

Check Point Survey Report

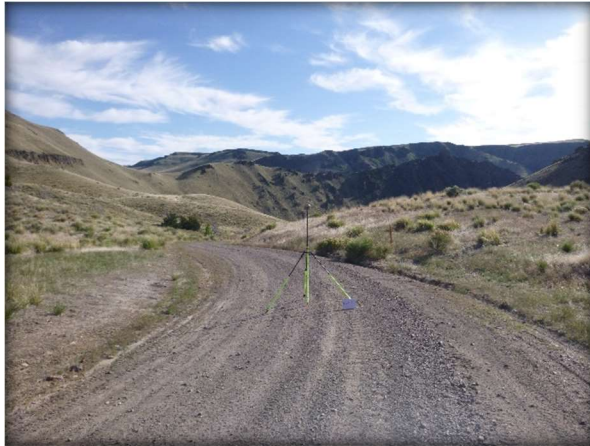
NV NORTHWEST ELKO 2020 D20 Lidar Project

USGS Contract: G16PC00020

Task Order Number: 140G0220F0313

Prepared for:

United States Geological Survey (USGS)



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 Engineers Inc. is under contract to the United States Geological Survey to provide 260 Check Points in the State of Nevada. Under the above referenced USGS Task Order, Dewberry is tasked to complete the quality assurance of LiDAR products. As part of this work Dewberry staff will complete Check Point surveys that will be used to evaluate vertical and horizontal accuracy. The ground survey was conducted from November 2020 thru August, 2021.

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 Ground Control 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 11 North, NAD83 (2011) in meters. Final Vertical elevations are referenced to NAVD88 in meters using Geoid model 2018B (Geoid18B).

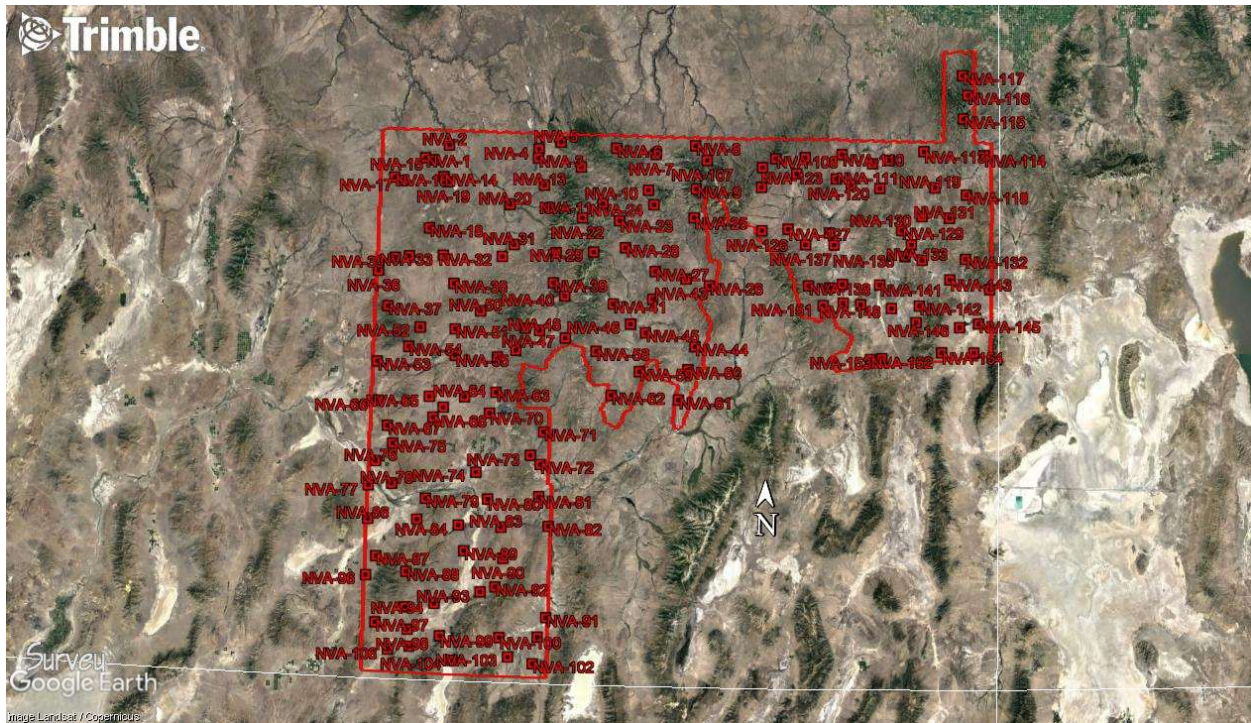
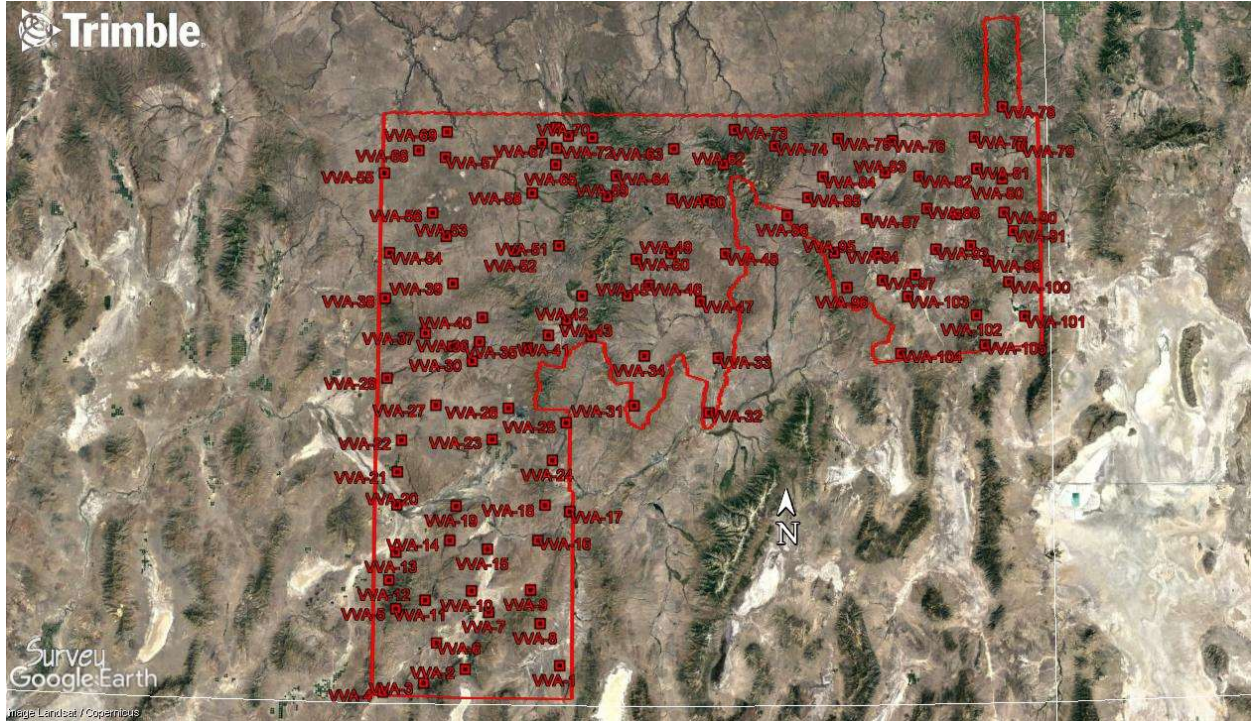
1.2 *Points of Contact*

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

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1.3 Project Area



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 260 Check 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 Check Point locations are detailed on the “Control Point Documentation Report” sheets attached to this report.

