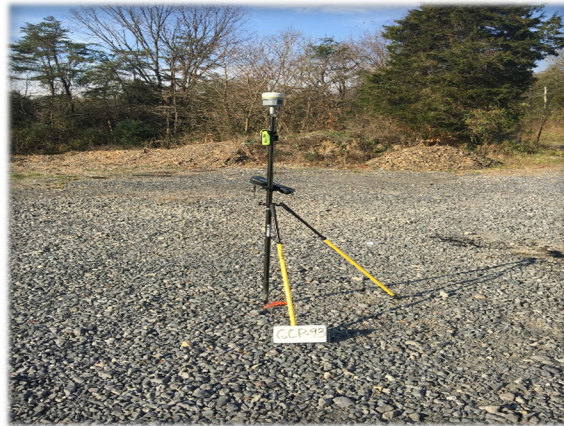


Ground Control Point Survey Report

FEMA Region 3 - Virginia/West Virginia LiDAR Mapping Project

Contract # G16PC00020
Task Order Number: G16PD01238

Prepared for:
USGS – United States Geological Survey



Prepared By:

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	Including: a) Point Documentation Report & Photos of Survey Points	
	b) Final Coordinate List in Excel Format	
	c) NGS Data Sheets for Project Controls	

1. INTRODUCTION

1.1 *Project Summary*

Dewberry Consultants LLC is under contract to USGS United States Geological Survey to provide 100 Ground Control Points in the States of Virginia and West Virginia. Under the above referenced USGS Task Order, Dewberry is tasked to complete the quality assurance of LiDAR mapping products. As part of this work Dewberry staff will complete Ground Control Point surveys that will be used to evaluate the mapping accuracy. The ground survey was conducted between the dates of November 18th and December 21st, 2016.

Existing NGS Control Points were located and surveyed to check the accuracy of the RTK/GPS survey equipment with the results shown in Section 2.4 of this Report.

As an internal QA/QC procedure and to verify that the Check Points meet the 95% confidence level approximately 50% of the points were re-observed and are shown in Section 5 of this report.

Final horizontal coordinates are referenced to UTM Zone 17, NAD83 (2011) in meters. Final Vertical elevations are referenced to NAVD88 in meters using Geoid model 2012B (Geoid12B).

