ	0.003	0.004	0.005	0.001	6887
19080XR	-0.014	-0.005	0.015	-0.013	29570
19080XS	-0.002	0.004	0.005	-0.009	27723
19080XT	0.017	-0.019	0.026	-0.056	31405
19080XT	0.017	-0.016	0.023	-0.063	31405
19080XT	0.000	0.003	0.003	-0.007	31405
19080XU	0.024	0.007	0.025	-0.001	26602

To	Delta North	Delta East	Delta Horiz	Delta Up	Length
19080XV	-0.002	0.006	0.006	-0.001	15383
19080XW	-0.011	0.004	0.012	0.001	18681
19080XX	-0.003	-0.005	0.006	0.005	23965
19080XY	0.000	0.004	0.004	-0.005	14085
19080XZ	0.007	0.006	0.009	0.002	10863

WOODS VVA-F CHECK POINTS

The woods checkpoints (VVAFxx) were surveyed by first establishing a temporary base station in the open nearby, and then using standard RTK methods over a radio link to locate the point in the woods.

LEAST SQUARES ADJUSTMENTS

Geolab was used to adjust the VRS/RTK vectors. No scaling of the apriori GPS statistics was done. Station errors (centering, HI and HT) of 0.005 m were input. The GEOID12B model was used.

The adjustment constrained the VRS CORS positions (as computed and broadcast by the network) in all three dimensions (NAD83 (2011) latitude, longitude, and ellipsoidal height). The estimated variance factors was 0.51. This adjustment provided the adjusted positions (NAD83 (2011) epoch 2010.0) and GPS derived orthometric heights (NAVD88) for the stations in the network. Table 5 lists the station confidence regions at the 95% level, in meters.

Table 5 - Station Confidence Regions @ 95% meters

Station Name	Semi-Major Axis	Azimuth	Semi-Minor Axis	Vertical
19080AA	0.0130	11	0.0120	0.0170
19080AB	0.0110	40	0.0100	0.0140
19080AC	0.0110	13	0.0100	0.0110
19080AD	0.0100	167	0.0100	0.0110
19080AE	0.0110	39	0.0100	0.0180
19080AF	0.0120	8	0.0110	0.0190
19080AG	0.0110	171	0.0100	0.0150
19080AH	0.0110	9	0.0100	0.0110
19080AI	0.0110	162	0.0100	0.0110
19080AJ	0.0120	177	0.0110	0.0160
19080AK	0.0120	178	0.0110	0.0140
19080AL	0.0120	166	0.0100	0.0130
19080AM	0.0140	161	0.0130	0.0230
19080AN	0.0170	118	0.0150	0.0240
19080AO	0.0110	1	0.0100	0.0130
19080AP	0.0100	26	0.0090	0.0100
19080AQ	0.0090	44	0.0090	0.0090
19080AR	0.0090	39	0.0090	0.0100
19080AS	0.0110	1	0.0100	0.0140
19080AT	0.0100	166	0.0100	0.0130
19080AU	0.0090	9	0.0090	0.0080
19080AV	0.0120	9	0.0100	0.0130
19080AW	0.0110	13	0.0100	0.0120
19080AX	0.0100	173	0.0100	0.0110
19080AY	0.0100	19	0.0090	0.0100
19080AZ	0.0120	170	0.0110	0.0190
19080BA	0.0100	1	0.0100	0.0110
19080BB	0.0100	178	0.0090	0.0090

19080BC	0.0110	171	0.0100	0.0120
19080BD	0.0120	8	0.0110	0.0150
19080BE	0.0140	174	0.0120	0.0210
19080BF	0.0110	14	0.0100	0.0120
19080BG	0.0110	59	0.0100	0.0190
19080BH	0.0100	30	0.0100	0.0110
19080BI	0.0100	37	0.0100	0.0110
19080BJ	0.0120	176	0.0110	0.0160
19080BK	0.0130	173	0.0110	0.0160
19080BL	0.0110	24	0.0110	0.0140
19080BM	0.0100	16	0.0100	0.0110
19080BN	0.0100	178	0.0100	0.0120
19080BO	0.0140	157	0.0120	0.0170
19080BP	0.0100	153	0.0090	0.0140
19080BQ	0.0120	22	0.0100	0.0130
19080BR	0.0110	43	0.0110	0.0140
19080BS	0.0110	174	0.0100	0.0130
19080BT	0.0110	172	0.0100	0.0120
19080BU	0.0110	3	0.0100	0.0130
19080BV	0.0100	17	0.0100	0.0120
19080BW	0.0100	9	0.0090	0.0120
19080BX	0.0100	24	0.0100	0.0120
19080BY	0.0110	47	0.0100	0.0130
19080BZ	0.0110	172	0.0100	0.0120
19080CA	0.0160	21	0.0150	0.0210
19080CB	0.0090	30	0.0080	0.0110
19080CC	0.0110	178	0.0110	0.0180
19080CD	0.0110	37	0.0110	0.0160
19080CE	0.0110	3	0.0100	0.0120
19080CF	0.0140	121	0.0120	0.0290
19080CG	0.0110	3	0.0100	0.0120
19080CH	0.0160	21	0.0130	0.0200
19080CI	0.0140	36	0.0130	0.0180
19080CJ	0.0110	10	0.0110	0.0150
19080CK	0.0140	36	0.0120	0.0230
19080CL	0.0100	17	0.0100	0.0110
19080CM	0.0130	40	0.0120	0.0190
19080CN	0.0110	7	0.0100	0.0150
19080CO	0.0110	136	0.0100	0.0160
19080CP	0.0090	6	0.0080	0.0130
19080CQ	0.0140	179	0.0110	0.0170
19080CR	0.0110	5	0.0100	0.0120
19080CS	0.0110	24	0.0110	0.0140
19080CT	0.0130	168	0.0120	0.0270
19080CU	0.0140	11	0.0110	0.0150
19080CV	0.0120	8	0.0120	0.0160
19080CW	0.0120	162	0.0110	0.0150
19080CX	0.0100	39	0.0090	0.0160
19080CY	0.0140	13	0.0140	0.0250
19080CZ	0.0120	17	0.0110	0.0180
19080DA	0.0160	24	0.0120	0.0230
19080DB	0.0120	170	0.0110	0.0140
19080DC	0.0110	29	0.0100	0.0130
19080DD	0.0150	167	0.0120	0.0190
19080DE	0.0160	22	0.0150	0.0220
19080DF	0.0200	3	0.0190	0.0270
19080DG	0.0210	54	0.0190	0.0310
19080DH	0.0210	21	0.0180	0.0340
19080DI	0.0200	147	0.0170	0.0260
19080DJ	0.0170	176	0.0170	0.0200
19080DK	0.0300	171	0.0240	0.0440
19080DL	0.0210	12	0.0180	0.0290
19080DM	0.0160	166	0.0140	0.0200
19080DN	0.0180	175	0.0150	0.0220
19080DO	0.0140	4	0.0140	0.0170
19080DP	0.0140	11	0.0130	0.0150