2.3 *Network Design*

The GPS survey performed by Dewberry Engineers Inc. office located in Lanham, MD was tied to a Real Time Network operated by Trimble. 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.

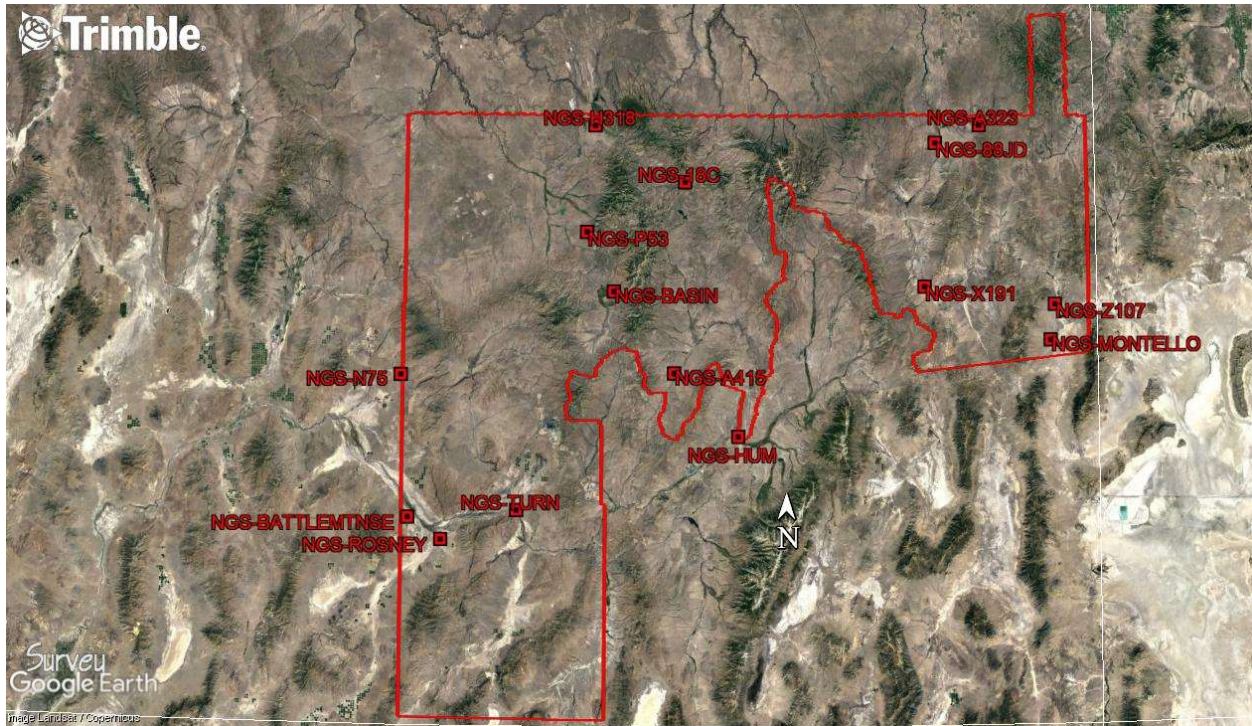
Each occupation which utilized OPUS (if used) was occupied between 20 and 30 minutes. Field GPS observations are detailed on the “Control Point Documentation Reports” submitted as part of this report.

Eleven (11) existing NGS monument listed in the NSRS database were located for the Louisiana 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. The results are as follows:

PT. #	Observed Values			Data Sheet Values			ΔX	ΔY	ΔZ
	NORTHING	EASTING	ELEVS.	NORTHING	EASTING	ELEVS.			
A415	4556755.625	597201.610	1792.336	N/A	N/A	1792.357	N/A	N/A	-0.021
H318	4645922.608	567335.240	1634.992	4645922.566	567335.260	1634.963	0.042	-0.020	0.029
P53	4607311.130	564856.911	1746.832	N/A	N/A	1746.782	N/A	N/A	0.050
MONTELLO	4571311.519	734211.165	1497.041	4571311.524	734211.178	1497.083	-0.005	-0.013	-0.042
TURN	4506576.055	540732.445	1414.283	4506576.036	540732.436	1414.314	0.019	0.009	-0.031
X191	4589595.160	687675.677	1742.776	N/A	N/A	1742.753	N/A	N/A	0.023
Z107	4584253.152	735571.218	1501.732	N/A	N/A	1501.691	N/A	N/A	0.041
88JD	4641753.604	690674.869	1591.494	4641753.579	690674.872	1591.500	0.025	-0.003	-0.006
A323	4648524.639	706689.172	1830.667	N/A	N/A	1830.620	N/A	N/A	0.047
N75	4555041.052	498118.947	1420.862	4555041.019	498118.969	1420.889	0.033	-0.022	-0.027
18C	4625754.835	600114.196	2001.672	N/A	N/A	2001.699	N/A	N/A	-0.027

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

NGS Monuments



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 the Trimble RTX network 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 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 2019) 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/ELEVATIONS

POINT ID	NORTHING (m)	EASTING (m)	ELEV. (m)
UTM 11 North, NAD83 (2011), NAVD 88, Meters, Geoid 18			
NVA			
NVA-1	4638182.852	516987.55	1638.144
NVA-2	4643666.827	526407.017	1581.613
NVA-3	4639691.036	562594.388	1632.273
NVA-4	4643409.776	562722.303	1635.408
NVA-5	4646378.76	571459.407	1633.014
NVA-6	4644757.815	593992.217	2065.816
NVA-7	4642892.66	610011.651	1603.136
NVA-8	4646963.85	625701.819	1941.166
NVA-9	4629570.503	626622.996	2572.591
NVA-10	4628386.953	607399.465	1893.306
NVA-11	4622337.622	589251.662	1750.545
NVA-12	4636687.62	580004.821	1681.383
NVA-13	4628853.944	565433.543	1694.205
NVA-14	4630818.723	524707.819	1602.682
NVA-15	4637495.169	520256.308	1612.284
NVA-16	4629942.8	504857.116	1614.352
NVA-17	4628717.604	508233.403	1608.964
NVA-18	4610026.847	519726.567	1651.665
NVA-19	4628809.877	526480.28	1615.87
NVA-20	4620611.083	551893.529	1543.96
NVA-21	4619875.109	567823.41	1763.125
NVA-22	4616228.817	581279.525	1864.346
NVA-23	4615659.573	596251.152	1899.558
NVA-24	4622608.665	609820.994	2029.88
NVA-25	4617979.12	626163.302	1957.198
NVA-26	4590994.879	633381.275	1933.719
NVA-27	4595881.881	611380.204	1944.678
NVA-28	4604922.401	599045.346	1947.56
NVA-29	4602697.192	586282.611	2180.872
NVA-30	4601831.179	571208.308	1735.748
NVA-31	4604559.096	554138.043	1657.933
NVA-32	4599643.613	549562.697	1595.896
NVA-33	4599228.707	525720.479	1653.432
NVA-34	4598465.309	512045.723	1657.397
NVA-35	4597702.385	506256.297	1602.746
NVA-36	4592224.834	499770.168	1476.574
NVA-37	4578146.428	504225.553	1972.423
NVA-38	4588055.477	530498.102	1722.084