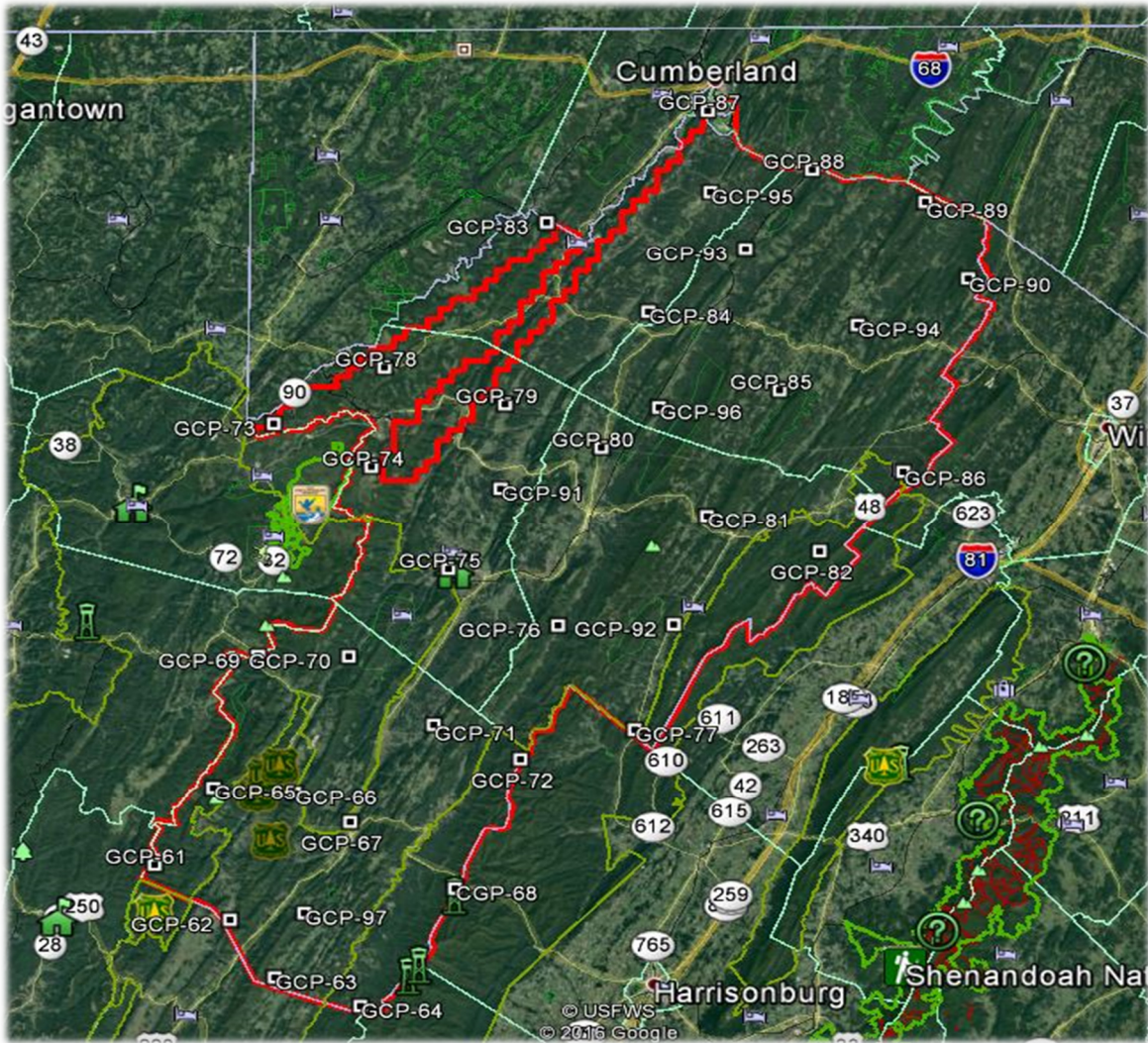
1.2 *Points of Contact*

Questions regarding the technical aspects of this report should be addressed to:

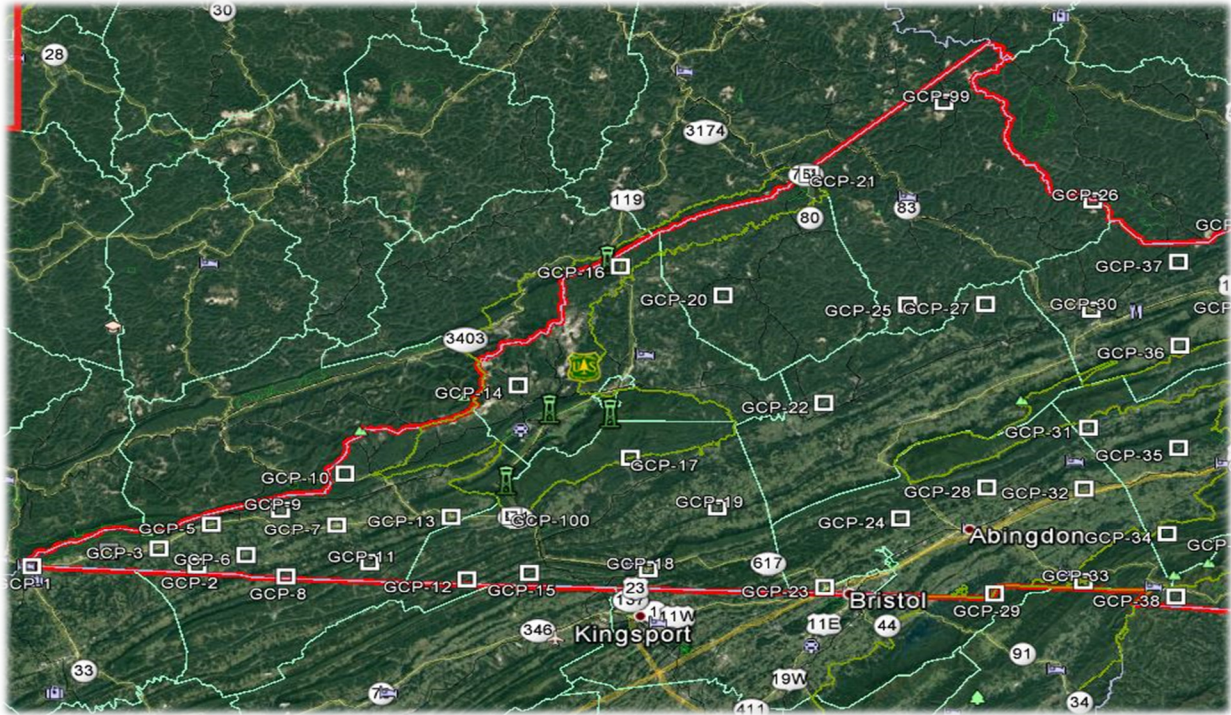
Dewberry Consultants LLC

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1.3 Project Areas



West Virginia



Virginia

PROJECT DETAILS

2.1 *Survey Equipment*

In performing the GPS observations Trimble R-10 GNSS receiver/antenna attached to a two meter fixed height pole with a Trimble TSC3 Data Collector to collect GPS raw data were used to perform the field surveys.

2.2 *Survey Point Detail*

The 100 Ground Control Points were well distributed throughout the project area.

A sketch was made for each location and a nail was set at the point where possible or at an identifiable point. The Ground Control Point locations are detailed on the “Check Point Documentation Report” sheets attached to this report.

2.3 *Network Design*

The GPS survey performed by Dewberry Consultants LLC office located in Lanham, MD was tied to a Real Time Network operated by KEYNET GPS, Inc. The network is a series of “real-time” continuously operating, high precision GPS reference stations. All of the reference stations have been linked together using Trimble GPSNet software, creating a Virtual Reference Station System (VRS).

The Trimble NetR5 Reference Station is a multi-channel, multi-frequency GNSS (Global Navigation Satellite System) receiver designed for use as a stand-alone reference station or as part of a GNSS infrastructure solution. Trimble R-Track technology in the NetR5 receiver supports the modernized GPS L2C and L5 signals as well as GLONASS L1/L2 signals.

2.4 Field Survey Procedures and Analysis

Dewberry field surveyors used Trimble R-10 GNSS receivers, which is a geodetic quality dual frequency GPS receiver, to collect data at each surveyed location.

All locations were occupied once with approximately 50% of the locations being re-observed. All re-observations matched the initially derived station positions within the allowable tolerance of $\pm 5\text{cm}$ or within the 95% confidence level. Each occupation which utilized the VRS network was occupied for approximately three (3) minutes in duration and measured to 180 epochs.

Each occupation which utilized OPUS (if used) was occupied between 20 and 30 minutes.

Field GPS observations are detailed on the “Check Point Documentation Reports” submitted as part of this report.

Six (6) existing NGS monument listed in the NSRS database were located for the West Virginia area as an additional QA/QC method to check the horizontal and vertical accuracy of the VRS network as well as being the primary project control monuments designated as HW1425, AJ8002AI6316, HW1435, HW3473 and JW0308. The results are as follows:

NGS PT. ID	As Surveyed (m)			Published (m)			Differences (m)		
	Northing(m)	Easting(m)	Elev.(m)	Northing(m)	Easting(m)	Elev.(m)	ΔN	ΔE	$\Delta \text{Elev.}$
C 17	4280008.583	645293.262	559.310	4280008.677	645293.111	559.324	N/A	N/A	0.014
FARM	4385420.644	694290.260	205.475	4385420.647	694290.261	205.515	0.003	0.001	0.040
J 13 020	4385919.734	691987.082	185.478	4385919.727	691987.091	185.510	0.007	0.009	0.032
J 17	4297844.385	650850.877	416.156	4297844.444	650850.809	416.152	N/A	N/A	0.004
MIDWAY	4297842.676	650855.348	416.474	4297842.731	650855.284	416.490	N/A	N/A	0.016
W 17	4324270.781	675063.172	250.386	4324270.786	675063.186	250.310	0.005	0.014	N/A

