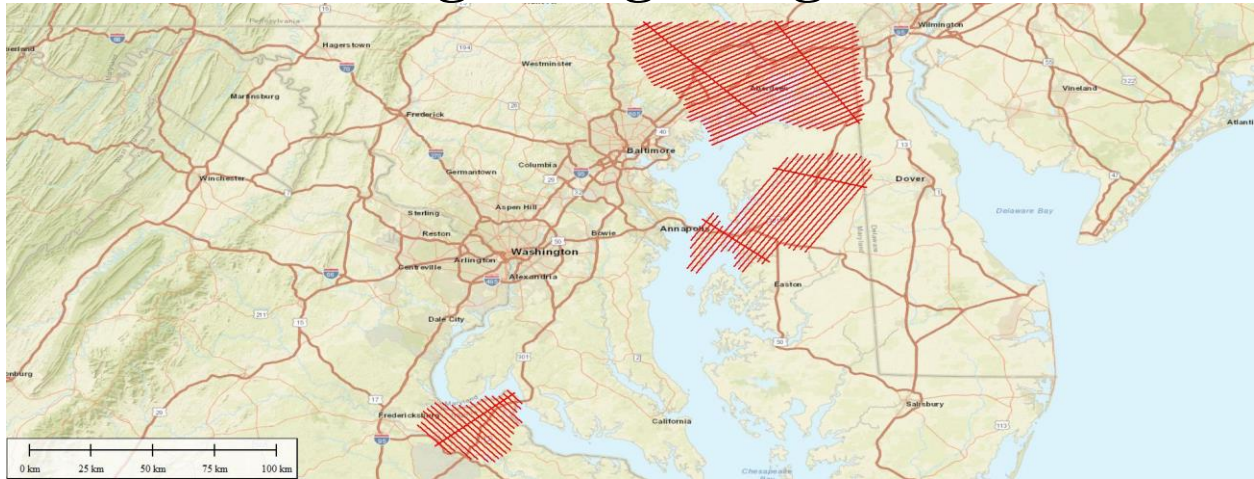


REPORT OF LIDAR SURVEY
United States Geological Survey
Ground Control Report
North Chesapeake Bay Maryland
&
King George Virginia



Performed by:



For:

Fugro Geospatial

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REPORT OF USGS LIDAR SURVEY NORTH CHESAPEAKE BAY & KING GEORGE VA

INTRODUCTION

Terrasurv, Inc of Pittsburgh, PA was tasked by Fugro Geospatial with performing a control survey in support of LiDAR data collection covering three discrete areas in northeastern Maryland and northern Virginia. The project consisted of two parts: 20 ground control (calibration) points (GCP) and 115 quality control points (QC: NVA/VVA/VVAF), for a total of 135 new stations. 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 Stations used to control the network.

Table 1 - Map Symbology and Control Quantity

Type	Symbol	VA Quantity
Ground Control (GCP)	Green Dot	20
Non-Vegetated (NVA)	Red Dot	64
Vegetated (VVA)	Red X	2
Woods (VVA-F)	Yellow X	49
CORS	Red cross in white square	12

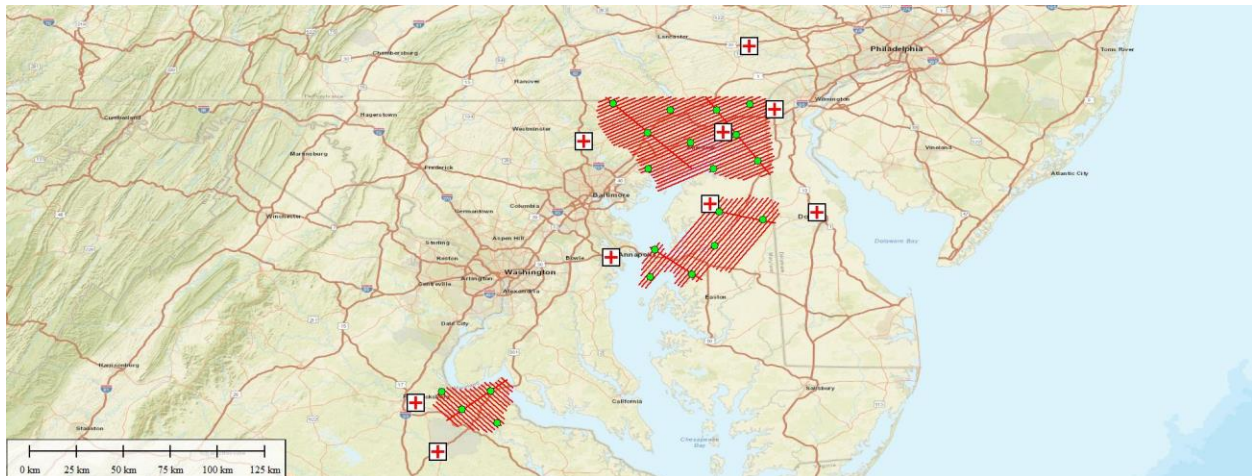


Figure 1 – GCP stations and CORS

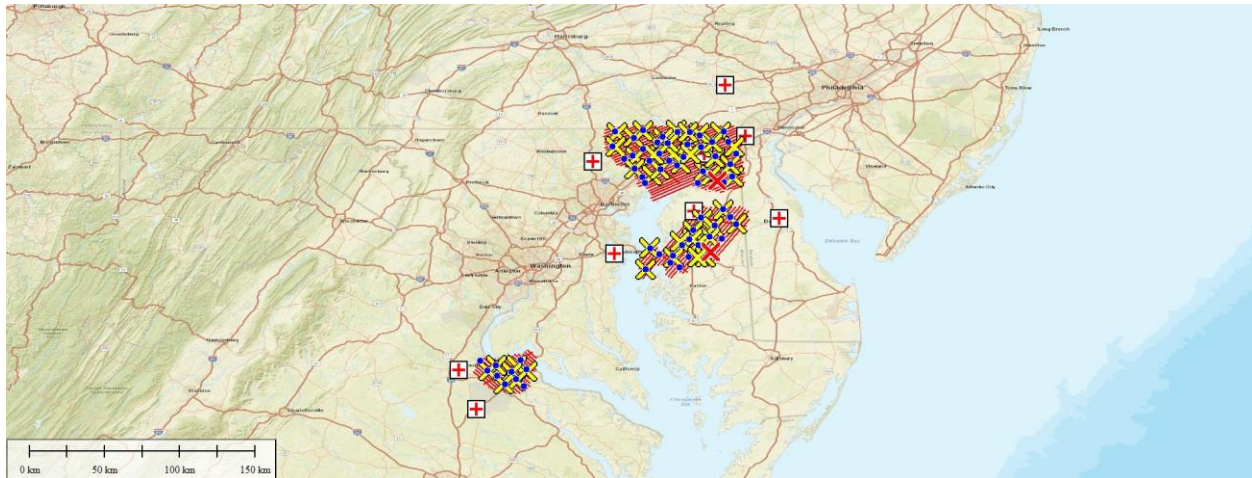


Figure 2 – Checkpoints and CORS

CONTROL

The National Spatial Reference System (NSRS) was used to provide control for the network. The [Hexagon SmartNet](#) real time network (RTN) was utilized, with a total of nine CORS from the 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 GEOID18 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, and 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
	PRS488974149	CHESTERTOWN	CORS
	PRS754828615	DOVER	CORS
	PRS862175355	COATESVILLE	CORS
	PRS868366819	NEWARK EAST	CORS
	PRS918882811	NORTH EAST	CORS
	PRS962419751	HEREFORD	CORS
	RTCM0371	SOUTH RIVER	CORS
	RTCM0561	BOWLING GREEN	CORS
	RTCM0572	FREDERICKSBURG	CORS
BASEF04	20040WA	PASSAPATANZY	Woods base
F01BS	20040WJ	DAHLGREN	Woods traverse
F01S6	20040WK	DAHLGREN	Woods traverse
F02BS	20040WM	DAHLGREN	Woods traverse
F02S6	20040WL	DAHLGREN	Woods traverse
F03BASE	20040WB	KING GEORGE	Woods base
F03BS	20040WC	KING GEORGE	Woods traverse
F05BS	20040WH	KING GEORGE	Woods traverse
F05S6	20040WI	KING GEORGE	Woods traverse
F06BS	20040WF	ROLLINS FORK	Woods traverse
F06S6	20040WG	ROLLINS FORK	Woods traverse
F07BS	20040WD	PORT ROYAL	Woods traverse
F07S6	20040WE	PORT ROYAL	Woods traverse
F08BASE	20040WZ	CHURCH HILL	Woods base

Station Name	GPSID	USGS Quadrangle	Description
F09BASE	20040XC	SUDLERSVILLE	Woods base
F10BASE	20040XB	SUDLERSVILLE	Woods base
F11BASE	20040XA	CHURCH HILL	Woods base
F12BASE	20040WW	CENTREVILLE	Woods base
F13BASE	20040WY	PRICE	Woods base
F14BASE	20040WX	CENTREVILLE	Woods base
F15BASE	20040WV	CENTREVILLE	Woods base
F16BS	20040WP	QUEENSTOWN	Woods traverse
F16S6	20040WQ	QUEENSTOWN	Woods traverse
F17S6	20040WT	RIDGELY	Woods traverse
F18BASE	20040WO	KENT ISLAND	Woods base
F19S6	20040WN	LOVE POINT	Woods traverse
F20BASE	20040WU	LANGFORD CREEK	Woods base
F21BS	20040WS	WYE MILLS	Woods traverse
F21S6	20040WR	WYE MILLS	Woods traverse
F22BS	20040YO	FAWN GROVE	Woods traverse
F22S6	20040YN	FAWN GROVE	Woods traverse
F23BS	20040YQ	NORRISVILLE	Woods traverse
F23S6	20040YP	NORRISVILLE	Woods traverse
F24BS	20040YS	PHOENIX	Woods traverse
F24S6	20040YR	PHOENIX	Woods traverse
F25BS	20040YU	JARRETTSVILLE	Woods traverse
F25S6	20040YT	JARRETTSVILLE	Woods traverse
F26BS	20040ZB	WHITE MARSH	Woods traverse
F26S6	20040ZC	WHITE MARSH	Woods traverse
F27BS	20040ZA	EDGEWOOD	Woods traverse
F27S6	20040YZ	EDGEWOOD	Woods traverse
F28BS	20040YY	EDGEWOOD	Woods traverse
F28S6	20040YX	EDGEWOOD	Woods traverse
F29BS	20040YE	ABERDEEN	Woods traverse
F29S6	20040YD	ABERDEEN	Woods traverse
F30BS	20040YK	DELTA	Woods traverse
F30S6	20040YJ	DELTA	Woods traverse
F31BS	20040XP	EARLEVILLE	Woods traverse
F31S6	20040XO	EARLEVILLE	Woods traverse
F32BASE	20040XX	CECILTON	Woods base
F32S6	20040XE	CECILTON	Woods traverse
F33BS	20040YW	BEL AIR	Woods traverse
F33S6	20040YV	BEL AIR	Woods traverse
F34BS	20040YA	ABERDEEN	Woods traverse
F34S6	20040XZ	ABERDEEN	Woods traverse
F35S6	20040XW	RISING SUN	Woods traverse
F36BS	20040XV	CONOWINGO DAM	Woods traverse
F36S6	20040XU	CONOWINGO DAM	Woods traverse
F37BS	20040YI	CONOWINGO DAM	Woods traverse
F37S6	20040YH	CONOWINGO DAM	Woods traverse
F38BS	20040YM	DELTA	Woods traverse
F38S6	20040YL	DELTA	Woods traverse
F39BASE	20040XD	EARLEVILLE	Woods base
F40S6	20040XF	ELKTON	Woods traverse
F41BS	20040XN	NORTH EAST	Woods traverse
F41S6	20040XM	NORTH EAST	Woods traverse
F42BS	20040XJ	BAY VIEW	Woods traverse
F42S6	20040XI	BAY VIEW	Woods traverse
F43S6	20040XY	HAVRE DE GRACE	Woods traverse
F44BS	20040XL	BAY VIEW	Woods traverse
F44S6	20040XK	BAY VIEW	Woods traverse
F45BS	20040XR	RISING SUN	Woods traverse
F45S6	20040XQ	RISING SUN	Woods traverse
F46BS	20040XT	RISING SUN	Woods traverse
F46S6	20040XS	RISING SUN	Woods traverse
F47BS	20040YC	HAVRE DE GRACE	Woods traverse
F47S6	20040YB	HAVRE DE GRACE	Woods traverse
F48BS	20040YG	CONOWINGO DAM	Woods traverse

Station Name	GPSID	USGS Quadrangle	Description
F48S6	20040YF	CONOWINGO DAM	Woods traverse
F49BS	20040XH	ELKTON	Woods traverse
F49S6	20040XG	ELKTON	Woods traverse
GCP01	20040A	PASSAPATANZY	BARE=center of an asphalt cul-de-sac for Alberta Court
GCP02	20040B	KING GEORGE	BARE=centerline of Anqora Drive and asphalt drive to the south of Port Conway Road
GCP03	20040D	DAHLGREN	BARE=northeast asphalt of Thompson Road and south side of Dahlgren Road
GCP04	20040C	ROLLINS FORK	BARE=center of a gravel lot for a farmer's stand between Rollins Fork Road and Kings Highway
GCP05	20040R	NORRISVILLE	BARE=asphalt centerline of a drive to #2448 on the north side of Island Branch Road
GCP06	20040F	KENT ISLAND	BARE=asphalt centerline of Brick House Road and north edge of Romancoke Road
GCP07	20040S	BEL AIR	BARE=asphalt center of Wooden Branch Court cul-de-sac
GCP08	20040T	EDGEWOOD	BARE=center of Chimney Oak Drive cul-de-sac
GCP09	20040E	LOVE POINT	BARE=centerline of John Kallis Lane and the south edge of Blue Bay Road
GCP10	20040Q	CONOWINGO DAM	BARE=gravel centerline of a private drive to the south off of Paddrick Road
GCP11	20040G	QUEENSTOWN	BARE=center of north side of Wye Hall Road and east from Wye Island Road
GCP12	20040P	ABERDEEN	BARE=asphalt centerline of a drive to Union United Methodist Church on the north side of Post Road
GCP13	20040H	CENTREVILLE	BARE=asphalt park n ride lot on the north side of Tidewater Drive and west side of US301
GCP14	20040K	SPESUTIE	BARE=gravel centerline of a drive to the south and to the Girl Scout Camp
GCP15	20040O	RISING SUN	BARE=asphalt center of the Pearl Wyn Lane cul-de-sac
GCP16	20040I	CHESTERTOWN	BARE=asphalt centerline of Sheaffer Road and west edge of Leverage Road
GCP17	20040N	NORTH EAST	BARE=asphalt northeast quadrant of the intersection of Old York Road and Shady Beach Road
GCP18	20040M	NEWARK WEST	BARE=asphalt centerline of Entrance #2 on the south side of Telegraph Road
GCP19	20040L	CECILTON	BARE=asphalt center of a cul-de-sac at the end of Vulcans way
GCP20	20040J	SUDLERSVILLE	BARE=asphalt centerline of Busic Church Road and the west edge of Duhamel Church Road
NVA01	20040DP	DELTA	BARE=asphalt centerline of a drive to the fire station on the south side of Pylesville Road
NVA02	20040DV	PHOENIX	BARE=asphalt centerline of a private drive to the north of Norrisville Road
NVA03	20040DT	NORRISVILLE	BARE=asphalt centerline of the drive to Fish and Barrel on the south side of Harkins Road
NVA04	20040DY	JARRETTSVILLE	BARE=asphalt drive on the south side of Boggs Road
NVA05	20040EA	BEL AIR	BARE=asphalt center of Cone Hill Court cul-de-sac
NVA06	20040EB	BEL AIR	BARE=asphalt center of Loch Carren Way cul-de-sac
NVA07	20040EI	EDGEWOOD	BARE=asphalt parking lot of Dollar Store on the north side of US40 and west of Joppa Road
NVA08	20040EH	EDGEWOOD	BARE=center of Ramsey Court cul-de-sac
NVA09	20040DI	ABERDEEN	BARE=asphalt of Bel Air Drive and west of Aberdeen Thoroughway
NVA10	20040DF	HAVRE DE GRACE	BARE=asphalt center of the Wilfong Court cul-de-sac
NVA11	20040DD	ABERDEEN	BARE=center of center lane for a park n ride lot on the southwest side of Churchville Road and southeast of Technology Drive
NVA12	20040DJ	CONOWINGO DAM	BARE=asphalt north side of the intersection of Darlington Road, Old Quaker Road and Main street
NVA13	20040DN	DELTA	BARE=asphalt center of a parking lot at an abandoned business
NVA14	20040DL	CONOWINGO DAM	BARE=asphalt centerline of Patrick Meadows Farm drive to the south off of Paddrick Road