NVA-39	4589765.257	570609.208	1741.375
NVA-40	4584696.572	575383.28	1767.712
NVA-41	4582220.373	594986.424	1876.481
NVA-42	4584729.163	610785.689	1935.884
NVA-43	4593370.296	623853.478	1906.508
NVA-44	4566381.352	628488.459	1765.849
NVA-45	4571173.718	608408.322	1733.786
NVA-46	4574399.115	602235.875	1783.893
NVA-47	4567836.891	576266.256	1845.81
NVA-48	4570431.071	565737.455	1789.732
NVA-49	4571253.691	559969.467	1876.645
NVA-50	4577416.025	541661.51	1720.664
NVA-51	4569850.591	531709.08	1623.695
NVA-52	4570039.95	517596.727	2150.149
NVA-53	4555789.71	500683.872	1424.323
NVA-54	4562170.453	513232.453	1623.502
NVA-55	4559313.075	532153.272	1668.084
NVA-56	4559142.502	549124.849	1815.315
NVA-57	4562197.083	556501.793	1869.752
NVA-58	4563013.335	588779.873	1857.57
NVA-59	4555519.423	606522.212	1934.055
NVA-60	4557014.317	626017.01	1638.71
NVA-61	4544742.115	622678.189	1616.103
NVA-62	4545596.89	595595.073	1837.271
NVA-63	4545047.103	549158.424	1731.37
NVA-64	4542770.483	536506.311	1555.459
NVA-65	4542416.63	522291.262	1523.433
NVA-66	4540048.398	501647.374	1425.349
NVA-67	4530124.475	505751.378	1433.954
NVA-68	4534140.309	524101.477	1487.782
NVA-69	4538274.129	528038.334	1511.322
NVA-70	4536574.494	546823.112	1583.713
NVA-71	4529874.784	568973.775	1618.092
NVA-72	4516772.211	567962.75	1552.412
NVA-73	4520316.161	563924.724	1589.06
NVA-74	4512677.259	542171.176	1413.298
NVA-75	4523092.273	508200.397	1418.876
NVA-76	4515707.726	501453.694	1362.971
NVA-77	4505895.571	498867.06	1374.324
NVA-78	4506898.939	508333.65	1373.33
NVA-79	4501481.807	522272.621	1387.876
NVA-80	4502071.2	547298.128	1521.018
NVA-81	4503838.072	567913.708	1595.4

NVA-82	4492094.617	572188.273	1510.504
NVA-83	4490975.822	553070.262	1447.897
NVA-84	4491184.773	535878.901	1450.975
NVA-85	4492909.785	519035.476	1419.066
NVA-86	4492420.008	499127.234	1463.756
NVA-87	4477513.204	502954.673	1464.407
NVA-88	4471788.447	515448.501	1989.368
NVA-89	4480897.202	538474.199	1451.059
NVA-90	4478534.237	554358.812	1674.52
NVA-91	4455321.132	572564.362	1612.086
NVA-92	4466887.465	551601.111	1584.563
NVA-93	4464640.8	545667.742	1473.712
NVA-94	4459270.399	527257.872	1519.546
NVA-95	4457402.047	515287.508	1738.652
NVA-96	4469689.1	499141.346	1518.901
NVA-97	4450869.868	503570.465	1881.673
NVA-98	4448437.388	516708.611	1531.314
NVA-99	4446289.294	529897.651	1655.853
NVA-100	4446602.712	553964.625	1762.684
NVA-101	4447353.62	569393.579	1664.105
NVA-102	4436503.252	567787.811	1759.095
NVA-103	4438895.845	557705.358	1707.247
NVA-104	4436623.282	535348.612	1748.886
NVA-105	4441613.198	517755.286	1618.175
NVA-106	4440119.599	509053.684	1560.627
NVA-107	4641273.81	630559.884	1795.558
NVA-108	4643041.957	658225.749	2426.128
NVA-109	4643986.578	670081.594	1859.798
NVA-110	4645840.117	684990.659	1759.471
NVA-111	4642703.24	697460.339	1615.071
NVA-112	4644285.179	704173.722	1801.56
NVA-113	4648426.179	718086.817	1775.928
NVA-114	4647924.906	742621.249	1547.573
NVA-115	4662276.568	733596.258	1910.586
NVA-116	4671823.996	735143.311	2207.96
NVA-117	4679757.928	732698.855	2200.359
NVA-118	4631646.71	735967.056	1665.176
NVA-119	4633985.662	723125.432	1753.267
NVA-120	4632857.755	700720.035	1663.656
NVA-121	4633727.291	689115.33	1614.135
NVA-122	4635981.622	683014.696	1941.916
NVA-123	4637307.738	666880.313	1829.97
NVA-124	4639277.92	652978.126	2340.865

NVA-125	4631312.449	652947.308	2008.163
NVA-126	4613919.281	653712.757	1874.036
NVA-127	4614933.786	664199.532	1959.206
NVA-128	4614068.262	680929.098	1702.906
NVA-129	4616286.629	710189.642	1697.4
NVA-130	4622215.863	718211.949	1707.813
NVA-131	4622001.78	729404.328	1842.03
NVA-132	4605718.382	736498.946	1620.037
NVA-133	4604633.133	718913.634	1633.251
NVA-134	4610645.122	714299.964	1621.44
NVA-135	4605789.87	711868.616	1603.783
NVA-136	4609345.483	682985.414	1736.821
NVA-137	4608954.793	671520.035	1833.106
NVA-138	4592503.023	673262.378	1968.647
NVA-139	4592031.005	681915.844	1781.313
NVA-140	4593684.884	686999.556	1803.332
NVA-141	4594045.878	702091.066	1648.096
NVA-142	4586222.99	718445.411	1719.655
NVA-143	4597231.106	730479.715	1550.527
NVA-144	4593915.206	746802.695	1725.9
NVA-145	4579980.932	742894.105	1458.746
NVA-146	4578156.203	735214.979	1497.955
NVA-147	4579458.619	717378.95	1839.813
NVA-148	4584791.345	707204.881	1753.627
NVA-149	4585859.353	694715.362	1705.272
NVA-150	4586157.883	687562.904	1760.169
NVA-151	4584775.553	679530.605	1838.508
NVA-152	4563966.1	699437.535	1903.134
NVA-153	4564449.388	704070.3	1889.442
NVA-154	4567750.447	728240.393	1612.059
NVA-155	4568165.82	741377.631	1556.444
POINT ID	NORTHING (m)	EASTING (m)	ELEV. (m)
UTM 11, NAD83 (2011), NAVD 88, Meters, Geoid 18			
VVA			
VVA-1	4443519.38	568911.914	1687.36
VVA-2	4441530.093	533458.37	1771.008
VVA-3	4436059.142	517885.499	1743.878
VVA-4	4432334.655	502579.844	1568.208
VVA-5	4463758.639	507076.363	1886.906
VVA-6	4451142.021	522488.928	1490.766
VVA-7	4463097.142	541940.574	1450.499
VVA-8	4459196.305	561342.454	1820.787
VVA-9	4471681.188	557567.415	1580.019

