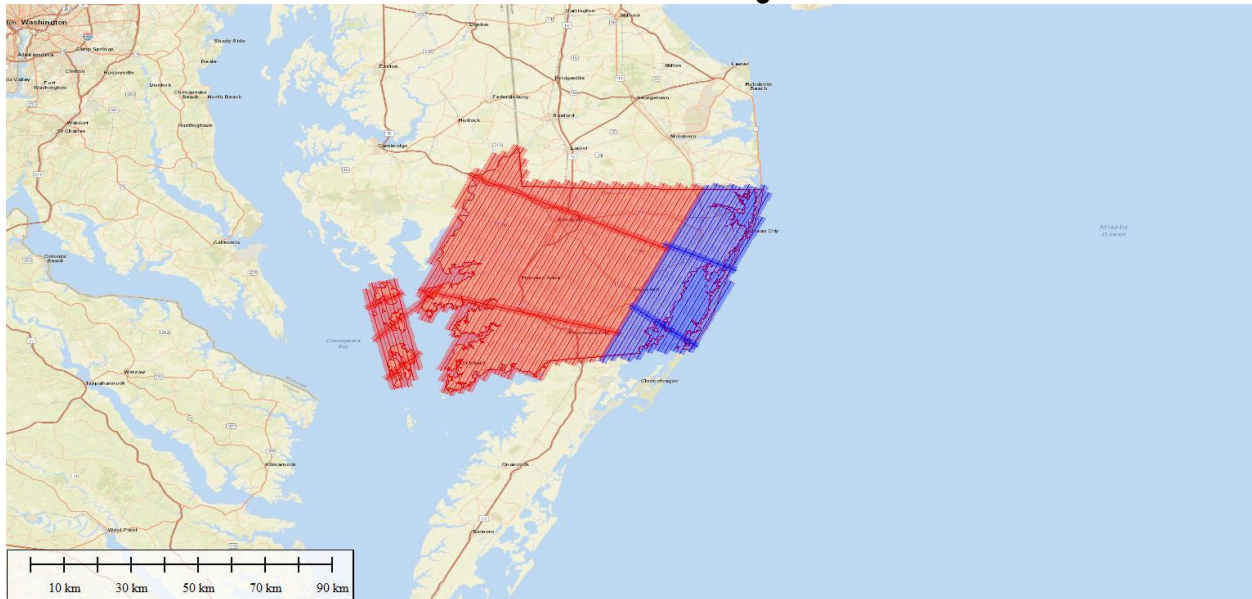


REPORT OF LIDAR SURVEY

United States Geological Survey

Ground Control Report

Southeast Maryland



Performed by:



For:

Fugro Geospatial

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REPORT OF USGS LIDAR SURVEY SOUTHEAST MARYLAND

INTRODUCTION

Terrasurv, Inc of Pittsburgh, PA was tasked by Fugro Geospatial with performing a control survey in support of LiDAR data collection in the Maryland portion of the Delmarva peninsula below Delaware which included all of Somerset, Worcester, and Wicomico counties. The project consisted of two parts: 14 ground control (calibration) points (GCP) and 110 quality control points (QC: NVA/VVA/VVAF), for a total of 124 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, and two existing NSRS benchmarks used as a check.

Table 1 - Map Symbology and Control Quantity

Type	Symbol	VA Quantity
Ground Control (GCP)	Green Dot	14
Non-Vegetated (NVA)	Red Dot	61
Vegetated (VVA)	Yellow X	3
Woods (VVA-F)	Green tree	46
CORS	Red cross in white square	4
NSRS benchmarks	Red X	2

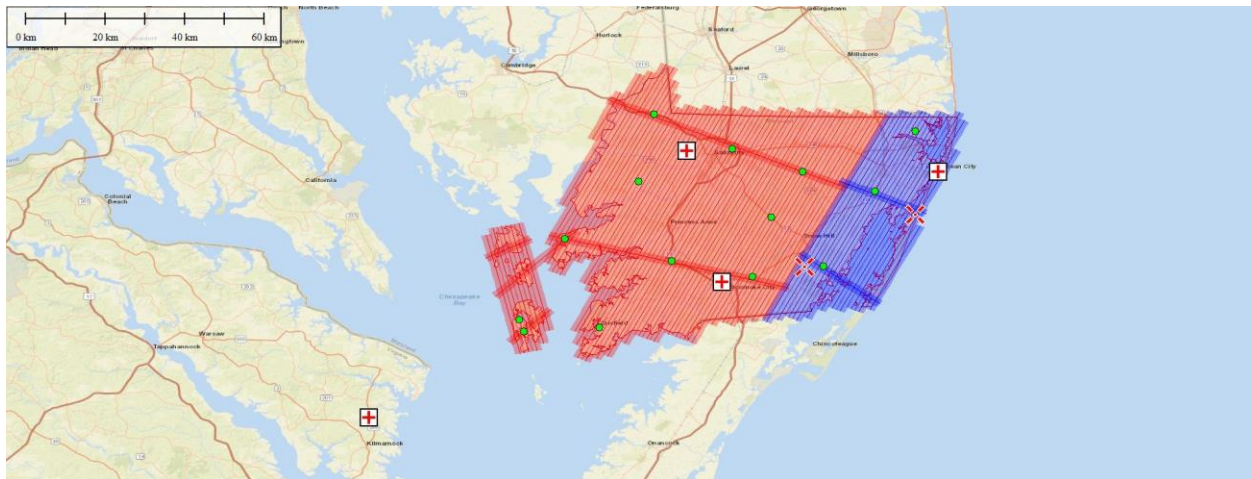


Figure 1 – GCP stations, NSRS, and CORS

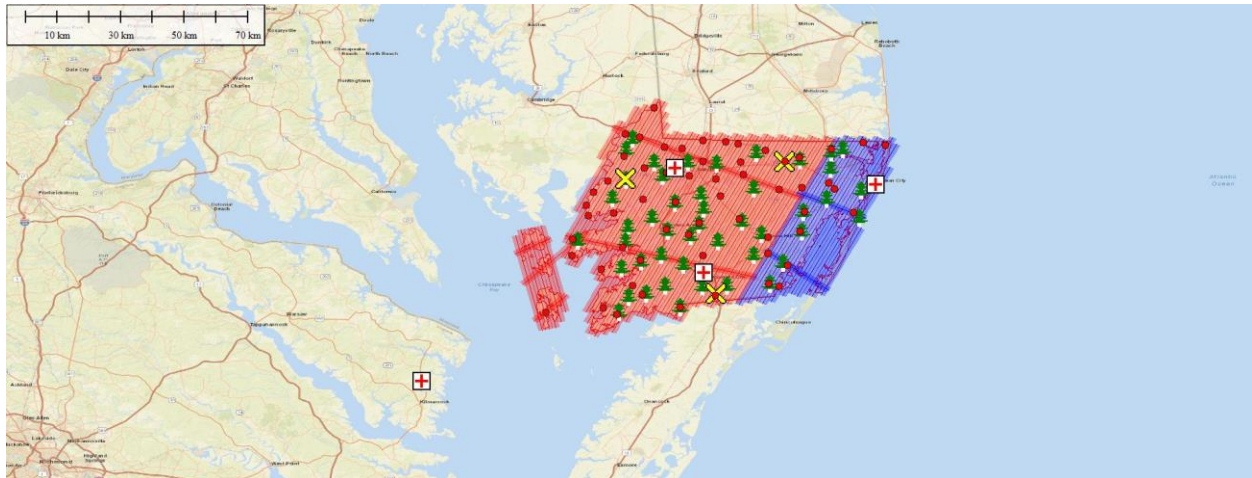


Figure 2 – Checkpoints and CORS

CONTROL

The National Spatial Reference System (NSRS) was used to provide control for the network. The [KeyNetGPS](#) real time network (RTN) was utilized, with a total of four 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). In addition, two existing NSRS benchmarks were included in the network as a check.

STATIONS

Table 2 lists the stations established in this survey, including the GCP, NVA, VVA, and VVA-F, the temporary base stations established to enable survey of VVA-F points in wooded areas, and the four CORS and two existing NSRS stations.

Table 2 - Station List

Station Name	GPSID	USGS Quadrangle	Description
	HB10	EDEN	Keynet CORS
	HB5B	POCOMOKE CITY	Keynet CORS
	MDOC	OCEAN CITY	Keynet CORS
	HOB9	REEDVILLE	Keynet CORS
GCP01	20047AA	HEBRON	BARE=north shoulder of US50 and east of Barren Creek Road.
GCP02	20047AB	DELMAR	BARE=centerline of the north entrance drive to Providence Church on the east side of Parker Road.
GCP03	20047AC	BERLIN	BARE=centerline of a road to the south of Ironshire Station Road.
GCP04	20047AD	DEAL ISLAND	BARE=western end of a parking lot for a vacant business on the north side of Deal Island Road.
GCP05	20047AE	PRINCESS ANNE	BARE=center of drive to the parking lot for a church on the south side of Old Princess Anne Road and north side of US13.
GCP06	20047AF	POCOMOKE CITY	BARE=center of a cross over along Worcester highway.
GCP07	20047AG	BOXIRON	BARE=centerline of Boxiron Road and south edge of Cherrix Road.
GCP08	20047AH	WANGO	BARE=centerline of an asphalt drive apron to a chicken farm on the north side of Mt Hermon Road.

Station Name	GPSID	USGS Quadrangle	Description
GCP09	20047AI	SELBYVILLE	BARE=centerline of Caterpillar Road and east edge of St Martins Neck Road.
GCP10	20047AJ	CRISFIELD	BARE=southeast quadrant of the intersection of William D Gerald Drive and William D Gerald Drive.
GCP11	20047AK	EWELL	BARE=center of Bay Avenue.
GCP12	20047AL	EWELL	BARE=Smith Island Road and in front of Ewell Elementary School.
GCP13	20047AM	WETIPQUIN	BARE=south edge of Green Hill Church Road and centerline of a sand field road to the south.
GCP14	20047AN	SNOW HILL	BARE=centerline of Village Trail and opposite a drive to the north.
NVA01	20047AO	SHARPTOWN	BARE=center of a parking lot for the Cherry Beach boat ramp
NVA02	20047AP	MARDELA SPRINGS	BARE=centerline Station Street and south side of Railroad Street.
NVA03	20047AQ	WETIPQUIN	BARE=centerline of Royal Oak Road and north edge of Wetipquin Road.
NVA04	20047AR	NANTICOKE	BARE=center of driving lane in southern end of a parking lot for the Nanticoke Harbor Boat Ramp.
NVA05	20047AS	DEAL ISLAND	BARE=north side of Nanticoke Road at the dead end and a gravel turn around area.
NVA06	20047AT	MONIE	BARE=southern part of a parking lot for the Pine Beach Boat Ramp.
NVA07	20047AU	DEAL ISLAND	BARE=center of the intersection of Eldon Willing Road and Haines Point Road.
NVA08	20047AV	DEAL ISLAND	BARE=gravel pull-off on the west side of Deal Island Road.
NVA09	20047AW	EWELL	BARE=centerline of Wharf Street.
NVA10	20047AX	MARION	BARE=center of the Frenchtown Road cul-de-sac.
NVA11	20047AY	MONIE	BARE=centerline of a sand drive to the east of Champ Road.
NVA12	20047AZ	CRISFIELD	BARE=center of the intersection of Broad Street and 9th Street.
NVA13	20047BA	CRISFIELD	BARE=end of William Maddox Road.
NVA14	20047BB	SAXIS	BARE=centerline of Williams Point Road and west edge of Shelltown Road.
NVA15	20047BC	POCOMOKE CITY	BARE=northern part of a parking lot for the Layfield Veterinary Services on the west side of Ocean Highway
NVA16	20047BD	GIRDLETREE	BARE=centerline of Portersville Road and north side of George Island Landing.
NVA17	20047BE	BOXIRON	BARE=northern end of a parking lot for a boat ramp at the end of George Island Landing Road.
NVA18	20047BF	BOXIRON	BARE=beach at the end of Truitts Landing Road.
NVA19	20047BG	SNOW HILL	BARE=center of an asphalt parking lot for Collins Temple on the north side of Castle Hill Road.
NVA20	20047BH	PUBLIC LANDING	BARE=centerline of Basket Switch Road and north edge of Cedartown Road.
NVA21	20047BI	TINGLES ISLAND	BARE=northeastern part of the parking lot for Assateague State Park boat ramps.
NVA22	20047BJ	BERLIN	BARE=centerline intersection of Austin Circle.
NVA23	20047BK	BERLIN	BARE=center of Dueling Way and Top Deck Court.
NVA24	20047BL	OCEAN CITY	BARE=center of a parking lot behind The Dough Roller.
NVA25	20047BM	DELMAR	BARE=centerline intersection of Penn Avenue and Walnut Street.
NVA26	20047BN	HEBRON	BARE=center of Bevin Lane cul-de-sac.
NVA27	20047BO	MARION	BARE=center of the intersection of Coulbourns Court loop
NVA28	20047BP	MARION	BARE=northwest quadrant of the intersection of Fairmont Road and Fontaine Road.
NVA29	20047BQ	PRINCESS ANNE	BARE=centerline of Hampden Avenue and the south edge of Post Office Road.
NVA30	20047BR	SNOW HILL	BARE=centerline of the northern entrance drive to the Post Office from a parking lot.
NVA31	20047BS	DIVIDING CREEK	BARE=centerline of Wallace Taylor Road and west edge of Cokesbury Road and Courthouse Road.