Station Name	GPSID	USGS Quadrangle	Description
NVA15	20040CT	RISING SUN	BARE=asphalt center of the Wrays Way cul-de-sac
NVA16	20040DB	HAVRE DE GRACE	BARE=gravel area on the south shoulder of I95N near a water treatment plant
NVA17	20040CV	RISING SUN	BARE=asphalt center of the Little brick Court cul-de-sac
NVA18	20040CL	NEWARK WEST	BARE=asphalt drive apron to Citgo on the south side of Telegraph Road
NVA19	20040CN	BAY VIEW	BARE=asphalt centerline of an access road to I95 on the east side of Bouchelle Road
NVA20	20040CK	NEWARK WEST	BARE=asphalt centerline of Wedgemont Drive and north edge of Ricketts Mill Road
NVA21	20040CP	NORTH EAST	BARE=asphalt center of the Old York Court cul-de-sac
NVA22	20040CR	EARLEVILLE	BARE=asphalt centerline of Caldwell Road and west edge of turkey Point Road
NVA23	20040CG	ELKTON	BARE=gravel parking lot on the south side of Augustine Herman Highway and south of a strip mall
NVA24	20040CB	SPESUTIE	BARE=asphalt intersection of Ches Haven Road and Grove Neck Road
NVA25	20040CE	CECILTON	BARE=asphalt center of the Cabot Court cul-de-sac
NVA26	20040BZ	CECILTON	BARE=asphalt centerline of the entrance drive to MRDC Head Start on the north side of Augustine Herman Highway
NVA27	20040CD	EARLEVILLE	BARE=asphalt centerline of Pearce Creek Drive and the south edge of Crystal Beach Road
NVA28	20040EE	PERRYMAN	BARE=asphalt center of the drive to Church Creek Elementary School on the east side of Church Creek Road
NVA29	20040EJ	WHITE MARSH	BARE=asphalt parking lot for Tacos Tolteca on the south side of US1 and north of Reckord Road
NVA30	20040ED	BEL AIR	BARE=center of entrance drive to Rolling Greens on the east side of Priestford Road
NVA31	20040DS	FAWN GROVE	BARE=asphalt parking lot on the east side of Rocks Road at a church
NVA32	20040DX	JARRETTSVILLE	BARE=asphalt centerline of Choate Road and north edge of Fallston Road
NVA33	20040CX	CONOWINGO DAM	BARE=asphalt parking lot south of Potters Baptist Church on the west side of Connely Road
NVA34	20040CZ	RISING SUN	BARE=gravel centerline of Lords Drive to the south of Jacob Tome Memorial Highway
NVA35	20040CI	ELKTON	BARE=center of Manor Circle on the north side of W Williams Road
NVA36	20040BR	CHESTERTOWN	BARE=asphalt centerline of Union Church Road and west edge of Leverage Road
NVA37	20040BU	SUDLERSVILLE	BARE=gravel centerline of a drive to the east of Duhamel Corner Road
NVA38	20040BY	SUDLERSVILLE	BARE=asphalt northern shoulder of McGinnes Road and a field access
NVA39	20040BS	CHURCH HILL	BARE=asphalt center of a parking lot on the north side of Barclay Road and east of US301
NVA40	20040BG	CENTREVILLE	BARE=asphalt center of cul-de-sac of Quail Lane
NVA41	20040BL	CENTREVILLE	BARE=asphalt northeast quadrant of a drive to a gas station and the south edge of Ruthsburg Road
NVA42	20040BD	RIDGELY	BARE=asphalt centerline of Crouse Mills Road and east edge of Damsontown Road
NVA43	20040BA	WYE MILLS	BARE=asphalt centerline of Grange Road and on the west edge of Centerville Road and north of US50
NVA44	20040AZ	QUEENSTOWN	BARE=asphalt south side of Wye Hall Road and centerline extended of a gravel drive south
NVA45	20040AW	QUEENSTOWN	BARE=asphalt centerline of Prospect Bay Drive E
NVA46	20040AT	KENT ISLAND	BARE=north edge of an asphalt bike path on the south side of Romancoke Road and centerline extended of Dorchester Road
NVA47	20040AR	LOVE POINT	BARE=asphalt centerline of Grollman Road and northeast side of Old Love Point Road

Station Name	GPSID	USGS Quadrangle	Description
NVA48	20040AV	KENT ISLAND	BARE=asphalt centerline of Wharf Drive and south edge of Main Street
NVA49	20040BI	CENTREVILLE	BARE=asphalt centerline of Hatchett Road and the south edge of Sparks Mill Road
NVA50	20040BE	CENTREVILLE	BARE=asphalt centerline of Wrights Neck Road and north edge of CR18
NVA51	20040BP	PRICE	BARE=asphalt centerline of Echo Lane and west edge of Willow Branch Road
NVA52	20040BN	PRICE	BARE=gravel centerline of the Schraders Farm gravel drive to the East side of Bridgetown Road
NVA53	20040BW	SUDLERSVILLE	BARE=asphalt northwest quadrant of the intersection of Sudlersville Road and Duhamel Corner Road
NVA54	20040AX	QUEENSTOWN	BARE=asphalt centerline of Wye Harbor Drive northeast from Bennett Point Road
NVA55	20040AA	PASSAPATANZY	BARE=center of an asphalt cul-de-sac on Sedgwick Court.
NVA56	20040AK	ROLLINS FORK	BARE=northeast quadrant of the intersection of Wilmont Road and Rollins Fork Road
NVA57	20040AB	PASSAPATANZY	BARE=gravel drive on the south side of White Hall Road
NVA58	20040AF	PORT ROYAL	BARE=centerline of Old Wharf Road and the south side of Port Conway Road
NVA59	20040AG	PORT ROYAL	BARE=centerline of Salem Church Road and southeast side of US301
NVA60	20040AM	KING GEORGE	BARE=asphalt centerline of a drive apron to Ralph Bunche High School on the south side of US301
NVA61	20040AI	ROLLINS FORK	BARE=centerline of a private gravel drive to the north of Big Timber Road
NVA62	20040AO	DAHLGREN	BARE=gravel apron of Nottingham Lane on the north side of Windsor Drive
NVA63	20040AQ	DAHLGREN	BARE=asphalt north shoulder of Dahlgren Road and east side of Owens Drive
NVA64	20040AC	KING GEORGE	BARE=centerline of an asphalt drive apron to the south of Caledon Road
VVAF01	20040AL	DAHLGREN	WOODS=south side of Good Hope Road and a cemetery and west side of Tetotum Road
VVAF02	20040AP	DAHLGREN	WOODS=north side of US301 and west side of a high voltage power line R-O-W
VVAF03	20040AE	KING GEORGE	WOODS=on the west side of Comorn Road and south of Caledon Road
VVAF04	20040AD	PASSAPATANZY	WOODS=on the north side of White Hall Road and west side of Lambs Creek Church Road
VVAF05	20040AN	KING GEORGE	WOODS=on the south side of US301 and north edge of the Ralph Bunche High School property
VVAF06	20040AJ	ROLLINS FORK	WOODS=on the south side of Kings highway and east side of a baseball field
VVAF07	20040AH	PORT ROYAL	WOODS=on the north side of Port Conway Road
VVAF08	20040BQ	CHURCH HILL	WOODS=north side of Church Hill Road
VVAF09	20040BX	SUDLERSVILLE	WOODS=east side of Millington Road and north side of a field
VVAF10	20040BV	SUDLERSVILLE	WOODS=north side of Busic Church Road
VVAF11	20040BT	CHURCH HILL	WOODS=along the western side of US301 and south from Hall Road
VVAF12	20040BJ	CENTREVILLE	WOODS=northeast side of Hatchett Road
VVAF13	20040BO	PRICE	WOODS=on the northeast side of Willow Branch Road and north side of a field
VVAF14	20040BK	CENTREVILLE	WOODS=north side of Tidewater Drive and east of a park n ride lot
VVAF15	20040BH	CENTREVILLE	WOODS=north side of Watson Road and southwest side of Spaniard Neck Road
VVAF16	20040AY	QUEENSTOWN	WOODS=west side of Bennett Point Road and north side of Grasonville Cemetery Road
VVAF17	20040BC	RIDGELY	WOODS=west side of Damsontown Road and south side of Crouse Mill Road
VVAF19	20040AS	LOVE POINT	WOODS=north side of Blue Bay Road

Station Name	GPSID	USGS Quadrangle	Description
VVAF19	20040AU	KENT ISLAND	WOODS=north side of Romancoke Road and west side of Dorchester Road
VVAF20	20040BF	LANGFORD CREEK	WOODS=north side of Spider Web Road
VVAF21	20040BB	WYE MILLS	WOODS= north side of Charles Boyle Road
VVAF22	20040DR	FAWN GROVE	WOODS=north side of Old Pylesville Road and north of Stansbury Road and west side of Rocks Road
VVAF23	20040DU	NORRISVILLE	WOODS=north side of jolly Acres Road and west from Amos Road
VVAF24	20040DW	PHOENIX	WOODS=east side of Jarrettsville Pike and opposite a drive
VVAF25	20040DZ	JARRETTSVILLE	WOODS=south side of Bear Hollow Court
VVAF26	20040EK	WHITE MARSH	WOODS=north side of Reckford Road and west from US1
VVAF27	20040EG	EDGEWOOD	WOODS=on the north side of a road connecting US40 and Veterans Memorial Highway
VVAF28	20040EF	EDGEWOOD	WOODS=north side of Baneberry Drive and opposite Liriopie Court
VVAF29	20040DH	ABERDEEN	WOODS=north side of Country Club Road and opposite Oakington Road
VVAF30	20040DO	DELTA	WOODS=south side of Conowingo Road and west of an abandoned building
VVAF31	20040CS	EARLEVILLE	WOODS=northern end of boat ramp parking lot
VVAF32	20040CF	CECILTON	WOODS=north side of Bohemia Church Road and just west of a dirt drive to the south
VVAF33	20040EC	BEL AIR	WOODS=north side of a parking lot for Hickory Copy Center Harford Community College
VVAF34	20040DC	HAVRE DE GRACE	WOODS=south shoulder of I95N and at a water treatment plant
VVAF34	20040DE	ABERDEEN	WOODS=north side of Level Road and west from the intersection with Paradise Road
VVAF35	20040DA	RISING SUN	WOODS=north side of Jacob Tome Memorial Highway and east side of Waibel Road
VVAF36	20040CY	CONOWINGO DAM	WOODS=on the south side of Woody Brown Road and east side of a Power line ROW
VVAF37	20040DM	CONOWINGO DAM	WOODS=north side of Glen Cove Road
VVAF38	20040DQ	DELTA	WOODS=north side of Pylesville Road and south of a maintenance building
VVAF39	20040CC	EARLEVILLE	WOODS=north side of Crystal Beach Road
VVAF40	20040CH	ELKTON	WOODS=south of a gravel parking lot and south side of Augustine Herman Highway
VVAF41	20040CQ	NORTH EAST	WOODS=on the south side of Autumn Woods Drive
VVAF42	20040CM	BAY VIEW	WOODS=south side of Telegraph Road
VVAF44	20040CO	BAY VIEW	WOODS=on the north side of Quarry Road and east of Stevens Road
VVAF45	20040CU	RISING SUN	WOODS=east side of Wilson road and north of a detention pond
VVAF46	20040CW	RISING SUN	WOODS=south side of US1 and west from Jacob Tome Memorial Highway
VVAF47	20040DG	HAVRE DE GRACE	WOODS=north side of a drive to Perryville Branch Library on the west side of Coudon Blvd
VVAF48	20040DK	CONOWINGO DAM	TREES=traffic island at intersection of Shuresville Road and Stafford Road
VVAF49	20040CJ	ELKTON	WOODS=north side of Red Hill Road and west of Elkton Reservoir
VVANF01	20040CA	EARLEVILLE	BRUSH=in a traffic island at the intersection of Sandy Bottom Road and Grove Neck Road and SR282
VVANF02	20040BM	RIDGELY	BRUSH=field on the west side of Damsontown Road

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, along with a total station for the VVA-F (woods) points. Corrections were obtained from the SmartNet VRS network with corrections delivered over the cellular network. These corrections are applied in real time and used by the rover receiver 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. Some woods checkpoints (VVA-F) were located by establishing a temporary base nearby using the VRS network and then using the second R10 as a rover with corrections delivered over a radio link (RTK). Where the woods were too thick a different methodology was used where a pair of intervisible stations were established using the VRS network and a Trimble S6 total station was used to survey to the woods point. Table 3 summarizes the VRS/RTK occupations (precisions in meters). Occupations with ~~strickthrough~~ were rejected.

Table 3 – VRS/RTK Occupation Summary

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
RTCM0572	20040A	10/05/2020 19:17:21	19:20:20	0.010	0.029	14	1.6
RTCM0572	20040A	10/05/2020 19:22:19	19:25:18	0.009	0.029	14	1.6
RTCM0572	20040AA	10/05/2020 19:02:02	19:05:01	0.010	0.027	15	1.4
RTCM0572	20040AA	10/05/2020 19:08:22	19:11:21	0.009	0.026	15	1.4
RTCM0572	20040AB	10/05/2020 19:50:25	19:53:24	0.013	0.036	12	2.0
RTCM0572	20040AB	10/05/2020 19:53:54	19:56:53	0.014	0.039	13	1.9
RTCM0572	20040AB	10/05/2020 19:59:28	20:02:27	0.013	0.041	12	1.9
RTCM0572	20040AB	10/05/2020 20:03:37	20:06:36	0.013	0.038	12	1.9
RTCM0572	20040AC	10/05/2020 21:14:21	21:17:20	0.017	0.031	16	1.4
RTCM0572	20040AC	10/05/2020 21:18:19	21:21:18	0.013	0.030	15	1.5
20040WA	20040AD	10/05/2020 20:53:17	20:56:16	0.007	0.011	27	1.2
20040WA	20040AD	10/05/2020 20:56:57	20:59:56	0.006	0.008	25	1.2
RTCM0572	20040AF	10/05/2020 22:27:05	22:30:04	0.012	0.037	15	1.3
RTCM0572	20040AF	10/05/2020 22:30:29	22:33:28	0.012	0.038	16	1.2
RTCM0572	20040AG	10/05/2020 22:41:50	22:44:49	0.013	0.038	16	1.3
RTCM0572	20040AG	10/05/2020 22:46:33	22:49:32	0.013	0.035	16	1.3
RTCM0561	20040AI	10/06/2020 12:02:12	12:05:11	0.014	0.040	14	1.7
RTCM0561	20040AI	10/06/2020 12:05:38	12:08:38	0.014	0.042	16	1.3
RTCM0572	20040AK	10/06/2020 12:56:08	12:59:07	0.011	0.042	14	1.8
RTCM0572	20040AK	10/06/2020 12:59:57	13:02:56	0.011	0.044	13	2.0
RTCM0572	20040AM	10/06/2020 13:43:33	13:46:32	0.014	0.032	14	1.4
RTCM0572	20040AM	10/06/2020 13:47:07	13:50:06	0.012	0.028	14	1.4
RTCM0572	20040AO	10/06/2020 14:48:59	14:51:58	0.017	0.035	13	1.4
RTCM0572	20040AO	10/06/2020 14:52:42	14:55:41	0.018	0.040	13	1.4
RTCM0572	20040AQ	10/06/2020 15:32:02	15:35:01	0.012	0.049	11	2.1
RTCM0572	20040AQ	10/06/2020 15:36:04	15:39:03	0.012	0.046	11	2.1
RTCM0371	20040AR	10/06/2020 17:43:45	17:46:44	0.015	0.032	14	1.6
RTCM0371	20040AR	10/06/2020 17:47:34	17:50:33	0.013	0.029	14	1.6
RTCM0371	20040AT	10/06/2020 18:42:00	18:44:59	0.011	0.034	14	1.5
RTCM0371	20040AT	10/06/2020 18:45:30	18:48:29	0.011	0.033	14	1.5
20040WO	20040AU	10/06/2020 18:58:22	19:04:21	0.008	0.011	18	1.2
20040WO	20040AU	10/06/2020 19:04:46	19:05:50	0.015	0.087	19	1.3
20040WO	20040AU	10/06/2020 19:06:06	19:10:39	0.009	0.012	18	1.2
RTCM0371	20040AV	10/06/2020 19:34:32	19:37:31	0.012	0.032	16	1.3
RTCM0371	20040AV	10/06/2020 19:38:33	19:41:32	0.012	0.035	16	1.3
RTCM0371	20040AW	10/06/2020 19:54:16	19:57:15	0.015	0.045	13	2.0
RTCM0371	20040AW	10/06/2020 19:57:55	20:00:54	0.015	0.046	13	2.1
RTCM0371	20040AW	10/06/2020 20:01:34	20:04:40	0.015	0.044	13	2.1
RTCM0371	20040AX	10/06/2020 20:14:01	20:17:00	0.015	0.034	15	1.4