VVA-10	4470918.179	535379.407	1467.777
VVA-11	4467180.987	518033.532	1809.848
VVA-12	4474439.207	504278.937	1654.297
VVA-13	4484964.574	506795.604	1395.515
VVA-14	4489759.599	526976.336	1744.773
VVA-15	4486656.833	541138.761	1440.622
VVA-16	4490254.096	560049.28	1574.844
VVA-17	4501248.243	571775.307	1484.625
VVA-18	4503519.49	562452.459	1772.994
VVA-19	4502661.199	529129.861	1397.343
VVA-20	4502667.239	506859.869	1373.587
VVA-21	4514979.612	506870.736	1416.089
VVA-22	4526839.046	508259.104	1426.757
VVA-23	4527710.565	542226.254	1472.281
VVA-24	4520331.496	564964.312	1570.98
VVA-25	4534462.427	569879.222	1639.496
VVA-26	4539517.351	548190.471	1604.714
VVA-27	4540185.952	520975.436	1540.232
VVA-28	4550031.198	502447.648	1403.548
VVA-29	4562278.849	526760.068	1582.525
VVA-30	4556886.203	534322.923	1706.738
VVA-31	4541217.615	595197.72	1890.261
VVA-32	4539026.448	623293.741	1593.034
VVA-33	4559554.025	626428.067	1641.158
VVA-34	4559879.052	598742.766	1796.199
VVA-35	4562139.805	555042.334	1840.183
VVA-36	4564164.136	536960.584	1623.057
VVA-37	4567034.251	516622.95	1805.106
VVA-38	4579835.123	501328.33	1912.764
VVA-39	4585760.868	526604.157	1773.658
VVA-40	4573188.671	537868.09	1669.174
VVA-41	4566961.264	562765.751	1811.674
VVA-42	4572685.979	569516.594	1752.636
VVA-43	4566768.027	578685.781	1894.148
VVA-44	4581888.47	575051.554	1747.075
VVA-45	4582261.345	592052.041	1948.876
VVA-46	4586276.037	600109.873	1835.129
VVA-47	4580567.852	619475.266	1737.548
VVA-48	4598535.247	628430.806	1865.634
VVA-49	4598320.143	608092.761	1931.374
VVA-50	4595907.902	595166.924	1905.984
VVA-51	4600428.129	566091.476	1693.453
VVA-52	4598214.08	549818.141	1605.791

VVA-53	4603378.074	523780.833	1650.025
VVA-54	4596864.671	502588.203	1609.645
VVA-55	4626702.139	500114.805	1632.502
VVA-56	4612088.872	518474.991	1635.878
VVA-57	4632947.437	522907.307	1613.063
VVA-58	4620013.976	555737.27	1566.515
VVA-59	4619101.516	583793.795	1811.814
VVA-60	4618628.404	608201.147	1965.901
VVA-61	4618430.812	621146.023	1825.795
VVA-62	4631781.285	627194.586	2578.171
VVA-63	4637402.71	608493.309	1678.458
VVA-64	4626915.81	587142.161	1730.209
VVA-65	4630778.024	564369.086	1671.402
VVA-66	4638678.443	559087.772	1687.541
VVA-67	4637031.136	564654.508	1642.21
VVA-68	4635357.508	512858.383	1574.985
VVA-69	4642508.812	523382.616	1600.045
VVA-70	4641620.687	568903.038	1644.469
VVA-71	4644656.488	564242.308	1637.005
VVA-72	4641049.141	577941.797	1666.522
VVA-73	4644939.402	631161.168	1724.113
VVA-74	4639120.488	646357.734	2501.018
VVA-75	4642329.856	670062.632	1839.616
VVA-76	4642005.496	690547.299	1592.63
VVA-77	4644081.456	721569.854	1909.188
VVA-78	4655679.237	732004.368	2009.139
VVA-79	4641069.571	739441.332	1575.927
VVA-80	4628584.599	732178.681	1737.901
VVA-81	4632174.604	722585.709	1758.929
VVA-82	4628866.423	700712.432	1703.351
VVA-83	4629996.912	687901.349	1621.807
VVA-84	4627922.113	664545.732	1749.215
VVA-85	4620005.839	658986.933	1851.107
VVA-86	4613226.688	651381.383	1913.527
VVA-87	4612538.204	681209.497	1702.162
VVA-88	4616791.337	703818.343	1794.922
VVA-89	4614796.943	714998.678	1641.917
VVA-90	4615913.599	733026.698	1774.73
VVA-91	4609126.557	736608.063	1659.052
VVA-92	4603219.464	720617.98	1655.316
VVA-93	4601629.996	707489.017	1622.778
VVA-94	4599864.18	685614.456	1788.578
VVA-95	4599639.821	669206.742	1964.632

VVA-96	4586686.263	674145.494	1933.072
VVA-97	4589615.996	687566.461	1740.613
VVA-98	4592000.153	699879.167	1657.772
VVA-99	4597655.949	727506.531	1549.882
VVA-100	4589937.281	735283.738	1529.389
VVA-101	4577173.305	741539.228	1467.172
VVA-102	4577300.599	723205.302	1885.315
VVA-103	4583741.825	697110.955	1741.847
VVA-104	4562392.242	694829.237	1854.256
VVA-105	4566094.934	726655.442	1689.046

4. GPS OBSERVATIONS

POINT ID	OBSERV. DATE	JULIAN DATE	TIME OF DAY (AST)	RE-OBSERV. DATE	RE-OBSERV. TIME
NVA-1	8/8/2021	220	17:49	8/9/2021	12:01
NVA-2	8/8/2021	220	18:46	8/9/2021	7:02
NVA-3	7/26/2021	207	14:34	N/A	N/A
NVA-4	1/13/2021	13	13:28	N/A	N/A
NVA-5	1/13/2021	13	12:15	N/A	N/A
NVA-6	7/28/2021	209	13:34	N/A	N/A
NVA-7	5/28/2021	148	17:35	5/31/2021	16:51
NVA-8	5/31/2021	151	18:22	N/A	N/A
NVA-9	7/25/2021	206	13:42	N/A	N/A
NVA-10	5/28/2021	148	16:21	5/31/2021	19:35
NVA-11	1/11/2021	11	12:40	1/12/2021	16:46
NVA-12	1/13/2021	13	11:08	N/A	N/A
NVA-13	1/12/2021	12	14:42	1/13/2021	15:14
NVA-14	8/9/2021	221	9:58	N/A	N/A
NVA-15	8/9/2021	221	8:37	N/A	N/A
NVA-16	8/8/2021	220	16:17	8/9/2021	14:58
NVA-17	8/9/2021	221	13:12	N/A	N/A
NVA-18	8/3/2021	215	11:56	N/A	N/A
NVA-19	8/9/2021	221	10:26	N/A	N/A
NVA-20	7/29/2021	210	13:17	N/A	N/A
NVA-21	1/12/2021	12	14:04	1/13/2021	15:40
NVA-22	5/21/2021	141	13:22	N/A	N/A
NVA-23	1/11/2021	11	12:11	N/A	N/A
NVA-24	5/28/2021	148	14:55	5/31/2021	20:15
NVA-25	7/25/2021	206	14:55	N/A	N/A
NVA-26	1/15/2021	15	11:31	1/24/2021	11:30
NVA-27	1/24/2021	24	13:56	N/A	N/A
NVA-28	1/11/2021	11	10:56	1/11/2021	15:18
NVA-29	5/21/2021	141	17:12	N/A	N/A
NVA-30	1/12/2021	12	12:31	1/13/2021	17:00
NVA-31	2/1/2021	32	14:55	N/A	N/A
NVA-32	2/1/2021	32	16:05	N/A	N/A
NVA-33	8/3/2021	215	10:20	N/A	N/A
NVA-34	8/2/2021	214	16:45	N/A	N/A
NVA-35	8/2/2021	214	15:59	N/A	N/A
NVA-36	8/2/2021	214	13:59	N/A	N/A