19080DQ	0.0140	6	0.0140	0.0170
19080DR	0.0190	154	0.0160	0.0210
19080DS	0.0170	15	0.0160	0.0230
19080DT	0.0150	41	0.0140	0.0190
19080DU	0.0270	68	0.0170	0.0280
19080DV	0.0140	36	0.0140	0.0160
19080DW	0.0110	7	0.0100	0.0200
19080DX	0.0340	31	0.0290	0.0470
19080DY	0.0150	153	0.0140	0.0250
19080DZ	0.0160	173	0.0140	0.0170
19080EA	0.0160	147	0.0140	0.0200
19080EB	0.0170	22	0.0170	0.0220
19080EC	0.0160	143	0.0150	0.0190
19080ED	0.0200	89	0.0180	0.0330
19080EE	0.0160	7	0.0150	0.0180
19080EF	0.0190	33	0.0160	0.0340
19080EG	0.0150	8	0.0150	0.0180
19080EH	0.0160	172	0.0140	0.0190
19080EI	0.0170	21	0.0140	0.0270
19080EJ	0.0210	174	0.0190	0.0310
19080EK	0.0230	140	0.0160	0.0320
19080EL	0.0290	40	0.0190	0.0330
19080EM	0.0200	9	0.0180	0.0370
19080EN	0.0180	29	0.0160	0.0270
19080EO	0.0160	173	0.0150	0.0240
19080EP	0.0150	158	0.0140	0.0230
19080EQ	0.0160	160	0.0150	0.0240
19080ER	0.0140	21	0.0120	0.0160
19080ES	0.0120	37	0.0110	0.0160
19080ET	0.0100	1	0.0100	0.0110
19080EU	0.0110	178	0.0100	0.0140
19080EV	0.0110	2	0.0100	0.0150
19080EW	0.0100	4	0.0100	0.0140
19080EX	0.0120	33	0.0110	0.0140
19080EY	0.0120	14	0.0110	0.0150
19080EZ	0.0220	46	0.0150	0.0270
19080FA	0.0100	15	0.0100	0.0130
19080FB	0.0130	168	0.0110	0.0230
19080FC	0.0120	18	0.0110	0.0150
19080FD	0.0120	34	0.0110	0.0160
19080FE	0.0120	23	0.0110	0.0190
19080WA	0.0110	15	0.0100	0.0130
19080WB	0.0100	43	0.0100	0.0110
19080WC	0.0100	11	0.0090	0.0100
19080WD	0.0110	155	0.0100	0.0190
19080WE	0.0150	21	0.0110	0.0230
19080WF	0.0110	169	0.0100	0.0130
19080WG	0.0170	9	0.0140	0.0320
19080WL	0.0240	40	0.0140	0.0260
19080WM	0.0130	33	0.0110	0.0210
19080WN	0.0130	172	0.0110	0.0180
19080WO	0.0160	174	0.0130	0.0230
19080WP	0.0120	157	0.0110	0.0180
19080WQ	0.0130	172	0.0110	0.0170
19080XA	0.0100	22	0.0100	0.0120
19080XB	0.0180	21	0.0150	0.0320
19080XC	0.0150	14	0.0140	0.0200
19080XD	0.0300	29	0.0250	0.0420
19080XE	0.0140	13	0.0140	0.0150
19080XF	0.0160	5	0.0150	0.0220
19080XG	0.0280	171	0.0220	0.0410
19080XH	0.0160	147	0.0140	0.0230
19080XI	0.0150	5	0.0140	0.0180
19080XJ	0.0130	23	0.0110	0.0180
19080XK	0.0070	88	0.0070	0.0120
19080XL	0.0140	37	0.0120	0.0170

19080XM	0.0120	9	0.0110	0.0140
19080XN	0.0110	154	0.0100	0.0140
19080XO	0.0110	147	0.0110	0.0150
19080XP	0.0120	177	0.0110	0.0180
19080XQ	0.0110	5	0.0100	0.0110
19080XR	0.0160	38	0.0130	0.0290
19080XS	0.0110	5	0.0110	0.0140
19080XT	0.0110	170	0.0090	0.0130
19080XU	0.0140	18	0.0130	0.0200
19080XV	0.0100	177	0.0100	0.0130
19080XW	0.0120	168	0.0100	0.0160
19080XX	0.0130	172	0.0110	0.0160
19080XY	0.0100	171	0.0090	0.0120
19080XZ	0.0100	9	0.0090	0.0110

SUMMARY

A LiDAR ground control network was established in southeastern Virginia. The estimated accuracy of the control network is ±0.05 m with respect to the NAD83 (2011) epoch 2010.0 reference frame and the NAVD88 vertical datum.

Adjusted Coordinates

Horizontal Datum: NAD83 (2011) epoch 2010.0
Vertical Datum: Ellipsoidal Height=NAVD88+GEOID12B
Units: meters

Table 6 - Geodetic Coordinates

Station Name	GPSID	Latitude	Longitude	Ellipsoidal H meters	NAVD 1988 meters
F01BASE	19080XJ	37°01'55.33992" N	77°23'43.21539" W	10.682	44.558
F02BASE	19080XF	37°06'49.98963" N	77°12'13.01065" W	5.423	39.379
F03BASE	19080XE	37°13'48.11453" N	77°13'52.63321" W	9.066	42.826
F04BASE	19080XB	37°18'36.22977" N	77°20'05.47534" W	-10.299	23.294
F05BASE	19080XH	37°07'32.08621" N	77°23'35.04911" W	16.878	50.702
F06BASE	19080XI	37°04'31.21073" N	77°18'50.72517" W	10.548	44.481
F07BASE	19080XG	37°07'30.40026" N	77°18'44.35363" W	11.574	45.461
F08BASE	19080XC	37°16'14.00318" N	77°11'55.94550" W	2.445	36.184
F09BASE	19080XW	37°28'34.23484" N	77°12'46.49578" W	2.855	36.275
F10BASE	19080XX	37°31'51.45151" N	77°12'50.11165" W	-10.827	22.573
F11BASE	19080WC	37°41'50.23117" N	77°30'40.58084" W	28.089	60.815
F12BASE	19080XZ	37°34'17.48671" N	77°37'17.41413" W	15.816	48.475
F13BASE	19080WA	37°35'45.92154" N	77°28'20.90924" W	22.878	55.825
F15BASE	19080XU	37°24'48.79143" N	77°02'39.72877" W	-11.884	22.170
F16BASE	19080XA	37°22'28.03847" N	77°19'22.28529" W	-15.411	18.057
F17BASE	19080XV	37°24'01.67363" N	77°10'30.02704" W	2.635	36.191
F18BASE	19080WB	37°33'49.87273" N	77°22'06.68228" W	24.240	57.399
F19BASE	19080XY	37°37'32.66761" N	77°35'13.61108" W	28.177	60.839
F20BASE	19080XD	37°14'21.30651" N	77°07'41.05228" W	0.547	34.505
F21BASE	19080XP	36°56'11.82915" N	76°52'59.36136" W	-9.137	26.071
F21BASE	19080XT	37°20'46.21299" N	76°54'58.12146" W	-22.662	12.007
F22BASE	19080XQ	36°54'52.00437" N	76°59'19.25988" W	-2.538	32.390
F23BASE	19080XN	36°48'46.97579" N	77°11'59.39413" W	-10.361	24.196
F24BASE	19080XL	36°32'56.51515" N	76°56'56.09446" W	-23.202	12.268
F25BASE	19080XO	36°47'13.08961" N	77°07'41.78350" W	-17.080	17.629
F26BASE	19080XK	36°38'03.38648" N	77°06'22.43449" W	-6.437	28.501
F27BASE	19080XM	36°39'34.17015" N	77°13'40.25808" W	-3.754	30.881
F28BASE	19080XR	37°15'29.95134" N	76°43'30.65019" W	-13.627	21.634
F29BASE	19080XS	37°16'53.82339" N	76°44'44.97503" W	-8.498	26.683
F30BASE	19080WQ	37°52'46.13010" N	78°08'36.61523" W	70.345	102.632
F31BASE	19080WE	37°55'52.20092" N	78°01'59.57153" W	112.424	144.734
F32BASE	19080WO	37°52'22.40904" N	77°57'13.80223" W	81.622	113.858
F33BASE	19080WN	37°56'03.14157" N	77°48'48.46002" W	70.046	102.310
F34BASE	19080WL	38°03'27.91139" N	77°51'00.74109" W	72.379	104.724
F35BASE	19080WG	38°00'30.59146" N	78°00'26.44800" W	101.904	134.237
F36BASE	19080WM	37°58'03.90458" N	77°50'24.21588" W	76.976	109.256
F37BASE	19080WF	37°58'06.50551" N	77°59'53.23521" W	90.545	122.870
F38BASE	19080WD	37°48'19.21134" N	77°59'21.16429" W	78.432	110.607
F39BASE	19080WP	37°53'30.81626" N	78°03'39.59092" W	119.654	151.933
GCP01	19080AA	38°01'22.66534" N	78°00'08.41535" W	105.080	137.418
GCP02	19080AB	37°35'32.88375" N	77°36'36.47317" W	24.420	57.076
GCP03	19080AC	37°40'25.01403" N	77°29'14.67278" W	29.836	62.651
GCP04	19080AD	37°04'46.65801" N	77°21'20.03957" W	9.510	43.409
GCP05	19080AE	36°37'15.57174" N	77°08'43.53045" W	-5.605	29.242
GCP06	19080AF	37°10'49.50735" N	77°13'21.25240" W	4.697	38.534
GCP07	19080AG	37°17'39.79565" N	77°16'04.03631" W	-20.882	12.770
GCP08	19080AH	37°20'08.43272" N	77°03'03.92999" W	-14.424	19.677
GCP09	19080AI	37°27'09.71652" N	77°19'57.79863" W	-0.548	32.779
GCP10	19080AJ	37°52'52.47081" N	78°02'21.37889" W	127.418	159.678
GCP11	19080AK	38°05'01.68065" N	77°50'48.04514" W	70.367	102.724
GCP12	19080AL	37°55'17.39584" N	77°49'40.05901" W	57.976	90.230
GCP13	19080AM	36°42'19.80628" N	77°18'38.70856" W	1.738	36.133
GCP14	19080AN	36°49'41.05205" N	77°05'39.16497" W	-7.005	27.735
GCP15	19080AO	36°55'28.30651" N	76°55'24.37392" W	-9.705	25.402
NVA01	19080AP	37°33'25.41568" N	77°39'09.29654" W	11.699	44.297
NVA02	19080AQ	37°33'47.47759" N	77°31'10.15715" W	29.099	61.995