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
RTCM0371	20040AX	10/06/2020 20:19:52	20:22:51	0.015	0.033	15	1.4
RTCM0371	20040AZ	10/06/2020 21:09:54	21:11:06	0.017	0.038	16	1.4
RTCM0371	20040AZ	10/06/2020 21:11:56	21:14:55	0.013	0.033	16	1.4
RTCM0371	20040AZ	10/06/2020 21:16:12	21:19:11	0.013	0.033	16	1.4
RTCM0572	20040B	10/05/2020 22:15:07	22:18:06	0.011	0.033	15	1.4
RTCM0572	20040B	10/05/2020 22:19:16	22:22:15	0.011	0.036	15	1.4
RTCM0371	20040BA	10/06/2020 21:46:48	21:49:47	0.011	0.029	15	1.4
RTCM0371	20040BA	10/06/2020 21:50:25	21:53:24	0.011	0.030	14	1.5
RTCM0371	20040BD	10/06/2020 22:51:18	22:54:17	0.015	0.037	13	1.4
RTCM0371	20040BD	10/06/2020 22:54:47	22:57:46	0.013	0.030	13	1.4
PRS488974149859	20040BE	10/07/2020 11:19:46	11:22:45	0.011	0.026	19	1.4
PRS488974149859	20040BE	10/07/2020 11:24:36	11:27:35	0.010	0.026	18	1.4
20040WU	20040BF	10/07/2020 11:53:09	11:56:08	0.009	0.014	20	1.5
20040WU	20040BF	10/07/2020 11:56:41	11:59:40	0.009	0.014	18	1.5
PRS488974149859	20040BG	10/07/2020 12:18:48	12:21:47	0.008	0.020	19	1.3
PRS488974149859	20040BG	10/07/2020 12:22:17	12:25:16	0.009	0.021	18	1.4
20040WV	20040BH	10/07/2020 12:42:46	12:45:45	0.011	0.021	19	1.6
20040WV	20040BH	10/07/2020 12:48:12	12:51:43	0.016	0.021	20	1.6
PRS488974149859	20040BI	10/07/2020 13:06:58	13:09:57	0.007	0.012	16	1.5
PRS488974149859	20040BI	10/07/2020 13:10:37	13:13:36	0.009	0.016	15	1.5
PRS488974149859	20040BI	10/07/2020 13:15:47	13:18:46	0.007	0.012	15	1.5
20040WW	20040BJ	10/07/2020 14:05:11	14:09:40	0.009	0.015	15	2.0
20040WW	20040BJ	10/07/2020 14:10:50	14:13:49	0.012	0.023	15	1.8
20040WX	20040BK	10/07/2020 14:41:05	14:44:04	0.011	0.018	17	1.9
20040WX	20040BK	10/07/2020 14:44:32	14:47:31	0.014	0.027	17	2.1
PRS488974149859	20040BL	10/07/2020 15:03:36	15:06:35	0.009	0.016	12	1.5
PRS488974149859	20040BL	10/07/2020 15:07:13	15:10:12	0.012	0.023	12	1.5
PRS488974149859	20040BM	10/07/2020 15:23:18	15:26:17	0.010	0.020	11	1.9
PRS488974149859	20040BM	10/07/2020 15:26:39	15:31:49	0.009	0.022	11	1.9
PRS488974149859	20040BN	10/07/2020 15:46:32	15:49:31	0.009	0.016	13	1.3
PRS488974149859	20040BN	10/07/2020 15:50:30	15:53:29	0.009	0.017	13	1.3
20040WY	20040BO	10/07/2020 16:19:37	16:22:36	0.010	0.014	14	1.5
20040WY	20040BO	10/07/2020 16:24:09	16:26:29	0.021	0.049	15	1.5
PRS488974149859	20040BP	10/07/2020 16:33:53	16:36:52	0.009	0.014	15	1.3
PRS488974149859	20040BP	10/07/2020 16:37:21	16:40:20	0.008	0.013	14	1.5
20040WZ	20040BQ	10/07/2020 17:08:08	17:11:07	0.008	0.012	15	1.8
20040WZ	20040BQ	10/07/2020 17:11:50	17:14:49	0.007	0.012	16	1.4
PRS488974149859	20040BR	10/07/2020 17:22:30	17:25:54	0.012	0.016	14	1.5
PRS488974149859	20040BR	10/07/2020 17:26:10	17:29:09	0.006	0.008	14	1.5
PRS488974149859	20040BS	10/07/2020 18:13:56	18:16:55	0.009	0.025	15	1.4
PRS488974149859	20040BS	10/07/2020 18:17:36	18:20:35	0.010	0.026	15	1.4
20040XA	20040BT	10/07/2020 18:38:36	18:41:35	0.008	0.017	15	2.1
20040XA	20040BT	10/07/2020 18:41:59	18:44:59	0.006	0.014	14	2.0
PRS488974149859	20040BU	10/07/2020 19:16:33	19:19:32	0.009	0.016	16	1.6
PRS488974149859	20040BU	10/07/2020 19:20:19	19:23:18	0.009	0.016	16	1.3
20040XB	20040BV	10/07/2020 19:41:37	19:44:36	0.013	0.020	12	1.8
20040XB	20040BV	10/07/2020 19:45:20	19:48:19	0.010	0.015	11	1.7
PRS754828615391	20040BW	10/07/2020 19:59:24	20:02:23	0.010	0.016	15	1.3
PRS754828615391	20040BW	10/07/2020 20:02:45	20:05:44	0.009	0.016	15	1.3
PRS754828615391	20040BW	10/07/2020 20:06:17	20:09:16	0.014	0.021	15	1.3
20040XC	20040BX	10/07/2020 20:30:10	20:33:09	0.006	0.009	16	1.4
20040XC	20040BX	10/07/2020 20:33:43	20:36:42	0.006	0.008	18	1.3
PRS488974149859	20040BY	10/07/2020 20:43:46	20:46:45	0.007	0.010	18	1.3
PRS488974149859	20040BY	10/07/2020 20:48:05	20:51:04	0.007	0.010	15	1.4
PRS488974149859	20040BZ	10/07/2020 21:08:43	21:11:42	0.008	0.011	16	1.4
PRS488974149859	20040BZ	10/07/2020 21:13:38	21:16:37	0.008	0.012	16	1.4
RTCM0572	20040C	10/06/2020 13:05:57	13:08:56	0.011	0.040	15	1.6
RTCM0572	20040C	10/06/2020 13:09:22	13:12:21	0.011	0.037	15	1.6
PRS488974149859	20040CA	10/07/2020 21:23:53	21:26:52	0.007	0.011	18	1.3
PRS488974149859	20040CA	10/07/2020 21:28:22	21:31:21	0.007	0.010	18	1.3
PRS488974149859	20040CB	10/07/2020 22:00:29	22:03:28	0.007	0.012	12	1.8
PRS488974149859	20040CB	10/07/2020 22:03:52	22:06:51	0.008	0.013	14	1.4
20040XD	20040CC	10/07/2020 22:27:50	22:30:49	0.009	0.026	19	1.2
20040XD	20040CC	10/07/2020 22:31:09	22:34:08	0.006	0.009	18	1.4

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
PRS91888281191	20040CD	10/07/2020 22:39:38	22:42:37	0.009	0.014	14	1.4
PRS91888281191	20040CD	10/07/2020 22:43:07	22:46:06	0.007	0.011	14	1.4
PRS91888281191	20040CE	10/08/2020 11:22:03	11:25:02	0.012	0.018	12	2.0
PRS91888281191	20040CE	10/08/2020 11:25:34	11:28:34	0.013	0.017	12	2.0
20040XX	20040CF	10/08/2020 11:49:09	11:52:08	0.031	0.080	16	2.4
PRS91888281191	20040CG	10/08/2020 12:46:59	12:49:58	0.009	0.024	15	1.5
PRS91888281191	20040CG	10/08/2020 12:51:31	12:54:30	0.009	0.025	15	1.5
PRS868366819557	20040CI	10/08/2020 13:24:59	13:27:58	0.008	0.010	14	1.3
PRS868366819557	20040CI	10/08/2020 13:30:11	13:33:10	0.009	0.012	13	1.4
PRS868366819557	20040CK	10/08/2020 14:14:57	14:17:56	0.011	0.020	13	1.4
PRS868366819557	20040CK	10/08/2020 14:18:52	14:21:52	0.012	0.021	13	1.4
PRS868366819557	20040CL	10/08/2020 14:44:11	14:47:10	0.013	0.026	14	1.4
PRS868366819557	20040CL	10/08/2020 14:48:09	14:51:08	0.013	0.029	13	1.5
PRS91888281191	20040CN	10/08/2020 15:52:59	15:55:58	0.009	0.018	11	2.3
PRS91888281191	20040CN	10/08/2020 15:56:34	15:59:33	0.007	0.012	12	1.6
PRS91888281191	20040CP	10/08/2020 16:41:34	16:44:33	0.005	0.008	13	1.5
PRS91888281191	20040CP	10/08/2020 16:44:58	16:47:58	0.006	0.009	12	1.7
PRS91888281191	20040CR	10/08/2020 17:39:17	17:42:16	0.010	0.016	12	1.9
PRS91888281191	20040CR	10/08/2020 17:42:55	17:45:54	0.008	0.013	13	1.9
PRS91888281191	20040CT	10/08/2020 19:10:56	19:13:55	0.007	0.012	14	1.5
PRS91888281191	20040CT	10/08/2020 19:14:57	19:17:56	0.007	0.013	14	1.5
PRS91888281191	20040CV	10/08/2020 20:07:28	20:10:27	0.010	0.020	13	1.5
PRS91888281191	20040CV	10/08/2020 20:11:06	20:14:05	0.009	0.018	14	1.4
PRS91888281191	20040CX	10/08/2020 20:50:44	20:53:44	0.011	0.024	16	1.4
PRS91888281191	20040CX	10/08/2020 20:55:15	20:58:14	0.011	0.023	16	1.4
PRS91888281191	20040CZ	10/08/2020 21:41:43	21:44:42	0.010	0.023	13	1.5
PRS91888281191	20040CZ	10/08/2020 21:47:20	21:50:19	0.009	0.024	12	1.8
RTCM0572	20040D	10/06/2020 15:42:48	15:45:47	0.012	0.042	11	2.1
RTCM0572	20040D	10/06/2020 15:47:36	15:50:35	0.012	0.044	11	2.1
PRS91888281191	20040DB	10/08/2020 22:24:02	22:27:01	0.010	0.024	12	1.4
PRS91888281191	20040DB	10/08/2020 22:29:54	22:32:53	0.010	0.023	12	1.8
PRS91888281191	20040DD	10/09/2020 11:32:05	11:35:05	0.009	0.014	15	1.3
PRS91888281191	20040DD	10/09/2020 11:35:30	11:38:29	0.009	0.015	16	1.2
PRS91888281191	20040DF	10/09/2020 12:15:26	12:18:25	0.009	0.025	14	1.7
PRS91888281191	20040DF	10/09/2020 12:19:01	12:22:00	0.009	0.026	14	1.7
PRS91888281191	20040DI	10/09/2020 13:42:59	13:45:58	0.008	0.010	14	1.4
PRS91888281191	20040DI	10/09/2020 13:46:22	13:49:21	0.009	0.012	13	1.6
PRS91888281191	20040DJ	10/09/2020 14:13:26	14:16:25	0.014	0.029	13	1.4
PRS91888281191	20040DJ	10/09/2020 14:17:08	14:20:07	0.015	0.027	12	1.7
PRS91888281191	20040DL	10/09/2020 15:04:04	15:07:03	0.011	0.026	11	1.5
PRS91888281191	20040DL	10/09/2020 15:07:44	15:10:43	0.012	0.026	11	1.5
PRS91888281191	20040DN	10/09/2020 16:04:54	16:07:53	0.008	0.016	13	1.5
PRS91888281191	20040DN	10/09/2020 16:08:32	16:11:31	0.010	0.017	14	1.4
PRS91888281191	20040DP	10/09/2020 16:50:14	16:53:14	0.011	0.022	13	1.4
PRS91888281191	20040DP	10/09/2020 16:55:00	16:57:59	0.011	0.024	12	1.5
PRS962419751241	20040DS	10/09/2020 17:48:48	17:51:47	0.010	0.015	14	1.3
PRS962419751241	20040DS	10/09/2020 17:52:11	17:55:10	0.010	0.015	13	1.5
PRS962419751241	20040DT	10/09/2020 18:22:07	18:25:06	0.012	0.030	15	1.4
PRS962419751241	20040DT	10/09/2020 18:25:28	18:28:27	0.012	0.031	15	1.4
PRS962419751241	20040DV	10/09/2020 19:39:55	19:42:54	0.013	0.033	13	1.6
PRS962419751241	20040DV	10/09/2020 19:44:57	19:49:10	0.012	0.032	13	1.6
PRS962419751241	20040DX	10/09/2020 20:21:46	20:24:45	0.013	0.030	14	1.4
PRS962419751241	20040DX	10/09/2020 20:28:25	20:31:24	0.013	0.030	15	1.4
PRS962419751241	20040DY	10/09/2020 20:40:56	20:43:55	0.015	0.027	15	1.4
PRS962419751241	20040DY	10/09/2020 20:44:32	20:47:31	0.016	0.027	14	1.5
RTCM0371	20040E	10/06/2020 17:53:58	17:56:57	0.011	0.026	14	1.3
RTCM0371	20040E	10/06/2020 17:57:24	18:00:23	0.012	0.028	15	1.3
PRS962419751241	20040EA	10/09/2020 21:50:07	21:53:07	0.009	0.023	13	1.6
PRS962419751241	20040EA	10/09/2020 21:53:43	21:56:42	0.010	0.024	14	1.5
PRS962419751241	20040EB	10/09/2020 22:27:15	22:30:14	0.012	0.035	12	1.5
PRS962419751241	20040EB	10/09/2020 22:32:19	22:35:18	0.012	0.033	13	1.5
PRS91888281191	20040ED	10/09/2020 23:07:35	23:10:34	0.011	0.019	11	1.7
PRS91888281191	20040ED	10/09/2020 23:11:36	23:13:24	0.013	0.023	10	2.2
PRS91888281191	20040EE	10/10/2020 11:53:04	11:56:03	0.010	0.018	16	1.2