NVA-37	7/31/2021	212	15:46	N/A	N/A
NVA-38	8/3/2021	215	7:58	N/A	N/A
NVA-39	2/1/2021	32	13:23	N/A	N/A
NVA-40	1/12/2021	12	10:34	2/1/2021	12:57
NVA-41	1/11/2021	11	16:41	N/A	N/A
NVA-42	1/24/2021	24	17:04	N/A	N/A
NVA-43	1/15/2021	15	16:56	N/A	N/A
NVA-44	1/11/2021	11	12:23	N/A	N/A
NVA-45	1/12/2021	12	14:39	N/A	N/A
NVA-46	1/9/2021	9	14:15	1/11/2021	17:03
NVA-47	1/10/2021	10	16:48	2/1/2021	12:26
NVA-48	1/21/2021	21	13:13	1/27/2021	11:16
NVA-49	1/26/2021	26	14:45	N/A	N/A
NVA-50	5/29/2021	149	17:06	N/A	N/A
NVA-51	1/30/2021	30	17:00	N/A	N/A
NVA-52	7/30/2021	211	13:01	N/A	N/A
NVA-53	1/28/2021	28	16:07	N/A	N/A
NVA-54	1/30/2021	30	15:50	N/A	N/A
NVA-55	1/28/2021	28	13:27	N/A	N/A
NVA-56	1/26/2021	26	16:18	1/27/2021	14:49
NVA-57	1/25/2021	25	16:09	1/30/2021	12:14
NVA-58	1/9/2021	9	15:55	1/10/2021	17:12
NVA-59	1/12/2021	12	13:05	N/A	N/A
NVA-60	1/11/2021	11	10:18	N/A	N/A
NVA-61	1/10/2021	10	13:40	N/A	N/A
NVA-62	1/9/2021	9	11:30	1/10/2021	15:45
NVA-63	1/14/2021	14	15:34	1/29/2021	13:00
NVA-64	5/27/2021	208	15:45	N/A	N/A
NVA-65	1/28/2021	28	13:16	N/A	N/A
NVA-66	1/27/2021	27	16:10	1/28/2021	14:55
NVA-67	1/27/2021	27	15:27	1/28/2021	14:22
NVA-68	1/28/2021	28	11:43	N/A	N/A
NVA-69	5/27/2021	208	16:20	N/A	N/A
NVA-70	1/14/2021	14	14:44	1/29/2021	11:49
NVA-71	1/24/2021	24	12:39	1/29/2021	15:16
NVA-72	1/24/2021	24	11:25	1/29/2021	14:28
NVA-73	2/3/2021	34	14:52	N/A	N/A
NVA-74	1/14/2021	14	13:34	1/29/2021	10:38
NVA-75	1/26/2021	26	17:05	1/27/2021	17:12
NVA-76	1/26/2021	26	16:25	N/A	N/A

NVA-77	11/4/2020	309	18:16	1/26/2021	14:43
NVA-78	1/26/2021	26	15:41	1/27/2021	17:44
NVA-79	11/4/2020	309	15:53	1/14/2021	16:39
NVA-80	11/5/2020	310	14:35	1/14/2021	12:28
NVA-81	11/4/2020	309	12:51	1/14/2021	10:28
NVA-82	1/9/2021	9	13:00	1/9/2021	17:37
NVA-83	1/30/2021	30	11:49	2/2/2021	11:00
NVA-84	1/24/2021	24	15:45	1/25/2021	11:18
NVA-85	1/24/2021	24	16:56	1/25/2021	10:18
NVA-86	1/26/2021	26	9:12	1/26/2021	13:46
NVA-87	1/26/2021	26	10:57	1/27/2021	12:53
NVA-88	5/24/2021	144	12:48	6/1/2021	13:28
NVA-89	1/25/2021	25	12:04	1/25/2021	17:52
NVA-90	1/30/2021	30	15:14	2/2/2021	17:00
NVA-91	1/9/2021	9	14:54	N/A	N/A
NVA-92	1/30/2021	30	14:25	N/A	N/A
NVA-93	1/30/2021	30	14:03	2/2/2021	15:59
NVA-94	1/25/2021	25	13:31	2/2/2021	11:53
NVA-95	5/24/2021	144	14:01	N/A	N/A
NVA-96	1/26/2021	26	12:07	1/27/2021	13:36
NVA-97	5/24/2021	144	17:54	N/A	N/A
NVA-98	1/25/2021	25	16:15	N/A	N/A
NVA-99	2/2/2021	34	12:30	N/A	N/A
NVA-100	1/10/2021	10	15:39	N/A	N/A
NVA-101	1/9/2021	9	15:44	N/A	N/A
NVA-102	1/10/2021	10	12:49	1/10/2021	17:33
NVA-103	1/10/2021	10	14:39	N/A	N/A
NVA-104	1/25/2021	25	14:51	2/2/2021	13:03
NVA-105	2/2/2021	33	14:17	N/A	N/A
NVA-106	5/24/2021	144	14:51	N/A	N/A
NVA-107	7/24/2021	205	16:09	7/25/2021	12:13
NVA-108	7/22/2021	203	17:32	N/A	N/A
NVA-109	1/20/2021	20	14:21	N/A	N/A
NVA-110	1/22/2021	22	11:40	1/22/2021	18:01
NVA-111	1/21/2021	21	11:48	1/22/2021	12:43
NVA-112	1/21/2021	21	13:59	1/22/2021	13:00
NVA-113	1/21/2021	21	15:49	1/22/2021	14:05
NVA-114	7/20/2021	201	11:01	N/A	N/A
NVA-115	7/19/2021	200	15:10	N/A	N/A
NVA-116	7/19/2021	200	14:07	7/21/2021	14:49

NVA-117	7/19/2021	200	13:04	7/21/2021	13:51
NVA-118	1/18/2021	18	15:05	N/A	N/A
NVA-119	1/17/2021	17	13:31	1/19/2021	14:48
NVA-120	1/21/2021	21	12:58	1/22/2021	11:46
NVA-121	1/15/2021	15	15:07	1/16/2021	13:04
NVA-122	1/16/2021	16	13:38	N/A	N/A
NVA-123	1/20/2021	20	13:46	N/A	N/A
NVA-124	7/22/2021	203	16:35	N/A	N/A
NVA-125	7/22/2021	203	15:28	N/A	N/A
NVA-126	1/20/2021	20	12:18	1/20/2021	16:20
NVA-127	1/20/2021	20	11:20	1/20/2021	16:42
NVA-128	1/15/2021	15	13:54	1/16/2021	11:58
NVA-129	1/19/2021	19	12:36	N/A	N/A
NVA-130	1/17/2021	17	11:51	1/19/2021	14:12
NVA-131	1/18/2021	18	15:41	N/A	N/A
NVA-132	1/18/2021	18	12:54	N/A	N/A
NVA-133	1/17/2021	17	14:24	1/19/2021	11:51
NVA-134	1/17/2021	17	11:09	1/19/2021	12:13
NVA-135	1/17/2021	17	10:49	1/17/2021	16:03
NVA-136	1/15/2021	15	13:31	1/16/2021	11:44
NVA-137	1/18/2021	18	16:35	1/23/2021	12:13
NVA-138	1/18/2021	18	12:30	1/23/2021	14:55
NVA-139	1/15/2021	15	16:27	1/16/2021	10:05
NVA-140	1/15/2021	15	12:40	1/16/2021	11:16
NVA-141	1/16/2021	16	16:38	1/17/2021	16:32
NVA-142	1/19/2021	19	13:21	N/A	N/A
NVA-143	1/17/2021	17	15:30	1/19/2021	10:51
NVA-144	1/16/2021	16	15:16	N/A	N/A
NVA-145	1/16/2021	16	15:57	1/17/2021	17:25
NVA-146	1/16/2021	16	16:27	1/19/2021	17:36
NVA-147	1/19/2021	19	14:30	N/A	N/A
NVA-148	1/20/2021	20	13:39	N/A	N/A
NVA-149	1/20/2021	20	10:37	1/20/2021	15:39
NVA-150	1/15/2021	15	11:39	1/15/2021	16:55
NVA-151	1/16/2021	16	10:29	N/A	N/A
NVA-152	1/17/2021	17	13:11	N/A	N/A
NVA-153	1/17/2021	17	14:20	N/A	N/A
NVA-154	1/16/2021	16	11:39	N/A	N/A
NVA-155	1/16/2021	16	13:30	1/17/2021	16:50