Station Name	GPSID	Latitude	Longitude	Ellipsoidal H meters	NAVD 1988 meters
NVA03	19080AR	37°35'10.68152" N	77°33'45.16267" W	51.156	83.931
NVA04	19080AS	37°38'35.19049" N	77°38'27.81514" W	25.184	57.681
NVA05	19080AT	37°42'15.30439" N	77°36'07.55982" W	38.984	71.472
NVA06	19080AU	37°42'22.19233" N	77°29'06.03434" W	32.839	65.608
NVA07	19080AV	37°37'25.78186" N	77°25'01.92752" W	19.872	52.892
NVA08	19080AW	37°34'12.67602" N	77°24'24.61156" W	11.578	44.667
NVA09	19080AX	37°32'39.90590" N	77°17'09.62203" W	5.702	38.998
NVA10	19080AY	37°30'44.09238" N	77°23'28.93765" W	11.309	44.493
NVA11	19080AZ	37°29'13.92538" N	77°11'21.01649" W	-2.201	31.263
NVA12	19080BA	37°27'39.61442" N	77°23'20.92745" W	10.570	43.833
NVA13	19080BB	37°24'06.92109" N	77°23'08.99918" W	-31.473	1.903
NVA14	19080BC	37°26'41.25893" N	77°16'05.15791" W	8.953	42.329
NVA15	19080BD	37°25'35.94471" N	77°06'18.49828" W	3.339	37.095
NVA16	19080BE	37°18'56.48054" N	76°53'34.28540" W	-8.881	25.898
NVA17	19080BF	37°09'52.79462" N	77°23'37.86139" W	13.618	47.398
NVA18	19080BG	37°11'54.65008" N	77°09'15.90855" W	1.588	35.532
NVA19	19080BH	37°01'30.91531" N	77°21'27.16347" W	0.241	34.176
NVA20	19080BI	37°38'35.19378" N	77°31'54.64150" W	39.861	72.622
NVA21	19080BJ	37°07'01.92871" N	77°11'34.98334" W	-5.448	28.523
NVA22	19080BK	37°06'09.11537" N	77°15'33.55282" W	3.888	37.809
NVA23	19080BL	37°22'02.92002" N	77°09'11.93158" W	-8.591	25.067
NVA24	19080BM	37°13'30.66922" N	77°18'27.20617" W	9.093	42.836
NVA25	19080BN	37°17'57.10746" N	77°12'18.06374" W	-27.759	5.929
NVA26	19080BO	37°22'09.79915" N	76°59'22.02066" W	2.160	36.511
NVA27	19080BP	36°40'56.90464" N	77°29'01.75184" W	0.617	34.464
NVA28	19080BQ	36°34'05.40844" N	77°15'02.94527" W	-20.940	13.632
NVA29	19080BR	36°39'48.72766" N	76°55'47.83103" W	-27.295	8.084
NVA30	19080BS	36°41'14.15866" N	76°56'34.42264" W	-16.254	19.056
NVA31	19080BT	36°42'37.60234" N	76°59'03.56051" W	-11.868	23.296
NVA32	19080BU	36°42'13.47167" N	77°12'19.62684" W	2.833	37.517
NVA33	19080BV	36°51'54.16757" N	76°51'29.28305" W	-12.390	22.959
NVA34	19080BW	36°54'25.61618" N	76°53'31.68854" W	-9.145	26.070
NVA35	19080BX	36°48'20.90059" N	76°56'46.86843" W	-14.045	21.106
NVA36	19080BY	36°35'41.58501" N	76°55'48.97597" W	-29.834	5.642
NVA37	19080BZ	36°43'32.58255" N	77°04'11.66710" W	-25.899	9.020
NVA38	19080CA	36°34'43.86557" N	77°01'14.71118" W	-14.457	20.745
NVA39	19080CB	36°35'07.40528" N	77°12'01.02710" W	-23.560	11.139
NVA40	19080CC	36°40'58.93142" N	77°23'01.74677" W	1.495	35.636
NVA41	19080CD	37°18'22.21080" N	76°44'04.65318" W	-10.244	24.915
NVA42	19080CE	37°25'44.12819" N	77°12'36.80735" W	4.680	38.136
NVA43	19080CF	37°21'09.86176" N	77°11'41.81393" W	-11.473	22.128
NVA44	19080CG	37°09'14.65575" N	77°19'53.06260" W	7.516	41.363
NVA45	19080CH	37°17'12.51810" N	77°06'45.39960" W	-22.276	11.650
NVA46	19080CI	37°17'04.67933" N	76°40'38.50013" W	-14.429	20.879
NVA47	19080CJ	37°15'06.36538" N	76°39'18.78849" W	-10.373	25.049
NVA48	19080CK	37°15'06.42362" N	76°43'57.11926" W	-8.497	26.760
NVA49	19080CL	36°51'36.09744" N	77°02'23.19005" W	-0.748	34.101
NVA50	19080CM	37°14'18.62373" N	77°11'08.98397" W	-2.497	31.312
NVA51	19080CN	37°52'39.44584" N	78°07'41.68217" W	95.895	128.178
NVA52	19080CO	37°49'45.15532" N	78°01'47.88680" W	74.987	107.193
NVA53	19080CP	37°49'50.97466" N	77°53'54.40734" W	70.992	103.186
NVA54	19080CQ	38°01'14.93027" N	77°59'33.33625" W	98.817	131.155
NVA55	19080CR	38°02'17.35689" N	77°45'32.76230" W	51.933	84.282
NVA56	19080CS	38°00'00.85243" N	77°45'27.14824" W	58.320	90.644
NVA57	19080CT	37°49'36.51938" N	77°55'39.29424" W	73.856	106.046
NVA58	19080CU	38°00'45.50343" N	77°54'13.69889" W	99.326	131.643
NVA59	19080CV	38°02'24.85096" N	77°47'38.21092" W	63.478	95.818
NVA60	19080CW	37°56'57.81128" N	77°55'30.36149" W	80.452	112.741
NVA61	19080CX	38°06'33.71728" N	77°54'58.01515" W	61.346	93.705
NVA62	19080CY	38°05'05.71031" N	77°49'28.77641" W	51.009	83.368
NVA63	19080CZ	37°53'09.61249" N	77°54'51.91117" W	42.791	75.030
NVA64	19080DA	37°57'18.63167" N	78°04'01.25773" W	103.289	135.608
NVA65	19080DB	37°54'59.07548" N	77°58'30.27254" W	84.654	116.940
NVA66	19080DC	38°00'45.46677" N	77°48'53.53875" W	58.891	91.207