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
PRS91888281191	20040EE	10/10/2020 11:57:58	12:00:57	0.008	0.015	14	1.6
PRS962419751241	20040EH	10/10/2020 13:11:02	13:14:01	0.008	0.017	15	1.4
PRS962419751241	20040EH	10/10/2020 13:14:42	13:17:41	0.009	0.019	15	1.4
PRS962419751241	20040EI	10/10/2020 13:40:08	13:43:07	0.010	0.017	12	1.7
PRS962419751241	20040EI	10/10/2020 13:43:39	13:46:38	0.011	0.018	13	1.6
PRS962419751241	20040EJ	10/10/2020 14:03:28	14:06:27	0.013	0.025	12	1.6
PRS962419751241	20040EJ	10/10/2020 14:06:56	14:09:56	0.014	0.026	12	1.6
RTCM0371	20040F	10/06/2020 18:30:31	18:33:30	0.011	0.035	14	1.6
RTCM0371	20040F	10/06/2020 18:33:59	18:36:58	0.011	0.034	14	1.6
RTCM0371	20040G	10/06/2020 21:23:00	21:25:59	0.012	0.031	15	1.6
RTCM0371	20040G	10/06/2020 21:27:23	21:30:22	0.012	0.031	16	1.4
PRS488974149859	20040H	10/07/2020 14:51:17	14:54:16	0.012	0.020	12	1.5
PRS488974149859	20040H	10/07/2020 14:56:03	14:59:03	0.012	0.020	11	2.2
PRS488974149859	20040I	10/07/2020 17:33:11	17:36:11	0.005	0.007	14	1.6
PRS488974149859	20040I	10/07/2020 17:36:45	17:39:44	0.005	0.008	14	1.6
PRS754828615391	20040J	10/07/2020 19:06:28	19:09:27	0.011	0.020	15	1.5
PRS754828615391	20040J	10/07/2020 19:09:58	19:12:57	0.009	0.017	15	1.5
PRS488974149859	20040K	10/07/2020 21:49:59	21:52:58	0.011	0.020	12	1.5
PRS488974149859	20040K	10/07/2020 21:53:19	21:56:18	0.009	0.017	12	1.8
PRS91888281191	20040L	10/08/2020 11:07:09	11:10:08	0.012	0.017	13	1.8
PRS91888281191	20040L	10/08/2020 11:13:09	11:16:08	0.011	0.017	13	1.7
PRS868366819557	20040M	10/08/2020 14:33:12	14:36:11	0.014	0.027	13	1.7
PRS868366819557	20040M	10/08/2020 14:36:55	14:39:54	0.014	0.025	14	1.4
PRS91888281191	20040N	10/08/2020 16:51:37	16:54:36	0.008	0.015	11	1.8
PRS91888281191	20040N	10/08/2020 16:54:58	16:57:57	0.008	0.013	9	2.4
PRS91888281191	20040O	10/08/2020 19:00:15	19:03:14	0.010	0.017	14	1.5
PRS91888281191	20040O	10/08/2020 19:03:45	19:06:44	0.007	0.014	14	1.5
PRS91888281191	20040P	10/09/2020 13:01:10	13:04:09	0.007	0.017	15	1.5
PRS91888281191	20040P	10/09/2020 13:05:04	13:08:03	0.009	0.019	15	1.5
PRS91888281191	20040Q	10/09/2020 14:53:55	14:56:54	0.011	0.026	10	2.0
PRS91888281191	20040Q	10/09/2020 14:57:36	15:00:35	0.012	0.028	10	1.7
PRS962419751241	20040R	10/09/2020 18:10:18	18:13:17	0.010	0.026	14	1.5
PRS962419751241	20040R	10/09/2020 18:14:28	18:17:27	0.011	0.026	15	1.4
PRS962419751241	20040S	10/09/2020 22:07:37	22:10:36	0.012	0.033	15	1.4
PRS962419751241	20040S	10/09/2020 22:11:21	22:14:20	0.011	0.030	15	1.4
PRS962419751241	20040T	10/10/2020 13:22:20	13:25:19	0.008	0.015	14	1.4
PRS962419751241	20040T	10/10/2020 13:26:12	13:29:11	0.009	0.015	14	1.4
RTCM0572	20040WA	10/05/2020 20:08:28	20:11:27	0.016	0.040	10	2.0
RTCM0572	20040WA	10/05/2020 20:12:35	20:15:34	0.014	0.034	10	2.0
RTCM0572	20040WA	10/05/2020 20:43:04	20:46:03	0.014	0.033	17	1.5
RTCM0572	20040WA	10/05/2020 20:46:33	20:49:32	0.012	0.031	16	1.4
RTCM0572	20040WB	10/05/2020 21:30:53	21:33:52	0.013	0.034	14	1.6
RTCM0572	20040WC	10/05/2020 21:41:56	21:44:55	0.012	0.028	14	1.6
RTCM0561	20040WD	10/06/2020 11:23:16	11:26:15	0.014	0.031	13	1.7
RTCM0561	20040WD	10/06/2020 11:45:52	11:48:51	0.014	0.035	13	1.9
RTCM0561	20040WD	10/06/2020 11:49:28	11:52:27	0.015	0.040	13	2.8
RTCM0561	20040WE	10/06/2020 11:28:34	11:31:33	0.015	0.040	13	1.8
RTCM0561	20040WE	10/06/2020 11:41:46	11:44:45	0.016	0.039	12	1.9
RTCM0561	20040WF	10/06/2020 12:14:42	12:17:41	0.014	0.041	17	1.3
RTCM0572	20040WF	10/06/2020 12:37:30	12:40:29	0.011	0.044	16	1.6
RTCM0561	20040WG	10/06/2020 12:19:38	12:22:37	0.012	0.040	15	1.6
RTCM0572	20040WG	10/06/2020 12:32:27	12:35:26	0.011	0.040	16	1.6
RTCM0572	20040WH	10/06/2020 13:52:42	13:55:41	0.013	0.029	13	1.4
RTCM0572	20040WI	10/06/2020 13:57:24	14:00:23	0.015	0.031	12	1.7
RTCM0572	20040WJ	10/06/2020 14:24:26	14:27:25	0.017	0.035	12	1.8
RTCM0572	20040WK	10/06/2020 14:30:04	14:33:03	0.021	0.040	12	1.9
RTCM0572	20040WL	10/06/2020 15:06:48	15:09:47	0.018	0.048	11	1.9
RTCM0572	20040WM	10/06/2020 15:12:12	15:15:11	0.015	0.047	12	1.7
RTCM0371	20040WN	10/06/2020 18:04:07	18:07:06	0.015	0.039	13	1.4
RTCM0371	20040WO	10/06/2020 18:50:06	18:53:05	0.012	0.037	15	1.3
RTCM0371	20040WP	10/06/2020 20:31:01	20:34:00	0.014	0.034	15	1.5
RTCM0371	20040WQ	10/06/2020 20:41:22	20:44:21	0.016	0.035	17	1.4
RTCM0371	20040WR	10/06/2020 22:16:56	22:19:55	0.013	0.042	14	1.4
RTCM0371	20040WS	10/06/2020 22:22:02	22:25:01	0.013	0.041	14	1.4

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
RTCM0371	20040WT	10/06/2020 22:43:57	22:46:56	0.015	0.040	13	1.5
PRS488974149859	20040WU	10/07/2020 11:43:22	11:46:21	0.015	0.042	14	1.6
PRS488974149859	20040WU	10/07/2020 11:47:05	11:50:04	0.014	0.040	16	1.3
PRS488974149859	20040WU	10/07/2020 12:02:09	12:05:08	0.012	0.018	17	1.5
PRS488974149859	20040WV	10/07/2020 12:32:31	12:35:30	0.010	0.027	16	1.8
PRS488974149859	20040WV	10/07/2020 12:36:14	12:39:13	0.010	0.026	14	1.8
PRS488974149859	20040WW	10/07/2020 13:31:00	13:33:59	0.008	0.011	13	1.5
PRS488974149859	20040WW	10/07/2020 13:35:22	13:38:21	0.009	0.012	12	1.6
PRS488974149859	20040WX	10/07/2020 14:30:59	14:33:58	0.011	0.015	13	1.6
PRS488974149859	20040WX	10/07/2020 14:34:31	14:37:30	0.012	0.017	13	1.6
PRS488974149859	20040WY	10/07/2020 16:06:34	16:09:33	0.010	0.019	12	1.6
PRS488974149859	20040WY	10/07/2020 16:10:19	16:13:18	0.011	0.022	12	1.6
PRS488974149859	20040WZ	10/07/2020 16:57:29	17:00:40	0.013	0.026	13	1.6
PRS488974149859	20040WZ	10/07/2020 17:01:17	17:04:28	0.012	0.026	13	1.7
PRS488974149859	20040XA	10/07/2020 18:26:55	18:29:54	0.009	0.027	14	1.6
PRS488974149859	20040XA	10/07/2020 18:30:31	18:33:30	0.010	0.028	14	1.6
PRS488974149859	20040XB	10/07/2020 19:27:28	19:30:27	0.009	0.016	13	1.5
PRS488974149859	20040XB	10/07/2020 19:30:54	19:33:53	0.010	0.017	13	1.5
PRS488974149859	20040XC	10/07/2020 20:18:09	20:21:08	0.010	0.021	14	1.5
PRS488974149859	20040XC	10/07/2020 20:23:14	20:26:13	0.010	0.020	15	1.4
PRS91888281191	20040XD	10/07/2020 22:18:47	22:21:46	0.008	0.012	14	1.4
PRS91888281191	20040XD	10/07/2020 22:22:07	22:25:06	0.008	0.012	14	1.4
PRS91888281191	20040XE	10/08/2020 12:13:02	12:16:01	0.009	0.017	12	1.9
PRS91888281191	20040XE	10/08/2020 12:24:19	12:27:18	0.010	0.022	12	1.8
PRS91888281191	20040XF	10/08/2020 12:56:47	12:59:46	0.010	0.025	15	1.4
PRS868366819557	20040XG	10/08/2020 13:47:46	13:51:27	0.016	0.020	10	1.9
PRS868366819557	20040XH	10/08/2020 13:53:51	13:56:50	0.012	0.016	10	2.1
PRS868366819557	20040XI	10/08/2020 15:09:19	15:15:12	0.012	0.039	11	1.9
PRS868366819557	20040XJ	10/08/2020 15:17:30	15:21:59	0.012	0.042	10	2.1
PRS91888281191	20040XK	10/08/2020 16:04:14	16:07:13	0.007	0.011	13	1.4
PRS91888281191	20040XL	10/08/2020 16:10:02	16:13:01	0.007	0.011	14	1.4
PRS91888281191	20040XM	10/08/2020 17:05:36	17:08:35	0.005	0.007	12	1.8
PRS91888281191	20040XN	10/08/2020 17:10:49	17:13:48	0.007	0.009	14	1.5
PRS91888281191	20040XO	10/08/2020 17:52:43	17:55:42	0.008	0.014	12	2.0
PRS91888281191	20040XP	10/08/2020 17:57:07	18:00:06	0.008	0.014	13	1.6
PRS91888281191	20040XQ	10/08/2020 19:43:07	19:46:06	0.008	0.016	12	1.9
PRS91888281191	20040XR	10/08/2020 19:47:58	19:50:57	0.008	0.015	13	1.6
PRS91888281191	20040XS	10/08/2020 20:26:29	20:29:28	0.011	0.021	12	3.2
PRS91888281191	20040XT	10/08/2020 20:31:49	20:34:48	0.010	0.022	12	3.0
PRS91888281191	20040XU	10/08/2020 21:03:58	21:06:57	0.014	0.027	14	1.6
PRS91888281191	20040XV	10/08/2020 21:09:15	21:12:14	0.012	0.025	13	1.7
PRS91888281191	20040XW	10/08/2020 21:51:32	21:54:31	0.009	0.023	11	2.1
PRS91888281191	20040XX	10/08/2020 11:39:59	11:42:58	0.013	0.020	13	2.3
PRS91888281191	20040XX	10/08/2020 11:43:39	11:46:38	0.012	0.019	13	2.3
PRS91888281191	20040XX	10/08/2020 12:08:01	12:11:00	0.011	0.022	13	1.7
PRS91888281191	20040XX	10/08/2020 12:27:58	12:30:57	0.008	0.016	13	1.6
PRS91888281191	20040XY	10/08/2020 22:18:24	22:21:23	0.010	0.026	12	1.6
PRS91888281191	20040XZ	10/09/2020 11:51:29	11:54:28	0.011	0.025	13	2.3
PRS91888281191	20040YA	10/09/2020 11:56:26	11:59:26	0.009	0.022	14	1.4
PRS91888281191	20040YB	10/09/2020 12:33:04	12:37:29	0.010	0.033	15	1.6
PRS91888281191	20040YC	10/09/2020 12:40:47	12:43:46	0.010	0.031	15	1.6
PRS91888281191	20040YD	10/09/2020 13:17:04	13:20:03	0.008	0.013	13	1.4
PRS91888281191	20040YE	10/09/2020 13:21:25	13:24:24	0.009	0.014	13	1.6
PRS91888281191	20040YF	10/09/2020 14:29:45	14:32:44	0.011	0.016	12	1.6
PRS91888281191	20040YG	10/09/2020 14:34:33	14:37:32	0.011	0.016	13	1.6
PRS91888281191	20040YH	10/09/2020 15:21:01	15:24:56	0.014	0.031	9	1.9
PRS91888281191	20040YI	10/09/2020 15:26:13	15:29:12	0.012	0.029	10	1.8
PRS91888281191	20040YJ	10/09/2020 16:21:56	16:24:56	0.009	0.015	14	1.3
PRS91888281191	20040YK	10/09/2020 16:27:41	16:30:40	0.007	0.012	14	1.3
PRS91888281191	20040YL	10/09/2020 17:04:56	17:08:35	0.012	0.024	13	1.5
PRS91888281191	20040YM	10/09/2020 17:12:05	17:15:04	0.013	0.025	13	1.5
PRS962419751241	20040YN	10/09/2020 17:29:10	17:32:09	0.014	0.021	12	1.8
PRS962419751241	20040YO	10/09/2020 17:34:13	17:37:12	0.009	0.014	13	1.5
PRS962419751241	20040YP	10/09/2020 19:01:22	19:04:21	0.011	0.031	13	1.6

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
PRS962419751241	20040YP	10/09/2020 19:20:42	19:23:41	0.010	0.026	14	1.3
PRS962419751241	20040YQ	10/09/2020 19:06:40	19:09:39	0.012	0.030	14	1.5
PRS962419751241	20040YQ	10/09/2020 19:16:24	19:19:23	0.009	0.023	14	1.5
PRS962419751241	20040YR	10/09/2020 19:55:58	19:58:57	0.012	0.027	13	1.8
PRS962419751241	20040YS	10/09/2020 20:00:55	20:03:54	0.013	0.029	14	1.4
PRS962419751241	20040YT	10/09/2020 21:19:35	21:22:34	0.012	0.027	15	1.5
PRS962419751241	20040YU	10/09/2020 21:24:14	21:27:13	0.013	0.027	16	1.4
PRS91888281191	20040YV	10/09/2020 22:46:15	22:49:14	0.013	0.021	12	1.9
PRS91888281191	20040YW	10/09/2020 22:50:24	22:53:24	0.008	0.013	11	1.7
PRS91888281191	20040YX	10/10/2020 12:09:19	12:12:18	0.009	0.017	13	1.7
PRS91888281191	20040YY	10/10/2020 12:15:16	12:18:15	0.010	0.023	13	1.7
PRS91888281191	20040YZ	10/10/2020 12:38:39	12:41:38	0.010	0.027	12	1.9
PRS91888281191	20040ZA	10/10/2020 12:43:30	12:46:29	0.011	0.026	13	1.8
PRS962419751241	20040ZB	10/10/2020 14:19:05	14:22:04	0.015	0.027	11	1.7
PRS962419751241	20040ZC	10/10/2020 14:23:48	14:27:02	0.017	0.030	13	1.4

Table 4 summarizes the total station observations to the woods points where it was not possible to use GNSS (mark-to-mark values in gons/meters).