POINT ID	OBSERV. DATE	JULIAN DATE	TIME OF DAY (AST)	RE-OBSERV. DATE	RE-OBSERV. TIME
VVA-1	1/9/2021	9	16:30	N/A	N/A
VVA-2	1/25/2021	25	14:33	2/2/2021	12:49
VVA-3	2/2/2021	33	14:40	N/A	N/A
VVA-4	5/24/2021	144	15:44	N/A	N/A
VVA-5	1/26/2021	26	12:48	N/A	N/A
VVA-6	1/25/2021	25	15:50	2/2/2021	13:53
VVA-7	1/30/2021	30	13:43	2/2/2021	15:42
VVA-8	1/10/2021	10	11:47	N/A	N/A
VVA-9	1/30/2021	30	15:38	2/2/2021	16:33
VVA-10	1/25/2021	25	12:50	1/25/2021	17:32
VVA-11	5/24/2021	144	12:15	6/1/2021	13:12
VVA-12	1/26/2021	26	11:16	1/27/2021	13:07
VVA-13	1/26/2021	26	10:03	1/27/2021	12:26
VVA-14	1/24/2021	24	16:10	1/25/2021	10:51
VVA-15	1/25/2021	25	11:43	2/2/2021	11:26
VVA-16	1/30/2021	30	12:19	N/A	N/A
VVA-17	1/9/2021	9	11:15	1/10/2021	10:23
VVA-18	1/24/2021	24	14:22	N/A	N/A
VVA-19	11/4/2020	325	15:13	1/14/2021	16:53
VVA-20	1/26/2021	26	15:24	1/28/2021	9:45
VVA-21	1/26/2021	26	16:00	1/28/2021	10:16
VVA-22	1/27/2021	27	14:57	1/28/2021	10:40
VVA-23	1/14/2021	14	14:11	1/29/2021	11:13
VVA-24	1/24/2021	24	13:41	1/29/2021	15:52
VVA-25	1/24/2021	24	13:00	1/29/2021	15:30
VVA-26	1/14/2021	14	14:58	1/29/2021	12:10
VVA-27	1/28/2021	28	13:34	N/A	N/A
VVA-28	1/28/2021	28	15:26	N/A	N/A
VVA-29	1/28/2021	28	16:06	1/30/2021	13:39
VVA-30	1/28/2021	28	14:08	N/A	N/A
VVA-31	1/9/2021	9	11:03	1/10/2021	15:31
VVA-32	1/10/2021	10	9:18	N/A	N/A
VVA-33	1/11/2021	11	11:06	N/A	N/A
VVA-34	1/9/2021	9	13:08	1/13/2021	9:44
VVA-35	1/25/2021	25	16:51	1/27/2021	17:16
VVA-36	1/27/2021	27	16:44	1/28/2021	12:38
VVA-37	7/30/2021	211	12:19	N/A	N/A
VVA-38	7/31/2021	210	15:10	N/A	N/A
VVA-39	8/3/2021	215	9:14	N/A	N/A
VVA-40	5/29/2021	149	15:55	N/A	N/A

VVA-41	1/21/2021	21	13:56	1/27/2021	11:57
VVA-42	1/25/2021	25	11:52	1/26/2021	13:04
VVA-43	1/10/2021	10	16:17	2/2/2021	12:16
VVA-44	1/12/2021	12	10:17	2/2/2021	12:49
VVA-45	1/11/2021	11	16:24	N/A	N/A
VVA-46	1/11/2021	11	10:14	1/13/2021	10:05
VVA-47	1/11/2021	11	15:02	N/A	N/A
VVA-48	1/15/2021	15	13:18	N/A	N/A
VVA-49	1/13/2021	13	15:33	N/A	N/A
VVA-50	5/26/2021	146	15:40	N/A	N/A
VVA-51	1/12/2021	12	12:55	1/13/2021	16:42
VVA-52	2/1/2021	32	16:20	N/A	N/A
VVA-53	8/3/2021	215	10:53	N/A	N/A
VVA-54	8/2/2021	214	14:44	N/A	N/A
VVA-55	8/8/2021	220	15:39	8/9/2021	15:24
VVA-56	8/3/2021	215	12:21	N/A	N/A
VVA-57	8/9/2021	221	9:30	N/A	N/A
VVA-58	7/29/2021	210	12:28	N/A	N/A
VVA-59	1/11/2021	11	13:40	N/A	N/A
VVA-60	2/4/2021	35	11:43	N/A	N/A
VVA-61	5/31/2021	151	12:41	N/A	N/A
VVA-62	7/25/2021	206	13:17	N/A	N/A
VVA-63	5/28/2021	148	19:00	N/A	N/A
VVA-64	1/11/2021	11	14:08	1/12/2021	16:31
VVA-65	1/12/2021	12	15:01	1/13/2021	15:04
VVA-66	7/26/2021	207	13:00	N/A	N/A
VVA-67	7/27/2021	208	15:46	N/A	N/A
VVA-68	8/8/2021	220	17:21	8/9/2021	12:20
VVA-69	8/8/2021	220	18:21	8/9/2021	8:05
VVA-70	7/26/2021	207	16:29	N/A	N/A
VVA-71	1/13/2021	13	13:07	N/A	N/A
VVA-72	1/13/2021	13	11:26	N/A	N/A
VVA-73	7/24/2021	205	15:43	7/25/2021	11:51
VVA-74	7/24/2021	205	13:07	N/A	N/A
VVA-75	1/20/2021	20	14:07	N/A	N/A
VVA-76	1/21/2021	21	11:22	1/22/2021	10:36
VVA-77	1/21/2021	21	15:25	1/22/2021	14:25
VVA-78	7/19/2021	200	16:23	N/A	N/A
VVA-79	7/20/2021	201	11:59	N/A	N/A
VVA-80	1/18/2021	18	14:45	N/A	N/A
VVA-81	1/17/2021	17	12:43	1/19/2021	14:40
VVA-82	1/21/2021	21	12:40	1/22/2021	12:04

VVA-83	1/15/2021	15	14:42	1/23/2021	11:14
VVA-84	1/20/2021	20	13:07	N/A	N/A
VVA-85	1/20/2021	20	12:41	N/A	N/A
VVA-86	1/20/2021	20	12:00	1/20/2021	16:04
VVA-87	1/16/2021	16	12:16	N/A	N/A
VVA-88	1/19/2021	19	13:04	N/A	N/A
VVA-89	1/17/2021	17	11:30	1/19/2021	13:52
VVA-90	1/18/2021	18	13:44	N/A	N/A
VVA-91	1/18/2021	18	13:14	N/A	N/A
VVA-92	1/17/2021	17	14:36	1/19/2021	11:41
VVA-93	1/17/2021	17	10:18	1/17/2021	16:19
VVA-94	1/15/2021	15	12:59	1/21/2021	10:24
VVA-95	1/18/2021	18	13:29	1/23/2021	13:38
VVA-96	1/18/2021	18	11:33	1/23/2021	15:17
VVA-97	1/15/2021	15	11:56	1/15/2021	16:46
VVA-98	1/16/2021	16	16:16	1/17/2021	16:39
VVA-99	1/17/2021	17	15:08	1/19/2021	11:03
VVA-100	1/18/2021	18	11:57	1/18/2021	16:46
VVA-101	1/16/2021	16	14:20	1/17/2021	17:14
VVA-102	1/19/2021	19	16:03	N/A	N/A
VVA-103	1/20/2021	20	12:26	N/A	N/A
VVA-104	1/17/2021	17	12:13	N/A	N/A
VVA-105	1/16/2021	16	12:10	N/A	N/A