Station Name	GPSID	Latitude	Longitude	Ellipsoidal H meters	NAVD 1988 meters
NVA67	19080DD	36°46'10.96131" N	77°13'52.98442" W	-15.752	18.818
VVA01	19080ER	37°18'45.85138" N	77°16'17.87308" W	-30.414	3.205
VVA02	19080ES	37°12'53.90731" N	77°04'24.54185" W	-12.560	21.642
VVA03	19080ET	36°42'26.10547" N	77°18'19.96284" W	3.161	37.574
VVA04	19080EU	36°40'26.67522" N	76°56'42.90796" W	-25.581	9.741
VVA05	19080EV	36°54'43.52785" N	76°54'07.81962" W	-10.616	24.566
VVA06	19080EW	36°39'10.59602" N	77°00'09.28562" W	-29.746	5.442
VVA07	19080EX	36°36'08.05264" N	77°20'22.44910" W	-12.537	21.781
VVA08	19080EY	37°16'45.97352" N	76°43'26.25176" W	-14.366	20.861
VVA09	19080EZ	37°02'15.93543" N	77°22'59.30687" W	8.369	42.258
VVA10	19080FA	37°38'55.58771" N	77°35'22.77430" W	54.564	87.179
VVA11	19080FB	37°50'38.09666" N	77°59'52.27159" W	92.764	124.978
VVA12	19080FC	37°55'35.31438" N	78°05'56.06246" W	92.896	125.209
VVA13	19080FD	38°04'36.37286" N	77°55'43.14721" W	86.429	118.786
VVA14	19080FE	37°59'13.68675" N	77°49'29.37865" W	72.263	104.559
VVAF01	19080DE	37°01'54.73034" N	77°23'43.33204" W	10.531	44.408
VVAF02	19080DF	37°06'50.26340" N	77°12'12.36275" W	3.499	37.456
VVAF03	19080DG	37°13'47.81121" N	77°13'51.44435" W	6.273	40.033
VVAF04	19080DH	37°18'36.76997" N	77°20'05.36938" W	-12.106	21.487
VVAF05	19080DI	37°07'32.55163" N	77°23'35.57737" W	16.259	50.083
VVAF06	19080DJ	37°04'30.51428" N	77°18'51.34340" W	8.863	42.796
VVAF07	19080DK	37°07'30.96957" N	77°18'44.30470" W	8.948	42.834
VVAF08	19080DL	37°16'14.58767" N	77°11'56.98859" W	-0.500	33.238
VVAF09	19080DM	37°28'35.21864" N	77°12'46.06723" W	3.827	37.247
VVAF10	19080DN	37°31'51.70910" N	77°12'50.59182" W	-9.737	23.662
VVAF11	19080DO	37°41'50.60077" N	77°30'39.25070" W	29.945	62.671
VVAF12	19080DP	37°34'16.87055" N	77°37'16.97823" W	15.548	48.208
VVAF13	19080DQ	37°35'44.81909" N	77°28'20.94675" W	23.095	56.043
VVAF14	19080DR	37°20'46.63532" N	76°54'58.21270" W	-22.654	12.014
VVAF15	19080DS	37°24'48.57244" N	77°02'38.87262" W	-14.440	19.615
VVAF16	19080DT	37°22'28.37531" N	77°19'21.50750" W	-17.747	15.721
VVAF17	19080DU	37°24'02.14676" N	77°10'30.26644" W	3.226	36.781
VVAF18	19080DV	37°33'50.68263" N	77°22'06.60025" W	24.696	57.855
VVAF19	19080DW	37°37'32.50049" N	77°35'12.78179" W	25.425	58.087
VVAF20	19080DX	37°14'21.55229" N	77°07'41.64731" W	-1.272	32.686
VVAF21	19080DY	36°56'12.34831" N	76°52'59.29503" W	-8.435	26.773
VVAF22	19080DZ	36°54'52.48467" N	76°59'17.87613" W	-3.387	31.542
VVAF23	19080EA	36°48'47.35345" N	77°11'58.63545" W	-9.704	24.853
VVAF24	19080EB	36°32'56.80084" N	76°56'56.01984" W	-23.277	12.192
VVAF25	19080EC	36°47'13.46940" N	77°07'42.30473" W	-17.282	17.426
VVAF26	19080ED	36°38'03.33607" N	77°06'24.78647" W	-6.593	28.344
VVAF27	19080EE	36°39'35.11592" N	77°13'40.66481" W	-3.026	31.610
VVAF28	19080EF	37°15'30.52232" N	76°43'32.49403" W	-12.399	22.860
VVAF29	19080EG	37°16'52.06994" N	76°44'44.33457" W	-7.568	27.613
VVAF30	19080EH	37°52'45.77772" N	78°08'36.16275" W	70.528	102.815
VVAF31	19080EI	37°55'51.27454" N	78°01'58.82125" W	112.091	144.400
VVAF32	19080EJ	37°52'23.02196" N	77°57'14.15599" W	81.413	113.649
VVAF33	19080EK	37°56'03.58871" N	77°48'46.11570" W	70.423	102.687
VVAF34	19080EL	38°03'27.69004" N	77°51'01.74128" W	73.288	105.632
VVAF35	19080EM	38°00'30.82903" N	78°00'25.49884" W	101.162	133.495
VVAF36	19080EN	37°58'04.60648" N	77°50'24.03576" W	77.780	110.061
VVAF37	19080EO	37°58'06.24863" N	77°59'51.78367" W	90.890	123.215
VVAF38	19080EP	37°48'19.70555" N	77°59'20.56991" W	79.148	111.323
VVAF39	19080EQ	37°53'31.54209" N	78°03'39.15037" W	120.643	152.923

Horizontal Datum: NAD83 (2011) epoch 2010.0
UTM Coordinates – Zones 17 and 18
Vertical Datum: Ellipsoidal Height=NAVD88+GEOID12B
Units: meters