Table 4 - Total Station Observations (meters and gons)

Stand point	Back sight	Fore point	HI	HT	Direction	M-to-M Zenith Distance	M-to-M Distance	Feature Code
20040WB	20040WC	20040AE	0.196	2.135	255.8992	112.3839	23.744	VVAF03
20040WB	20040WC	20040WC	0.196	2.050		106.2709	20.287	F03BS
20040WB	20040WC	20040WC	0.196	2.050		106.2709	20.287	F03BS
20040WE	20040WD	20040AH	0.196	2.135	234.3613	103.7729	24.308	VVAF07
20040WE	20040WD	20040WD	0.196	2.050		111.1970	9.418	F07BS
20040WE	20040WD	20040WD	0.196	2.050		111.1964	9.419	F07BS
20040WG	20040WF	20040AJ	0.196	2.135	250.8068	102.1907	26.214	VVAF06
20040WG	20040WF	20040WF	0.196	2.050		101.5402	52.205	F06BS
20040WG	20040WF	20040WF	0.196	2.050		101.5392	52.205	F06BS
20040WI	20040WH	20040AN	0.196	2.135	178.4795	104.8363	35.579	VVAF05
20040WI	20040WH	20040WH	0.196	2.050		102.1454	28.050	F05BS
20040WI	20040WH	20040WH	0.196	2.050		102.1455	28.049	F05BS
20040WK	20040WJ	20040AL	0.196	2.135	22.4692	102.8391	71.864	VVAF01
20040WK	20040WJ	20040WJ	0.196	2.050		104.5506	30.821	F01BS
20040WK	20040WJ	20040WJ	0.196	2.050		104.5504	30.821	F01BS
20040WL	20040WM	20040AP	0.196	2.135	244.6848	101.7705	37.433	VVAF02
20040WL	20040WM	20040WM	0.196	2.050		102.9555	48.116	F02BS
20040WL	20040WM	20040WM	0.196	2.050		102.9554	48.116	F02BS
20040WN	20040E	20040AS	0.196	2.135	221.0823	102.8512	30.000	VVAF19
20040WN	20040E	20040E	0.196	2.050		104.0723	24.696	GCP09
20040WN	20040E	20040E	0.196	2.050		104.0721	24.696	GCP09
20040WQ	20040WP	20040AY	0.196	2.135	99.6304	103.4830	26.559	VVAF16
20040WQ	20040WP	20040WP	0.196	2.050		103.2070	28.901	F16BS
20040WQ	20040WP	20040WP	0.196	2.050		103.2067	28.902	F16BS
20040WR	20040WS	20040BB	0.196	2.135	270.1582	102.3551	40.324	VVAF21
20040WR	20040WS	20040WS	0.196	2.050		102.7338	38.500	F21BS
20040WR	20040WS	20040WS	0.196	2.050		102.7332	38.500	F21BS
20040WT	20040BD	20040BC	0.196	2.135	43.5296	102.3809	33.933	VVAF17
20040WT	20040BD	20040BD	0.196	2.050		100.9474	80.872	NVA42
20040WT	20040BD	20040BD	0.196	2.050		100.9472	80.872	NVA42
20040XE	20040XX	20040CF	0.196	2.135	146.7639	102.2991	49.381	VVAF32
20040XE	20040XX	20040XX	0.196	2.050		103.3085	26.332	F32BS
20040XE	20040XX	20040XX	0.196	2.050		103.3081	26.332	F32BS

Stand point	Back sight	Fore point	HI	HT	Direction	M-to-M Zenith Distance	M-to-M Distance	Feature Code
20040XF	20040CG	20040CG	0.196	2.050		102.6471	33.337	NVA23
20040XF	20040CG	20040CG	0.196	2.050		102.6461	33.336	NVA23
20040XF	20040CG	20040CH	0.196	2.135	155.7769	102.7477	75.156	VVAF40
20040XG	20040XH	20040CJ	0.196	1.660	131.1697	98.8281	15.955	VVAF49
20040XG	20040XH	20040XH	0.196	2.050		110.3182	12.931	F49BS
20040XG	20040XH	20040XH	0.196	2.050		110.3191	12.931	F49BS
20040XI	20040XJ	20040CM	0.196	1.660	298.4157	105.9933	28.348	VVAF42
20040XI	20040XJ	20040XJ	0.196	2.050		101.0317	23.528	F42BS
20040XI	20040XJ	20040XJ	0.196	2.050		101.0316	23.527	F42BS
20040XK	20040XL	20040CO	0.196	1.660	93.0727	102.3407	26.645	VVAF44
20040XK	20040XL	20040XL	0.196	2.050		105.1404	14.812	F44BS
20040XK	20040XL	20040XL	0.196	2.050		105.1410	14.812	F44BS
20040XM	20040XN	20040CQ	0.196	1.660	291.8078	103.8671	31.109	VVAF41
20040XM	20040XN	20040XN	0.196	2.050		102.1021	16.530	F41BS
20040XM	20040XN	20040XN	0.196	2.050		102.1023	16.530	F41BS
20040XO	20040XP	20040CS	0.196	1.660	198.5532	102.5744	28.614	VVAF31
20040XO	20040XP	20040XP	0.196	2.050		108.6738	13.394	F31BS
20040XO	20040XP	20040XP	0.196	2.050		108.6739	13.393	F31BS
20040XQ	20040XR	20040CU	0.196	1.660	207.3158	101.9070	40.957	F45
20040XQ	20040XR	20040XR	0.196	2.050		104.0846	21.185	F45BS
20040XQ	20040XR	20040XR	0.196	2.050		104.0840	21.186	F45BS
20040XS	20040XT	20040CW	0.196	1.660	308.4586	102.9343	30.089	VVAF46
20040XS	20040XT	20040XT	0.196	2.050		105.1765	21.601	F46BS
20040XS	20040XT	20040XT	0.196	2.050		105.1759	21.601	F46BS
20040XU	20040XV	20040CY	0.196	1.660	211.9576	105.4838	33.775	VVAF36
20040XU	20040XV	20040XV	0.196	2.050		102.0238	16.333	F36BS
20040XU	20040XV	20040XV	0.196	2.050		102.0238	16.333	F36BS
20040XW	20040CZ	20040CZ	0.196	2.050		107.8557	13.437	NVA34
20040XW	20040CZ	20040CZ	0.196	2.050		107.8552	13.436	NVA34
20040XW	20040CZ	20040CZ	0.196	2.050		107.8552	13.437	NVA34
20040XW	20040CZ	20040DA	0.196	1.660	86.3752	104.9853	29.840	VVAF35
20040XY	20040DB	20040DB	0.196	2.050		105.1610	31.356	NVA16
20040XY	20040DB	20040DB	0.196	2.050		105.1611	31.356	NVA16
20040XY	20040DB	20040DC	0.196	1.660	139.7073	100.6696	39.157	VVAF43
20040XZ	20040YA	20040DE	0.196	1.660	105.2782	109.5998	16.664	VVAF34
20040XZ	20040YA	20040YA	0.196	2.050		107.2063	19.503	F34BS
20040XZ	20040YA	20040YA	0.196	2.050		107.2059	19.504	F34BS
20040YB	20040YC	20040DG	0.196	1.660	312.8305	101.1678	27.168	VVAF47
20040YB	20040YC	20040YC	0.196	2.050		105.6633	15.621	F47BS
20040YB	20040YC	20040YC	0.196	2.050		105.6632	15.621	F47BS
20040YD	20040YE	20040DH	0.196	1.660	99.8061	102.3347	43.419	VVAF29
20040YD	20040YE	20040YE	0.196	2.050		105.8691	18.538	F29BS
20040YD	20040YE	20040YE	0.196	2.050		105.8690	18.538	F29BS
20040YF	20040YG	20040DK	0.196	1.660	300.3015	103.4914	26.238	VVAF48
20040YF	20040YG	20040YG	0.196	2.050		108.9593	11.301	F48BS
20040YF	20040YG	20040YG	0.196	2.050		108.9583	11.302	F48BS
20040YH	20040YI	20040DM	0.196	1.660	300.7483	109.6472	21.836	VVAF37
20040YH	20040YI	20040YI	0.196	2.050		106.0648	13.959	F37BS
20040YH	20040YI	20040YI	0.196	2.050		106.0639	13.959	F37BS
20040YJ	20040YK	20040DO	0.196	1.660	187.5704	102.6109	28.150	VVAF30
20040YJ	20040YK	20040YK	0.196	2.050		108.7522	12.457	F30BS
20040YJ	20040YK	20040YK	0.196	2.050		108.7521	12.457	F30BS
20040YL	20040YM	20040DQ	0.196	1.660	58.4856	110.1434	26.103	VVAF38

Stand point	Back sight	Fore point	HI	HT	Direction	M-to-M Zenith Distance	M-to-M Distance	Feature Code
20040YL	20040YM	20040YM	0.196	2.050		107.2960	21.105	F38BS
20040YL	20040YM	20040YM	0.196	2.050		107.2964	21.105	F38BS
20040YN	20040YO	20040DR	0.196	1.660	212.7073	100.5590	25.251	VVAF22
20040YN	20040YO	20040YO	0.196	2.050		108.2532	14.536	F22BS
20040YN	20040YO	20040YO	0.196	2.050		108.2538	14.535	F22BS
20040YP	20040YQ	20040DU	0.196	1.660	174.5149	103.2055	34.510	VVAF23
20040YP	20040YQ	20040YQ	0.196	2.050		104.4748	18.528	F23BS
20040YP	20040YQ	20040YQ	0.196	2.050		104.4746	18.528	F23BS
20040YR	20040YS	20040DW	0.196	1.660	129.1283	106.9733	24.153	VVAF24
20040YR	20040YS	20040YS	0.196	2.050		102.6643	21.295	F24BS
20040YR	20040YS	20040YS	0.196	2.050		102.6646	21.294	F24BS
20040YT	20040YU	20040DZ	0.196	1.660	87.9429	108.0796	17.341	VVAF25
20040YT	20040YU	20040YU	0.196	2.050		111.2233	8.783	F25BS
20040YT	20040YU	20040YU	0.196	2.050		111.2236	8.783	F25BS
20040YV	20040YW	20040EC	0.196	1.660	110.7579	107.2743	19.959	VVAF33
20040YV	20040YW	20040YW	0.196	2.050		108.9502	13.318	F33BS
20040YV	20040YW	20040YW	0.196	2.050		108.9500	13.318	F33BS
20040YX	20040YY	20040EF	0.196	1.660	311.8257	109.9262	24.562	VVAF28
20040YX	20040YY	20040YY	0.196	2.050		105.9587	11.014	F28BS
20040YX	20040YY	20040YY	0.196	2.050		105.9584	11.015	F28BS
20040YZ	20040ZA	20040EG	0.196	1.660	283.9720	115.6254	17.361	VVAF27
20040YZ	20040ZA	20040ZA	0.196	2.050		106.8736	15.867	F27BS
20040YZ	20040ZA	20040ZA	0.196	2.050		106.8735	15.868	F27BS
20040ZC	20040ZB	20040EK	0.196	1.660	147.2112	106.7688	22.777	VVAF26
20040ZC	20040ZB	20040ZB	0.196	2.050		103.3655	22.068	F26BS
20040ZC	20040ZB	20040ZB	0.196	2.050		103.3673	22.068	F26BS

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 5. Stations which had observations that differed by more than 0.03 m in the vertical component were re-observed until agreement was achieved.

Table 5 - Repeat Baseline Analysis (meters)

From	To	Δ North	Δ East	Δ Horiz	Δ Up	Length
RTCM0572	20040A	0.004	0.009	0.009	-0.012	12287
RTCM0572	20040AA	0.008	0.004	0.009	-0.013	12560
RTCM0572	20040AB	-0.010	0.006	0.012	-0.037	14898
RTCM0572	20040AB	-0.020	0.008	0.022	-0.050	14898
RTCM0572	20040AB	-0.020	-0.008	0.022	-0.012	14898
RTCM0572	20040AB	-0.011	0.001	0.011	-0.014	14898
RTCM0572	20040AB	-0.011	-0.014	0.018	0.025	14898
RTCM0572	20040AB	0.000	-0.015	0.015	0.039	14898
RTCM0572	20040AC	-0.001	0.013	0.013	-0.020	19633
20040WA	20040AD	0.001	-0.006	0.006	0.014	43
RTCM0572	20040AF	0.011	0.002	0.011	-0.021	20319
RTCM0572	20040AG	-0.004	0.002	0.005	-0.001	25826
RTCM0561	20040AI	-0.005	0.001	0.005	0.029	28462
RTCM0572	20040AK	0.000	0.003	0.003	0.007	35541
RTCM0572	20040AM	0.000	0.001	0.001	-0.009	27603
RTCM0572	20040AO	0.006	0.010	0.012	0.004	35232
RTCM0572	20040AQ	0.005	0.001	0.005	-0.026	32640

From	To	Δ North	Δ East	Δ Horiz	Δ Up	Length
RTCM0371	20040AR	0.003	0.014	0.015	-0.007	18706
RTCM0371	20040AT	0.007	-0.002	0.007	-0.028	18963
20040WO	20040AU	-0.013	-0.003	0.013	0.134	44
20040WO	20040AU	-0.011	-0.003	0.012	0.038	44
20040WO	20040AU	0.002	-0.001	0.002	-0.096	44
RTCM0371	20040AV	0.009	-0.005	0.010	-0.007	23216
RTCM0371	20040AW	0.014	0.010	0.017	-0.036	29437
RTCM0371	20040AW	0.006	0.008	0.010	-0.034	29437
RTCM0371	20040AW	-0.008	-0.002	0.008	0.002	29437
RTCM0371	20040AX	-0.003	0.006	0.007	0.026	30368
RTCM0371	20040AZ	0.011	-0.003	0.012	0.001	34914
RTCM0371	20040AZ	0.016	-0.001	0.016	0.005	34914
RTCM0371	20040AZ	0.005	0.002	0.005	0.004	34914
RTCM0572	20040B	-0.006	0.002	0.006	0.022	19646
RTCM0371	20040BA	-0.006	0.000	0.006	0.002	38507
RTCM0371	20040BD	0.005	-0.007	0.009	-0.001	47183
PRS488974149859	20040BE	-0.001	0.005	0.005	-0.010	23240
20040WU	20040BF	-0.013	-0.001	0.013	0.017	23
PRS488974149859	20040BG	0.003	0.004	0.005	-0.004	18729
20040WV	20040BH	-0.009	-0.005	0.010	0.027	21
PRS488974149859	20040BI	-0.011	0.017	0.021	0.016	12737
PRS488974149859	20040BI	-0.024	0.024	0.034	0.035	12737
PRS488974149859	20040BI	-0.013	0.006	0.015	0.019	12737
20040WW	20040BJ	0.006	-0.009	0.011	0.008	28
20040WX	20040BK	0.000	0.001	0.001	0.018	40
PRS488974149859	20040BL	0.002	-0.003	0.003	-0.005	22612
PRS488974149859	20040BM	0.008	-0.001	0.008	-0.006	28189
PRS488974149859	20040BN	0.009	0.006	0.011	0.024	23278
20040WY	20040BO	-0.004	0.000	0.004	0.012	38
PRS488974149859	20040BP	-0.003	-0.002	0.003	0.009	18748
20040WZ	20040BQ	-0.013	-0.009	0.016	0.025	16
PRS488974149859	20040BR	0.009	-0.001	0.009	-0.025	5734
PRS488974149859	20040BS	-0.007	0.011	0.013	0.004	14579
20040XA	20040BT	0.006	0.004	0.007	-0.014	41
PRS488974149859	20040BU	0.002	-0.005	0.006	0.001	23704
20040XB	20040BV	0.012	-0.004	0.012	0.011	29
PRS754828615391	20040BW	-0.004	-0.006	0.007	0.033	25217
PRS754828615391	20040BW	-0.013	0.000	0.013	0.006	25217
PRS754828615391	20040BW	-0.009	0.006	0.011	-0.027	25217
20040XC	20040BX	-0.002	0.004	0.005	-0.010	31
PRS488974149859	20040BY	-0.004	-0.004	0.006	0.006	15341
PRS488974149859	20040BZ	-0.002	0.007	0.007	-0.007	24564
RTCM0572	20040C	-0.001	-0.006	0.006	0.003	35865
PRS488974149859	20040CA	-0.004	0.003	0.005	0.005	23500
PRS488974149859	20040CB	0.002	0.000	0.002	0.004	18588
20040XD	20040CC	0.013	-0.003	0.014	0.001	23
PRS91888281191	20040CD	-0.005	-0.004	0.006	-0.017	14406
PRS91888281191	20040CE	0.000	-0.002	0.002	-0.015	20738
PRS91888281191	20040CG	-0.007	0.009	0.011	-0.021	15120
PRS868366819557	20040CI	0.012	-0.004	0.012	0.003	12746
PRS868366819557	20040CK	0.003	-0.001	0.003	-0.005	9356
PRS868366819557	20040CL	-0.005	-0.003	0.005	0.023	11290
PRS91888281191	20040CN	-0.011	-0.004	0.011	-0.014	8994
PRS91888281191	20040CP	0.003	-0.008	0.009	0.004	5813
PRS91888281191	20040CR	-0.007	-0.006	0.009	0.013	11571