Nine (9) existing NGS monument listed in the NSRS database were located for the Virginia area as an additional QA/QC method to check the horizontal and vertical accuracy of the VRS network as well as being the primary project control monuments designated as GA3309, FZ1073, GX2101, FZ1351, FZ1078, GA1151, GX0591, FZ2792 and GA1485. The results are as follows:

NGS PT. ID	As Surveyed (m)			Published (m)			Differences (m)		
	Northing(m)	Easting(m)	Elev.(m)	Northing(m)	Easting(m)	Elev.(m)	ΔN	ΔE	$\Delta \text{Elev.}$
BRISTOL 2	4050563.133	395032.096	541.690	4050563.127	395032.117	541.617	0.006	0.021	N/A
C 37	4056680.922	429294.989	613.329	4056680.906	429295.016	613.300	0.016	0.027	0.029
GAP AZ MK	4102118.210	433131.972	716.535	4102118.208	433131.971	716.562	0.002	0.001	0.027
Y-505	4089549.569	492361.648	705.700	4089549.578	492361.658	705.682	0.009	0.010	0.018
GLADE	4070966.547	430427.710	665.413	4070966.563	430427.733	665.418	0.016	0.023	0.005
K 424	4095791.999	358276.344	691.917	4095791.996	358276.350	691.881	0.003	0.006	0.036
ORCHARD	4130126.302	536571.799	633.474	4130126.407	536571.876	633.472	N/A	N/A	0.002

SNOW	4048910.733	509987.447	791.030	4048910.880	509987.327	791.020	N/A	N/A	0.010
TON	4070193.650	320400.715	421.537	4070193.739	320400.670	421.530	N/A	N/A	0.007

The above results indicate that the VRS network is providing positional values within the 5cm parameters for this survey.

2.5 Adjustment

The survey data was collected using Virtual Reference Stations (VRS) methodology within a Virtual Reference System (VRS).

The system is designed to provide a true Network RTK performance, the RTKNet software enables high-accuracy positioning in real time across a geographic region. The RTKNet software package uses real-time data streams from KEYNET GPS, Inc system user and generates correction models for high-accuracy RTK GPS corrections throughout the network. Therefore, corrections were applied to the points as they were being collected, thus negating the need for a post process adjustment.

2.6 Data Processing Procedures

After field data is collected the information is downloaded from the data collectors into the office software. The Software program used is called TBC or Trimble Business Center.

Downloaded data is run through the TBC program to obtain the following reports; points report, point comparison report and a point detail report. The reports are reviewed for point accuracy and precision.

After review of the point data an “ASCII” or “txt” file which is the industry standard is created. Point files are loaded into our CADD program (Carlson Survey 2014) to make a visual check of the point data (Pt. #, Coordinates, Elev. and Description). The data can now be imported into the final product.

3. *FINAL COORDINATES*

Virginia

POINT ID	NORTHING (m)	EASTING (m)	ELEV. (m)
GCP-001	4053633.284	262282.735	443.623
GCP-002	4054292.323	288963.544	431.340
GCP-003	4057350.993	282799.805	427.713
GCP-004	4056706.369	274740.825	409.904
GCP-005	4062174.946	291174.164	439.848
GCP-006	4056393.718	296810.480	408.496
GCP-007	4062384.079	311271.098	449.587
GCP-008	4052452.372	303273.110	427.566
GCP-009	4065178.978	302243.956	438.682
GCP-010	4072226.628	312458.169	511.449
GCP-011	4055379.123	316661.256	366.496
GCP-012	4052389.565	332291.879	371.162
GCP-013	4064282.375	329575.183	500.014
GCP-014	4089229.360	339929.165	523.560
GCP-015	4053768.138	342301.026	435.130
GCP-016	4111858.791	355926.177	496.662
GCP-017	4075880.917	358111.257	473.905
GCP-018	4054788.934	361311.784	382.009
GCP-019	4066767.043	372173.427	528.562
GCP-020	4106696.220	372461.081	693.419
GCP-021	4129819.263	385959.397	451.596
GCP-022	4086696.557	388936.489	540.522
GCP-023	4051840.304	389643.132	536.959
GCP-024	4065148.718	401583.272	577.073
GCP-025	4105460.621	401995.100	477.198
GCP-026	4125569.654	431511.891	832.176
GCP-027	4105733.641	414595.019	665.671
GCP-028	4071226.196	415325.178	591.431
GCP-029	4051070.587	416887.895	639.654
GCP-030	4104895.622	431666.621	602.051
GCP-031	4082680.619	431506.380	521.088
GCP-032	4071157.546	430997.468	677.884
GCP-033	4053578.386	431178.208	606.356
GCP-034	4062797.945	444545.311	939.369
GCP-035	4079086.686	446125.846	620.651
GCP-036	4097463.943	442824.784	713.803