Station Name	GPSID	USGS Quadrangle	Description
NVA32	20047BT	DIVIDING CREEK	BARE=centerline of Post Office Road and west edge of Petes Hill Road.
NVA33	20047BU	SNOW HILL	BARE=centerline of a drive to the west to a lumber mill on the southwest side of Snow Mill Road.
NVA34	20047BV	SALISBURY	BARE=centerline of Dog House Drive and the west shoulder of Snow Hill Road.
NVA35	20047BW	EDEN	BARE=center of Benjamin Street cul-de-sac.
NVA36	20047BX	WHALEYSVILLE	BARE=center of the intersection of Steam Mill Hill Road and Duncan Xing Road.
NVA37	20047BY	ASSAWOMAN BAY	BARE=center of Gulf Stream Drive cul-de-sac.
NVA38	20047BZ	SELBYVILLE	BARE=center of Point View Road cul-de-sac.
NVA39	20047CA	SELBYVILLE	BARE=center of Old Stage Road.
NVA40	20047CB	NINEPIN BRANCH	BARE=north end of a parking lot for Faith Chapel Church on the west side of Ironshire Station Road.
NVA41	20047CC	POCOMOKE CITY	BARE=centerline intersection of Riverside Drive and Maple Street.
NVA42	20047CD	PITTSVILLE	BARE=center of the Y-intersection of Parsonsburg Road and Broad Street.
NVA43	20047CE	DELMAR	BARE=center of the intersection of Foxfield Circle and Huntsman Drive.
NVA44	20047CF	WANGO	BARE=centerline of Shavox Road and east edge of Forest Grove Road.
NVA45	20047CG	NINEPIN BRANCH	BARE=centerline of Bob Kelly Road and southwest edge of Libertytown Road.
NVA46	20047CH	DIVIDING CREEK	BARE=centerline of Ed Boston Road and north edge of Perryhawkin Road.
NVA47	20047CI	SALISBURY	BARE=centerline of McBriety Circle and south edge of N Pinehurst Avenue.
NVA48	20047CJ	EDEN	BARE=center of entrance to Quantico Post Office on the south side of Cherry Walk Road.
NVA49	20047CK	NINEPIN BRANCH	BARE=center of Mill Street.
NVA50	20047CL	EDEN	BARE=center of a cul-de-sac on the south side of Redden Ferry Road.
NVA51	20047CM	MARDELA SPRINGS	BARE=centerline of Marsh Road and west side of Bradley Road.
NVA52	20047CN	NANTICOKE	BARE=centerline of Texas Road and south edge of Nanticoke Road.
NVA53	20047CO	EDEN	BARE=center of the Foxtail Court cul-de-sac.
NVA54	20047CP	PITTSVILLE	BARE=centerline of Cobbs Hill Road and east edge of Gumboro Road.
NVA55	20047CQ	PITTSVILLE	BARE=centerline of Melson Church Road and north edge of Melson Road.
NVA56	20047CR	DELMAR	BARE=northern quadrant of the intersection of Rum Ridge Road and Melson Road.
NVA57	20047CS	SALISBURY	BARE=center of the Bravo Court cul-de-sac.
NVA58	20047CT	WHALEYSVILLE	BARE=center of the Holland Avenue cul-de-sac.
NVA59	20047CU	HEBRON	BARE=center of Carter Court cul-de-sac.
NVA60	20047CV	MARDELA SPRINGS	BARE=centerline of Baptist Church Road and the north edge of Hurleys Neck Road.
NVA61	20047CW	KINGSTON	BARE=centerline of Quindocqua Road and south edge of LQ Powell Road.
VVA01	20047CX	MARDELA SPRINGS	WOODS=north side of Hurleys Neck Road and east of tailors Trail Road.
VVA02	20047CY	MARDELA SPRINGS	WOODS=north side of US50 and west side of a powerline ROW.
VVA03	20047CZ	HEBRON	WOODS=north side of Quantico Road and east side of a high voltage powerline R-O-W.
VVA04	20047DA	WETIPQUIN	WOODS=north side of Nanticoke Road.
VVA05	20047DB	EDEN	WOODS=west side of N Upper Ferry Road and north side of a field
VVA06	20047DC	DELMAR	WOODS=north side of an access road and east side of Westwood Drive.
VVA07	20047DD	DELMAR	WOODS=north side of Morris Leonard Road.
VVA08	20047DE	SALISBURY	WOODS=north side of Jackson Road.

Station Name	GPSID	USGS Quadrangle	Description
VVA09	20047DF	SALISBURY	WOODS=north side of McGrath Road and just west from a dirt drive to the south.
VVA10	20047DG	WANGO	WOODS=northside of Wango Road.
VVA11	20047DH	PITTSVILLE	WOODS=south side of Bob Smith Drive and west side of a high voltage power line R-O-W.
VVA12	20047DI	SELBYVILLE	WOODS=north side of Ocean City Expressway.
VVA13	20047DJ	NINEPIN BRANCH	WOODS=northeast side of Patey Woods Road and opposite the Pentecostal Church of Good.
VVA14	20047DK	BERLIN	WOODS=north side of Sinepuxent Road.
VVA15	20047DL	SNOW HILL	WOODS=north side of Worcester Highway and north of entrance to Pocomoke State Park.
VVA16	20047DM	DIVIDING CREEK	WOODS=north side of Whitesburg Road and opposite a chicken farm.
VVA17	20047DN	DIVIDING CREEK	WOODS=northeast side of Perryhawkin Road.
VVA18	20047DO	PRINCESS ANNE	WOODS=north side of Post Office Road and east of a cell tower.
VVA19	20047DP	PRINCESS ANNE	WOODS=north side of W Ridge Road and east of New road.
VVA20	20047DQ	WETIPQUIN	WOODS= southwest side of Capitola Road.
VVA21	20047DR	DEAL ISLAND	WOODS= east side of a cemetery on the east side of Cemetery Road.
VVA22	20047DS	MONIE	WOODS=north side of Drawbridge Road.
VVA23	20047DT	PRINCESS ANNE	WOODS=north side of Camp Road at a pull off and east side of US13.
VVA24	20047DU	KINGSTON	WOODS=northeast side of US13 and north of Costen Road.
VVA25	20047DV	GIRDLETREE	WOODS=north side of Greenbackville Road and just past the gate.
VVA26	20047DW	POCOMOKE CITY	WOODS=north side of Sheepphouse Road and west side of a high voltage line.
VVA27	20047DX	POCOMOKE CITY	WOODS=northeast side of New Bridge road at a bend.
VVA28	20047DY	KINGSTON	WOODS=south side of MD667.
VVA29	20047DZ	KINGSTON	WOODS=north side of Whittington Road.
VVA30	20047EA	MARION	WOODS=north side of Holland Crossing Road and west side of a field.
VVA31	20047EB	CRISFIELD	WOODS=north side of Johnson Creek Road.
VVA32	20047EC	SNOW HILL	WOODS=north side of Algonquin Trail and northeast side of SRL2.
VVA33	20047ED	SAXIS	WOODS=north side of Back Shelltown Road.
VVA34	20047EE	BOXIRON	WOODS=north side of Truitts Landing Road and east of Boxiron Road.
VVA35	20047EF	DIVIDING CREEK	WOODS=north side of Post Office Road.
VVA36	20047EG	TINGLES ISLAND	WOODS=northwest side of McCabe Road and northeast side of Blue Crab Scenic Parkway.
VVA37	20047EH	SELBYVILLE	WOODS=north side of Martins Port Drive.
VVA38	20047EI	BERLIN	WOODS=north side of Worcester Road and opposite the intersection with Harrison Road.
VVA39	20047EJ	SELBYVILLE	WOODS=north side of Service Road A and south side of US113.
VVA40	20047EK	EDEN	WOODS=west side of Carleton Lane and east of a private drive.
VVA41	20047EL	MONIE	WOODS=north side of Oriole Road and west of a cemetery.
VVA42	20047EM	MARION	WOODS=north side of Fairmont Road.
VVA43	20047EN	MARION	WOODS=north side of Fairmont Road and east side of a gravel parking lot for a church.
VVA44	20047EO	PUBLIC LANDING	WOODS=north side of Basket Switch Road and northeast of a field.
VVA45	20047EP	WHALEYSVILLE	WOODS=west side of Whaleyville Road
VVA46	20047EQ	SNOW HILL	WOODS=northeast side of Snow Hill Road.
VVANF1	20047ER	WHALEYSVILLE	BRUSH=northeast side of Market Street in a vacant lot.
VVANF2	20047ES	WETIPQUIN	BRUSH=south shoulder of Nanticoke Road.
VVANF3	20047ET	POCOMOKE CITY	BRUSH=southeast part of a vacant lot on the east side of US13.
VVA32BASE	20047WA	SNOW HILL	Woods Base
VVA46BASE	20047WB	SNOW HILL	Woods Base
VVA44BASE	20047WC	PUBLIC LANDING	Woods Base
VVA34BASE	20047WD	BOXIRON	Woods Base

Station Name	GPSID	USGS Quadrangle	Description
VVA15BASE	20047WE	SNOW HILL	Woods Base
VVA25BASE	20047WF	GIRDLETREE	Woods Base
VVA26BASE	20047WG	POCOMOKE CITY	Woods Base
VVA27BASE	20047WH	POCOMOKE CITY	Woods Base
VVA10BASE	20047WI	WANGO	Woods Base
VVA08BASE	20047WJ	SALISBURY	Woods Base
VVA09BASE	20047WK	SALISBURY	Woods Base
VVA35BASE	20047WL	DIVIDING CREEK	Woods Base
VVA17BASE	20047WM	DIVIDING CREEK	Woods Base
VVA16BASE	20047WN	DIVIDING CREEK	Woods Base
VVA24BASE	20047WO	KINGSTON	Woods Base
VVA28BASE	20047WP	KINGSTON	Woods Base
VVA33BASE	20047WQ	SAXIS	Woods Base
VVA38BASE	20047WR	BERLIN	Woods Base
VVA13BASE	20047WS	NINEPIN BRANCH	Woods Base
VVA36BASE	20047WT	TINGLES ISLAND	Woods Base
VVA14BASE	20047WU	BERLIN	Woods Base
VVA37BASE	20047WV	SELBYVILLE	Woods Base
VVA39BASE	20047WW	SELBYVILLE	Woods Base
VVA12BASE	20047WX	SELBYVILLE	Woods Base
VVA40BASE	20047WY	EDEN	Woods Base
VVA18BASE	20047WZ	PRINCESS ANNE	Woods Base
VVA23BASE	20047XA	PRINCESS ANNE	Woods Base
VVA29BASE	20047XB	KINGSTON	Woods Base
VVA30BASE	20047XC	MARION	Woods Base
VVA31BASE	20047XD	CRISFIELD	Woods Base
VVA43BASE	20047XE	MARION	Woods Base
VVA42BASE	20047XF	MARION	Woods Base
VVA21BASE	20047XG	DEAL ISLAND	Woods Base
VVA19BASE	20047XH	PRINCESS ANNE	Woods Base
VVA22BASE	20047XI	MONIE	Woods Base
VVA41BASE	20047XJ	MONIE	Woods Base
VVA20BASE	20047XK	WETIPQUIN	Woods Base
VVA04BASE	20047XL	WETIPQUIN	Woods Base
VVA05BASE	20047XM	EDEN	Woods Base
VVA06BASE	20047XN	DELMAR	Woods Base
VVA07BASE	20047XO	DELMAR	Woods Base
VVA45BASE	20047XP	WHALEYSVILLE	Woods Base
VVA11BASE	20047XQ	PITTSVILLE	Woods Base
VVA03BASE	20047XR	HEBRON	Woods Base
VVA01BASE	20047XS	MARDELA SPRINGS	Woods Base
VVA02BASE	20047XT	MARDELA SPRINGS	Woods Base
GIRDLE	AJ7998	GIRDLETREE	Existing H & V NSRS station
GPS6	DP9260	TINGLES ISLAND	Existing H & V NSRS station

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 Keynet 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. The 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). Due to a bug in the field software, the vectors from the woods bases to the woods checkpoints were stored with an additional offset of up to several meters which varied at each station. The offset was corrected in the processing. Table 3 summarizes the VRS/RTK occupations (precisions in meters). Occupations with ~~strike through~~ were rejected.

Table 3 – VRS/RTK Occupation Summary

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
HB10	20047AA	11/22/2020 17:32:09	17:35:08	0.007	0.009	17	1.2
HB10	20047AA	11/22/2020 17:35:43	17:38:42	0.007	0.009	18	1.2
HB10	20047AB	11/21/2020 21:39:07	21:42:07	0.005	0.009	14	1.6
HB10	20047AB	11/21/2020 21:42:27	21:45:26	0.006	0.011	13	1.6
MDOC	20047AC	11/19/2020 14:23:28	14:26:27	0.010	0.016	12	1.6
MDOC	20047AC	11/19/2020 14:26:58	14:29:57	0.008	0.011	12	1.7
HB10	20047AD	11/20/2020 21:19:15	21:22:14	0.010	0.018	14	1.5
HB10	20047AD	11/20/2020 21:22:35	21:25:34	0.010	0.020	14	1.5
HB5B	20047AE	11/20/2020 14:10:04	14:13:03	0.007	0.011	13	1.6
HB5B	20047AE	11/20/2020 14:13:53	14:15:24	0.008	0.013	13	1.6
HB10	20047AF	11/17/2020 20:02:43	20:05:42	0.010	0.015	13	1.5
HB10	20047AF	11/17/2020 20:06:35	20:08:48	0.006	0.009	12	1.6
MDOC	20047AG	11/17/2020 16:16:09	16:16:21	0.014	0.028	14	1.5
HB5B	20047AG	11/17/2020 16:18:27	16:21:04	0.012	0.022	12	1.8
HB5B	20047AG	11/17/2020 16:22:34	16:24:46	0.013	0.021	13	1.5
HB10	20047AH	11/19/2020 12:13:15	12:16:14	0.014	0.031	11	1.7
HB10	20047AH	11/19/2020 12:16:41	12:19:40	0.014	0.031	11	1.6
MDOC	20047AI	11/19/2020 20:01:50	20:04:49	0.008	0.012	11	1.5
MDOC	20047AI	11/19/2020 20:06:06	20:09:05	0.008	0.012	12	1.5
HB5B	20047AJ	11/20/2020 18:11:15	18:15:54	0.009	0.013	11	1.9
HB5B	20047AJ	11/20/2020 18:16:28	18:17:53	0.019	0.029	14	1.5
HB5B	20047AJ	11/20/2020 18:18:22	18:21:21	0.009	0.017	13	1.6
HOB9	20047AK	11/18/2020 21:23:57	21:26:56	0.011	0.018	13	1.5
HOB9	20047AK	11/18/2020 21:28:08	21:31:07	0.010	0.016	13	1.5
HOB9	20047AL	11/18/2020 20:54:01	20:57:00	0.010	0.019	12	1.6
HOB9	20047AL	11/18/2020 20:57:30	21:00:29	0.010	0.021	12	1.6
HB10	20047AM	11/21/2020 16:53:58	16:56:57	0.006	0.012	14	1.5
HB10	20047AM	11/21/2020 16:57:27	17:00:26	0.008	0.014	14	1.5
HB5B	20047AN	11/17/2020 14:14:02	14:16:35	0.011	0.016	14	1.4
HB5B	20047AN	11/17/2020 14:18:03	14:21:03	0.009	0.014	14	1.5
HB10	20047AO	11/22/2020 19:10:34	19:13:33	0.008	0.011	16	1.3
HB10	20047AO	11/22/2020 19:15:03	19:18:11	0.013	0.018	16	1.2
HB10	20047AP	11/22/2020 17:44:12	17:47:11	0.006	0.008	17	1.3
HB10	20047AP	11/22/2020 17:47:31	17:50:30	0.007	0.010	16	1.3
HB10	20047AQ	11/21/2020 18:46:31	18:49:30	0.010	0.017	12	1.8
HB10	20047AQ	11/21/2020 18:50:31	18:53:30	0.008	0.015	13	1.8
HB10	20047AR	11/21/2020 18:06:06	18:09:05	0.009	0.014	15	1.4
HB10	20047AR	11/21/2020 18:09:24	18:12:23	0.009	0.015	15	1.4
HB10	20047AS	11/21/2020 18:20:24	18:23:23	0.008	0.013	15	1.3
HB10	20047AS	11/21/2020 18:23:58	18:26:57	0.008	0.013	14	1.5
HB10	20047AT	11/21/2020 14:59:57	15:02:56	0.009	0.014	16	1.2
HB10	20047AT	11/21/2020 15:04:07	15:07:07	0.009	0.014	15	1.3
HB10	20047AU	11/20/2020 21:08:27	21:11:26	0.010	0.019	13	1.4
HB10	20047AU	11/20/2020 21:11:48	21:14:47	0.010	0.018	15	1.3
HB5B	20047AV	11/20/2020 20:48:42	20:51:41	0.009	0.017	13	1.4
HB5B	20047AV	11/20/2020 20:52:07	20:55:06	0.009	0.017	13	1.4
HB5B	20047AV	11/20/2020 20:55:36	20:58:35	0.009	0.018	13	1.5
HOB9	20047AW	11/18/2020 21:35:34	21:38:33	0.011	0.017	12	1.5
HOB9	20047AW	11/18/2020 21:39:00	21:42:00	0.011	0.017	12	1.5
HB5B	20047AX	11/20/2020 19:33:14	19:36:13	0.009	0.013	14	1.3
HB5B	20047AX	11/20/2020 19:36:39	19:39:39	0.009	0.013	15	1.3
HB5B	20047AY	11/21/2020 14:00:47	14:03:46	0.009	0.013	14	1.5
HB5B	20047AY	11/21/2020 14:04:15	14:07:14	0.009	0.014	13	1.8
HB10	20047AZ	11/20/2020 17:48:46	17:51:45	0.009	0.013	13	1.5
HB10	20047AZ	11/20/2020 17:52:04	17:55:03	0.009	0.013	14	1.4
HB10	20047BA	11/20/2020 16:37:08	16:40:07	0.012	0.032	14	1.6