From	To	Δ North	Δ East	Δ Horiz	Δ Up	Length
PRS91888281191	20040CT	0.008	-0.005	0.010	-0.005	12414
PRS91888281191	20040CV	0.008	-0.002	0.008	-0.012	16199
PRS91888281191	20040CX	0.001	0.003	0.003	-0.001	19945
PRS91888281191	20040CZ	-0.006	0.004	0.007	0.021	10662
RTCM0572	20040D	0.000	-0.006	0.006	-0.016	31920
PRS91888281191	20040DB	0.022	0.003	0.022	0.007	4924
PRS91888281191	20040DD	-0.009	-0.001	0.009	-0.002	18504
PRS91888281191	20040DF	0.002	-0.004	0.005	-0.002	10908
PRS91888281191	20040DI	-0.009	-0.003	0.009	0.014	15901
PRS91888281191	20040DJ	0.002	0.004	0.005	0.011	20052
PRS91888281191	20040DL	0.006	-0.015	0.016	-0.015	24264
PRS91888281191	20040DN	-0.003	0.000	0.003	0.001	25210
PRS91888281191	20040DP	0.004	0.003	0.005	-0.007	34932
PRS962419751241	20040DS	0.005	-0.008	0.009	0.016	26057
PRS962419751241	20040DT	0.007	0.002	0.007	-0.007	22571
PRS962419751241	20040DV	0.013	0.008	0.015	-0.005	13940
PRS962419751241	20040DX	-0.010	0.002	0.010	-0.013	16107
PRS962419751241	20040DY	-0.013	-0.011	0.017	0.002	20668
RTCM0371	20040E	0.004	0.001	0.004	-0.026	18572
PRS962419751241	20040EA	0.006	-0.005	0.008	-0.010	27126
PRS962419751241	20040EB	0.001	-0.001	0.002	0.014	29201
PRS91888281191	20040ED	0.007	0.005	0.009	0.001	22969
PRS91888281191	20040EE	0.005	0.004	0.006	0.005	24685
PRS962419751241	20040EH	-0.006	-0.003	0.007	0.009	30280
PRS962419751241	20040EI	-0.005	-0.003	0.006	-0.014	27579
PRS962419751241	20040EJ	0.006	-0.004	0.008	0.001	21941
RTCM0371	20040F	-0.005	0.002	0.006	-0.010	19266
RTCM0371	20040G	-0.004	-0.004	0.005	0.025	34557
PRS488974149859	20040H	-0.007	-0.003	0.008	0.014	22347
PRS488974149859	20040I	0.004	0.003	0.005	0.004	5618
PRS754828615391	20040J	-0.009	-0.001	0.009	-0.002	22664
PRS488974149859	20040K	-0.003	-0.003	0.004	-0.001	18532
PRS91888281191	20040L	0.006	-0.004	0.008	-0.012	20786
PRS868366819557	20040M	-0.002	-0.004	0.004	-0.007	10463
PRS91888281191	20040N	0.015	-0.007	0.016	0.013	5605
PRS91888281191	20040O	-0.003	0.005	0.006	-0.004	12158
PRS91888281191	20040P	0.002	0.001	0.002	-0.011	14404
PRS91888281191	20040Q	-0.003	0.003	0.005	0.003	24420
PRS962419751241	20040R	0.015	0.000	0.015	0.009	23420
PRS962419751241	20040S	-0.002	-0.001	0.002	0.017	26499
PRS962419751241	20040T	0.004	0.000	0.004	-0.002	30198
RTCM0572	20040WA	0.013	-0.007	0.015	-0.023	14908
RTCM0572	20040WA	0.000	-0.002	0.002	-0.008	15504
RTCM0561	20040WD	-0.008	-0.010	0.013	0.048	21865
RTCM0561	20040WD	-0.004	-0.014	0.014	0.039	21865
RTCM0561	20040WD	0.004	-0.004	0.005	-0.009	21865
RTCM0561	20040WE	-0.017	-0.002	0.017	0.027	21867
PRS488974149859	20040WU	0.012	0.002	0.012	-0.050	21220
PRS488974149859	20040WU	-0.008	0.001	0.008	-0.042	21220
PRS488974149859	20040WU	-0.020	-0.001	0.020	0.008	21220
PRS488974149859	20040WV	-0.014	-0.003	0.014	0.025	18482
PRS488974149859	20040WW	0.003	0.008	0.009	-0.005	12931
PRS488974149859	20040WX	-0.003	0.000	0.003	0.018	22354
PRS488974149859	20040WY	0.008	0.000	0.008	0.008	19246
PRS488974149859	20040WZ	-0.011	-0.005	0.012	-0.031	7248

From	To	Δ North	Δ East	Δ Horiz	Δ Up	Length
PRS488974149859	20040XA	-0.004	0.002	0.005	0.028	14599
PRS488974149859	20040XB	-0.019	0.007	0.020	0.007	23666
PRS488974149859	20040XC	-0.009	-0.012	0.015	0.022	15186
PRS91888281191	20040XD	-0.008	-0.007	0.011	-0.015	14699
PRS91888281191	20040XE	-0.002	0.003	0.004	0.011	21442
PRS91888281191	20040XX	-0.010	0.002	0.010	0.000	20674
PRS91888281191	20040XX	0.002	0.004	0.005	0.016	21450
PRS962419751241	20040YP	0.011	0.007	0.013	0.022	22609
PRS962419751241	20040YQ	-0.001	0.008	0.008	-0.014	22598

LEAST SQUARES ADJUSTMENTS

Geolab was used to adjust the VRS/RTK vectors and the total station data in a combined adjustment. No scaling of the apriori GPS statistics was done. Station errors (centering, HI and HT) of 0.005 m were input. The GEOID18 model was used.

The adjustment constrained the CORS positions (as computed and broadcast by the network) in all three dimensions (NAD83 (2011) latitude, longitude, and ellipsoidal height). The estimated variance factor for the GPS observations was 0.20. This adjustment provided the adjusted positions (NAD83 (2011) epoch 2010.0) and GPS derived orthometric heights (NAVD88) for the stations in the network. The adjusted latitude/longitudes were transformed to UTM Zone 18 grid coordinates. Figure 3 shows the GNSS horizontal and vertical residuals for this adjustment (in meters).

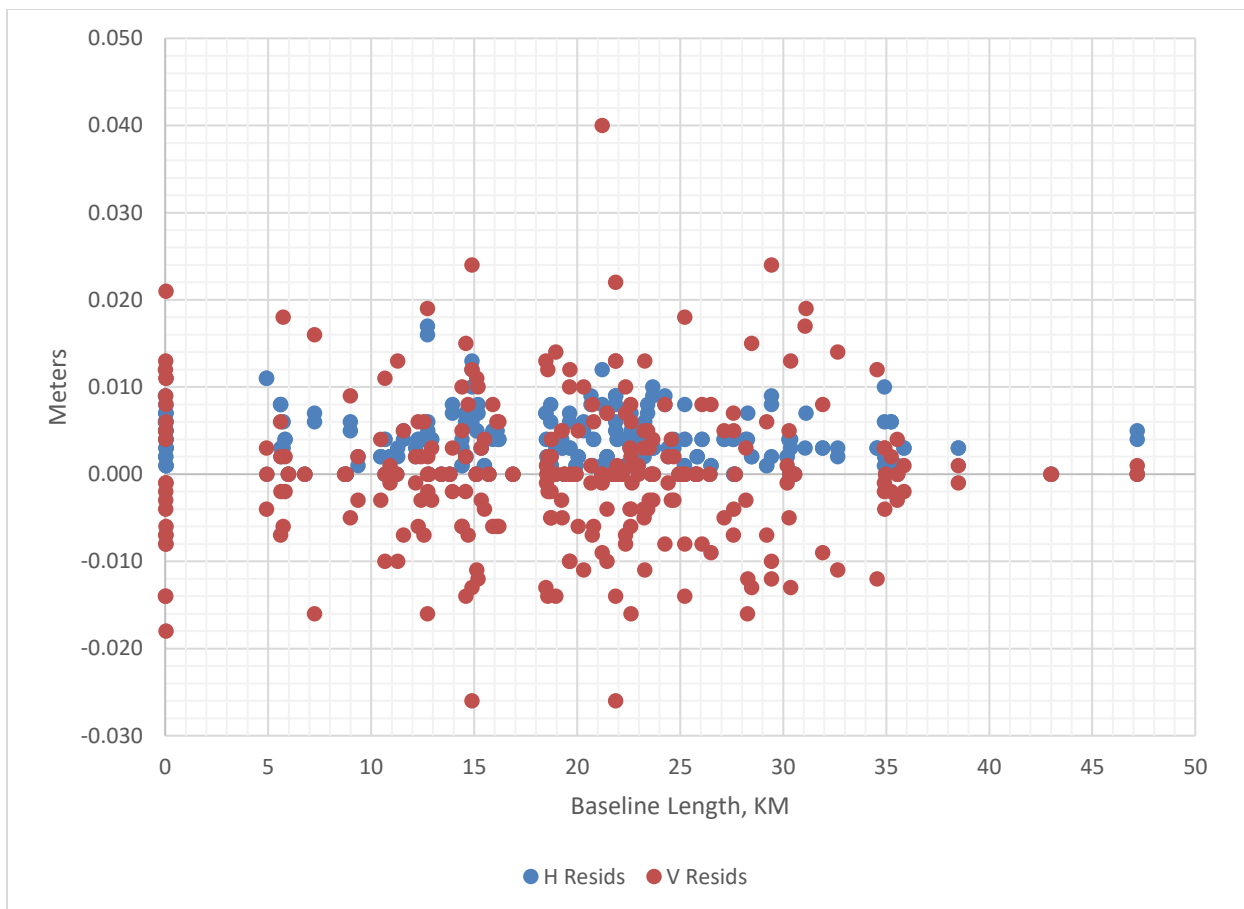


Figure 3 - Constrained Adjustment Residuals (meters)

Table 6 lists the station confidence regions at the 95% level, in meters.

Table 6 - Station Confidence Regions @ 95% meters

Station Name	Semi-Major Axis	Azimuth	Semi-Minor Axis	Vertical
20040A	0.008	18	0.007	0.019
20040AA	0.008	25	0.007	0.017
20040AB	0.007	174	0.006	0.017
20040AC	0.012	32	0.008	0.020
20040AD	0.012	10	0.010	0.022
20040AE	0.030	84	0.010	0.020
20040AF	0.009	139	0.008	0.024
20040AG	0.010	148	0.008	0.023
20040AH	0.037	79	0.008	0.015
20040AI	0.012	15	0.007	0.026
20040AJ	0.013	53	0.007	0.019
20040AK	0.009	158	0.008	0.027
20040AL	0.041	116	0.013	0.024
20040AM	0.010	156	0.008	0.019
20040AN	0.037	167	0.009	0.019
20040AO	0.013	35	0.008	0.024
20040AP	0.023	138	0.012	0.030
20040AQ	0.009	3	0.008	0.030
20040AR	0.010	6	0.009	0.019
20040AS	0.036	43	0.007	0.016

Station Name	Semi-Major Axis	Azimuth	Semi-Minor Axis	Vertical
2004OAT	0.009	22	0.008	0.022
2004OAU	0.015	2	0.014	0.035
2004OAV	0.009	1	0.008	0.021
2004OAW	0.009	10	0.007	0.023
2004OAX	0.011	178	0.008	0.021
2004OAY	0.021	26	0.009	0.022
2004OAZ	0.009	41	0.007	0.018
2004OB	0.008	164	0.008	0.022
2004OBA	0.008	33	0.008	0.019
2004OBB	0.025	80	0.010	0.026
2004OBC	0.010	38	0.009	0.018
2004OBD	0.009	118	0.008	0.018
2004OBE	0.009	168	0.007	0.017
2004OBF	0.012	175	0.010	0.017
2004OBG	0.008	9	0.006	0.014
2004OBH	0.013	153	0.010	0.022
2004OBI	0.006	179	0.005	0.008
2004OBJ	0.011	24	0.010	0.015
2004OBK	0.013	24	0.011	0.018
2004OBL	0.009	31	0.007	0.013
2004OBM	0.008	25	0.007	0.014
2004OBN	0.008	7	0.007	0.011
2004OBO	0.013	18	0.011	0.019
2004OBP	0.008	174	0.007	0.010
2004OBQ	0.012	41	0.011	0.019
2004OBR	0.008	139	0.007	0.008
2004OBS	0.008	24	0.007	0.016
2004OBT	0.011	25	0.010	0.020
2004OBU	0.008	1	0.007	0.011
2004OBV	0.012	9	0.010	0.016
2004OBW	0.007	8	0.006	0.010
2004OBX	0.011	11	0.010	0.015
2004OBY	0.007	19	0.006	0.008
2004OBZ	0.007	20	0.007	0.008
2004OC	0.009	167	0.008	0.024
2004OCA	0.007	23	0.006	0.008
2004OCB	0.007	177	0.007	0.009
2004OCC	0.010	152	0.010	0.013
2004OCD	0.007	141	0.007	0.009
2004OCE	0.011	8	0.007	0.012
2004OCF	0.022	76	0.007	0.009
2004OCG	0.008	144	0.006	0.013
2004OCH	0.039	105	0.007	0.013
2004OCI	0.008	158	0.007	0.008
2004OCJ	0.038	116	0.009	0.012
2004OCK	0.009	7	0.008	0.014
2004OCL	0.010	35	0.008	0.018
2004OCM	0.023	47	0.009	0.026
2004OCN	0.007	166	0.007	0.010
2004OCO	0.027	98	0.008	0.009
2004OCP	0.007	166	0.006	0.007
2004OCQ	0.028	47	0.007	0.007
2004OCR	0.008	3	0.007	0.010
2004OCS	0.037	125	0.008	0.010
2004OCT	0.007	1	0.006	0.009
2004OCU	0.035	126	0.008	0.011
2004OCV	0.008	178	0.007	0.013
2004OCW	0.024	32	0.008	0.014
2004OCX	0.009	30	0.007	0.016
2004OCY	0.050	16	0.008	0.017
2004OCZ	0.008	141	0.006	0.013
2004OD	0.009	161	0.008	0.027
2004ODA	0.029	50	0.007	0.013
2004ODB	0.008	163	0.006	0.013

Station Name	Semi-Major Axis	Azimuth	Semi-Minor Axis	Vertical
2004ODC	0.025	131	0.007	0.013
2004ODD	0.008	12	0.007	0.010
2004ODE	0.019	128	0.009	0.015
2004ODF	0.008	7	0.007	0.017
2004ODG	0.029	83	0.009	0.021
2004ODH	0.037	116	0.008	0.010
2004ODI	0.008	161	0.007	0.008
2004ODJ	0.010	10	0.009	0.018
2004ODK	0.038	21	0.008	0.011
2004ODL	0.009	14	0.008	0.017
2004ODM	0.030	48	0.010	0.019
2004ODN	0.008	174	0.007	0.011
2004ODO	0.039	106	0.008	0.010
2004ODP	0.009	165	0.008	0.015
2004ODQ	0.021	34	0.009	0.016
2004ODR	0.036	66	0.009	0.012
2004ODS	0.009	31	0.007	0.010
2004ODT	0.009	22	0.008	0.019
2004ODU	0.027	157	0.006	0.012
2004ODV	0.010	15	0.008	0.021
2004ODW	0.025	23	0.009	0.018
2004ODX	0.010	17	0.008	0.019
2004ODY	0.012	31	0.008	0.018
2004ODZ	0.034	69	0.009	0.018
2004OE	0.009	28	0.007	0.015
2004OEA	0.008	7	0.007	0.016
2004OEB	0.009	154	0.008	0.022
2004OEC	0.028	91	0.009	0.011
2004OED	0.009	20	0.008	0.014
2004OEE	0.008	6	0.006	0.011
2004OEF	0.034	51	0.008	0.013
2004OEG	0.022	87	0.009	0.017
2004OEH	0.008	175	0.007	0.012
2004OEI	0.009	163	0.007	0.012
2004OEJ	0.010	4	0.009	0.016
2004OEK	0.034	151	0.011	0.019
2004OF	0.009	35	0.008	0.022
2004OG	0.009	36	0.008	0.020
2004OH	0.010	39	0.007	0.013
2004OI	0.006	169	0.006	0.006
2004OJ	0.008	178	0.007	0.012
2004OK	0.008	156	0.007	0.012
2004OL	0.010	177	0.007	0.012
2004OM	0.011	31	0.008	0.017
2004ON	0.008	153	0.007	0.010
2004OO	0.008	8	0.007	0.010
2004OP	0.008	171	0.007	0.012
2004OQ	0.009	22	0.008	0.017
2004OR	0.009	23	0.008	0.017
2004OS	0.009	150	0.008	0.020
2004OT	0.008	166	0.007	0.010
2004OWA	0.010	14	0.008	0.020
2004OWB	0.014	45	0.008	0.020
2004OWC	0.013	45	0.008	0.020
2004OWD	0.008	26	0.006	0.015
2004OWE	0.010	39	0.006	0.015
2004OWF	0.009	26	0.005	0.018
2004OWG	0.009	25	0.005	0.018
2004OWH	0.014	176	0.009	0.019
2004OWI	0.014	177	0.009	0.019
2004OWJ	0.015	76	0.012	0.024
2004OWK	0.016	94	0.013	0.024
2004OWL	0.013	72	0.011	0.030
2004OWM	0.012	55	0.012	0.030