GCP-037	4114208.806	445466.515	563.625
GCP-038	4050884.476	446087.333	1077.112
GCP-039	4061687.545	461099.080	936.843
GCP-040	4074762.602	460777.724	852.464
GCP-041	4088505.885	461006.223	690.926
GCP-042	4106829.187	462093.290	923.819
GCP-043	4122882.288	461528.842	771.864
GCP-044	4131436.887	468552.475	840.047
GCP-045	4117744.131	490641.459	660.796
GCP-046	4090259.424	490898.957	743.069
GCP-047	4052507.947	490408.076	780.330
GCP-048	4047743.309	513076.028	822.941
GCP-049	4060843.234	509607.050	765.074
GCP-050	4075762.281	490339.396	666.434
GCP-051	4084746.111	517570.826	617.263
GCP-052	4094984.196	510787.629	699.584
GCP-053	4111595.505	505333.894	695.868
GCP-054	4123937.716	501213.808	560.529
GCP-055	4133706.377	520029.727	487.708
GCP-056	4118558.842	519445.089	561.018
GCP-057	4132361.823	550958.576	641.524
GCP-058	4142185.682	554662.650	551.677
GCP-059	4136425.015	565402.151	472.063
GCP-060	4144406.934	569521.413	832.840
GCP-098	4141131.589	533727.110	692.803
GCP-099	4143810.268	407417.335	288.884
GCP-100	4064589.706	339207.480	406.970

West Virginia

POINT ID	NORTHING (m)	EASTING (m)	ELEV. (m)
GCP-061	4274708.765	619665.925	1177.393
GCP-062	4266720.740	629764.684	859.620
GCP-063	4258871.555	635826.689	828.270
GCP-064	4254237.571	647181.161	731.415
GCP-065	4286171.485	627258.971	1237.307
GCP-066	4285580.214	637978.547	1021.712
GCP-067	4281338.054	645427.688	512.083
GCP-068	4271757.249	659481.718	1045.347
GCP-069	4305684.978	632874.578	987.884

GCP-070	4304365.047	643565.844	434.293
GCP-071	4295914.728	656232.666	605.541
GCP-072	4291123.673	667892.370	919.469
GCP-073	4340020.581	634354.587	923.882
GCP-074	4332512.356	644278.463	1125.033
GCP-075	4318925.039	658053.667	313.414
GCP-076	4310826.440	672540.695	300.160
GCP-077	4295582.160	682926.140	481.850
GCP-078	4348561.191	648890.288	855.262
GCP-079	4343404.094	664956.486	384.806
GCP-080	4336561.576	677337.513	298.250
GCP-081	4327364.093	692019.660	493.573
GCP-082	4322338.753	707065.919	470.307
GCP-083	4370461.110	669997.893	264.541
GCP-084	4357399.851	683772.156	239.296
GCP-085	4346131.387	701377.875	390.759
GCP-086	4334355.856	718006.059	390.156
GCP-087	4387357.994	691148.191	222.732
GCP-088	4378907.265	705181.486	165.578
GCP-089	4374409.365	720333.143	342.610
GCP-090	4363077.581	726214.617	320.764
GCP-091	4330951.100	664583.781	392.894
GCP-092	4311222.635	687873.280	470.944
GCP-093	4366947.858	696506.801	195.659
GCP-094	4355908.326	711586.052	359.217
GCP-095	4375313.468	691683.138	178.996
GCP-096	4343275.961	685387.436	234.268
GCP-097	4267847.931	639559.274	837.349