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
HB10	20047BA	11/20/2020 16:41:31	16:44:30	0.010	0.019	10	2.2
HB10	20047BB	11/18/2020 18:45:40	18:46:56	0.013	0.023	10	2.5
HB5B	20047BB	11/18/2020 18:48:48	18:50:12	0.008	0.011	14	1.4
HB5B	20047BB	11/18/2020 18:50:46	18:51:56	0.013	0.022	13	1.5
HB5B	20047BB	11/18/2020 18:52:18	18:55:17	0.008	0.012	8	2.8
HB10	20047BC	11/17/2020 20:53:52	20:55:33	0.011	0.022	10	1.6
HB10	20047BC	11/17/2020 20:53:52	20:55:33	0.011	0.022	10	1.6
HB10	20047BC	11/17/2020 20:56:17	20:58:55	0.011	0.022	10	2.0
MDOC	20047BD	11/17/2020 19:11:06	19:14:05	0.010	0.018	12	1.8
MDOC	20047BD	11/17/2020 19:15:40	19:18:39	0.008	0.014	12	1.7
HB5B	20047BE	11/17/2020 19:24:25	19:26:22	0.011	0.018	13	1.6
HB5B	20047BE	11/17/2020 19:28:33	19:34:49	0.008	0.013	7	4.0
HB5B	20047BE	11/17/2020 19:36:08	19:39:07	0.008	0.012	14	1.3
HB5B	20047BF	11/17/2020 16:54:49	17:01:24	0.010	0.021	11	2.2
HB5B	20047BF	11/17/2020 17:02:31	17:05:30	0.010	0.020	9	2.3
MDOC	20047BG	11/17/2020 17:16:04	17:19:51	0.009	0.015	8	3.1
MDOC	20047BG	11/17/2020 17:20:10	17:25:30	0.009	0.015	5	2.9
MDOC	20047BH	11/17/2020 15:28:49	15:31:48	0.011	0.018	14	1.5
MDOC	20047BH	11/17/2020 15:32:30	15:33:32	0.012	0.020	8	1.5
MDOC	20047BI	11/19/2020 15:40:18	15:43:17	0.009	0.014	15	1.4
MDOC	20047BI	11/19/2020 15:43:49	15:46:48	0.010	0.014	15	1.4
MDOC	20047BJ	11/19/2020 13:03:39	13:11:54	0.013	0.027	6	1.5
MDOC	20047BJ	11/19/2020 13:12:58	13:18:33	0.010	0.015	12	1.4
MDOC	20047BJ	11/19/2020 13:19:05	13:22:04	0.010	0.016	12	1.4
MDOC	20047BK	11/19/2020 13:31:12	13:34:11	0.007	0.011	13	1.5
MDOC	20047BK	11/19/2020 13:34:34	13:37:33	0.011	0.017	13	1.5
MDOC	20047BL	11/19/2020 18:21:33	18:24:32	0.003	0.006	14	1.5
MDOC	20047BL	11/19/2020 18:27:10	18:30:09	0.003	0.005	14	1.5
HB10	20047BM	11/22/2020 15:25:21	15:28:21	0.007	0.011	15	1.4
HB10	20047BM	11/22/2020 15:28:40	15:31:40	0.007	0.011	15	1.4
HB10	20047BN	11/22/2020 16:02:58	16:05:57	0.006	0.011	12	1.6
HB10	20047BN	11/22/2020 16:06:46	16:09:45	0.006	0.010	13	1.6
HB5B	20047BO	11/20/2020 14:31:10	14:34:09	0.008	0.014	17	1.2
HB5B	20047BO	11/20/2020 14:34:54	14:37:53	0.008	0.015	17	1.2
HB5B	20047BP	11/20/2020 19:09:05	19:12:04	0.010	0.019	10	2.4
HB5B	20047BP	11/20/2020 19:12:29	19:15:28	0.010	0.016	9	1.9
HB5B	20047BQ	11/20/2020 13:00:04	13:03:03	0.011	0.019	12	1.5
HB5B	20047BQ	11/20/2020 13:03:33	13:06:32	0.010	0.017	12	1.8
HB5B	20047BR	11/17/2020 15:03:20	15:06:20	0.008	0.013	14	1.5
HB5B	20047BR	11/17/2020 15:06:59	15:09:58	0.009	0.014	13	1.5
HB5B	20047BS	11/18/2020 17:00:33	17:03:32	0.005	0.010	13	1.6
HB5B	20047BS	11/18/2020 17:04:00	17:07:00	0.007	0.012	12	1.7
HB5B	20047BT	11/18/2020 14:38:33	14:41:32	0.008	0.017	12	1.7
HB5B	20047BT	11/18/2020 14:42:05	14:45:04	0.009	0.020	12	1.7
HB5B	20047BU	11/17/2020 13:13:53	13:16:52	0.009	0.015	12	1.7
HB5B	20047BU	11/17/2020 13:17:41	13:20:40	0.010	0.016	13	1.7
HB10	20047BV	11/17/2020 12:58:48	13:01:47	0.008	0.017	11	1.6
HB10	20047BV	11/17/2020 13:02:17	13:05:16	0.009	0.018	11	1.9
HB10	20047BW	11/20/2020 12:14:56	12:17:55	0.008	0.016	10	1.6
HB10	20047BW	11/20/2020 12:18:31	12:21:30	0.008	0.016	9	1.7
MDOC	20047BX	11/22/2020 13:22:12	13:25:11	0.008	0.012	14	1.5
MDOC	20047BX	11/22/2020 13:25:38	13:28:37	0.009	0.014	14	1.5
MDOC	20047BY	11/19/2020 19:13:51	19:16:50	0.009	0.013	12	1.6
MDOC	20047BY	11/19/2020 19:17:25	19:20:24	0.008	0.012	12	1.6
MDOC	20047BZ	11/19/2020 19:42:44	19:45:43	0.007	0.010	12	1.5
MDOC	20047BZ	11/19/2020 19:46:23	19:49:22	0.008	0.012	12	1.5
MDOC	20047CA	11/19/2020 20:42:44	20:45:43	0.008	0.014	9	1.7
MDOC	20047CA	11/19/2020 20:46:08	20:49:07	0.008	0.014	11	1.6
MDOC	20047CB	11/19/2020 12:44:08	12:47:07	0.009	0.025	9	2.9
MDOC	20047CB	11/19/2020 12:47:48	12:50:47	0.012	0.023	9	2.9
HB5B	20047CC	11/18/2020 17:19:04	17:23:49	0.014	0.022	5	1.9
HB5B	20047CC	11/18/2020 17:24:59	17:27:58	0.005	0.007	11	2.7
HB5B	20047CC	11/18/2020 17:28:33	17:31:32	0.004	0.005	9	1.9
HB10	20047CD	11/22/2020 12:35:57	12:38:56	0.009	0.017	11	1.8

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
HB10	20047CD	11/22/2020 12:39:26	12:42:42	0.010	0.020	10	1.8
HB10	20047CE	11/21/2020 21:21:30	21:24:07	0.006	0.009	13	1.5
HB10	20047CE	11/21/2020 21:25:15	21:28:14	0.006	0.009	14	1.5
HB10	20047CF	11/18/2020 12:19:34	12:22:33	0.009	0.016	11	1.6
HB10	20047CF	11/18/2020 12:23:04	12:26:03	0.010	0.016	11	1.6
MDOC	20047CG	11/19/2020 12:28:26	12:31:25	0.010	0.021	10	1.5
MDOC	20047CG	11/19/2020 12:32:31	12:35:30	0.011	0.029	10	1.8
HB5B	20047CH	11/18/2020 15:26:36	15:29:35	0.011	0.017	12	1.9
HB5B	20047CH	11/18/2020 15:30:02	15:33:01	0.015	0.024	11	2.0
HB10	20047CI	11/17/2020 12:18:21	12:21:20	0.005	0.011	12	1.6
HB10	20047CI	11/17/2020 12:22:52	12:25:51	0.005	0.009	12	1.6
HB10	20047CJ	11/21/2020 19:48:16	19:51:15	0.006	0.008	14	1.4
HB10	20047CJ	11/21/2020 19:51:46	19:54:45	0.005	0.007	15	1.3
MDOC	20047CK	11/19/2020 14:38:35	14:41:34	0.008	0.013	14	1.3
MDOC	20047CK	11/19/2020 14:41:58	14:44:57	0.009	0.016	14	1.4
HB10	20047CL	11/21/2020 15:32:13	15:35:12	0.009	0.016	13	1.8
HB10	20047CL	11/21/2020 15:43:29	15:46:28	0.008	0.013	14	1.5
HB10	20047CM	11/22/2020 17:56:41	17:59:40	0.009	0.013	16	1.4
HB10	20047CM	11/22/2020 18:00:02	18:01:23	0.016	0.023	15	1.4
HB10	20047CN	11/21/2020 17:50:39	17:53:38	0.009	0.013	16	1.3
HB10	20047CN	11/21/2020 17:53:58	17:56:57	0.009	0.012	15	1.3
HB10	20047CO	11/21/2020 20:04:12	20:07:11	0.003	0.005	15	1.3
HB10	20047CO	11/21/2020 20:07:45	20:10:44	0.003	0.005	13	1.4
HB10	20047CP	11/22/2020 14:10:18	14:13:17	0.009	0.014	13	1.9
HB10	20047CP	11/22/2020 14:13:41	14:16:40	0.009	0.014	13	1.9
HB10	20047CQ	11/22/2020 14:52:08	14:57:27	0.009	0.012	14	1.3
HB10	20047CQ	11/22/2020 14:58:05	15:01:04	0.015	0.019	13	1.4
HB10	20047CR	11/22/2020 15:08:08	15:11:07	0.010	0.014	11	1.7
HB10	20047CR	11/22/2020 15:11:41	15:14:40	0.011	0.017	12	1.8
HB10	20047CS	11/17/2020 12:41:00	12:43:59	0.007	0.011	12	1.5
HB10	20047CS	11/17/2020 12:44:32	12:47:31	0.007	0.012	12	1.5
MDOC	20047CT	11/22/2020 12:58:02	13:01:01	0.009	0.013	14	1.4
MDOC	20047CT	11/22/2020 13:01:39	13:03:14	0.012	0.017	15	1.3
HB10	20047CU	11/22/2020 15:42:33	15:45:32	0.007	0.011	13	1.7
HB10	20047CU	11/22/2020 15:46:00	15:48:59	0.007	0.012	13	1.7
HB10	20047CV	11/22/2020 16:52:15	16:55:15	0.008	0.013	13	1.8
HB10	20047CV	11/22/2020 16:56:01	16:59:00	0.008	0.014	13	1.6
HB5B	20047CW	11/20/2020 14:45:51	14:48:50	0.007	0.012	16	1.3
HB5B	20047CW	11/20/2020 14:49:14	14:52:14	0.008	0.013	16	1.3
20047XS	20047CX	11/22/2020 17:13:46	17:16:46	0.009	0.019	20	1.4
20047XS	20047CX	11/22/2020 17:17:20	17:20:19	0.007	0.014	19	1.4
20047XT	20047CY	11/22/2020 18:36:57	18:39:56	0.010	0.020	12	2.1
20047XT	20047CY	11/22/2020 18:41:01	18:42:08	0.014	0.024	15	1.9
20047XT	20047CY	11/22/2020 18:43:50	18:50:40	0.022	0.033	7	2.4
20047XT	20047CY	11/22/2020 18:52:10	18:53:04	0.016	0.028	15	2.0
20047XR	20047CZ	11/22/2020 16:31:01	16:34:00	0.006	0.010	21	1.4
20047XR	20047CZ	11/22/2020 16:34:23	16:37:22	0.007	0.011	23	1.5
20047XL	20047DA	11/21/2020 19:24:23	19:26:21	0.014	0.018	16	1.5
20047XL	20047DA	11/21/2020 19:29:37	19:30:15	0.021	0.028	17	1.6
20047XL	20047DA	11/21/2020 19:31:44	19:36:41	0.011	0.013	16	1.6
20047XM	20047DB	11/21/2020 20:30:55	20:33:34	0.006	0.009	17	1.4
20047XM	20047DB	11/21/2020 20:36:16	20:37:04	0.006	0.009	19	1.4
20047XN	20047DC	11/21/2020 21:05:37	21:08:37	0.007	0.009	17	1.3
20047XN	20047DC	11/21/2020 21:09:09	21:12:08	0.007	0.012	17	1.3
20047XO	20047DD	11/22/2020 12:19:59	12:22:58	0.011	0.016	16	1.7
20047XO	20047DD	11/22/2020 12:23:27	12:26:26	0.009	0.013	16	2.0
20047WJ	20047DE	11/18/2020 13:40:37	13:44:45	0.013	0.022	14	2.0
20047WJ	20047DE	11/18/2020 13:45:54	13:53:25	0.009	0.014	13	1.7
20047WK	20047DF	11/18/2020 14:17:48	14:20:47	0.006	0.011	17	1.4
20047WK	20047DF	11/18/2020 14:22:36	14:25:35	0.007	0.012	13	1.8
20047WI	20047DG	11/18/2020 12:51:54	12:55:15	0.012	0.013	15	1.6
20047WI	20047DG	11/18/2020 13:00:19	13:06:09	0.012	0.019	14	2.1
20047XQ	20047DH	11/22/2020 14:34:08	14:37:08	0.006	0.012	19	1.5
20047XQ	20047DH	11/22/2020 14:37:35	14:40:34	0.005	0.011	20	1.3