Station Name	Semi-Major Axis	Azimuth	Semi-Minor Axis	Vertical
2004OWN	0.015	33	0.007	0.016
2004OWO	0.013	2	0.012	0.034
2004OWP	0.012	64	0.011	0.022
2004OWQ	0.013	63	0.011	0.022
2004OWR	0.012	31	0.010	0.026
2004OWS	0.012	30	0.010	0.026
2004OWT	0.013	92	0.009	0.018
2004OWU	0.008	167	0.007	0.014
2004OWV	0.009	165	0.007	0.017
2004OWW	0.008	27	0.007	0.008
2004OWX	0.009	38	0.008	0.011
2004OWY	0.009	167	0.007	0.014
2004OWZ	0.009	38	0.009	0.017
2004OXA	0.008	27	0.007	0.018
2004OXB	0.008	5	0.007	0.011
2004OXC	0.008	18	0.007	0.014
2004OXD	0.007	38	0.007	0.009
2004OXE	0.007	134	0.006	0.009
2004OXF	0.011	138	0.006	0.013
2004OXG	0.018	155	0.007	0.012
2004OXH	0.014	154	0.007	0.012
2004OXI	0.012	173	0.008	0.026
2004OXJ	0.012	172	0.008	0.026
2004OXK	0.010	174	0.006	0.008
2004OXL	0.010	175	0.006	0.008
2004OXM	0.009	159	0.006	0.007
2004OXN	0.010	161	0.006	0.007
2004OXO	0.010	129	0.007	0.010
2004OXP	0.010	128	0.007	0.010
2004OXQ	0.010	128	0.007	0.011
2004OXR	0.010	127	0.007	0.011
2004OXS	0.012	152	0.008	0.014
2004OXT	0.011	151	0.008	0.014
2004OXU	0.014	16	0.008	0.017
2004OXV	0.013	18	0.008	0.017
2004OXW	0.010	136	0.006	0.013
2004OXX	0.007	133	0.006	0.009
2004OXY	0.011	166	0.006	0.013
2004OXZ	0.013	4	0.007	0.015
2004OYA	0.011	4	0.007	0.015
2004OYB	0.012	177	0.007	0.020
2004OYC	0.011	177	0.007	0.020
2004OYD	0.010	9	0.007	0.009
2004OYE	0.011	8	0.007	0.009
2004OYF	0.011	129	0.009	0.011
2004OYG	0.011	133	0.009	0.011
2004OYH	0.014	152	0.009	0.019
2004OYI	0.012	160	0.009	0.019
2004OYJ	0.010	122	0.007	0.010
2004OYK	0.009	123	0.007	0.009
2004OYL	0.013	143	0.008	0.016
2004OYM	0.013	145	0.008	0.016
2004OYN	0.011	63	0.008	0.011
2004OYO	0.011	42	0.008	0.011
2004OYP	0.008	2	0.006	0.012
2004OYQ	0.008	177	0.006	0.012
2004OYR	0.011	52	0.009	0.018
2004OYS	0.012	60	0.009	0.018
2004OYT	0.012	170	0.009	0.018
2004OYU	0.012	168	0.009	0.018
2004OYV	0.013	157	0.008	0.011
2004OYW	0.010	157	0.008	0.011
2004OYX	0.011	153	0.007	0.013
2004OYY	0.011	152	0.007	0.013

Station Name	Semi-Major Axis	Azimuth	Semi-Minor Axis	Vertical
20040YZ	0.011	26	0.008	0.017
20040ZA	0.012	28	0.008	0.017
20040ZB	0.015	9	0.009	0.019
20040ZC	0.017	8	0.009	0.019

SUMMARY

A LiDAR ground control network was established in northeastern Maryland and northern 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 (using GEOID18).

Adjusted Coordinates

Horizontal Datum: NAD83 (2011) epoch 2010.0

Vertical Datum: NAVD88=Ellipsoidal Height-GEOID18

UTM Zone: 18

Units: meters

Table 7 - Adjusted Coordinates

Station Name	GPSID	Latitude	Longitude	Ellip Height	NAVD 1988	UTM Northing	UTM Easting
	PRS488974149	39°13'45.21495" N	76°02'58.52399" W	-19.012	14.427	4342739.385	409407.119
	PRS754828615	39°11'12.28025" N	75°32'19.71093" W	-3.207	31.062	4337638.407	453466.371
	PRS862175355	39°58'48.20066" N	75°51'45.97637" W	165.236	198.796	4425899.995	426332.195
	PRS868366819	39°40'36.24970" N	75°44'34.82861" W	6.528	39.529	4392142.879	436278.671
	PRS918882811	39°34'08.72702" N	75°59'14.99439" W	-14.770	18.437	4380397.943	415179.179
	PRS962419751	39°31'32.31142" N	76°39'06.12198" W	127.864	160.206	4376412.754	358036.833
	RTCM0371	38°58'28.07436" N	76°31'19.88503" W	-14.530	18.750	4315044.793	368140.236
	RTCM0384	39°13'45.21495" N	76°02'58.52399" W	-19.012	14.427	4342739.385	409407.119
	RTCM0561	38°03'00.62619" N	77°20'51.17374" W	43.158	75.841	4213983.643	294018.058
	RTCM0572	38°16'58.69153" N	77°27'09.46846" W	-4.928	27.609	4240057.443	285480.308
BASEF04	20040WA	38°16'36.94336" N	77°16'32.15123" W	-1.198	31.532	4238990.901	300949.969
F01BS	20040WJ	38°16'26.39671" N	77°02'47.25916" W	13.834	47.209	4238197.225	320987.825
F01S6	20040WK	38°16'27.39366" N	77°02'47.24395" W	16.035	49.410	4238227.949	320988.875
F02BS	20040WM	38°18'30.50956" N	77°06'21.14617" W	13.630	46.813	4242139.896	315877.360
F02S6	20040WL	38°18'29.08145" N	77°06'21.93904" W	15.863	49.045	4242096.311	315857.098
F03BASE	20040WB	38°18'34.67956" N	77°13'47.72731" W	29.671	62.487	4242522.991	305033.142
F03BS	20040WC	38°18'35.18628" N	77°13'48.25353" W	27.676	60.491	4242538.920	305020.737
F05BS	20040WH	38°16'18.98725" N	77°08'13.13018" W	22.883	56.018	4238147.973	313063.577
F05S6	20040WI	38°16'18.96385" N	77°08'11.97728" W	23.828	56.964	4238146.605	313091.578
F06BS	20040WF	38°13'10.97892" N	77°06'25.22211" W	21.701	54.962	4232292.201	315553.935
F06S6	20040WG	38°13'10.05036" N	77°06'23.42826" W	22.963	56.225	4232262.585	315596.909
F07BS	20040WD	38°11'57.14973" N	77°11'04.18362" W	-13.827	19.244	4230173.572	308716.105
F07S6	20040WE	38°11'57.39383" N	77°11'04.40625" W	-12.179	20.891	4230181.224	308710.867
F08BASE	20040WZ	39°10'38.32447" N	75°59'55.37109" W	-17.211	16.359	4336928.404	413734.954
F09BASE	20040XC	39°14'04.15386" N	75°52'25.81231" W	-13.770	19.871	4343162.171	424582.739
F10BASE	20040XB	39°09'15.88242" N	75°47'35.09681" W	-10.964	23.002	4334211.517	431474.667
F11BASE	20040XA	39°08'08.56479" N	75°55'50.86392" W	-7.264	26.504	4332249.358	419554.251
F12BASE	20040WW	39°06'46.01349" N	76°03'10.56333" W	-14.131	19.494	4329819.899	408968.439
F13BASE	20040WY	39°04'23.73626" N	75°57'08.64129" W	-11.292	22.653	4325337.999	417614.307
F14BASE	20040WX	39°01'42.80462" N	76°01'41.88120" W	-13.505	20.460	4320448.564	410992.474
F15BASE	20040WV	39°03'46.31800" N	76°03'27.05243" W	-13.361	20.405	4324285.054	408507.967
F16BS	20040WP	38°57'08.41612" N	76°10'14.87062" W	-28.987	4.974	4312139.175	398549.123
F16S6	20040WQ	38°57'09.35205" N	76°10'14.88912" W	-27.532	6.428	4312168.032	398549.048
F17S6	20040WT	38°57'17.50467" N	75°58'41.78951" W	-11.693	22.667	4312222.622	415234.796
F18BASE	20040WO	38°52'54.31902" N	76°20'18.92055" W	-29.719	4.077	4304506.415	383894.287
F19S6	20040WN	39°00'36.48524" N	76°18'46.69239" W	-26.473	7.053	4318721.205	386321.748
F20BASE	20040WU	39°02'55.95461" N	76°07'51.18096" W	-24.461	9.217	4322808.912	402140.888

Station Name	GPSID	Latitude	Longitude	Ellip Height	NAVD 1988	UTM Northing	UTM Easting
F21BS	20040WS	38°57'13.96918" N	76°01'35.71117" W	-12.957	21.307	4312159.688	411047.392
F21S6	20040WR	38°57'14.69644" N	76°01'37.00902" W	-11.304	22.958	4312182.458	411016.406
F22BS	20040YO	39°40'22.06387" N	76°24'35.07185" W	129.914	162.562	4392391.460	379090.156
F22S6	20040YN	39°40'22.44728" N	76°24'35.41762" W	131.793	164.441	4392403.411	379082.104
F23BS	20040YQ	39°41'50.00612" N	76°30'36.60890" W	184.234	216.734	4395242.954	370522.087
F23S6	20040YP	39°41'50.05915" N	76°30'35.83623" W	185.535	218.035	4395244.279	370540.517
F24BS	20040YS	39°36'43.85833" N	76°30'57.99049" W	190.094	222.559	4385812.764	369853.418
F24S6	20040YR	39°36'43.20689" N	76°30'57.69705" W	190.985	223.450	4385792.561	369860.076
F25BS	20040YU	39°33'09.39882" N	76°23'46.59103" W	91.289	123.959	4379034.214	380037.914
F25S6	20040YT	39°33'09.28680" N	76°23'46.92304" W	92.829	125.500	4379030.883	380029.937
F26BS	20040ZB	39°28'57.62737" N	76°24'19.80810" W	67.733	100.522	4371284.488	379123.957
F26S6	20040ZC	39°28'57.62940" N	76°24'18.88599" W	68.899	101.688	4371284.207	379145.988
F27BS	20040ZA	39°26'27.18660" N	76°17'55.80410" W	-26.283	6.813	4366508.817	388231.086
F27S6	20040YZ	39°26'27.46590" N	76°17'56.35676" W	-24.574	8.523	4366517.618	388217.999
F28BS	20040YY	39°28'35.61448" N	76°15'06.34801" W	-12.408	20.676	4370410.853	392336.820
F28S6	20040YX	39°28'35.40201" N	76°15'06.71593" W	-11.378	21.705	4370404.425	392327.938
F29BS	20040YE	39°30'46.55284" N	76°07'32.25468" W	-21.559	11.608	4374304.440	403236.498
F29S6	20040YD	39°30'46.40549" N	76°07'31.50571" W	-19.853	13.315	4374299.674	403254.326
F30BS	20040YK	39°38'10.22106" N	76°16'05.44647" W	102.848	135.641	4388145.544	391174.573
F30S6	20040YJ	39°38'09.85884" N	76°16'05.66623" W	104.556	137.348	4388134.450	391169.177
F31BS	20040XP	39°28'04.49521" N	75°59'11.01415" W	-22.138	11.207	4369168.024	415151.125
F31S6	20040XO	39°28'04.84210" N	75°59'10.68574" W	-20.319	13.026	4369178.632	415159.089
F32BASE	20040XX	39°25'58.45955" N	75°48'38.15799" W	-10.268	23.217	4365131.813	430238.044
F32S6	20040XE	39°25'59.23233" N	75°48'37.69330" W	-8.900	24.585	4365155.536	430249.367
F33BS	20040YW	39°33'54.07660" N	76°17'14.29923" W	84.848	117.674	4380271.972	389420.179
F33S6	20040YV	39°33'54.28520" N	76°17'13.81702" W	86.714	119.540	4380278.238	389431.777
F34BS	20040YA	39°34'20.56525" N	76°10'13.10404" W	92.061	125.031	4380951.288	399481.298
F34S6	20040XZ	39°34'20.58262" N	76°10'12.29244" W	94.264	127.235	4380951.572	399500.669
F35S6	20040XW	39°37'31.44675" N	76°05'16.83198" W	112.646	145.654	4386747.317	406621.336
F36BS	20040XV	39°42'35.84316" N	76°09'16.08784" W	104.722	137.657	4396203.064	401037.970
F36S6	20040XU	39°42'35.78163" N	76°09'15.40717" W	105.241	138.177	4396200.958	401054.154
F37BS	20040YI	39°39'57.39281" N	76°13'55.47267" W	54.024	86.865	4391406.529	394318.163
F37S6	20040YH	39°39'57.21942" N	76°13'56.01074" W	55.352	88.193	4391401.360	394305.269
F38BS	20040YM	39°42'32.41983" N	76°21'09.38632" W	113.573	146.331	4396334.979	384051.240
F38S6	20040YL	39°42'32.86467" N	76°21'08.72077" W	115.987	148.745	4396348.455	384067.295
F39BASE	20040XD	39°26'26.24027" N	75°56'46.23597" W	-7.877	25.517	4366101.880	418578.766
F40S6	20040XF	39°30'25.06704" N	75°49'52.05256" W	-23.805	9.552	4373366.978	428547.278
F41BS	20040XN	39°32'58.60845" N	75°55'21.66945" W	20.913	54.150	4378177.135	420724.146
F41S6	20040XM	39°32'58.80735" N	75°55'21.02696" W	21.458	54.696	4378183.110	420739.543
F42BS	20040XJ	39°42'00.32059" N	75°53'20.71745" W	45.769	78.793	4394848.687	423776.154
F42S6	20040XI	39°42'00.54899" N	75°53'19.77534" W	46.151	79.174	4394855.506	423798.660
F43S6	20040XY	39°36'40.03026" N	76°00'21.16898" W	68.563	101.665	4385080.020	413652.442
F44BS	20040XL	39°38'12.40596" N	75°56'10.50288" W	42.480	75.577	4387863.311	419659.415
F44S6	20040XK	39°38'12.42120" N	75°56'09.88405" W	43.674	76.772	4387863.627	419674.170
F45BS	20040XR	39°41'28.80423" N	76°01'00.17166" W	77.706	110.703	4393993.293	412823.216
F45S6	20040XQ	39°41'29.39667" N	76°00'59.72529" W	79.064	112.062	4394011.437	412834.055