4. GPS OBSERVATIONS

Virginia

POINT ID	OBSERV. DATE	JULIAN DATE	TIME OF DAY	RE-OBSERV. DATE	RE-OBSERV. TIME
GCP-001	12/8/2016	343	11:36	12/10/2016	10:53
GCP-002	12/9/2016	344	11:11	N/A	N/A
GCP-003	12/8/2016	343	15:16	N/A	N/A
GCP-004	12/8/2016	343	14:09	12/10/2016	12:53
GCP-005	12/8/2016	343	16:40	N/A	N/A
GCP-006	12/9/2016	344	12:36	N/A	N/A
GCP-007	12/11/2016	346	9:39	12/18/2016	9:21
GCP-008	12/9/2016	344	13:30	12/11/2016	12:14
GCP-009	12/11/2016	346	11:36	12/13/2016	11:09
GCP-010	12/12/2016	347	10:13	N/A	N/A
GCP-011	12/9/2016	344	15:24	N/A	N/A
GCP-012	12/10/2016	345	11:29	N/A	N/A
GCP-013	12/11/2016	346	15:31	12/12/2016	16:53
GCP-014	12/16/2016	351	11:34	12/18/2016	11:38
GCP-015	12/10/2016	345	12:54	12/12/2016	11:46
GCP-016	12/18/2016	353	9:32	12/19/2016	10:09
GCP-017	12/15/2016	350	10:57	12/17/2016	11:12
GCP-018	12/10/2016	345	15:57	12/12/2016	10:58
GCP-019	12/14/2016	349	13:45	12/15/2016	12:48
GCP-020	12/17/2016	352	14:28	12/19/2016	13:04
GCP-021	12/18/2016	353	14:21	12/19/2016	15:59
GCP-022	12/15/2016	350	15:56	N/A	N/A
GCP-023	12/13/2016	348	9:50	N/A	N/A
GCP-024	12/13/2016	348	12:54	N/A	N/A
GCP-025	12/16/2016	351	16:35	12/17/2016	12:13
GCP-026	11/18/2016	323	17:48	11/19/2016	10:01
GCP-027	12/16/2016	351	15:05	12/17/2016	10:46
GCP-028	12/14/2016	349	14:00	12/15/2016	11:00
GCP-029	12/13/2016	348	16:42	12/14/2016	14:28
GCP-030	11/17/2016	322	14:33	12/19/2016	10:50
GCP-031	11/17/2016	322	9:45	12/19/2016	14:05
GPC-032	11/18/2016	321	8:32	12/19/2016	16:54
GPC-033	12/19/2016	354	14:00	N/A	N/A
GCP-034	11/15/2016	320	17:26	11/16/2016	8:27

GCP-035	11/17/2016	322	6:56	12/19/2016	15:56
GCP-036	11/11/2016	316	13:25	11/12/2016	8:55
GCP-037	11/10/2016	315	14:15	N/A	N/A
GCP-038	11/15/2016	320	13:04	11/16/2016	10:33
GCP-039	11/14/2016	319	13:14	11/15/2016	7:52
GCP-040	11/12/2016	317	17:03	N/A	N/A
GCP-041	11/11/2016	316	16:21	12/20/2016	17:44
GCP-042	11/11/2016	316	12:01	12/20/2016	14:00
GCP-043	11/10/2016	315	14:30	12/20/2016	15:15
GCP-044	11/10/2016	315	13:25	12/20/2016	16:15
GCP-045	11/10/2016	315	9:00	12/21/2016	11:25
GCP-046	11/10/2016	315	11:51	12/21/2016	15:55
GCP-047	11/13/2016	318	13:06	12/21/2016	8:27
GCP-048	11/13/2016	318	15:13	N/A	N/A
GCP-049	11/13/2016	318	16:09	N/A	N/A
GCP-050	11/10/2016	315	15:50	11/11/2016	9:02
GCP-051	11/9/2016	314	13:47	12/21/2016	13:30
GCP-052	11/9/2016	314	11:10	12/21/2016	14:32
GCP-053	11/8/2016	313	14:52	12/21/2016	13:22
GCP-054	11/10/2016	315	8:00	11/11/2016	8:00
GCP-055	11/8/2016	313	16:50	12/21/2016	9:17
GCP-056	11/8/2016	313	11:54	N/A	N/A
GCP-057	11/8/2016	313	10:30	N/A	N/A
GCP-058	11/8/2016	313	11:42	12/20/2016	14:09
GCP-059	11/7/2016	312	14:21	11/8/16/16	6:50
GCP-060	11/7/2016	312	15:24	11/8/2016	8:20
GCP-098	11/18/2016	323	14:52	11/9/2016	11:50
GCP-099	12/19/2016	354	9:27	N/A	N/A
GCP-100	12/11/2016	346	16:07	12/12/2016	13:59