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
20047WX	20047DI	11/19/2020 21:36:19	21:36:47	0.011	0.016	18	1.5
20047WX	20047DI	11/19/2020 21:36:19	21:36:47	0.011	0.016	18	1.5
20047WX	20047DI	11/19/2020 21:38:19	21:41:26	0.009	0.016	17	1.5
20047WX	20047DI	11/19/2020 21:43:00	21:45:59	0.006	0.010	18	1.8
20047WS	20047DJ	11/19/2020 15:01:18	15:04:17	0.007	0.015	17	1.9
20047WS	20047DJ	11/19/2020 15:04:43	15:05:51	0.023	0.036	17	2.1
20047WS	20047DJ	11/19/2020 15:07:57	15:10:56	0.010	0.019	18	1.8
20047WU	20047DK	11/19/2020 17:17:23	17:20:22	0.006	0.009	18	1.7
20047WU	20047DK	11/19/2020 17:22:38	17:26:05	0.008	0.013	18	1.5
20047WE	20047DL	11/17/2020 18:02:28	18:05:28	0.008	0.012	19	1.5
20047WE	20047DL	11/17/2020 18:06:03	18:06:50	0.013	0.019	19	1.5
20047WN	20047DM	11/18/2020 16:40:30	16:44:04	0.008	0.011	15	1.9
20047WN	20047DM	11/18/2020 16:45:01	16:46:09	0.011	0.021	14	1.8
20047WM	20047DN	11/18/2020 16:00:10	16:02:14	0.012	0.017	14	1.3
20047WM	20047DN	11/18/2020 16:06:10	16:15:44	0.010	0.015	9	2.3
20047WZ	20047DO	11/20/2020 13:24:40	13:27:39	0.009	0.013	18	1.5
20047WZ	20047DO	11/20/2020 13:30:10	13:33:09	0.007	0.012	17	1.5
20047XH	20047DP	11/21/2020 13:05:52	13:08:51	0.007	0.013	18	1.4
20047XH	20047DP	11/21/2020 13:09:38	13:12:37	0.006	0.013	16	1.6
20047XK	20047DQ	11/21/2020 17:24:14	17:25:59	0.028	0.047	20	1.3
20047XK	20047DQ	11/21/2020 17:26:30	17:30:15	0.009	0.015	18	1.3
20047XK	20047DQ	11/21/2020 17:31:00	17:34:14	0.030	0.048	18	1.3
20047XK	20047DQ	11/21/2020 17:35:14	17:38:13	0.006	0.010	18	1.3
20047XK	20047DQ	11/21/2020 17:39:29	17:39:59	0.025	0.038	22	1.2
20047XG	20047DR	11/20/2020 21:47:05	21:50:04	0.016	0.020	18	1.3
20047XG	20047DR	11/20/2020 21:50:58	21:51:16	0.027	0.035	21	1.2
20047XI	20047DS	11/21/2020 13:36:58	13:39:57	0.008	0.012	16	1.5
20047XI	20047DS	11/21/2020 13:40:27	13:46:02	0.010	0.015	6	1.9
20047XA	20047DT	11/20/2020 13:56:55	13:59:54	0.007	0.009	21	1.2
20047XA	20047DT	11/20/2020 14:00:18	14:03:17	0.009	0.011	16	1.3
20047WO	20047DU	11/18/2020 17:56:22	17:59:21	0.008	0.016	22	1.3
20047WO	20047DU	11/18/2020 17:59:54	18:02:53	0.006	0.012	20	1.4
20047WF	20047DV	11/17/2020 18:59:20	19:01:49	0.006	0.014	14	2.2
20047WF	20047DV	11/17/2020 19:02:44	19:05:43	0.007	0.016	15	2.0
20047WG	20047DW	11/17/2020 20:36:16	20:38:12	0.037	0.048	12	1.7
20047WG	20047DW	11/17/2020 20:41:28	20:43:21	0.016	0.021	11	2.3
20047WH	20047DX	11/17/2020 21:37:48	21:41:23	0.007	0.015	14	2.2
20047WH	20047DX	11/17/2020 21:51:30	21:52:17	0.011	0.021	13	2.0
20047WH	20047DX	11/17/2020 21:52:36	21:53:25	0.013	0.023	15	1.9
20047WH	20047DX	11/17/2020 21:55:29	21:58:58	0.021	0.034	14	2.0
20047WP	20047DY	11/18/2020 18:27:30	18:30:29	0.008	0.015	19	1.3
20047WP	20047DY	11/18/2020 18:30:49	18:33:48	0.007	0.013	20	1.2
20047XB	20047DZ	11/20/2020 15:37:53	15:41:43	0.008	0.016	16	2.5
20047XB	20047DZ	11/20/2020 15:42:16	15:44:56	0.014	0.040	15	2.9
20047XB	20047DZ	11/20/2020 15:47:23	15:50:22	0.009	0.019	16	2.1
20047XC	20047EA	11/20/2020 16:11:32	16:14:31	0.010	0.018	14	1.6
20047XC	20047EA	11/20/2020 16:16:44	16:19:43	0.009	0.017	18	1.4
20047XC	20047EA	11/20/2020 16:21:13	16:24:31	0.011	0.021	16	1.6
20047XD	20047EB	11/20/2020 17:26:16	17:29:15	0.008	0.012	17	1.5
20047XD	20047EB	11/20/2020 17:29:41	17:32:40	0.006	0.009	17	1.5
20047WA	20047EC	11/17/2020 14:01:10	14:03:50	0.009	0.018	16	1.4
20047WA	20047EC	11/17/2020 14:05:00	14:05:35	0.010	0.022	18	1.3
20047WQ	20047ED	11/18/2020 19:21:39	19:24:38	0.010	0.018	16	1.9
20047WQ	20047ED	11/18/2020 19:25:08	19:28:07	0.010	0.019	14	1.8
20047WD	20047EE	11/17/2020 16:39:06	16:42:11	0.008	0.016	14	2.9
20047WD	20047EE	11/17/2020 16:43:10	16:46:25	0.009	0.019	13	3.1
20047WL	20047EF	11/18/2020 15:02:22	15:05:21	0.012	0.022	11	2.6
20047WL	20047EF	11/18/2020 15:06:51	15:13:53	0.011	0.017	11	2.6
20047WT	20047EG	11/19/2020 16:29:04	16:33:03	0.008	0.009	23	1.2
20047WT	20047EG	11/19/2020 16:33:21	16:36:20	0.007	0.008	23	1.3
20047WV	20047EH	11/19/2020 20:26:33	20:29:33	0.006	0.011	17	1.4
20047WV	20047EH	11/19/2020 20:30:03	20:33:02	0.006	0.009	17	1.3
20047WR	20047EI	11/19/2020 14:04:54	14:06:46	0.023	0.014	19	1.3
20047WR	20047EI	11/19/2020 14:12:23	14:15:33	0.008	0.012	17	1.5

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
20047WW	20047EJ	11/19/2020 21:04:07	21:07:06	0.005	0.007	18	1.3
20047WW	20047EJ	11/19/2020 21:07:45	21:10:45	0.004	0.006	17	1.4
20047WY	20047EK	11/20/2020 12:35:13	12:38:12	0.008	0.022	14	2.5
20047WY	20047EK	11/20/2020 12:39:31	12:42:31	0.008	0.026	14	3.0
20047XJ	20047EL	11/21/2020 14:29:08	14:32:07	0.006	0.008	22	1.3
20047XJ	20047EL	11/21/2020 14:32:30	14:35:29	0.007	0.010	22	1.3
20047XF	20047EM	11/20/2020 20:00:02	20:03:01	0.008	0.012	15	1.3
20047XF	20047EM	11/20/2020 20:03:42	20:06:41	0.007	0.009	16	1.3
20047XE	20047EN	11/20/2020 18:55:06	18:58:09	0.006	0.010	18	1.3
20047XE	20047EN	11/20/2020 18:58:34	19:01:33	0.008	0.012	17	1.5
20047WC	20047EO	11/17/2020 15:50:51	15:52:56	0.011	0.023	11	1.8
20047WC	20047EO	11/17/2020 15:53:30	15:54:29	0.013	0.018	9	1.6
20047XP	20047EP	11/22/2020 13:45:40	13:48:39	0.009	0.013	19	1.3
20047XP	20047EP	11/22/2020 13:49:24	13:52:23	0.007	0.011	19	1.4
20047WB	20047EQ	11/17/2020 14:48:33	14:51:37	0.007	0.011	18	1.5
20047WB	20047EQ	11/17/2020 14:52:09	14:55:08	0.009	0.014	18	1.5
MDOC	20047ER	11/22/2020 13:07:23	13:10:22	0.009	0.013	14	1.3
MDOC	20047ER	11/22/2020 13:10:41	13:13:41	0.011	0.016	15	1.3
HB10	20047ES	11/21/2020 19:01:57	19:04:56	0.009	0.016	12	1.9
HB10	20047ES	11/21/2020 19:05:44	19:08:44	0.010	0.016	11	2.1
HB10	20047ET	11/17/2020 21:03:40	21:06:39	0.006	0.011	9	3.1
HB10	20047ET	11/17/2020 21:07:05	21:10:04	0.006	0.010	12	1.5
HB5B	20047WA	11/17/2020 13:29:17	13:32:16	0.012	0.023	11	1.9
HB5B	20047WA	11/17/2020 13:33:19	13:36:20	0.015	0.027	10	2.4
HB5B	20047WA	11/17/2020 13:37:21	13:41:09	0.015	0.027	9	2.9
HB5B	20047WB	11/17/2020 14:35:26	14:38:25	0.008	0.014	14	1.5
HB5B	20047WB	11/17/2020 14:38:51	14:41:50	0.009	0.016	14	1.5
MDOC	20047WC	11/17/2020 15:40:54	15:43:53	0.016	0.028	12	2.0
MDOC	20047WC	11/17/2020 15:44:28	15:45:20	0.019	0.028	12	2.0
HB5B	20047WD	11/17/2020 16:29:17	16:32:16	0.012	0.021	13	1.6
HB5B	20047WD	11/17/2020 16:32:43	16:35:42	0.013	0.030	13	1.5
HB10	20047WE	11/17/2020 17:50:19	17:55:55	0.010	0.014	10	2.3
HB10	20047WE	11/17/2020 17:56:21	17:59:21	0.008	0.013	13	1.4
MDOC	20047WF	11/17/2020 18:41:37	18:44:36	0.012	0.021	12	1.7
MDOC	20047WF	11/17/2020 18:45:02	18:51:55	0.010	0.017	7	2.4
HB10	20047WG	11/17/2020 20:18:28	20:21:27	0.007	0.011	11	1.4
HB10	20047WG	11/17/2020 20:22:17	20:25:16	0.007	0.012	11	1.5
HB5B	20047WH	11/17/2020 21:21:04	21:24:03	0.010	0.016	8	2.3
HB5B	20047WH	11/17/2020 21:28:19	21:33:02	0.007	0.014	5	5.6
HB10	20047WI	11/18/2020 12:36:07	12:39:30	0.010	0.032	9	3.2
HB10	20047WI	11/18/2020 12:42:01	12:45:50	0.010	0.027	9	3.3
HB10	20047WJ	11/18/2020 13:25:58	13:28:57	0.008	0.013	11	1.9
HB10	20047WJ	11/18/2020 13:29:24	13:32:23	0.008	0.013	11	1.8
HB10	20047WK	11/18/2020 14:07:04	14:10:03	0.008	0.014	13	1.4
HB10	20047WK	11/18/2020 14:10:29	14:13:28	0.010	0.016	11	1.5
HB5B	20047WL	11/18/2020 14:48:07	14:52:23	0.013	0.020	10	2.3
HB5B	20047WL	11/18/2020 14:53:19	14:56:40	0.020	0.036	9	2.3
HB5B	20047WM	11/18/2020 15:36:01	15:39:00	0.009	0.017	7	2.7
HB5B	20047WM	11/18/2020 15:39:39	15:43:15	0.009	0.017	6	2.9
HB5B	20047WN	11/18/2020 16:29:26	16:32:25	0.009	0.020	10	2.0
HB5B	20047WN	11/18/2020 16:32:56	16:35:55	0.008	0.019	11	2.3
HB10	20047WO	11/18/2020 17:39:57	17:44:51	0.008	0.012	7	4.7
HB10	20047WO	11/18/2020 17:45:15	17:48:14	0.007	0.010	12	1.7
HB5B	20047WP	11/18/2020 18:17:58	18:20:57	0.008	0.011	13	1.6
HB5B	20047WP	11/18/2020 18:21:13	18:24:13	0.008	0.012	13	1.6
HB10	20047WQ	11/18/2020 19:09:14	19:12:13	0.009	0.016	8	2.2
HB10	20047WQ	11/18/2020 19:12:51	19:15:50	0.009	0.015	10	1.9
MDOC	20047WR	11/19/2020 13:51:31	13:56:34	0.007	0.012	10	1.8
MDOC	20047WR	11/19/2020 13:57:18	14:00:17	0.008	0.014	12	1.5
MDOC	20047WS	11/19/2020 14:50:35	14:53:34	0.012	0.021	11	2.0
MDOC	20047WS	11/19/2020 14:54:06	14:57:05	0.015	0.022	11	2.0
MDOC	20047WT	11/19/2020 16:16:37	16:19:36	0.008	0.013	14	1.6
MDOC	20047WT	11/19/2020 16:19:54	16:22:53	0.008	0.014	14	1.6
MDOC	20047WU	11/19/2020 16:56:27	17:09:06	0.009	0.012	12	1.6