5. POINT COMPARISON

Point ID	Point CK	Delta North (M)	Delta East (M)	Vertical Difference (M)
NVA				
NVA-001	NVA-001 CK	-0.003	-0.015	0.002
NVA-002	NVA-002 CK	-0.012	-0.018	-0.011
NVA-003	NVA-003 CK	N/A	N/A	N/A
NVA-004	NVA-004 CK	N/A	N/A	N/A
NVA-005	NVA-005 CK	N/A	N/A	N/A
NVA-006	NVA-006 CK	N/A	N/A	N/A
NVA-007	NVA-007 CK	-0.017	0.012	-0.013
NVA-008	NVA-008 CK	N/A	N/A	N/A
NVA-009	NVA-009 CK	N/A	N/A	N/A
NVA-010	NVA-010 CK	-0.011	-0.003	0.023
NVA-011	NVA-011 CK	-0.023	-0.015	0.001
NVA-012	NVA-012 CK	N/A	N/A	N/A
NVA-013	NVA-013 CK	-0.020	0.032	-0.021
NVA-014	NVA-014 CK	N/A	N/A	N/A
NVA-015	NVA-015 CK	N/A	N/A	N/A
NVA-016	NVA-016 CK	-0.009	0.000	0.044
NVA-017	NVA-017 CK	N/A	N/A	N/A
NVA-018	NVA-018 CK	N/A	N/A	N/A
NVA-019	NVA-019 CK	N/A	N/A	N/A
NVA-020	NVA-020 CK	N/A	N/A	N/A
NVA-021	NVA-021 CK	-0.019	0.032	0.043
NVA-022	NVA-022 CK	N/A	N/A	N/A
NVA-023	NVA-023 CK	-0.009	-0.013	-0.021
NVA-024	NVA-024 CK	-0.009	-0.021	0.015
NVA-025	NVA-025 CK	N/A	N/A	N/A
NVA-026	NVA-026 CK	-0.047	0.019	-0.014
NVA-027	NVA-027 CK	N/A	N/A	N/A
NVA-028	NVA-028 CK	0.027	-0.012	-0.013
NVA-029	NVA-029 CK	N/A	N/A	N/A
NVA-030	NVA-030 CK	-0.010	0.001	-0.022
NVA-031	NVA-031 CK	N/A	N/A	N/A
NVA-032	NVA-032 CK	N/A	N/A	N/A
NVA-033	NVA-033 CK	N/A	N/A	N/A
NVA-034	NVA-034 CK	N/A	N/A	N/A
NVA-035	NVA-035 CK	N/A	N/A	N/A
NVA-036	NVA-036 CK	N/A	N/A	N/A
NVA-037	NVA-037 CK	N/A	N/A	N/A
NVA-038	NVA-038 CK	N/A	N/A	N/A
NVA-039	NVA-039 CK	N/A	N/A	N/A

NVA-040	NVA-040 CK	0.032	0.006	-0.011
NVA-041	NVA-041 CK	N/A	N/A	N/A
NVA-042	NVA-042 CK	N/A	N/A	N/A
NVA-043	NVA-043 CK	N/A	N/A	N/A
NVA-044	NVA-044 CK	N/A	N/A	N/A
NVA-045	NVA-045 CK	N/A	N/A	N/A
NVA-046	NVA-046 CK	-0.006	-0.028	0.005
NVA-047	NVA-047 CK	-0.004	0.000	-0.029
NVA-048	NVA-048 CK	-0.009	0.024	-0.034
NVA-049	NVA-049 CK	N/A	N/A	N/A
NVA-050	NVA-050 CK	N/A	N/A	N/A
NVA-051	NVA-051 CK	N/A	N/A	N/A
NVA-052	NVA-052 CK	N/A	N/A	N/A
NVA-053	NVA-053 CK	N/A	N/A	N/A
NVA-054	NVA-054 CK	N/A	N/A	N/A
NVA-055	NVA-055 CK	N/A	N/A	N/A
NVA-056	NVA-056 CK	-0.006	-0.027	0.027
NVA-057	NVA-057 CK	0.032	0.008	-0.001
NVA-058	NVA-058 CK	-0.017	-0.012	-0.020
NVA-059	NVA-059 CK	N/A	N/A	N/A
NVA-060	NVA-060 CK	N/A	N/A	N/A
NVA-061	NVA-061 CK	N/A	N/A	N/A
NVA-062	NVA-062 CK	0.015	0.023	-0.013
NVA-063	NVA-063 CK	0.024	0.015	-0.022
NVA-064	NVA-064 CK	N/A	N/A	N/A
NVA-065	NVA-065 CK	-0.013	0.007	0.004
NVA-066	NVA-066 CK	0.003	0.015	0.021
NVA-067	NVA-067 CK	-0.003	-0.019	0.036
NVA-068	NVA-068 CK	0.008	-0.014	0.001
NVA-069	NVA-069 CK	N/A	N/A	N/A
NVA-070	NVA-070 CK	-0.006	0.033	-0.010
NVA-071	NVA-071 CK	-0.004	0.009	-0.009
NVA-072	NVA-072 CK	-0.004	0.011	-0.004
NVA-073	NVA-073 CK	N/A	N/A	N/A
NVA-074	NVA-074 CK	-0.009	0.017	0.029
NVA-075	NVA-075 CK	-0.016	-0.009	0.014
NVA-076	NVA-076 CK	N/A	N/A	N/A
NVA-077	NVA-077 CK	N/A	N/A	N/A
NVA-078	NVA-078 CK	0.025	0.018	0.009
NVA-079	NVA-079 CK	-0.014	-0.003	-0.013
NVA-080	NVA-080 CK	-0.014	0.018	-0.025
NVA-081	NVA-081 CK	0.003	0.002	0.018
NVA-082	NVA-082 CK	-0.005	-0.005	0.019