West Virginia

POINT ID	OBSERV. DATE	JULIAN DATE	TIME OF DAY	RE-OBSERV. DATE	RE-OBSERV. TIME
GCP-061	12/7/2016	342	10:43	12/8/2016	9:55
GCP-062	12/7/2016	342	9:12	12/7/2016	16:05
GCP-063	12/6/2016	341	13:01	12/7/2016	9:35
GCP-064	12/5/2016	340	9:14	12/5/2016	16:05
GCP-065	12/7/2016	342	12:50	N/A	N/A
GCP-066	12/6/2016	341	13:34	12/7/2016	15:06

GCP-067	12/4/2016	339	15:01	N/A	N/A
GCP-068	12/3/2016	338	17:18	12/4/2016	12:39
GCP-069	12/5/2016	340	14:07	12/6/2016	11:33
GCP-070	12/5/2016	340	12:01	12/6/2016	9:38
GCP-071	12/7/2016	342	12:04	N/A	N/A
GCP-072	12/3/2016	338	14:38	12/4/2016	10:08
GCP-073	12/4/2016	339	12:43	N/A	N/A
GCP-074	12/4/2016	339	11:56	12/4/2016	12:00
GCP-075	12/4/2016	339	15:08	12/5/2016	9:10
GCP-076	12/2/2016	337	12:54	12/3/2016	11:57
GCP-077	12/1/2016	336	12:39	N/A	N/A
GCP-078	11/22/2016	327	9:40	11/22/2016	21:45
GCP-079	11/22/2016	327	10:50	11/22/2016	11:00
GCP-080	11/22/2016	327	12:15	12/3/2016	7:44
GCP-081	11/23/2016	328	10:15	12/3/2016	12:55
GCP-082	11/23/2016	328	13:30	N/A	N/A
GCP-083	11/21/2016	326	9:00	12/2/2016	12:11
GCP-084	11/20/2016	325	13:40	N/A	N/A
GCP-085	11/21/2016	326	16:05	12/3/2016	9:37
GCP-086	11/23/2016	328	15:30	N/A	N/A
GCP-087	11/18/2016	323	14:00	12/2/2016	8:18
GCP-088	11/19/2016	324	9:40	12/1/2016	12:18
GCP-089	11/19/2016	324	12:00	12/1/2016	10:46
GCP-090	11/19/2016	324	15:00	12/1/2016	9:46
GCP-091	12/3/2016	338	14:15	12/4/2016	8:15
GCP-092	12/1/2016	336	14:23	N/A	N/A
GCP-093	11/19/2016	324	9:40	12/1/2016	13:10
GCP-094	11/20/2016	325	9:15	12/1/2016	15:30
GCP-095	11/19/2016	324	9:00	12/2/2016	9:51
GCP-096	11/22/2016	327	14:15	12/3/2016	8:55
GCP-097	12/6/2016	341	11:01	N/A	N/A