Table 6 - UTM Zone 17 and 18 coordinates

Station Name	UTM17 Northing	UTM17 Easting	UTM18 Northing	UTM18 Easting	NAVD88
F01BASE	4104505.954	820652.624	4101109.657	286944.539	44.558
F02BASE	4114255.708	837350.682	4109778.721	304210.652	39.379
F03BASE	4127049.952	834377.539	4122723.643	302054.991	42.826
F04BASE	4135572.143	824840.547	4131825.894	293085.120	23.294
F05BASE	4114896.176	820459.888	4111483.973	287407.862	50.702
F06BASE	4109589.280	827696.145	4105734.911	294289.242	44.481
F07BASE	4115120.313	827638.757	4111254.096	294581.125	45.461
F08BASE	4131663.487	837073.616	4127152.953	305035.372	36.184
F09BASE	4154438.191	834910.839	4149998.042	304325.357	36.275
F10BASE	4160515.780	834576.976	4156079.024	304379.607	22.573
F11BASE	4177959.791	807604.091	4175197.257	278595.716	60.815
F12BASE	4163644.148	798385.171	4161507.197	268485.366	48.475
F13BASE	4166855.271	811448.949	4163876.183	281720.646	55.825
F15BASE	4148100.289	850114.571	4142712.283	319079.805	22.170
F16BASE	4142760.977	825625.618	4138944.797	294324.278	18.057
F17BASE	4146169.479	838606.117	4141518.766	307483.790	36.191
F18BASE	4163627.444	820768.594	4160062.312	290809.054	57.399
F19BASE	4169771.887	801204.394	4167439.599	271688.856	60.839
F20BASE	4128443.565	843497.213	4123535.794	311235.881	34.505
F21BASE	4095765.806	866692.728	4089497.864	332296.754	26.071
F21BASE	4141104.556	861792.985	4134997.289	330276.545	12.007
F22BASE	4092902.847	857392.620	4087228.603	322846.731	32.390
F23BASE	4080876.067	839020.672	4076391.412	303775.754	24.196
F24BASE	4052489.167	862655.631	4046614.024	325564.628	12.268
F25BASE	4078237.801	845524.643	4073353.310	310095.183	17.629
F26BASE	4061368.384	848182.169	4056368.306	311689.730	28.501
F27BASE	4063732.499	837192.293	4059411.783	300879.773	30.881
F28BASE	4132101.576	879160.676	4124923.872	347014.818	21.634
F29BASE	4134605.396	877212.051	4127542.400	345231.556	26.683
F30BASE	4196290.290	751228.419	4197102.753	223523.232	102.632
F31BASE	4202329.795	760747.860	4202517.926	233412.465	144.734
F32BASE	4196087.151	767937.565	4195825.794	240185.683	113.858
F33BASE	4203305.416	780054.940	4202248.796	252740.614	102.310
F34BASE	4216908.362	776360.205	4216058.964	249930.932	104.724
F35BASE	4210985.384	762745.784	4211027.025	235963.899	134.237
F36BASE	4206949.000	777590.252	4206042.779	250516.107	109.256
F37BASE	4206569.293	763699.343	4206558.646	236630.871	122.870
F38BASE	4188488.320	765066.925	4188427.285	236832.986	110.607
F39BASE	4197893.521	758442.999	4198238.901	230826.823	151.933
GCP01	4212605.014	763133.883	4212618.265	236455.638	137.418
GCP02	4166004.998	799305.899	4163803.409	269554.513	57.076
GCP03	4175411.014	809807.409	4172514.208	280630.185	62.651
GCP04	4109923.101	823989.033	4106301.676	290613.460	43.409
GCP05	4059752.423	844735.211	4054972.323	308152.195	29.242
GCP06	4121573.651	835371.109	4117200.389	302699.210	38.534
GCP07	4134065.056	830855.631	4129941.640	298987.644	12.770
GCP08	4139430.123	849881.573	4134083.996	318296.955	19.677
GCP09	4151412.078	824413.521	4147648.712	293665.565	32.779

Station Name	UTM17 Northing	UTM17 Easting	UTM18 Northing	UTM18 Easting	NAVD88
GCP10	4196771.822	760391.417	4196994.166	232699.190	159.678
GCP11	4219809.930	776571.493	4218940.339	250329.052	102.724
GCP12	4201851.989	778842.983	4200876.667	251437.893	90.230
GCP13	4068550.692	829581.906	4064692.091	293592.012	36.133
GCP14	4082923.886	848379.033	4077846.357	313234.699	27.735
GCP15	4094269.229	863160.594	4088228.170	328682.092	25.402
NVA01	4161940.350	795696.793	4159979.135	265694.872	44.297
NVA02	4163048.231	807432.232	4160335.485	277471.473	61.995
NVA03	4165473.395	803533.863	4163003.215	273737.892	83.931
NVA04	4171527.554	796372.929	4169499.680	266981.625	57.681
NVA05	4178438.110	799565.267	4176188.862	270608.090	71.472
NVA06	4179031.935	809883.431	4176120.704	280937.685	65.608
NVA07	4170119.351	816213.002	4166827.251	286680.383	52.892
NVA08	4164200.251	817356.272	4160851.252	287442.642	44.667
NVA09	4161755.388	828145.268	4157725.055	298045.582	38.998
NVA10	4157821.323	818969.785	4154386.852	288645.012	44.493
NVA11	4155746.922	836961.862	4151172.327	306453.644	31.263
NVA12	4152140.813	819384.975	4148695.441	288697.310	43.833
NVA13	4145594.061	819929.925	4142131.932	288824.373	1.903
NVA14	4150759.471	830167.030	4146631.897	299361.233	42.329
NVA15	4149329.970	844673.501	4144284.047	313733.747	37.095
NVA16	4137810.324	864004.363	4131573.611	332271.693	25.898
NVA17	4119231.884	820225.359	4115822.765	287447.935	47.398
NVA18	4123826.009	841342.587	4119068.462	308795.523	35.532
NVA19	4103881.157	824044.544	4100272.806	290287.864	34.176
NVA20	4171878.820	806012.363	4169233.890	276619.203	72.622
NVA21	4114661.489	838274.929	4110124.961	305157.808	28.523
NVA22	4112798.596	832448.351	4108635.287	299230.522	37.809
NVA23	4142585.928	840676.749	4137814.397	309320.595	25.067
NVA24	4126245.000	827628.938	4122348.185	295274.717	42.836
NVA25	4134820.733	836400.825	4130343.561	304564.667	5.929
NVA26	4143403.208	855186.289	4137707.862	323837.109	36.511
NVA27	4065412.776	814208.901	4062523.837	278063.826	34.464
NVA28	4053515.520	835534.438	4049327.379	298589.059	13.632
NVA29	4065271.683	863814.625	4059283.296	327517.258	8.084
NVA30	4067856.882	862545.591	4061939.481	326413.819	19.056
NVA31	4070273.721	858733.930	4064586.918	322765.369	23.296
NVA32	4068723.265	839000.649	4064275.142	302994.854	37.517
NVA33	4087917.065	869268.008	4081513.295	334370.590	22.959
NVA34	4092455.987	866033.812	4086240.315	331432.023	26.070
NVA35	4081002.606	861678.587	4075097.325	326372.299	21.106
NVA36	4057649.730	864109.691	4051667.438	327335.680	5.642
NVA37	4071651.425	851015.207	4066443.116	315156.797	9.020
NVA38	4055530.286	856084.428	4050055.077	319203.625	20.745
NVA39	4055604.861	839983.163	4051133.362	303155.313	11.139
NVA40	4065808.087	823146.128	4062359.387	287002.302	35.636
NVA41	4137376.021	878082.496	4130248.235	346274.554	24.915
NVA42	4149202.573	835360.215	4144749.222	304440.300	38.136
NVA43	4140800.177	837054.074	4136263.958	305595.329	22.128
NVA44	4118268.981	825817.969	4114509.009	292964.338	41.363
NVA45	4133779.219	844652.015	4128782.117	312725.165	11.650
NVA46	4135216.078	883270.504	4127767.109	351307.447	20.879
NVA47	4131657.455	885402.632	4124086.122	353206.614	25.049
NVA48	4131346.501	878540.987	4124210.665	346349.482	26.760