GPS BASE	GPSID	UTC Start	UTC End	Horz Prec	Vert Prec	# of SV's	PDOP
MDOC	20047WU	11/19/2020 17:09:35	17:12:34	0.011	0.014	11	1.6
MDOC	20047WV	11/19/2020 20:16:21	20:19:20	0.009	0.014	12	1.7
MDOC	20047WV	11/19/2020 20:19:45	20:22:44	0.009	0.015	12	1.6
MDOC	20047WV	11/19/2020 20:54:18	20:57:17	0.010	0.020	11	1.7
MDOC	20047WV	11/19/2020 20:57:54	21:00:54	0.009	0.019	11	1.7
MDOC	20047WX	11/19/2020 21:20:36	21:24:29	0.013	0.025	10	1.5
MDOC	20047WX	11/19/2020 21:25:52	21:28:51	0.009	0.017	11	1.7
HB10	20047WY	11/20/2020 12:24:50	12:27:49	0.009	0.020	10	1.9
HB10	20047WY	11/20/2020 12:28:19	12:31:22	0.009	0.019	9	1.9
HB5B	20047WZ	11/20/2020 13:09:13	13:12:12	0.010	0.016	12	1.8
HB5B	20047WZ	11/20/2020 13:16:06	13:19:05	0.011	0.017	12	1.8
HB5B	20047XA	11/20/2020 13:45:58	13:48:57	0.009	0.016	13	1.4
HB5B	20047XA	11/20/2020 13:49:30	13:52:29	0.009	0.016	14	1.3
HB5B	20047XB	11/20/2020 14:59:00	15:01:59	0.010	0.016	13	1.6
HB5B	20047XB	11/20/2020 15:02:21	15:05:20	0.010	0.017	13	1.7
HB10	20047XC	11/20/2020 16:03:30	16:05:06	0.015	0.038	14	1.6
HB10	20047XC	11/20/2020 16:05:32	16:06:27	0.012	0.018	12	1.9
HB10	20047XD	11/20/2020 17:03:43	17:06:42	0.015	0.033	11	1.5
HB5B	20047XD	11/20/2020 17:16:05	17:19:05	0.013	0.017	11	1.6
HB5B	20047XD	11/20/2020 17:19:28	17:20:28	0.016	0.020	12	1.6
HB5B	20047XE	11/20/2020 18:45:50	18:48:49	0.010	0.015	12	1.7
HB5B	20047XE	11/20/2020 18:49:15	18:52:14	0.011	0.016	12	1.7
HB5B	20047XF	11/20/2020 19:50:23	19:53:25	0.012	0.019	11	1.4
HB5B	20047XF	11/20/2020 19:53:52	19:56:51	0.012	0.018	12	1.4
HB10	20047XG	11/20/2020 21:30:41	21:33:40	0.010	0.023	11	1.9
HB10	20047XG	11/20/2020 21:34:07	21:37:06	0.011	0.026	11	2.0
HB10	20047XH	11/21/2020 12:57:07	13:00:06	0.009	0.015	12	1.9
HB10	20047XH	11/21/2020 13:00:27	13:03:26	0.009	0.016	13	1.8
HB10	20047XI	11/21/2020 13:28:09	13:31:08	0.011	0.017	13	1.6
HB10	20047XI	11/21/2020 13:31:27	13:34:26	0.010	0.016	14	1.5
HB5B	20047XJ	11/21/2020 14:19:05	14:22:04	0.011	0.017	14	1.6
HB5B	20047XJ	11/21/2020 14:22:23	14:25:22	0.009	0.016	14	1.6
HB10	20047XK	11/21/2020 17:12:37	17:15:36	0.008	0.013	13	1.5
HB10	20047XK	11/21/2020 17:15:53	17:18:52	0.009	0.013	14	1.4
HB10	20047XL	11/21/2020 19:10:30	19:13:29	0.010	0.017	11	1.9
HB10	20047XL	11/21/2020 19:13:49	19:16:48	0.010	0.017	12	1.9
HB10	20047XM	11/21/2020 20:18:28	20:21:27	0.006	0.012	12	1.6
HB10	20047XM	11/21/2020 20:21:51	20:24:50	0.005	0.010	11	2.0
HB10	20047XN	11/21/2020 20:53:55	20:56:54	0.004	0.008	14	1.4
HB10	20047XN	11/21/2020 20:58:38	21:01:37	0.005	0.009	12	1.5
HB10	20047XO	11/22/2020 12:08:46	12:14:15	0.008	0.019	10	2.5
HB10	20047XO	11/22/2020 12:14:45	12:16:58	0.010	0.024	11	1.8
MDOC	20047XP	11/22/2020 13:32:35	13:35:34	0.012	0.017	12	1.6
MDOC	20047XP	11/22/2020 13:36:07	13:39:06	0.012	0.016	12	1.9
HB10	20047XQ	11/22/2020 14:23:53	14:26:53	0.010	0.022	13	1.9
HB10	20047XQ	11/22/2020 14:27:24	14:30:23	0.010	0.022	13	1.9
HB10	20047XR	11/22/2020 16:20:42	16:23:41	0.005	0.011	12	2.2
HB10	20047XR	11/22/2020 16:24:15	16:27:14	0.006	0.012	12	2.2
HB10	20047XS	11/22/2020 17:04:50	17:07:49	0.009	0.014	13	1.7
HB10	20047XS	11/22/2020 17:08:10	17:11:09	0.009	0.013	13	1.6
HB10	20047XT	11/22/2020 18:25:16	18:28:15	0.012	0.019	11	2.1
HB10	20047XT	11/22/2020 18:28:52	18:32:19	0.013	0.018	11	2.1
HB5B	AJ7998	11/17/2020 18:22:00	18:24:59	0.007	0.011	15	1.5
HB5B	AJ7998	11/17/2020 18:25:37	18:28:36	0.012	0.018	15	1.5
MDOC	DP9260	11/19/2020 16:03:18	16:06:17	0.007	0.011	14	1.6
MDOC	DP9260	11/19/2020 16:06:35	16:09:34	0.007	0.012	14	1.6

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

Table 4 - Repeat Baseline Analysis (meters)

From	To	Δ North	Δ East	Δ Horiz	Δ Up	Length
HB10	20047AA	0.004	0.006	0.007	-0.003	11212
HB10	20047AB	-0.002	0.002	0.003	0.003	9041
MDOC	20047AC	-0.009	0.003	0.010	0.007	13348
HB10	20047AD	-0.006	-0.003	0.007	-0.006	32439
HB5B	20047AE	-0.007	0.001	0.007	-0.005	11208
HB10	20047AF	0.011	-0.003	0.011	-0.016	33963
HB5B	20047AG	-0.004	0.001	0.004	0.001	20397
HB10	20047AH	-0.002	0.004	0.004	0.002	23510
MDOC	20047AI	0.001	0.000	0.002	-0.008	11038
HB5B	20047AJ	-0.039	0.004	0.039	-0.021	26800
HB5B	20047AJ	-0.001	-0.007	0.008	0.025	26800
HB5B	20047AJ	0.037	-0.011	0.039	0.046	26800
HOB9	20047AK	-0.003	-0.012	0.012	0.018	37513
HOB9	20047AL	-0.008	0.004	0.009	-0.014	38565
HB10	20047AM	-0.006	-0.006	0.008	0.009	12150
HB5B	20047AN	0.004	0.000	0.004	0.018	18885
HB10	20047AO	0.021	0.003	0.022	-0.005	19610
HB10	20047AP	0.005	-0.002	0.006	0.003	13046
HB10	20047AQ	0.007	0.005	0.009	0.000	17108
HB10	20047AR	0.000	-0.005	0.005	-0.003	24861
HB10	20047AS	0.003	0.001	0.003	0.002	26027
HB10	20047AT	-0.006	0.006	0.009	-0.008	20667
HB10	20047AU	-0.002	0.002	0.003	-0.011	33639
HB5B	20047AV	0.004	-0.003	0.005	-0.031	33038
HB5B	20047AV	-0.008	0.003	0.008	-0.029	33038
HB5B	20047AV	-0.012	0.006	0.013	0.001	33038
HOB9	20047AW	-0.012	-0.011	0.016	-0.004	37648
HB5B	20047AX	-0.007	0.001	0.007	-0.010	25300
HB5B	20047AY	0.003	0.005	0.006	0.008	21493
HB10	20047AZ	0.010	0.000	0.010	-0.002	47292
HB10	20047BA	0.017	0.016	0.024	0.031	47977
HB5B	20047BB	-0.009	0.008	0.013	0.003	12283
HB5B	20047BB	0.011	0.000	0.011	0.000	12283
HB5B	20047BB	0.020	-0.008	0.022	-0.003	12283
HB10	20047BC	0.000	0.000	0.000	0.000	41094
HB10	20047BC	-0.011	0.000	0.011	0.014	41094
HB10	20047BC	-0.011	0.000	0.011	0.014	41094
MDOC	20047BD	-0.009	-0.007	0.012	0.001	40703
HB5B	20047BE	0.029	-0.022	0.036	0.050	19356
HB5B	20047BE	0.021	-0.022	0.030	0.066	19356
HB5B	20047BE	-0.008	0.000	0.008	0.016	19356
HB5B	20047BF	-0.005	0.001	0.005	0.011	21093
MDOC	20047BG	0.008	-0.008	0.012	0.016	34294
MDOC	20047BH	0.009	-0.001	0.009	-0.003	23754
MDOC	20047BI	0.000	0.004	0.004	-0.012	10356
MDOC	20047BJ	0.006	0.004	0.008	0.044	11633
MDOC	20047BJ	-0.003	0.004	0.005	0.019	11633
MDOC	20047BJ	-0.009	0.000	0.009	-0.025	11633
MDOC	20047BK	-0.004	-0.003	0.005	-0.014	10290
MDOC	20047BL	-0.002	-0.002	0.003	0.022	1604
HB10	20047BM	0.005	0.000	0.005	-0.011	10993

From	To	Δ North	Δ East	Δ Horiz	Δ Up	Length
HB10	20047BN	-0.003	0.003	0.005	-0.020	7146
HB5B	20047BO	0.008	-0.009	0.012	-0.004	18008
HB5B	20047BP	-0.001	0.002	0.002	0.016	16166
HB5B	20047BQ	-0.010	0.002	0.010	0.001	16350
HB5B	20047BR	-0.001	0.023	0.023	0.006	19504
HB5B	20047BS	0.002	0.002	0.003	0.015	5243
HB5B	20047BT	0.014	-0.003	0.014	-0.021	15617
HB5B	20047BU	-0.003	-0.008	0.008	0.004	19069
HB10	20047BV	0.009	-0.001	0.009	0.004	14298
HB10	20047BW	-0.003	-0.001	0.003	0.011	10549
MDOC	20047BX	-0.003	-0.003	0.005	-0.011	20687
MDOC	20047BY	0.016	0.013	0.021	-0.017	12634
MDOC	20047BZ	-0.011	0.007	0.013	-0.012	13548
MDOC	20047CA	0.001	-0.002	0.002	0.019	15632
MDOC	20047CB	0.009	0.000	0.009	-0.016	18278
HB5B	20047CC	0.004	-0.005	0.007	0.037	740
HB5B	20047CC	0.009	-0.004	0.010	0.020	740
HB5B	20047CC	0.005	0.001	0.005	-0.018	740
HB10	20047CD	-0.006	0.011	0.013	-0.019	16407
HB10	20047CE	0.007	0.007	0.010	-0.018	7217
HB10	20047CF	-0.010	0.009	0.014	0.014	17031
MDOC	20047CG	-0.013	-0.002	0.013	0.018	23843
HB5B	20047CH	0.003	0.007	0.008	-0.012	12476
HB10	20047CI	0.002	0.002	0.003	0.003	4213
HB10	20047CJ	-0.002	0.000	0.002	0.001	7485
MDOC	20047CK	-0.002	0.009	0.009	0.006	19545
HB10	20047CL	-0.015	0.007	0.017	0.005	12559
HB10	20047CM	0.005	-0.005	0.007	-0.001	16239
HB10	20047CN	0.003	-0.002	0.004	0.016	21512
HB10	20047CO	-0.002	0.001	0.002	0.004	2555
HB10	20047CP	0.005	-0.004	0.006	0.005	22990
HB10	20047CQ	0.000	-0.008	0.008	-0.017	17413
HB10	20047CR	-0.007	-0.004	0.008	-0.004	15043
HB10	20047CS	-0.001	-0.001	0.002	-0.002	10687
MDOC	20047CT	-0.021	0.006	0.021	-0.028	23521
HB10	20047CU	0.001	0.003	0.003	0.000	6400
HB10	20047CV	0.001	-0.001	0.001	0.004	13127
HB5B	20047CW	0.001	0.002	0.002	0.003	16614
20047XS	20047CX	-0.002	-0.005	0.005	-0.035	17
20047XT	20047CY	-0.022	0.021	0.030	0.062	17
20047XT	20047CY	-0.034	0.022	0.041	0.071	17
20047XT	20047CY	-0.025	0.024	0.035	0.074	17
20047XT	20047CY	-0.012	0.001	0.012	0.009	17
20047XT	20047CY	-0.003	0.003	0.004	0.012	17
20047XT	20047CY	0.009	0.002	0.010	0.003	17
20047XR	20047CZ	0.002	0.002	0.003	0.012	23
20047XL	20047DA	0.005	0.052	0.053	0.029	25
20047XL	20047DA	0.031	0.029	0.042	-0.039	25
20047XL	20047DA	0.026	-0.024	0.035	-0.068	25
20047XM	20047DB	0.000	0.018	0.018	0.016	61
20047XN	20047DC	0.006	-0.004	0.007	0.019	28
20047XO	20047DD	0.003	-0.009	0.010	0.008	18
20047WJ	20047DE	0.013	-0.012	0.017	-0.042	16
20047WK	20047DF	-0.006	-0.006	0.009	0.027	25
20047WI	20047DG	-0.037	0.008	0.038	0.018	18