Station Name	GPSID	Latitude	Longitude	Ellip Height	NAVD 1988	UTM Northing	UTM Easting
F46BS	20040XT	39°42'05.04046" N	76°05'03.35668" W	70.508	103.477	4395178.288	407044.494
F46S6	20040XS	39°42'05.51644" N	76°05'02.69562" W	72.262	105.231	4395192.772	407060.414
F47BS	20040YC	39°34'08.53491" N	76°03'58.68927" W	-12.412	20.727	4380469.311	408410.113
F47S6	20040YB	39°34'08.51765" N	76°03'59.34075" W	-11.024	22.115	4380468.963	408394.562
F48BS	20040YF	39°38'06.74311" N	76°11'46.57208" W	60.974	93.855	4387953.646	397344.044
F48S6	20040YF	39°38'06.43924" N	76°11'46.82848" W	62.559	95.440	4387944.359	397337.807
F49BS	20040XH	39°36'54.03423" N	75°48'25.97240" W	5.910	39.021	4385339.695	430710.577
F49S6	20040XG	39°36'54.19468" N	75°48'25.47926" W	7.997	41.108	4385344.536	430722.380
GCP01	20040A	38°19'59.33494" N	77°19'38.67700" W	-8.170	24.451	4245342.991	296574.436
GCP02	20040B	38°15'05.60509" N	77°13'54.12830" W	-15.684	17.195	4236081.610	304722.062
GCP03	20040D	38°20'17.32814" N	77°05'40.02722" W	6.946	40.117	4245410.038	316950.792
GCP04	20040C	38°11'04.04329" N	77°03'45.00161" W	19.488	52.879	4228291.554	319363.193
GCP05	20040R	39°42'22.35024" N	76°30'38.58219" W	178.110	210.616	4396240.947	370491.889
GCP06	20040F	38°52'52.23067" N	76°20'05.44047" W	-31.910	1.896	4304437.281	384218.143
GCP07	20040S	39°33'56.60863" N	76°20'52.09197" W	93.827	126.544	4380426.169	384224.379
GCP08	20040T	39°23'42.63181" N	76°20'37.75900" W	-6.109	26.988	4361492.457	384284.066
GCP09	20040E	39°00'36.08607" N	76°18'45.80494" W	-28.052	5.475	4318708.592	386342.915
GCP10	20040Q	39°40'26.07310" N	76°14'15.07604" W	75.602	108.446	4392297.175	393863.263
GCP11	20040G	38°53'37.56324" N	76°08'14.15330" W	-28.467	5.778	4305602.586	401373.773
GCP12	20040P	39°31'08.50911" N	76°08'31.51245" W	-20.863	12.263	4374999.154	401830.036
GCP13	20040H	39°01'43.00907" N	76°01'41.94362" W	-15.699	18.266	4320454.883	410991.045
GCP14	20040K	39°23'44.24422" N	76°01'57.27443" W	-19.316	14.052	4361189.355	411086.527
GCP15	20040O	39°40'34.43771" N	76°01'00.19190" W	89.404	122.409	4392317.188	412803.740
GCP16	20040I	39°11'31.61498" N	76°00'19.34671" W	-16.780	16.759	4338577.560	413177.901
GCP17	20040N	39°33'23.25710" N	75°55'27.66508" W	38.131	71.359	4378938.497	420588.858
GCP18	20040M	39°42'06.20260" N	75°51'38.18793" W	83.423	116.439	4395006.210	426219.630
GCP19	20040L	39°25'58.21988" N	75°49'18.33118" W	-19.381	14.099	4365133.114	429277.577
GCP20	20040J	39°09'11.63983" N	75°47'51.03176" W	-11.335	22.626	4334084.084	431091.057
NVA01	20040DP	39°42'34.23432" N	76°21'05.93031" W	117.573	150.333	4396389.680	384134.380
NVA02	20040DV	39°36'47.86458" N	76°32'08.01889" W	189.368	221.806	4385964.640	368185.616
NVA03	20040DT	39°42'08.66095" N	76°31'18.80760" W	179.765	212.252	4395835.091	369526.802
NVA04	20040DY	39°33'30.67092" N	76°24'54.17025" W	108.147	140.791	4379715.236	378435.357
NVA05	20040EA	39°35'57.57206" N	76°21'02.69305" W	88.607	121.312	4384159.269	384027.450
NVA06	20040EB	39°31'46.05814" N	76°18'43.60156" W	68.594	101.458	4376355.989	387231.691
NVA07	20040EI	39°25'45.52071" N	76°21'22.51899" W	-5.886	27.134	4365297.036	383270.346
NVA08	20040EH	39°23'48.55769" N	76°20'29.70683" W	-7.835	25.263	4361672.281	384479.391
NVA09	20040DI	39°30'04.89382" N	76°09'01.66895" W	-14.436	18.718	4373047.114	401084.918
NVA10	20040DF	39°33'09.46099" N	76°06'45.49008" W	17.135	50.238	4378696.311	404407.678
NVA11	20040DD	39°31'47.02916" N	76°11'48.06316" W	59.542	92.564	4376247.664	397152.683
NVA12	20040DJ	39°38'05.33321" N	76°12'17.85482" W	59.693	92.563	4387920.148	396597.752
NVA13	20040DN	39°38'10.26568" N	76°16'04.47677" W	101.938	134.731	4388146.593	391197.708
NVA14	20040DL	39°40'23.59652" N	76°14'09.36942" W	70.740	103.586	4392218.948	393998.169
NVA15	20040CT	39°40'43.79025" N	76°00'54.62406" W	83.010	116.015	4392604.023	412939.646
NVA16	20040DB	39°36'40.24761" N	76°00'19.88935" W	66.024	99.126	4385086.379	413683.030
NVA17	20040CV	39°41'55.77990" N	76°04'25.73289" W	81.857	114.830	4394882.004	407937.077
NVA18	20040CL	39°42'11.88852" N	75°52'12.19966" W	76.768	109.784	4395189.320	425411.362

Station Name	GPSID	Latitude	Longitude	Ellip Height	NAVD 1988	UTM Northing	UTM Easting
NVA19	20040CN	39°38'28.86153" N	75°56'24.63073" W	53.661	86.749	4388374.145	419327.963
NVA20	20040CK	39°38'21.36223" N	75°50'26.37627" W	7.458	40.557	4388058.278	427864.849
NVA21	20040CP	39°33'22.20114" N	75°55'19.00887" W	41.277	74.505	4378903.823	420795.099
NVA22	20040CR	39°27'54.21657" N	75°59'43.84140" W	-15.520	17.825	4368859.771	414363.227
NVA23	20040CG	39°30'25.82630" N	75°49'51.06105" W	-25.191	8.167	4373390.166	428571.173
NVA24	20040CB	39°23'44.43465" N	76°01'34.69641" W	-14.647	18.724	4361189.067	411626.648
NVA25	20040CE	39°26'05.81923" N	75°49'10.98765" W	-14.749	18.730	4365365.791	429455.265
NVA26	20040BZ	39°24'02.61608" N	75°52'10.68222" W	-10.784	22.704	4361607.889	425122.912
NVA27	20040CD	39°26'33.30095" N	75°57'01.00678" W	-7.768	25.620	4366323.262	418227.978
NVA28	20040EE	39°28'35.60274" N	76°14'54.75299" W	-1.891	31.196	4370406.648	392613.845
NVA29	20040EJ	39°28'57.10323" N	76°24'09.87258" W	60.110	92.904	4371264.629	379361.069
NVA30	20040ED	39°34'21.71355" N	76°15'17.14598" W	74.128	106.994	4381084.505	392227.567
NVA31	20040DS	39°39'54.49940" N	76°24'27.93938" W	131.831	164.476	4391538.964	379246.756
NVA32	20040DX	39°32'26.94116" N	76°27'55.37994" W	136.853	169.449	4377819.681	374078.881
NVA33	20040CX	39°42'04.20937" N	76°08'41.86719" W	70.151	103.085	4395217.340	401840.378
NVA34	20040CZ	39°37'31.14523" N	76°05'17.23268" W	110.993	144.000	4386738.137	406611.670
NVA35	20040CI	39°34'09.58664" N	75°47'43.53394" W	-12.401	20.805	4380260.914	431677.625
NVA36	20040BR	39°11'25.94011" N	76°00'20.17014" W	-17.349	16.192	4338402.838	413156.207
NVA37	20040BU	39°08'59.98129" N	75°47'41.33350" W	-11.561	22.416	4333722.647	431320.684
NVA38	20040BY	39°14'24.35283" N	75°52'20.83155" W	-14.760	18.876	4343783.699	424708.147
NVA39	20040BS	39°08'27.31135" N	75°55'28.89449" W	-12.048	21.716	4332821.865	420087.578
NVA40	20040BG	39°03'41.89543" N	76°04'27.91575" W	-26.030	7.709	4324165.872	407043.638
NVA41	20040BL	39°01'35.83359" N	76°01'22.11323" W	-14.502	19.482	4320228.313	411465.367
NVA42	20040BD	38°57'20.12353" N	75°58'41.96003" W	-12.896	21.461	4312303.395	415231.559
NVA43	20040BA	38°57'20.69624" N	76°04'42.70889" W	-17.313	16.835	4312419.048	406548.862
NVA44	20040AZ	38°53'32.85706" N	76°08'00.45112" W	-28.873	5.385	4305453.406	401702.059
NVA45	20040AW	38°55'14.32600" N	76°11'22.90436" W	-29.726	4.309	4308643.400	396865.617
NVA46	20040AT	38°52'54.20633" N	76°20'18.74139" W	-31.781	2.015	4304502.878	383898.553
NVA47	20040AR	39°00'27.88067" N	76°18'37.91727" W	-28.662	4.872	4318452.909	386528.980
NVA48	20040AV	38°58'16.01709" N	76°15'15.57711" W	-32.112	1.599	4314319.403	391339.648
NVA49	20040BI	39°06'52.44516" N	76°03'16.83183" W	-14.973	18.645	4330019.915	408820.198
NVA50	20040BE	39°01'38.37179" N	76°07'14.04052" W	-13.018	20.752	4320406.235	403004.193
NVA51	20040BP	39°04'37.17908" N	75°57'20.56006" W	-13.711	20.211	4325755.402	417332.266
NVA52	20040BN	39°03'54.31063" N	75°52'55.34284" W	-17.478	16.646	4324369.492	423692.034
NVA53	20040BW	39°11'30.33483" N	75°49'50.21327" W	-16.260	17.532	4338385.281	428269.641
NVA54	20040AX	38°57'52.95508" N	76°10'19.19723" W	-29.876	4.033	4313513.491	398462.640
NVA55	20040AA	38°20'06.04517" N	77°19'30.41282" W	-22.250	10.373	4245544.796	296780.317
NVA56	20040AK	38°11'03.53578" N	77°03'59.20451" W	21.747	55.130	4228283.611	319017.277
NVA57	20040AB	38°16'39.01042" N	77°16'56.99864" W	6.101	38.815	4239069.509	300347.734
NVA58	20040AF	38°14'55.36922" N	77°13'28.39908" W	-17.370	15.535	4235751.005	305339.923
NVA59	20040AG	38°11'40.42180" N	77°10'47.14685" W	-14.157	18.931	4229648.145	309118.408
NVA60	20040AM	38°16'19.15652" N	77°08'14.89719" W	24.015	57.148	4238154.184	313020.756
NVA61	20040AI	38°13'37.79983" N	77°06'45.49773" W	28.244	61.484	4233130.225	315079.721
NVA62	20040AO	38°17'06.56401" N	77°02'59.84992" W	-18.093	15.263	4239442.205	320709.316
NVA63	20040AQ	38°20'20.40665" N	77°05'10.57330" W	8.923	42.116	4245488.746	317668.063
NVA64	20040AC	38°18'36.13704" N	77°13'51.03485" W	24.590	57.402	4242569.861	304953.888

Station Name	GPSID	Latitude	Longitude	Ellip Height	NAVD 1988	UTM Northing	UTM Easting
VVAF01	20040AL	38°16'25.21865" N	77°02'48.29815" W	12.832	46.206	4238161.469	320961.773
VVAF02	20040AP	38°18'28.54649" N	77°06'23.32145" W	14.822	48.004	4242080.586	315823.144
VVAF03	20040AE	38°18'33.93794" N	77°13'47.91055" W	25.082	57.897	4242500.236	305028.139
VVAF04	20040AD	38°16'36.90648" N	77°16'30.40441" W	-3.013	29.718	4238988.719	300992.390
VVAF05	20040AN	38°16'19.31736" N	77°08'10.58840" W	21.128	54.265	4238156.722	313125.582
VVAF06	20040AJ	38°13'09.21631" N	77°06'23.22270" W	22.062	55.324	4232236.760	315601.323
VVAF07	20040AH	38°11'58.17804" N	77°11'04.49002" W	-13.619	19.451	4230205.446	308709.399
VVAF08	20040BQ	39°10'38.66659" N	75°59'54.90401" W	-19.415	14.155	4336938.827	413746.277
VVAF09	20040BX	39°14'04.98778" N	75°52'25.07389" W	-16.192	17.450	4343187.707	424600.690
VVAF10	20040BV	39°09'16.72267" N	75°47'34.60748" W	-13.246	20.719	4334237.316	431486.638
VVAF11	20040BT	39°08'09.57222" N	75°55'51.93735" W	-11.839	21.927	4332280.679	419528.798
VVAF12	20040BJ	39°06'46.90489" N	76°03'10.77993" W	-15.909	17.715	4329847.438	408963.556
VVAF13	20040BO	39°04'24.97483" N	75°57'08.50056" W	-14.242	19.701	4325376.145	417618.088
VVAF14	20040BK	39°01'42.52319" N	76°01'40.25828" W	-16.603	17.363	4320439.447	411031.398
VVAF15	20040BH	39°03'46.98646" N	76°03'27.28034" W	-15.340	18.425	4324305.724	408502.729
VVAF16	20040AY	38°57'09.33379" N	76°10'15.99021" W	-28.984	4.975	4312167.809	398522.538
VVAF17	20040BC	38°57'18.39127" N	75°58'40.95644" W	-12.962	21.398	4312249.737	415255.141
VVAF19	20040AS	39°00'37.21803" N	76°18'47.51064" W	-27.816	5.710	4318744.078	386302.394
VVAF19	20040AU	38°52'55.59782" N	76°20'19.72828" W	-32.316	1.478	4304546.121	383875.403
VVAF20	20040BF	39°02'56.10500" N	76°07'52.11356" W	-26.449	7.229	4322813.827	402118.528
VVAF21	20040BB	38°57'15.98777" N	76°01'36.75277" W	-12.795	21.466	4312222.196	411023.022
VVAF22	20040DR	39°40'23.19843" N	76°24'35.83897" W	131.572	164.219	4392426.727	379072.429
VVAF23	20040DU	39°41'50.58401" N	76°30'34.55909" W	183.798	216.299	4395259.949	370571.207
VVAF24	20040DW	39°36'43.11194" N	76°30'56.69813" W	188.345	220.810	4385789.232	369883.847
VVAF25	20040DZ	39°33'08.82661" N	76°23'46.51600" W	90.634	123.305	4379016.545	380039.431
VVAF26	20040EK	39°28'58.17231" N	76°24'18.24785" W	66.482	99.271	4371300.707	379161.494
VVAF27	20040EG	39°26'27.98325" N	76°17'56.13131" W	-28.792	4.304	4366533.490	388223.618
VVAF28	20040EF	39°28'36.10886" N	76°15'07.16174" W	-15.193	17.890	4370426.365	392317.590
VVAF29	20040DH	39°30'47.77015" N	76°07'31.06392" W	-21.445	11.722	4374341.614	403265.402
VVAF30	20040DO	39°38'08.97374" N	76°16'05.95045" W	103.401	136.194	4388107.258	391162.016
VVAF31	20040CS	39°28'05.60178" N	75°59'10.00025" W	-21.475	11.869	4369201.873	415175.725
VVAF32	20040CF	39°26'00.70626" N	75°48'38.49667" W	-10.683	22.801	4365201.147	430230.570
VVAF33	20040EC	39°33'54.89120" N	76°17'14.09458" W	84.438	117.264	4380297.016	389425.422
VVAF34	20040DC	39°36'38.86469" N	76°00'21.81954" W	68.151	101.254	4385044.260	413636.526
VVAF34	20040DE	39°34'21.11599" N	76°10'12.25432" W	91.760	124.731	4380968.004	399501.792
VVAF35	20040DA	39°37'31.97940" N	76°05'17.87184" W	110.312	143.319	4386764.039	406596.744
VVAF36	20040CY	39°42'35.45469" N	76°09'14.05948" W	102.335	135.271	4396190.466	401086.115
VVAF37	20040DM	39°39'57.86853" N	76°13'56.34940" W	52.056	84.897	4391421.483	394297.475
VVAF38	20040DQ	39°42'33.03505" N	76°21'09.77994" W	111.845	144.603	4396354.088	384042.153
VVAF39	20040CC	39°26'26.77523" N	75°56'45.54977" W	-8.886	24.508	4366118.200	418595.342
VVAF40	20040CH	39°30'22.64369" N	75°49'52.35541" W	-27.048	6.311	4373292.336	428539.356
VVAF41	20040CQ	39°32'57.92819" N	75°55'20.39311" W	19.570	52.808	4378155.851	420754.393
VVAF42	20040CM	39°41'59.68299" N	75°53'19.39260" W	43.486	76.510	4394828.717	423807.511
VVAF44	20040CO	39°38'13.27604" N	75°56'10.04059" W	42.695	75.792	4387890.020	419670.714
VVAF45	20040CU	39°41'30.45971" N	76°00'58.69639" W	77.838	110.834	4394043.933	412858.932
VVAF46	20040CW	39°42'04.72180" N	76°05'01.96521" W	70.876	103.845	4395168.063	407077.513

Station Name	GPSID	Latitude	Longitude	Ellip Height	NAVD 1988	UTM Northing	UTM Easting
VVAF47	20040DG	39°34'09.38613" N	76°03'59.15123" W	-11.523	21.616	4380495.684	408399.402
VVAF48	20040DK	39°38'06.90677" N	76°11'47.74575" W	61.121	94.002	4387959.064	397316.134
VVAF49	20040CJ	39°36'54.70975" N	75°48'25.41821" W	8.290	41.401	4385360.402	430723.979
VVANF01	20040CA	39°24'40.60084" N	75°54'37.98948" W	-10.438	23.010	4362813.635	421611.496
VVANF02	20040BM	38°59'16.73139" N	75°56'52.49706" W	-20.889	13.412	4315870.106	417903.630