Station Name	UTM17 Northing	UTM17 Easting	UTM18 Northing	UTM18 Easting	NAVD88
NVA49	4086671.483	853089.527	4081286.959	318165.836	34.101
NVA50	4128152.462	838374.440	4123569.891	306109.986	31.312
NVA51	4196125.456	752577.087	4196851.515	224858.720	128.178
NVA52	4191022.997	761393.682	4191192.591	233330.012	107.193
NVA53	4191579.006	772965.794	4191004.301	244913.469	103.186
NVA54	4212394.180	763997.134	4212352.195	237303.491	131.155
NVA55	4215008.178	784431.649	4213642.399	257861.162	84.282
NVA56	4210804.233	784715.406	4209430.065	257873.202	90.644
NVA57	4191048.510	770415.674	4190638.701	242334.802	106.046
NVA58	4211742.928	771823.208	4211197.677	245070.818	131.643
NVA59	4215133.075	781364.626	4213964.841	254809.364	95.818
NVA60	4204660.924	770185.280	4204236.612	242980.155	112.741
NVA61	4222442.821	770385.631	4221966.948	244327.015	93.705
NVA62	4220000.045	778498.966	4219005.557	252264.419	83.368
NVA63	4197656.478	771357.053	4197171.931	243698.726	75.030
NVA64	4204900.299	757692.472	4205279.969	230528.747	135.608
NVA65	4200856.352	765911.959	4200715.195	238471.060	116.940
NVA66	4212005.694	779632.875	4210956.346	252879.925	91.207
NVA67	4075954.106	836394.390	4071648.245	300848.637	18.818
VVA01	4136088.341	830434.340	4131985.849	298695.859	3.205
VVA02	4125948.393	848453.753	4120734.532	316019.366	21.642
VVA03	4068762.854	830039.780	4064875.028	294061.884	37.574
VVA04	4066383.785	862396.865	4060480.395	326173.520	9.741
VVA05	4092969.777	865115.318	4086810.124	330548.809	24.566
VVA06	4063822.412	857368.674	4058241.211	321001.257	5.442
VVA07	4056990.220	827444.257	4053296.962	290738.086	21.781
VVA08	4134450.948	879162.945	4127264.897	347165.875	20.861
VVA09	4105182.203	821713.813	4101717.193	288045.481	42.258
VVA10	4172320.310	800886.650	4170001.910	271534.791	87.179
VVA11	4192745.613	764168.300	4192733.462	236209.590	124.978
VVA12	4201627.255	754989.250	4202187.454	227620.141	125.209
VVA13	4218788.473	769405.962	4218383.833	243113.436	118.786
VVA14	4209146.058	778855.273	4208153.361	251919.792	104.559
VVAF01	4104487.050	820650.454	4101090.940	286941.183	44.408
VVAF02	4114264.790	837366.343	4109786.788	304226.841	37.456
VVAF03	4127041.768	834407.223	4122713.603	302084.071	40.033
VVAF04	4135588.901	824842.510	4131842.480	293088.140	21.487
VVAF05	4114910.029	820446.300	4111498.647	287395.187	50.083
VVAF06	4109567.213	827681.706	4105713.817	294273.451	42.796
VVAF07	4115137.914	827639.282	4111271.614	294582.760	42.834
VVAF08	4131680.475	837047.187	4127171.566	305010.097	33.238
VVAF09	4154468.951	834920.149	4150028.119	304336.598	37.247
VVAF10	4160523.247	834564.864	4156087.242	304368.007	23.662
VVAF11	4177972.402	807636.254	4175207.777	278628.602	62.671
VVAF12	4163625.536	798396.552	4161487.905	268495.531	48.208
VVAF13	4166821.245	811449.307	4163842.224	281718.831	56.043
VVAF14	4141117.482	861790.175	4135010.351	330274.564	12.014
VVAF15	4148094.421	850135.913	4142705.077	319100.707	19.615
VVAF16	4142772.109	825644.352	4138954.709	294343.666	15.721
VVAF17	4146183.829	838599.636	4141533.485	307478.240	36.781
VVAF18	4163652.494	820769.641	4160087.226	290811.697	57.855
VVAF19	4169767.475	801224.918	4167433.886	271709.046	58.087
VVAF20	4128450.543	843482.234	4123543.699	311221.388	32.686
VVAF21	4095781.886	866693.677	4089513.832	332298.711	26.773

Station Name	UTM17 Northing	UTM17 Easting	UTM18 Northing	UTM18 Easting	NAVD88
VVAF22	4092919.101	857426.258	4087242.692	322881.284	31.542
VVAF23	4080888.460	839039.018	4076402.619	303794.822	24.853
VVAF24	4052498.054	862657.116	4046622.791	325566.662	12.192
VVAF25	4078248.987	845511.242	4073365.302	310082.523	17.426
VVAF26	4061364.456	848123.785	4056368.035	311631.276	28.344
VVAF27	4063761.261	837181.041	4059441.166	300870.351	31.610
VVAF28	4132117.128	879114.428	4124942.298	346969.716	22.860
VVAF29	4134552.033	877230.270	4127488.067	345246.331	27.613
VVAF30	4196279.766	751239.808	4197091.516	223533.923	102.815
VVAF31	4202301.819	760767.091	4202488.769	233429.856	144.400
VVAF32	4196105.765	767928.302	4195844.963	240177.636	113.649
VVAF33	4203321.162	780111.715	4202260.852	252798.273	102.687
VVAF34	4216900.710	776336.054	4216052.888	249906.341	105.632
VVAF35	4210993.454	762768.701	4211033.601	235987.289	133.495
VVAF36	4206970.790	777593.913	4206064.284	250521.163	110.061
VVAF37	4206562.517	763735.026	4206549.585	236666.043	123.215
VVAF38	4188504.026	765080.973	4188442.056	236848.013	111.323
VVAF39	4197916.237	758453.057	4198260.925	230838.322	152.923

Horizontal Datum: NAD83 (2011) epoch 2010.0
State Plane Coordinates – Virginia South
Vertical Datum: Ellipsoidal Height=NAVD88+GEOID12B
Units: meters & US Survey FT