From	To	Δ North	Δ East	Δ Horiz	Δ Up	Length
20047XQ	20047DH	0.006	0.010	0.012	0.000	28
20047WX	20047DI	0.000	0.000	0.000	0.000	14
20047WX	20047DI	0.008	0.005	0.009	-0.003	14
20047WX	20047DI	0.014	0.013	0.019	0.000	14
20047WX	20047DI	0.008	0.005	0.009	-0.003	14
20047WX	20047DI	0.014	0.013	0.019	0.000	14
20047WX	20047DI	0.006	0.008	0.010	0.003	14
20047WS	20047DJ	-0.032	0.014	0.035	-0.055	21
20047WS	20047DJ	-0.014	-0.009	0.017	0.008	21
20047WS	20047DJ	0.018	-0.023	0.029	0.063	21
20047WU	20047DK	-0.002	-0.013	0.013	-0.003	18
20047WE	20047DL	0.005	-0.018	0.018	-0.005	29
20047WN	20047DM	0.007	0.014	0.016	-0.012	25
20047WM	20047DN	0.018	0.005	0.019	-0.034	46
20047WZ	20047DO	0.006	-0.015	0.016	0.015	91
20047XH	20047DP	-0.016	0.003	0.017	0.006	23
20047XK	20047DQ	-0.039	0.056	0.068	0.108	45
20047XK	20047DQ	-0.020	0.090	0.092	-0.060	45
20047XK	20047DQ	-0.054	0.040	0.067	0.125	45
20047XK	20047DQ	-0.057	0.042	0.071	0.124	45
20047XK	20047DQ	0.019	0.034	0.039	-0.169	45
20047XK	20047DQ	-0.014	-0.016	0.021	0.016	45
20047XK	20047DQ	-0.018	-0.014	0.023	0.015	45
20047XK	20047DQ	-0.034	-0.050	0.060	0.185	45
20047XK	20047DQ	-0.037	-0.048	0.061	0.184	45
20047XK	20047DQ	-0.003	0.002	0.004	-0.001	45
20047XG	20047DR	-0.008	0.014	0.016	-0.035	88
20047XI	20047DS	-0.003	-0.004	0.005	0.005	27
20047XA	20047DT	0.007	0.007	0.009	-0.009	42
20047WO	20047DU	-0.002	0.009	0.009	-0.015	27
20047WF	20047DV	-0.010	-0.003	0.011	0.013	38
20047WG	20047DW	0.012	-0.022	0.025	-0.040	45
20047WH	20047DX	0.687	1.067	1.269	0.123	30
20047WH	20047DX	0.679	1.056	1.255	0.146	30
20047WH	20047DX	0.682	1.059	1.260	0.134	30
20047WH	20047DX	-0.008	-0.012	0.014	0.024	28
20047WH	20047DX	-0.005	-0.008	0.010	0.012	28
20047WH	20047DX	0.003	0.003	0.004	-0.012	28
20047WP	20047DY	0.002	0.007	0.007	0.017	27
20047XB	20047DZ	0.012	-0.025	0.028	-0.076	16
20047XB	20047DZ	0.014	-0.031	0.034	-0.076	16
20047XB	20047DZ	0.002	-0.006	0.006	0.000	16
20047XC	20047EA	-0.005	-0.010	0.011	-0.076	27
20047XC	20047EA	-0.001	-0.008	0.008	-0.059	27
20047XC	20047EA	0.004	0.002	0.005	0.017	27
20047XD	20047EB	0.001	0.000	0.001	-0.004	16
20047WA	20047EC	-0.020	0.019	0.027	0.002	34
20047WQ	20047ED	0.005	0.003	0.006	-0.010	14
20047WD	20047EE	0.029	-0.012	0.031	-0.023	37
20047WL	20047EF	-0.011	0.004	0.011	0.049	20
20047WT	20047EG	-0.006	0.002	0.006	-0.001	16
20047WV	20047EH	0.003	0.001	0.003	-0.034	101
20047WR	20047EI	0.004	0.001	0.004	-0.025	21
20047WW	20047EJ	0.000	-0.002	0.002	0.007	50
20047WY	20047EK	0.017	0.010	0.020	-0.011	32

From	To	Δ North	Δ East	Δ Horiz	Δ Up	Length
20047XJ	20047EL	-0.001	0.002	0.002	0.006	38
20047XF	20047EM	0.001	0.000	0.001	0.001	18
20047XE	20047EN	-0.011	0.002	0.011	0.003	30
20047WC	20047EO	0.005	0.006	0.008	-0.006	33
20047XP	20047EP	-0.008	0.008	0.012	0.002	61
20047WB	20047EQ	0.009	0.014	0.017	-0.014	28
MDOC	20047ER	0.000	-0.012	0.012	0.015	23694
HB10	20047ES	0.008	-0.006	0.010	-0.017	12573
HB10	20047ET	-0.002	0.000	0.002	0.009	40592
HB5B	20047WA	-0.010	0.008	0.013	-0.048	18936
HB5B	20047WA	-0.007	0.012	0.014	-0.023	18936
HB5B	20047WA	0.003	0.004	0.005	0.025	18936
HB5B	20047WB	0.000	0.000	0.001	0.019	18944
MDOC	20047WC	-0.004	0.007	0.008	-0.043	23280
HB5B	20047WD	-0.003	-0.007	0.008	-0.006	19852
HB10	20047WE	0.000	0.004	0.004	0.003	33094
MDOC	20047WF	0.004	-0.016	0.016	0.014	40300
HB10	20047WG	-0.006	-0.001	0.006	0.016	38618
HB5B	20047WH	0.017	0.001	0.017	-0.010	3994
HB10	20047WI	0.000	0.002	0.002	0.011	20193
HB10	20047WJ	-0.004	0.001	0.004	0.006	10028
HB10	20047WK	0.005	0.004	0.006	-0.004	13986
HB5B	20047WL	-0.002	0.006	0.007	0.007	15599
HB5B	20047WM	-0.010	-0.001	0.010	0.013	12286
HB5B	20047WN	0.008	0.002	0.009	0.023	10729
HB10	20047WO	-0.007	-0.002	0.007	-0.007	29964
HB5B	20047WP	0.007	-0.003	0.008	-0.002	10288
HB10	20047WQ	0.011	0.004	0.012	-0.008	43123
MDOC	20047WR	0.005	-0.005	0.007	-0.005	12830
MDOC	20047WS	0.005	0.004	0.007	-0.001	19764
MDOC	20047WT	-0.002	-0.001	0.003	0.004	10825
MDOC	20047WU	0.009	-0.004	0.010	0.001	3981
MDOC	20047WV	0.004	-0.003	0.005	-0.012	14283
MDOC	20047WW	0.002	0.003	0.004	-0.025	15354
MDOC	20047WX	0.002	0.002	0.003	0.012	12598
HB10	20047WY	0.001	-0.001	0.002	-0.028	10511
HB5B	20047WZ	-0.008	0.009	0.012	0.005	16382
HB5B	20047XA	0.002	-0.009	0.010	0.011	12141
HB5B	20047XB	0.007	0.005	0.009	0.009	15602
HB10	20047XC	-0.001	-0.008	0.008	-0.005	41615
HB5B	20047XD	0.015	0.000	0.015	-0.011	24301
HB5B	20047XE	-0.001	-0.006	0.007	0.020	16088
HB5B	20047XF	0.005	0.001	0.005	0.005	20467
HB10	20047XG	-0.003	0.001	0.003	-0.020	32851
HB10	20047XH	0.002	-0.004	0.004	-0.013	16233
HB10	20047XI	0.001	0.003	0.003	0.010	21610
HB5B	20047XJ	-0.001	0.001	0.001	0.000	22001
HB10	20047XK	0.009	-0.006	0.011	-0.003	17989
HB10	20047XL	0.010	0.000	0.010	-0.017	12578
HB10	20047XM	-0.005	-0.001	0.006	0.013	3791
HB10	20047XN	0.003	0.001	0.003	-0.013	3750
HB10	20047XO	0.001	-0.002	0.002	-0.020	10303
MDOC	20047XP	-0.003	0.017	0.017	-0.007	20454
HB10	20047XQ	0.000	0.000	0.000	-0.003	20640
HB10	20047XR	-0.004	-0.002	0.004	0.011	5747

From	To	Δ North	Δ East	Δ Horiz	Δ Up	Length
HB10	20047XS	-0.003	0.001	0.003	-0.003	13653
HB10	20047XT	0.003	0.010	0.011	0.004	14394
HB5B	AJ7998	0.002	-0.008	0.008	0.002	16762
MDOC	DP9260	-0.007	0.000	0.007	-0.006	11646

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 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 adjustment was 0.43. 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).

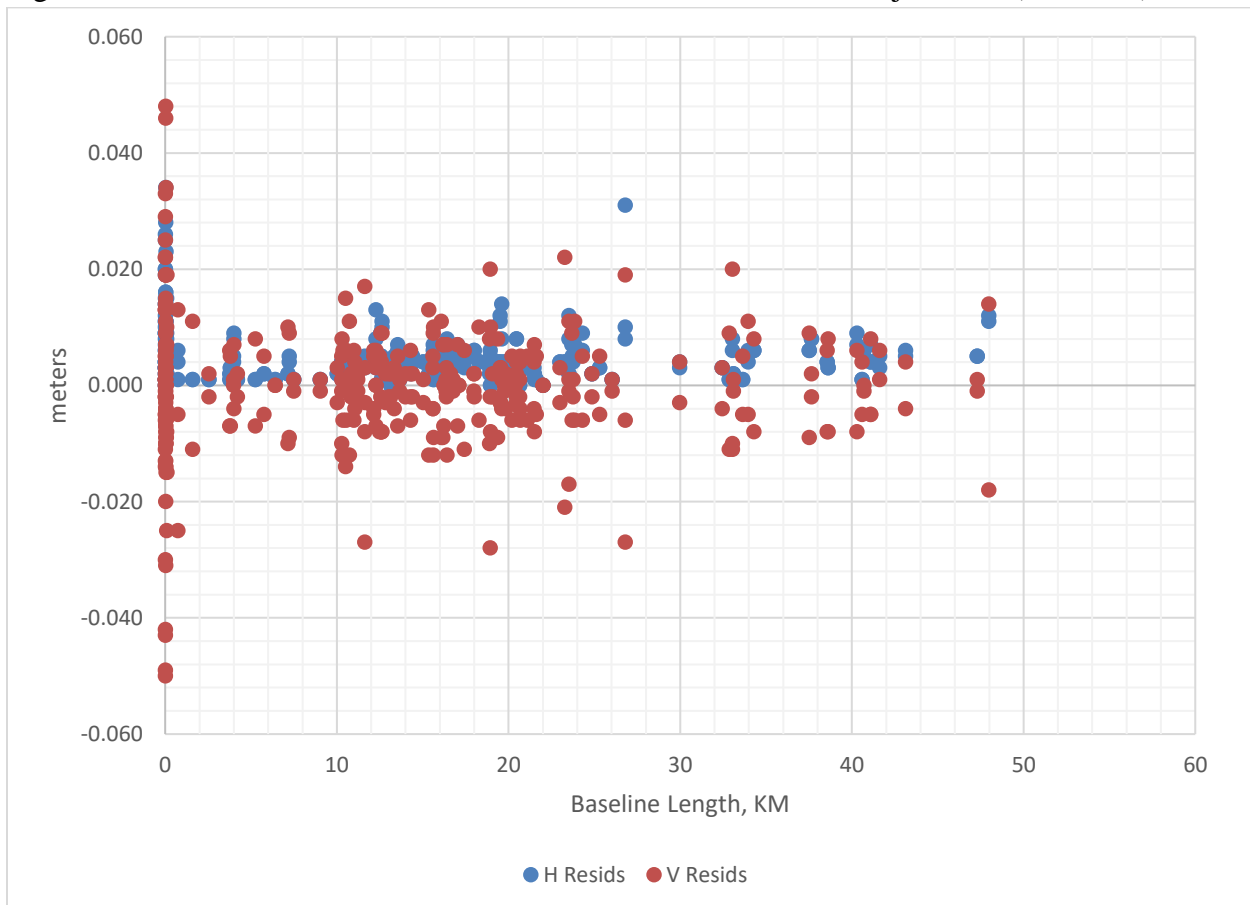


Figure 3 - Constrained Adjustment Residuals (meters)

Table 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
20047AA	0.010	9	0.009	0.010
20047AB	0.009	179	0.009	0.011
20047AC	0.011	179	0.010	0.013
20047AD	0.013	15	0.010	0.019
20047AE	0.010	3	0.010	0.012
20047AF	0.010	109	0.010	0.012
20047AG	0.014	1	0.011	0.021
20047AH	0.016	32	0.011	0.029
20047AI	0.010	71	0.010	0.013
20047AJ	0.011	40	0.009	0.014
20047AK	0.013	11	0.010	0.017
20047AL	0.012	18	0.011	0.019
20047AM	0.010	175	0.009	0.013
20047AN	0.012	170	0.010	0.015
20047AO	0.012	42	0.011	0.014
20047AP	0.010	16	0.009	0.011
20047AQ	0.011	24	0.011	0.016
20047AR	0.011	27	0.010	0.015
20047AS	0.011	30	0.010	0.013
20047AT	0.011	44	0.010	0.014
20047AU	0.012	9	0.010	0.018
20047AV	0.009	11	0.008	0.014
20047AW	0.013	12	0.010	0.017
20047AX	0.011	34	0.010	0.013
20047AY	0.011	177	0.010	0.014
20047AZ	0.012	35	0.010	0.013
20047BA	0.012	166	0.011	0.022
20047BB	0.009	30	0.009	0.011
20047BC	0.010	31	0.009	0.017
20047BD	0.011	32	0.011	0.016
20047BE	0.011	13	0.010	0.013
20047BF	0.012	163	0.011	0.019
20047BG	0.012	165	0.010	0.015
20047BH	0.014	34	0.011	0.019
20047BI	0.011	40	0.011	0.014
20047BJ	0.010	176	0.009	0.014
20047BK	0.011	169	0.010	0.014
20047BL	0.008	18	0.008	0.008
20047BM	0.011	27	0.009	0.012
20047BN	0.010	12	0.009	0.011
20047BO	0.011	176	0.010	0.015
20047BP	0.012	108	0.011	0.017
20047BQ	0.013	156	0.011	0.018
20047BR	0.011	27	0.010	0.014
20047BS	0.010	156	0.009	0.012
20047BT	0.011	172	0.010	0.018
20047BU	0.012	160	0.010	0.016
20047BV	0.011	132	0.010	0.017
20047BW	0.011	25	0.010	0.016
20047BX	0.011	178	0.010	0.014
20047BY	0.011	41	0.010	0.013
20047BZ	0.010	15	0.010	0.012
20047CA	0.011	17	0.010	0.014
20047CB	0.012	13	0.011	0.022
20047CC	0.008	171	0.008	0.008
20047CD	0.011	29	0.011	0.018
20047CE	0.010	16	0.009	0.011
20047CF	0.011	30	0.011	0.016