5. POINT COMPARISON

Virginia

POINT ID	POINT CK	DELTA NORTH (m)	DELTA EAST (m)	VERT. DIFF (m)
GCP-001	GCP-001CK	0.020	0.020	0.029
GCP-004	GCP-004CK	0.013	0.019	0.008
GCP-007	GCP-007CK	0.034	0.032	0.036
GCP-008	GCP-008CK	0.021	0.019	0.033
GCP-009	GCP-009CK	0.002	0.009	0.005
GCP-013	GCP-013CK	0.004	0.008	0.014
GCP-014	GCP-014CK	0.003	0.018	0.048
GCP-015	GCP-015CK	0.012	0.006	0.006
GCP-016	GCP-016CK	0.019	0.010	0.041
GCP-017	GCP-017CK	0.004	0.007	0.009
GCP-018	GCP-018CK	0.009	0.007	0.006
GCP-019	GCP-019CK	0.006	0.003	0.022
GCP-020	GCP-020CK	0.010	0.001	0.047
GCP-021	GCP-021CK	0.007	0.012	0.005
GCP-025	GCP-025CK	0.015	0.002	0.017
GCP-026	GCP-026CK	0.001	0.005	0.012
GCP-027	GCP-027CK	0.010	0.009	0.021
GCP-028	GCP-028CK	0.003	0.006	0.029
GCP-029	GCP-029CK	0.013	0.009	0.008
GCP-030	GCP-030RC	0.001	0.012	0.000
GCP-031	GCP-031RC	0.027	0.019	0.020
GCP-032	GCP-032RC	0.017	0.001	0.043
GCP-034	GCP-034CK	0.003	0.007	0.016
GCP-035	GCP-035RC	0.013	0.012	0.026
GCP-036	GCP-036CK	0.000	0.008	0.007
GCP-038	GCP-038CK	0.004	0.003	0.004
GCP-039	GCP-039CK	0.008	0.002	0.047
GCP-041	GCP-041CK	0.036	0.010	0.006
GCP-042	GCP-042RC	0.013	0.005	0.031
GCP-043	GCP-043RC	0.005	0.000	0.018
GCP-044	GCP-044RC	0.010	0.004	0.023
GCP-045	GCP-045RC	0.001	0.003	0.025
GCP-046	GCP-046RC	0.012	0.002	0.024
GCP-047	GCP-047RC	0.001	0.002	0.046
GCP-050	GCP-050CK	0.014	0.001	0.005
GCP-051	GCP-051RC	0.020	0.003	0.032

GCP-052	GCP-052RC	0.006	0.003	0.043
GCP-053	GCP-053RC	0.005	0.007	0.018
GCP-054	GCP-054CK	0.018	0.005	0.034
GCP-055	GCP-055RC	0.004	0.009	0.023
GCP-058	GCP-058RC	0.002	0.005	0.015
GCP-059	GCP-059CK	0.012	0.007	0.011
GCP-060	GCP-060CK	0.028	0.007	0.028
GCP-098	GCP-098RC	0.015	0.003	0.015
GCP-100	GCP-100CK	0.002	0.013	0.002

West Virginia

POINT ID	POINT CK	DELTA NORTH (m)	DELTA EAST (m)	VERT. DIFF (m)
GCP-061	GCP-061CK	0.006	0.017	0.021
GCP-062	GCP-062CK	0.011	0.014	0.018
GCP-063	GCP-063CK	0.006	0.009	0.029
GCP-064	GCP-064CK	0.001	0.009	0.018
GCP-066	GCP-066CK	0.007	0.004	0.014
GCP-068	GCP-068CK	0.023	0.001	0.000
GCP-069	GCP-069CK	0.016	0.014	0.002
GCP-070	GCP-070CK	0.007	0.002	0.011
GCP-072	GCP-072CK	0.004	0.001	0.021
GCP-074	GCP-074CK	0.004	0.005	0.005
GCP-075	GCP-075CK	0.008	0.002	0.003
GCP-076	GCP-076CK	0.015	0.006	0.003
GCP-078	GCP-078RC	0.001	0.002	0.006
GCP-079	GCP-079CK	0.001	0.005	0.007
GCP-080	GCP-080CK	0.009	0.010	0.018
GCP-081	GCP-081CK	0.018	0.005	0.015
GCP-083	GCP-083CK	0.002	0.000	0.000
GCP-085	GCP-085CK	0.013	0.005	0.015
GCP-087	GCP-087CK	0.001	0.001	0.013
GCP-088	GCP-088CK	0.005	0.001	0.016
GCP-089	GCP-089CK	0.020	0.031	0.003
GCP-090	GCP-090CK	0.001	0.006	0.000
GCP-091	GCP-091CK	0.005	0.002	0.011
GCP-093	GCP-093CK	0.030	0.002	0.006
GCP-094	GCP-094CK	0.011	0.001	0.016
GCP-095	GCP-095CK	0.001	0.001	0.019
GCP-096	GCP-096CK	0.009	0.007	0.001