Table 7 - Virginia South Zone State Plane Coordinates

Station Name	Northing meters	Easting meters	NAVD 1988 meters	Northing US FT	Easting US FT	NAVD 1988 US FT
F01BASE	1078113.308	3598280.641	44.558	3537110.078	11805359.069	146.187
F02BASE	1087412.308	3615212.361	39.379	3567618.548	11860909.220	129.196
F03BASE	1100267.067	3612579.945	42.826	3609792.870	11852272.702	140.505
F04BASE	1109029.622	3603280.718	23.294	3638541.350	11821763.488	76.424
F05BASE	1088495.581	3598360.734	50.702	3571172.586	11805621.841	166.345
F06BASE	1083005.525	3605448.400	44.481	3553160.626	11828875.291	145.935
F07BASE	1088530.816	3605536.273	45.461	3571288.185	11829163.588	149.150
F08BASE	1104803.070	3615393.990	36.184	3624674.738	11861505.116	118.714
F09BASE	1127603.298	3613837.629	36.275	3699478.486	11856398.955	119.012
F10BASE	1133681.349	3613665.974	22.573	3719419.559	11855835.784	74.058
F11BASE	1151823.442	3587193.216	60.815	3778940.741	11768983.075	199.524
F12BASE	1137770.208	3577602.383	48.475	3732834.424	11737517.152	159.038
F13BASE	1140629.275	3590736.789	55.825	3742214.546	11780608.949	183.153
F15BASE	1120870.752	3628850.949	22.170	3677390.127	11905655.155	72.736
F16BASE	1116188.279	3604255.017	18.057	3662027.712	11824960.001	59.242
F17BASE	1119248.061	3617308.154	36.191	3672066.346	11867785.170	118.737
F18BASE	1137156.869	3599958.843	57.399	3730822.160	11810864.971	188.317
F19BASE	1143815.945	3580581.939	60.839	3752669.481	11747292.578	199.603
F20BASE	1101418.257	3621723.465	34.505	3613569.732	11882271.069	113.205
F21BASE	1068182.605	3644026.501	26.071	3504529.097	11955443.611	85.535
F21BASE	1113576.457	3640325.663	12.007	3653458.759	11943301.780	39.393
F22BASE	1065566.500	3634666.474	32.390	3495946.093	11924734.924	106.266
F23BASE	1054035.062	3616008.266	24.196	3458113.367	11863520.452	79.383
F24BASE	1025078.203	3638875.961	12.268	3363110.739	11938545.549	40.249
F25BASE	1051231.596	3622434.729	17.629	3448915.663	11884604.606	57.838
F26BASE	1034317.135	3624652.080	28.501	3393422.132	11891879.365	93.507
F27BASE	1036961.800	3613738.147	30.881	3402098.838	11856072.569	101.315
F28BASE	1104129.739	3657426.020	21.634	3622465.651	11999405.201	70.978
F29BASE	1106680.578	3655546.916	26.683	3630834.531	11993240.172	87.542
F30BASE	1171647.677	3531362.538	102.632	3843980.754	11585811.926	336.718
F31BASE	1177426.763	3541036.802	144.734	3862940.972	11617551.576	474.848
F32BASE	1170996.114	3548052.763	113.858	3841843.084	11640569.774	373.549
F33BASE	1177882.086	3560353.354	102.310	3864434.810	11680925.963	335.662
F34BASE	1191572.267	3557028.801	104.724	3909350.014	11670018.657	343.582
F35BASE	1186021.600	3543266.107	134.237	3891139.198	11624865.552	440.409
F36BASE	1181588.686	3557989.070	109.256	3876595.546	11673169.142	358.451
F37BASE	1181583.412	3544099.949	122.870	3876578.244	11627601.248	403.116
F38BASE	1163480.802	3544980.707	110.607	3817186.598	11630490.870	362.883
F39BASE	1173055.978	3538614.574	151.933	3848601.154	11609604.648	498.467
GCP01	1187629.464	3543697.548	137.418	3896414.334	11626281.039	450.846
GCP02	1140103.906	3578585.038	57.076	3740490.898	11740741.079	187.257
GCP03	1149218.698	3589325.760	62.651	3770395.012	11775979.597	205.547
GCP04	1083436.153	3601754.840	43.409	3554573.444	11816757.336	142.418
GCP05	1032792.323	3621168.206	29.242	3388419.478	11880449.355	95.938
GCP06	1094772.144	3613427.897	38.534	3591764.943	11855054.691	126.424
GCP07	1107365.558	3609247.988	12.770	3633081.834	11841341.108	41.896
GCP08	1112219.887	3628388.565	19.677	3649008.079	11904138.151	64.557
GCP09	1124860.227	3603274.006	32.779	3690478.929	11821741.469	107.542
GCP10	1171882.857	3540531.305	159.678	3844752.340	11615893.124	523.877
GCP11	1194465.556	3557318.302	102.724	3918842.412	11670968.461	337.020
GCP12	1176462.632	3559103.406	90.230	3859777.819	11676825.090	296.030
GCP13	1041970.662	3606262.198	36.133	3418532.081	11831545.228	118.546
GCP14	1055836.889	3625406.708	27.735	3464024.860	11894355.175	90.994
GCP15	1066780.475	3640461.037	25.402	3499928.941	11943745.919	83.340
NVA01	1136139.902	3574871.538	44.297	3727485.661	11728557.704	145.331
NVA02	1136933.848	3586623.303	61.995	3730090.466	11767113.286	203.395
NVA03	1139460.145	3582794.082	83.931	3738378.824	11754550.250	275.364

Station Name	Northing meters	Easting meters	NAVD 1988 meters	Northing US FT	Easting US FT	NAVD 1988 US FT
NVA04	1145698.702	3575802.672	57.681	3758846.491	11731612.600	189.242
NVA05	1152516.367	3579176.286	71.472	3781214.114	11742680.863	234.488
NVA06	1152833.315	3589498.590	65.608	3782253.966	11776546.622	215.249
NVA07	1143762.211	3595582.189	52.892	3752493.187	11796505.899	173.530
NVA08	1137819.933	3596566.085	44.667	3732997.564	11799733.897	146.545
NVA09	1135090.633	3607276.023	38.998	3724043.186	11834871.419	127.946
NVA10	1131406.006	3598007.655	44.493	3711954.539	11804463.447	145.974
NVA11	1128855.657	3615920.593	31.263	3703587.267	11863232.811	102.569
NVA12	1125721.617	3598271.269	43.833	3693305.005	11805328.323	143.809
NVA13	1119168.680	3598641.759	1.903	3671805.909	11806543.837	6.243
NVA14	1124055.668	3609002.556	42.329	3687839.305	11840535.884	138.874
NVA15	1122243.006	3623450.635	37.095	3681892.261	11887937.625	121.703
NVA16	1110229.077	3642446.292	25.898	3642476.562	11950259.211	84.967
NVA17	1092832.007	3598240.499	47.398	3585399.677	11805227.369	155.505
NVA18	1096864.137	3619450.270	35.532	3598628.422	11874813.094	116.575
NVA19	1077400.464	3601651.923	34.176	3534771.357	11816419.683	112.126
NVA20	1145792.074	3585440.719	72.622	3759152.830	11763233.426	238.261
NVA21	1087793.255	3616145.973	28.523	3568868.371	11863972.247	93.579
NVA22	1086085.890	3610278.496	37.809	3563266.789	11844722.031	124.045
NVA23	1115614.740	3619280.852	25.067	3660146.027	11874257.260	82.241
NVA24	1099641.107	3605819.225	42.836	3607739.198	11830091.907	140.538
NVA25	1107973.669	3614805.532	5.929	3635076.947	11859574.484	19.452
NVA26	1116046.420	3633790.331	36.511	3661562.297	11921860.443	119.787
NVA27	1039234.654	3590826.341	34.464	3409555.693	11780902.752	113.071
NVA28	1026800.828	3611818.825	13.632	3368762.383	11849775.596	44.724
NVA29	1037811.415	3640362.247	8.084	3404886.284	11943421.804	26.522
NVA30	1040425.388	3639161.891	19.056	3413462.294	11939483.638	62.520
NVA31	1042937.032	3635418.479	23.296	3421702.578	11927202.125	76.430
NVA32	1041899.186	3615673.167	37.517	3418297.578	11862421.047	123.087
NVA33	1060279.615	3646393.317	22.959	3478600.704	11963208.741	75.325
NVA34	1064895.301	3643282.433	26.070	3493744.000	11953002.448	85.531
NVA35	1053573.231	3638636.460	21.106	3456598.175	11937759.787	69.245
NVA36	1030193.563	3640460.489	5.642	3379893.380	11943744.121	18.510
NVA37	1044512.351	3627746.787	9.020	3426870.938	11902032.582	29.593
NVA38	1028283.768	3632392.655	20.745	3373627.661	11917274.903	68.061
NVA39	1028772.837	3616315.612	11.139	3375232.215	11864528.802	36.545
NVA40	1039398.073	3599763.346	35.636	3410091.844	11810223.579	116.916
NVA41	1109423.334	3656489.027	24.915	3639833.056	11996331.084	81.742
NVA42	1122363.016	3614147.287	38.136	3682285.995	11857414.890	125.118
NVA43	1113927.460	3615616.027	22.128	3654610.343	11862233.583	72.598
NVA44	1091723.227	3603800.627	41.363	3581761.953	11823469.222	135.705
NVA45	1106715.649	3623017.399	11.650	3630949.590	11886516.250	38.222
NVA46	1107130.182	3661610.698	20.879	3632309.605	12013134.431	68.501
NVA47	1103521.763	3663645.027	25.049	3620470.985	12019808.725	82.182
NVA48	1103392.345	3656787.508	26.760	3620046.386	11997310.350	87.795
NVA49	1059456.559	3630207.704	34.101	3475900.393	11910106.441	111.880
NVA50	1101262.657	3616600.348	31.312	3613059.235	11865462.975	102.729
NVA51	1171446.772	3532705.762	128.178	3843321.619	11590218.819	420.531
NVA52	1166111.834	3541378.490	107.193	3825818.576	11618672.597	351.682
NVA53	1166356.959	3552955.550	103.186	3826622.789	11656654.999	338.536
NVA54	1187395.529	3544554.417	131.155	3895646.830	11629092.282	430.298
NVA55	1189455.815	3565041.516	84.282	3902406.287	11696307.039	276.515
NVA56	1185248.211	3565211.514	90.644	3888601.839	11696864.777	297.388
NVA57	1165895.352	3550393.470	106.046	3825108.334	11648249.241	347.919
NVA58	1186533.807	3552356.371	131.643	3892819.666	11654689.195	431.899
NVA59	1189663.429	3561980.738	95.818	3903087.435	11686265.137	314.363
NVA60	1179502.057	3550529.057	112.741	3869749.664	11648694.082	369.884
NVA61	1197263.410	3551208.940	93.705	3928021.706	11650924.663	307.430
NVA62	1194603.396	3559249.199	83.368	3919294.642	11677303.412	273.517
NVA63	1172472.214	3551511.430	75.030	3846685.923	11651917.084	246.161
NVA64	1180077.400	3538052.971	135.608	3871637.270	11607762.123	444.907
NVA65	1175815.686	3546157.034	116.940	3857655.297	11634350.201	383.661
NVA66	1186585.678	3560166.164	91.207	3892989.846	11680311.821	299.235
NVA67	1049187.906	3613257.742	18.818	3442210.654	11854496.442	61.739