Station Name	Semi-Major Axis	Azimuth	Semi-Minor Axis	Vertical
20047CG	0.012	34	0.011	0.023
20047CH	0.014	22	0.011	0.019
20047CI	0.009	33	0.009	0.011
20047CJ	0.009	162	0.009	0.010
20047CK	0.011	2	0.010	0.015
20047CL	0.011	37	0.010	0.014
20047CM	0.013	18	0.012	0.016
20047CN	0.011	25	0.010	0.013
20047CO	0.008	18	0.008	0.008
20047CP	0.011	180	0.010	0.014
20047CQ	0.014	43	0.011	0.015
20047CR	0.013	31	0.010	0.015
20047CS	0.010	44	0.009	0.013
20047CT	0.012	176	0.010	0.015
20047CU	0.010	38	0.009	0.012
20047CV	0.011	166	0.009	0.014
20047CW	0.011	6	0.010	0.013
20047CX	0.016	162	0.013	0.021
20047CY	0.017	18	0.015	0.024
20047CZ	0.014	155	0.013	0.017
20047DA	0.018	129	0.015	0.022
20047DB	0.013	154	0.013	0.016
20047DC	0.013	6	0.013	0.015
20047DD	0.016	4	0.015	0.025
20047DE	0.016	166	0.015	0.021
20047DF	0.015	179	0.014	0.019
20047DG	0.018	172	0.015	0.031
20047DH	0.015	21	0.014	0.024
20047DI	0.016	28	0.012	0.022
20047DJ	0.019	51	0.014	0.025
20047DK	0.016	161	0.014	0.018
20047DL	0.016	147	0.016	0.020
20047DM	0.015	138	0.015	0.024
20047DN	0.017	11	0.015	0.023
20047DO	0.017	18	0.014	0.021
20047DP	0.015	2	0.014	0.020
20047DQ	0.015	11	0.013	0.018
20047DR	0.020	118	0.019	0.032
20047DS	0.017	167	0.014	0.021
20047DT	0.016	27	0.014	0.020
20047DU	0.015	4	0.013	0.018
20047DV	0.016	37	0.015	0.024
20047DW	0.024	121	0.017	0.028
20047DX	0.016	59	0.014	0.024
20047DY	0.015	39	0.013	0.019
20047DZ	0.015	130	0.014	0.023
20047EA	0.017	157	0.015	0.026
20047EB	0.019	14	0.015	0.021
20047EC	0.017	179	0.014	0.027
20047ED	0.017	34	0.015	0.024
20047EE	0.017	61	0.016	0.029
20047EF	0.021	148	0.016	0.029
20047EG	0.015	170	0.013	0.017
20047EH	0.015	64	0.014	0.018
20047EI	0.017	141	0.014	0.019
20047EJ	0.015	14	0.013	0.021
20047EK	0.015	3	0.015	0.029
20047EL	0.016	160	0.014	0.020
20047EM	0.017	116	0.015	0.021
20047EN	0.016	49	0.014	0.020
20047EO	0.022	23	0.018	0.032
20047EP	0.017	146	0.015	0.021
20047EQ	0.016	164	0.014	0.020
20047ER	0.012	177	0.010	0.015

Station Name	Semi-Major Axis	Azimuth	Semi-Minor Axis	Vertical
20047ES	0.012	135	0.010	0.016
20047ET	0.009	32	0.009	0.011
20047WA	0.012	163	0.010	0.020
20047WB	0.011	170	0.010	0.015
20047WC	0.018	21	0.014	0.026
20047WD	0.013	104	0.012	0.023
20047WE	0.011	20	0.011	0.014
20047WF	0.012	53	0.011	0.018
20047WG	0.010	106	0.010	0.012
20047WH	0.012	57	0.009	0.015
20047WI	0.012	174	0.011	0.027
20047WJ	0.011	177	0.009	0.013
20047WK	0.012	5	0.010	0.015
20047WL	0.015	142	0.013	0.022
20047WM	0.011	28	0.010	0.016
20047WN	0.011	58	0.010	0.019
20047WO	0.011	18	0.010	0.012
20047WP	0.011	30	0.010	0.012
20047WQ	0.012	36	0.010	0.015
20047WR	0.011	158	0.009	0.013
20047WS	0.015	49	0.011	0.020
20047WT	0.011	157	0.010	0.014
20047WU	0.013	156	0.010	0.013
20047WV	0.011	65	0.010	0.014
20047WW	0.012	16	0.010	0.019
20047WX	0.013	25	0.010	0.019
20047WY	0.011	170	0.010	0.019
20047WZ	0.013	14	0.011	0.016
20047XA	0.012	7	0.010	0.016
20047XB	0.012	28	0.011	0.016
20047XC	0.013	164	0.013	0.021
20047XD	0.016	14	0.012	0.018
20047XE	0.013	52	0.010	0.016
20047XF	0.013	108	0.011	0.018
20047XG	0.012	10	0.011	0.023
20047XH	0.011	179	0.010	0.015
20047XI	0.013	168	0.010	0.016
20047XJ	0.012	170	0.010	0.017
20047XK	0.012	17	0.010	0.013
20047XL	0.013	140	0.010	0.017
20047XM	0.009	30	0.009	0.012
20047XN	0.009	20	0.009	0.010
20047XO	0.012	28	0.010	0.020
20047XP	0.014	147	0.011	0.017
20047XQ	0.012	18	0.011	0.021
20047XR	0.009	177	0.009	0.012
20047XS	0.012	167	0.010	0.014
20047XT	0.014	4	0.011	0.018
AJ7998	0.011	31	0.010	0.014
DP9260	0.010	167	0.010	0.012

SUMMARY

A LiDAR ground control network was established in southeastern Maryland. 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 6 - Adjusted Coordinates

Station Name	GPSID	Latitude	Longitude	Ellipsoidal Height	NAVD 1988	UTM Northing	UTM Easting
GCP01	20047AA	38°27'26.13218" N	75°43'52.14159" W	-25.634	9.975	4256803.981	436207.183
GCP02	20047AB	38°22'46.19573" N	75°33'15.71499" W	-22.929	12.898	4248068.003	451579.924
GCP03	20047AC	38°17'03.34320" N	75°13'55.34649" W	-25.279	10.807	4237380.704	479706.324
GCP04	20047AD	38°10'38.28584" N	75°55'52.65659" W	-33.837	1.957	4225897.066	418431.314
GCP05	20047AE	38°07'33.53333" N	75°41'27.04754" W	-30.998	5.098	4220018.461	439449.078
GCP06	20047AF	38°05'31.38216" N	75°30'30.02797" W	-32.975	3.305	4216150.299	455424.714
GCP07	20047AG	38°06'55.10664" N	75°20'56.80829" W	-31.509	4.801	4218666.291	469396.785
GCP08	20047AH	38°19'42.20429" N	75°23'42.41911" W	-25.114	10.871	4242325.452	465465.034
GCP09	20047AI	38°25'07.59913" N	75°08'26.99658" W	-33.533	2.396	4252290.307	487705.935
GCP10	20047AJ	37°58'36.61870" N	75°51'12.22301" W	-35.317	0.782	4203588.694	425049.936
GCP11	20047AK	37°58'03.88785" N	76°01'27.36644" W	-35.465	0.519	4202731.225	410031.418
GCP12	20047AL	37°59'39.43301" N	76°02'04.25794" W	-35.505	0.432	4205685.988	409163.998
GCP13	20047AM	38°18'19.78710" N	75°45'56.06541" W	-34.363	1.442	4239988.569	433063.999
GCP14	20047AN	38°13'31.49826" N	75°27'57.49248" W	-26.602	9.517	4230928.516	459214.505
NVA01	20047AO	38°32'41.38439" N	75°43'01.34323" W	-32.606	2.956	4266511.389	437514.059
NVA02	20047AP	38°27'42.61270" N	75°45'27.12093" W	-27.920	7.660	4257330.561	433909.403
NVA03	20047AQ	38°20'14.00446" N	75°50'51.25638" W	-31.526	4.157	4243571.597	425926.934
NVA04	20047AR	38°16'10.17350" N	75°54'31.63563" W	-34.509	1.201	4236106.979	420502.958
NVA05	20047AS	38°14'27.56702" N	75°54'08.28008" W	-35.025	0.731	4232938.859	421039.643
NVA06	20047AT	38°14'50.15710" N	75°49'48.78338" W	-34.281	1.554	4233576.095	427353.936
NVA07	20047AU	38°10'28.78828" N	75°56'48.12287" W	-33.790	1.986	4225618.004	417078.824
NVA08	20047AV	38°07'39.82452" N	75°56'56.42530" W	-35.124	0.710	4220412.298	416823.528
NVA09	20047AW	37°58'02.49422" N	76°01'19.40905" W	-35.268	0.719	4202686.138	410225.105
NVA10	20047AX	38°05'18.11451" N	75°51'55.54706" W	-35.026	0.929	4215972.972	424108.148
NVA11	20047AY	38°09'04.13073" N	75°48'18.21023" W	-35.044	0.912	4222891.492	429462.787
NVA12	20047AZ	37°58'47.29457" N	75°51'39.73965" W	-35.317	0.772	4203923.913	424381.670
NVA13	20047BA	37°57'44.18704" N	75°49'20.78853" W	-35.295	0.849	4201948.250	427754.270
NVA14	20047BB	37°58'56.38828" N	75°38'37.23507" W	-34.820	1.494	4204049.920	443473.083
NVA15	20047BC	38°00'55.01177" N	75°32'38.02155" W	-29.998	6.367	4207650.048	452257.219
NVA16	20047BD	38°02'56.24641" N	75°23'29.37468" W	-30.760	5.618	4211319.289	465650.762
NVA17	20047BE	38°02'30.14543" N	75°21'43.20698" W	-36.027	0.375	4210504.360	468235.154
NVA18	20047BF	38°05'57.74083" N	75°20'17.14305" W	-35.913	0.424	4216894.660	470356.195
NVA19	20047BG	38°08'01.56452" N	75°23'40.46851" W	-26.396	9.871	4220730.543	465420.362
NVA20	20047BH	38°11'47.19447" N	75°18'14.57771" W	-29.446	6.759	4227654.815	473376.615
NVA21	20047BI	38°14'55.57974" N	75°09'09.64943" W	-35.003	1.148	4233428.412	486640.475
NVA22	20047BJ	38°19'58.04219" N	75°13'21.67863" W	-25.491	10.527	4242763.213	480537.216
NVA23	20047BK	38°18'58.60456" N	75°12'23.58759" W	-29.323	6.723	4240927.963	481943.430

Station Name	GPSID	Latitude	Longitude	Ellipsoidal Height	NAVD 1988	UTM Northing	UTM Easting
NVA24	20047BL	38°20'13.05878" N	75°06'14.39330" W	-34.270	1.779	4243207.709	490911.177
NVA25	20047BM	38°27'05.13367" N	75°34'42.39316" W	-21.041	14.694	4256062.043	449526.988
NVA26	20047BN	38°26'04.66826" N	75°41'12.12487" W	-23.166	12.506	4254263.184	440066.694
NVA27	20047BO	38°02'37.62607" N	75°46'38.45984" W	-34.391	1.696	4210958.237	431790.841
NVA28	20047BP	38°06'55.58482" N	75°45'21.34850" W	-33.888	2.148	4218893.307	433735.065
NVA29	20047BQ	38°12'06.66964" N	75°40'53.47676" W	-30.870	5.144	4228430.862	440328.296
NVA30	20047BR	38°10'42.54511" N	75°23'35.74152" W	-34.227	1.982	4225691.640	465556.475
NVA31	20047BS	38°07'36.97858" N	75°34'44.83304" W	-30.304	5.897	4220057.641	449242.347
NVA32	20047BT	38°13'12.36340" N	75°35'21.51413" W	-24.329	11.734	4230400.267	448415.009
NVA33	20047BU	38°13'51.71354" N	75°28'27.17285" W	-27.678	8.430	4231555.244	458496.063
NVA34	20047BV	38°17'46.61291" N	75°31'39.57570" W	-20.436	15.544	4238820.555	453859.723
NVA35	20047BW	38°16'45.91292" N	75°39'23.59679" W	-28.317	7.606	4237021.846	442575.364
NVA36	20047BX	38°24'15.92216" N	75°18'20.11346" W	-23.538	12.368	4250732.323	473318.253
NVA37	20047BY	38°26'22.50221" N	75°03'44.90554" W	-34.343	1.592	4254591.450	494547.873
NVA38	20047BZ	38°26'47.82646" N	75°07'31.31344" W	-34.970	0.928	4255377.597	489060.387
NVA39	20047CA	38°25'39.62077" N	75°12'57.41449" W	-25.819	10.077	4253289.975	481150.927
NVA40	20047CB	38°19'06.90562" N	75°17'54.57325" W	-28.687	7.335	4241205.780	473906.902
NVA41	20047CC	38°04'31.23253" N	75°34'15.25621" W	-35.451	0.819	4214328.314	449927.234
NVA42	20047CD	38°23'25.69520" N	75°28'15.45344" W	-11.764	24.099	4249244.995	458871.131
NVA43	20047CE	38°23'38.69593" N	75°34'44.00896" W	-25.502	10.289	4249699.340	449447.870
NVA44	20047CF	38°21'24.30153" N	75°27'50.63143" W	-19.439	16.478	4245500.321	459454.461
NVA45	20047CG	38°18'49.30604" N	75°21'42.70469" W	-28.807	7.207	4240683.122	468365.209
NVA46	20047CH	38°11'13.52788" N	75°37'09.71022" W	-27.106	8.982	4226754.744	445759.690
NVA47	20047CI	38°21'12.24145" N	75°37'03.09115" W	-31.823	4.002	4245207.138	446043.899
NVA48	20047CJ	38°22'27.22374" N	75°44'35.84381" W	-30.785	4.915	4247599.260	435073.728
NVA49	20047CK	38°15'07.50827" N	75°17'29.33664" W	-25.457	10.664	4233825.210	474496.449
NVA50	20047CL	38°17'09.67198" N	75°44'50.02277" W	-33.480	2.369	4237814.341	434650.517
NVA51	20047CM	38°28'12.44563" N	75°47'53.96351" W	-32.235	3.297	4258280.162	430358.655
NVA52	20047CN	38°18'22.87573" N	75°53'16.82222" W	-31.245	4.444	4240179.525	422360.156
NVA53	20047CO	38°21'41.37971" N	75°40'54.46873" W	-27.819	7.948	4246144.763	440434.764
NVA54	20047CP	38°25'24.98794" N	75°24'07.09141" W	-19.859	15.999	4252893.374	464912.030
NVA55	20047CQ	38°26'31.96983" N	75°28'40.22196" W	-17.680	18.116	4254989.527	458300.039
NVA56	20047CR	38°26'56.87219" N	75°30'50.10477" W	-19.260	16.512	4255774.026	455155.807
NVA57	20047CS	38°20'35.02187" N	75°32'31.34382" W	-23.569	12.323	4244018.535	452632.727
NVA58	20047CT	38°23'36.60308" N	75°20'44.39870" W	-25.813	10.099	4249532.775	469814.262
NVA59	20047CU	38°25'46.92784" N	75°38'12.10300" W	-21.593	14.122	4253685.042	444427.345
NVA60	20047CV	38°24'29.02983" N	75°48'06.09641" W	-29.572	6.032	4251396.365	430004.743
NVA61	20047CW	38°01'01.05733" N	75°44'56.72934" W	-34.407	1.742	4207961.552	434246.462
VVA01	20047CX	38°25'48.15857" N	75°47'49.58928" W	3.782	-31.796	4253831.873	430426.176
VVA02	20047CY	38°27'42.62908" N	75°46'46.27894" W	6.354	-29.205	4257347.072	431991.020
VVA03	20047CZ	38°23'44.94401" N	75°43'03.69825" W	7.755	-27.932	4249977.105	437328.196
VVA04	20047DA	38°20'46.12860" N	75°47'49.73470" W	3.033	-32.675	4244522.508	430342.214
VVA05	20047DB	38°21'23.69138" N	75°41'42.58879" W	6.920	-28.845	4245608.274	439262.864
VVA06	20047DC	38°23'41.90383" N	75°37'23.82592" W	12.595	-23.166	4249823.475	445571.799
VVA07	20047DD	38°23'27.07543" N	75°32'29.67075" W	13.429	-22.390	4249321.378	452704.454
VVA08	20047DE	38°18'14.86818" N	75°35'09.36633" W	11.253	-24.678	4239722.128	448769.435