Station Name	Northing meters	Easting meters	NAVD 1988 meters	Northing US FT	Easting US FT	NAVD 1988 US FT
VVA01	1109397.247	3608880.743	3.205	3639747.468	11840136.237	10.515
VVA02	1098796.118	3626606.937	21.642	3604966.930	11898292.926	71.004
VVA03	1042170.699	3606724.988	37.574	3419188.369	11833063.564	123.274
VVA04	1038958.391	3638975.362	9.741	3408649.322	11938871.668	31.959
VVA05	1065432.181	3642378.794	24.566	3495505.413	11950037.759	80.597
VVA06	1036530.631	3633888.657	5.442	3400684.245	11922183.036	17.854
VVA07	1030479.800	3603828.338	21.781	3380832.476	11823560.138	71.460
VVA08	1106474.889	3657490.293	20.861	3630159.699	11999616.068	68.441
VVA09	1078760.911	3599358.217	42.258	3539234.756	11808894.416	138.641
VVA10	1146370.010	3580332.614	87.179	3761048.940	11746474.583	286.020
VVA11	1167758.595	3544197.006	124.978	3831221.323	11627919.678	410.032
VVA12	1176879.579	3535263.839	125.209	3861145.752	11598611.446	410.790
VVA13	1193638.595	3550131.335	118.786	3916129.289	11647389.223	389.717
VVA14	1183749.640	3559312.149	104.559	3883685.277	11677509.941	343.041
VVAF01	1078094.484	3598277.978	44.408	3537048.321	11805350.332	145.695
VVAF02	1087420.966	3615228.238	37.456	3567646.954	11860961.312	122.887
VVAF03	1100258.112	3612609.373	40.033	3609763.488	11852369.250	131.342
VVAF04	1109046.305	3603283.121	21.487	3638596.086	11821771.372	70.495
VVAF05	1088509.775	3598347.527	50.083	3571219.152	11805578.512	164.314
VVAF06	1082983.866	3605433.400	42.796	3553089.567	11828826.081	140.407
VVAF07	1088548.379	3605537.260	42.834	3571345.808	11829166.826	140.531
VVAF08	1104820.732	3615368.047	33.238	3624732.684	11861419.999	109.048
VVAF09	1127633.767	3613847.744	37.247	3699578.451	11856432.139	122.201
VVAF10	1133689.129	3613654.079	23.662	3719445.083	11855796.756	77.631
VVAF11	1151835.177	3587225.679	62.671	3778979.243	11769089.581	205.613
VVAF12	1137751.313	3577613.256	48.208	3732772.432	11737552.822	158.162
VVAF13	1140595.280	3590736.239	56.043	3742103.013	11780607.144	183.868
VVAF14	1113589.437	3640323.200	12.014	3653501.344	11943293.698	39.416
VVAF15	1120864.327	3628872.103	19.615	3677369.046	11905724.557	64.354
VVAF16	1116198.901	3604274.021	15.721	3662062.560	11825022.352	51.578
VVAF17	1119262.562	3617302.062	36.781	3672113.923	11867765.183	120.672
VVAF18	1137181.859	3599960.557	57.855	3730904.149	11810870.593	189.813
VVAF19	1143810.990	3580602.322	58.087	3752653.224	11747359.452	190.574
VVAF20	1101425.620	3621708.691	32.686	3613593.888	11882222.598	107.237
VVAF21	1068198.634	3644027.868	26.773	3504581.686	11955448.097	87.838
VVAF22	1065581.852	3634700.484	31.542	3495996.461	11924846.505	103.484
VVAF23	1054046.962	3616026.908	24.853	3458152.407	11863581.614	81.539
VVAF24	1025087.039	3638877.672	12.192	3363139.728	11938551.162	40.000
VVAF25	1051243.115	3622421.637	17.426	3448953.452	11884561.653	57.172
VVAF26	1034314.718	3624593.676	28.344	3393414.205	11891687.753	92.992
VVAF27	1036990.815	3613727.653	31.610	3402194.033	11856038.142	103.707
VVAF28	1104146.483	3657380.265	22.860	3622520.586	11999255.085	75.000
VVAF29	1106626.827	3655563.694	27.613	3630658.183	11993295.218	90.594
VVAF30	1171636.855	3531373.636	102.815	3843945.247	11585848.338	337.319
VVAF31	1177398.292	3541055.266	144.400	3862847.563	11617612.151	473.752
VVAF32	1171014.961	3548044.008	113.649	3841904.917	11640541.051	372.863
VVAF33	1177896.288	3560410.500	102.687	3864481.405	11681113.447	336.899
VVAF34	1191565.275	3557004.464	105.632	3909327.072	11669938.813	346.561
VVAF35	1186029.045	3543289.223	133.495	3891163.626	11624941.393	437.975
VVAF36	1181610.357	3557993.316	110.061	3876666.646	11673183.069	361.092
VVAF37	1181575.680	3544135.420	123.215	3876552.877	11627717.623	404.248
VVAF38	1163496.117	3544995.164	111.323	3817236.845	11630538.300	365.232
VVAF39	1173078.406	3538625.234	152.923	3848674.737	11609639.622	501.715