Station Name	GPSID	Latitude	Longitude	Ellipsoidal Height	NAVD 1988	UTM Northing	UTM Easting
VVA09	20047DF	38°15'53.24945" N	75°34'44.62263" W	13.476	-22.524	4235353.385	449343.062
VVA10	20047DG	38°19'16.19261" N	75°26'12.64223" W	14.680	-21.303	4241540.144	461813.955
VVA11	20047DH	38°25'13.22580" N	75°25'44.35139" W	16.488	-19.360	4252541.464	462552.047
VVA12	20047DI	38°22'38.21646" N	75°13'10.45669" W	7.392	-28.566	4247699.443	480821.398
VVA13	20047DJ	38°15'16.60538" N	75°17'43.69674" W	10.263	-25.854	4234106.703	474148.329
VVA14	20047DK	38°18'54.26678" N	75°07'56.40990" W	3.061	-33.007	4240782.370	488431.129
VVA15	20047DL	38°07'57.03150" N	75°26'13.64729" W	6.238	-30.015	4220607.544	461690.729
VVA16	20047DM	38°10'17.97438" N	75°32'18.78910" W	9.262	-26.904	4224998.301	452826.792
VVA17	20047DN	38°11'11.89180" N	75°36'55.43495" W	8.165	-27.926	4226702.004	446106.621
VVA18	20047DO	38°12'08.17589" N	75°40'47.95487" W	4.960	-31.054	4228476.300	440462.938
VVA19	20047DP	38°14'16.72620" N	75°43'25.48844" W	4.234	-31.698	4232467.475	436662.461
VVA20	20047DQ	38°17'38.82457" N	75°50'12.12057" W	1.293	-34.476	4238779.910	426833.712
VVA21	20047DR	38°10'26.45251" N	75°55'59.07819" W	2.106	-33.689	4225533.912	418271.404
VVA22	20047DS	38°12'42.47388" N	75°47'34.27714" W	1.792	-34.113	4229611.984	430589.625
VVA23	20047DT	38°07'59.42703" N	75°41'54.80049" W	3.591	-32.490	4220821.596	438779.390
VVA24	20047DU	38°06'18.77194" N	75°38'10.33049" W	5.569	-30.610	4217679.989	444222.707
VVA25	20047DV	38°03'08.11784" N	75°23'21.79396" W	5.963	-30.412	4211684.396	465837.052
VVA26	20047DW	38°02'47.78637" N	75°30'41.55973" W	10.058	-26.281	4211109.707	455116.066
VVA27	20047DX	38°02'38.91575" N	75°34'55.11116" W	5.432	-30.869	4210872.655	448934.552
VVA28	20047DY	38°02'49.50996" N	75°41'14.24061" W	2.083	-34.103	4211262.258	439696.108
VVA29	20047DZ	38°01'29.43615" N	75°44'27.27168" W	1.708	-34.440	4208830.457	434971.696
VVA30	20047EA	38°00'53.45238" N	75°47'27.71550" W	2.094	-34.014	4207757.638	430562.964
VVA31	20047EB	37°58'20.87110" N	75°49'06.21753" W	0.667	-35.469	4203075.744	428119.756
VVA32	20047EC	38°13'38.72265" N	75°28'07.10361" W	9.712	-26.403	4231152.361	458981.952
VVA33	20047ED	37°59'10.31211" N	75°38'37.64070" W	2.014	-34.296	4204479.127	443466.155
VVA34	20047EE	38°06'39.94753" N	75°21'14.58816" W	10.207	-26.107	4218200.715	468962.063
VVA35	20047EF	38°13'12.09605" N	75°35'25.70637" W	11.291	-24.770	4230392.676	448313.020
VVA36	20047EG	38°14'17.28659" N	75°08'16.59545" W	1.015	-35.150	4232246.142	487928.223
VVA37	20047EH	38°25'56.81675" N	75°11'02.72354" W	4.059	-31.839	4253813.961	483932.768
VVA38	20047EI	38°17'27.54748" N	75°13'44.66608" W	6.212	-29.866	4238126.072	479967.640
VVA39	20047EJ	38°25'22.20936" N	75°13'00.31086" W	9.482	-26.419	4252753.480	481079.441
VVA40	20047EK	38°16'48.22512" N	75°39'36.58769" W	7.140	-28.780	4237095.360	442260.250
VVA41	20047EL	38°10'22.40779" N	75°47'56.39260" W	0.929	-35.012	4225299.524	430014.587
VVA42	20047EM	38°05'49.94916" N	75°48'34.94258" W	0.743	-35.256	4216910.087	429003.325
VVA43	20047EN	38°06'56.21802" N	75°45'16.75779" W	2.018	-34.020	4218911.913	433847.009
VVA44	20047EO	38°11'58.79458" N	75°17'59.78252" W	11.531	-24.670	4228011.171	473737.636
VVA45	20047EP	38°23'59.67986" N	75°18'19.93027" W	11.273	-24.638	4250231.684	473321.038
VVA46	20047EQ	38°11'32.97610" N	75°24'53.15345" W	6.870	-29.313	4227254.192	463680.071
VVANF1	20047ER	38°23'37.82667" N	75°20'51.34618" W	-25.373	10.538	4249571.122	469645.876
VVANF2	20047ES	38°20'45.63686" N	75°47'48.79891" W	-32.545	3.164	4244507.155	430364.799
VVANF3	20047ET	38°01'13.09054" N	75°32'31.57258" W	-29.899	6.460	4208206.326	452417.713
VVA32BASE	20047WA	38°13'37.71834" N	75°28'06.71420" W	-25.947	10.169	4231121.359	458991.263
VVA46BASE	20047WB	38°11'32.12877" N	75°24'53.26046" W	-27.547	8.636	4227228.088	463677.351
VVA44BASE	20047WC	38°11'57.87710" N	75°18'00.42363" W	-22.892	13.310	4227982.944	473721.951
VVA34BASE	20047WD	38°06'39.39314" N	75°21'15.88931" W	-23.753	12.560	4218183.750	468930.313
VVA15BASE	20047WE	38°07'56.14406" N	75°26'13.67385" W	-28.719	7.535	4220580.196	461689.954

Station Name	GPSID	Latitude	Longitude	Ellipsoidal Height	NAVD 1988	UTM Northing	UTM Easting
VVA25BASE	20047WF	38°03'07.43645" N	75°23'20.55406" W	-28.483	7.892	4211663.269	465867.182
VVA26BASE	20047WG	38°02'46.56218" N	75°30'40.61803" W	-24.200	12.139	4211071.851	455138.810
VVA27BASE	20047WH	38°02'38.23661" N	75°34'55.91239" W	-29.245	7.056	4210851.846	448914.892
VVA10BASE	20047WI	38°19'15.66068" N	75°26'12.58714" W	-19.168	16.815	4241523.742	461815.215
VVA08BASE	20047WJ	38°18'14.32025" N	75°35'09.13850" W	-22.499	13.431	4239705.205	448774.861
VVA09BASE	20047WK	38°15'52.66312" N	75°34'45.26486" W	-20.408	15.592	4235335.411	449327.342
VVA35BASE	20047WL	38°13'11.56838" N	75°35'25.34582" W	-22.834	13.228	4230376.357	448321.684
VVA17BASE	20047WM	38°11'10.47025" N	75°36'55.23705" W	-25.106	10.986	4226658.158	446111.144
VVA16BASE	20047WN	38°10'17.25916" N	75°32'19.23613" W	-24.969	11.198	4224976.321	452815.787
VVA24BASE	20047WO	38°06'18.15689" N	75°38'09.61511" W	-28.312	7.868	4217660.913	444239.999
VVA28BASE	20047WP	38°02'50.03209" N	75°41'13.37238" W	-32.201	3.986	4211278.194	439717.389
VVA33BASE	20047WQ	37°59'09.96635" N	75°38'37.92026" W	-32.444	3.866	4204468.517	443459.262
VVA38BASE	20047WR	38°17'27.60740" N	75°13'43.84038" W	-25.496	10.582	4238127.869	479987.702
VVA13BASE	20047WS	38°15'16.17642" N	75°17'44.38477" W	-23.975	12.142	4234093.535	474131.565
VVA36BASE	20047WT	38°14'16.80225" N	75°08'16.74310" W	-32.321	3.844	4232231.219	487924.611
VVA14BASE	20047WU	38°18'53.71087" N	75°07'56.17905" W	-31.150	4.918	4240765.227	488436.711
VVA37BASE	20047WV	38°25'56.22850" N	75°11'06.83686" W	-30.042	5.856	4253796.030	483833.007
VVA39BASE	20047WW	38°25'23.77693" N	75°13'01.05512" W	-24.949	10.952	4252801.838	481061.508
VVA12BASE	20047WX	38°22'37.78705" N	75°13'10.53596" W	-25.927	10.030	4247686.213	480819.443
VVA40BASE	20047WY	38°16'47.20347" N	75°39'36.70836" W	-27.129	8.790	4237063.891	442257.093
VVA18BASE	20047WZ	38°12'08.93857" N	75°40'51.60157" W	-28.797	7.217	4228500.459	440374.418
VVA23BASE	20047XA	38°07'58.64030" N	75°41'53.47091" W	-29.977	6.105	4220797.104	438811.576
VVA29BASE	20047XB	38°01'28.99847" N	75°44'27.03490" W	-32.595	3.554	4208816.921	434977.362
VVA30BASE	20047XC	38°00'52.63339" N	75°47'27.65352" W	-32.450	3.658	4207732.383	430564.260
VVA31BASE	20047XD	37°58'20.39695" N	75°49'06.40718" W	-33.689	2.447	4203061.171	428115.001
VVA43BASE	20047XE	38°06'55.91528" N	75°45'17.91870" W	-31.982	4.055	4218902.812	433818.664
VVA42BASE	20047XF	38°05'49.82590" N	75°48'34.23616" W	-33.097	2.902	4216906.138	429020.498
VVA21BASE	20047XG	38°10'27.10112" N	75°56'02.62433" W	-31.949	3.845	4225554.772	418185.324
VVA19BASE	20047XH	38°14'16.04343" N	75°43'25.26591" W	-29.852	6.080	4232446.389	436667.706
VVA22BASE	20047XI	38°12'41.64852" N	75°47'34.53711" W	-32.331	3.575	4229586.599	430583.085
VVA41BASE	20047XJ	38°10'22.98199" N	75°47'55.03906" W	-33.074	2.867	4225316.938	430047.672
VVA20BASE	20047XK	38°17'38.35686" N	75°50'10.42801" W	-32.346	3.423	4238765.122	426874.696
VVA04BASE	20047XL	38°20'45.64056" N	75°47'49.00005" W	-30.538	5.171	4244507.311	430359.917
VVA05BASE	20047XM	38°21'23.22697" N	75°41'40.20381" W	-26.918	8.848	4245593.525	439320.640
VVA06BASE	20047XN	38°23'41.02904" N	75°37'23.92025" W	-21.646	14.115	4249796.528	445569.329
VVA07BASE	20047XO	38°23'26.55207" N	75°32'29.54423" W	-20.898	14.921	4249305.229	452707.428
VVA45BASE	20047XP	38°24'00.92614" N	75°18'17.96491" W	-22.075	13.835	4250269.939	473368.835
VVA11BASE	20047XQ	38°25'13.68325" N	75°25'43.36032" W	-17.549	18.299	4252555.452	462576.145
VVA03BASE	20047XR	38°23'44.24706" N	75°43'03.56628" W	-25.990	9.697	4249955.598	437331.230
VVA01BASE	20047XS	38°25'47.66578" N	75°47'49.72551" W	-30.028	5.551	4253816.712	430422.741
VVA02BASE	20047XT	38°27'42.12707" N	75°46'46.45697" W	-26.223	9.336	4257331.635	431986.575
GIRDLE	AJ7998	38°06'46.20535" N	75°23'26.92866" W	-24.900	11.395	4218406.515	465740.194
GPS6	DP9260	38°13'52.15768" N	75°08'29.51309" W	-34.904	1.269	4231472.111	487613.023