NVA-083	NVA-083 CK	0.033	-0.001	-0.001
NVA-084	NVA-084 CK	-0.007	0.028	0.019
NVA-085	NVA-085 CK	-0.016	0.001	0.005
NVA-086	NVA-086 CK	-0.007	0.008	0.035
NVA-087	NVA-087 CK	0.012	-0.002	0.001
NVA-088	NVA-088 CK	0.027	0.002	0.019
NVA-089	NVA-089 CK	0.022	0.007	-0.034
NVA-090	NVA-090 CK	-0.008	-0.009	0.011
NVA-091	NVA-091 CK	N/A	N/A	N/A
NVA-092	NVA-092 CK	0.023	-0.010	-0.009
NVA-093	NVA-093 CK	0.014	0.000	0.004
NVA-094	NVA-094 CK	0.012	0.023	-0.015
NVA-095	NVA-095 CK	N/A	N/A	N/A
NVA-096	NVA-096 CK	0.004	-0.034	0.044
NVA-097	NVA-097 CK	N/A	N/A	N/A
NVA-098	NVA-098 CK	N/A	N/A	N/A
NVA-099	NVA-099 CK	N/A	N/A	N/A
NVA-100	NVA-100 CK	N/A	N/A	N/A
NVA-101	NVA-101 CK	N/A	N/A	N/A
NVA-102	NVA-102 CK	0.005	0.006	0.002
NVA-103	NVA-103 CK	N/A	N/A	N/A
NVA-104	NVA-104 CK	0.000	-0.001	-0.027
NVA-105	NVA-105 CK	N/A	N/A	N/A
NVA-106	NVA-106 CK	N/A	N/A	N/A
NVA-107	NVA-107 CK	0.017	-0.012	0.004
NVA-108	NVA-108 CK	N/A	N/A	N/A
NVA-109	NVA-109 CK	N/A	N/A	N/A
NVA-110	NVA-110 CK	0.014	-0.014	-0.008
NVA-111	NVA-111 CK	0.010	-0.023	0.020
NVA-112	NVA-112 CK	0.011	-0.012	0.029
NVA-113	NVA-113 CK	-0.005	-0.003	-0.024
NVA-114	NVA-114 CK	N/A	N/A	N/A
NVA-115	NVA-115 CK	N/A	N/A	N/A
NVA-116	NVA-116 CK	-0.013	0.023	0.029
NVA-117	NVA-117 CK	-0.015	0.000	-0.027
NVA-118	NVA-118 CK	N/A	N/A	N/A
NVA-119	NVA-119 CK	0.015	0.010	0.027
NVA-120	NVA-120 CK	-0.011	-0.016	-0.034
NVA-121	NVA-121 CK	-0.009	0.021	-0.044
NVA-122	NVA-122 CK	N/A	N/A	N/A
NVA-123	NVA-123 CK	N/A	N/A	N/A
NVA-124	NVA-124 CK	N/A	N/A	N/A
NVA-125	NVA-125 CK	N/A	N/A	N/A

NVA-126	NVA-126 CK	-0.030	0.012	0.019
NVA-127	NVA-127 CK	0.011	0.011	0.029
NVA-128	NVA-128 CK	-0.009	-0.012	-0.005
NVA-129	NVA-129 CK	N/A	N/A	N/A
NVA-130	NVA-130 CK	0.023	0.005	0.016
NVA-131	NVA-131 CK	N/A	N/A	N/A
NVA-132	NVA-132 CK	N/A	N/A	N/A
NVA-133	NVA-133 CK	0.007	0.001	-0.035
NVA-134	NVA-134 CK	0.017	0.016	0.015
NVA-135	NVA-135 CK	0.014	-0.025	-0.019
NVA-136	NVA-136 CK	-0.014	-0.009	-0.028
NVA-137	NVA-137 CK	0.036	0.008	0.041
NVA-138	NVA-138 CK	N/A	N/A	N/A
NVA-139	NVA-139 CK	0.002	0.005	-0.020
NVA-140	NVA-140 CK	-0.007	0.017	-0.044
NVA-141	NVA-141 CK	-0.027	-0.008	-0.010
NVA-142	NVA-142 CK	N/A	N/A	N/A
NVA-143	NVA-143 CK	0.012	-0.006	-0.006
NVA-144	NVA-144 CK	N/A	N/A	N/A
NVA-145	NVA-145 CK	-0.007	0.008	-0.014
NVA-146	NVA-146 CK	0.012	0.025	-0.002
NVA-147	NVA-147 CK	N/A	N/A	N/A
NVA-148	NVA-148 CK	N/A	N/A	N/A
NVA-149	NVA-149 CK	-0.020	0.007	0.021
NVA-150	NVA-150 CK	-0.016	-0.003	-0.015
NVA-151	NVA-151 CK	N/A	N/A	N/A
NVA-152	NVA-152 CK	N/A	N/A	N/A
NVA-153	NVA-153 CK	N/A	N/A	N/A
NVA-154	NVA-154 CK	N/A	N/A	N/A
NVA-155	NVA-155 CK	0.004	0.010	0.019

Point ID	Point CK	Delta North (M)	Delta East (M)	Vertical Difference (M)
VVA				
VVA-1	VVA-1 CK	N/A	N/A	N/A
VVA-2	VVA-2 CK	-0.014	0.014	0.011
VVA-3	VVA-3 CK	N/A	N/A	N/A
VVA-4	VVA-4 CK	N/A	N/A	N/A
VVA-5	VVA-5 CK	N/A	N/A	N/A
VVA-6	VVA-6 CK	0.008	0.004	-0.013
VVA-7	VVA-7 CK	-0.009	0.029	0.002
VVA-8	VVA-8 CK	N/A	N/A	N/A
VVA-9	VVA-9 CK	N/A	N/A	N/A

VVA-10	VVA-10 CK	-0.009	0.013	-0.023
VVA-11	VVA-11 CK	-0.009	0.010	0.013
VVA-12	VVA-12 CK	-0.031	-0.017	0.023
VVA-13	VVA-13 CK	0.023	-0.004	0.041
VVA-14	VVA-14 CK	-0.013	0.024	0.041
VVA-15	VVA-15 CK	-0.019	-0.023	0.001
VVA-16	VVA-16 CK	N/A	N/A	N/A
VVA-17	VVA-17 CK	-0.021	0.042	0.048
VVA-18	VVA-18 CK	N/A	N/A	N/A
VVA-19	VVA-19 CK	-0.028	0.029	-0.010
VVA-20	VVA-20 CK	-0.005	0.009	0.016
VVA-21	VVA-21 CK	0.017	0.016	0.030
VVA-22	VVA-22 CK	0.016	0.014	0.023
VVA-23	VVA-23 CK	0.017	0.004	0.011
VVA-24	VVA-24 CK	-0.001	0.000	-0.026
VVA-25	VVA-25 CK	-0.002	-0.001	0.043
VVA-26	VVA-26 CK	0.025	0.016	0.029
VVA-27	VVA-27 CK	0.007	-0.002	0.013
VVA-28	VVA-28 CK	N/A	N/A	N/A
VVA-29	VVA-29 CK	0.032	0.016	0.010
VVA-30	VVA-30 CK	N/A	N/A	N/A
VVA-31	VVA-31 CK	-0.011	-0.034	-0.024
VVA-32	VVA-32 CK	N/A	N/A	N/A
VVA-33	VVA-33 CK	N/A	N/A	N/A
VVA-34	VVA-34 CK	0.011	0.013	0.027
VVA-35	VVA-35 CK	0.006	0.008	0.015
VVA-36	VVA-36 CK	0.001	-0.010	-0.046
VVA-37	VVA-37 CK	N/A	N/A	N/A
VVA-38	VVA-38 CK	N/A	N/A	N/A
VVA-39	VVA-39 CK	N/A	N/A	N/A
VVA-40	VVA-40 CK	N/A	N/A	N/A
VVA-41	VVA-41 CK	0.022	-0.026	-0.002
VVA-42	VVA-42 CK	0.013	-0.018	-0.024
VVA-43	VVA-43 CK	0.010	0.013	-0.005
VVA-44	VVA-44 CK	0.000	-0.023	0.009
VVA-45	VVA-45 CK	N/A	N/A	N/A
VVA-46	VVA-46 CK	0.020	0.030	-0.012
VVA-47	VVA-47 CK	N/A	N/A	N/A
VVA-48	VVA-48 CK	N/A	N/A	N/A
VVA-49	VVA-49 CK	N/A	N/A	N/A
VVA-50	VVA-50 CK	N/A	N/A	N/A
VVA-51	VVA-51 CK	-0.014	0.008	-0.031
VVA-52	VVA-52 CK	N/A	N/A	N/A

VVA-53	VVA-53 CK	N/A	N/A	N/A
VVA-54	VVA-54 CK	N/A	N/A	N/A
VVA-55	VVA-55 CK	0.011	-0.011	0.028
VVA-56	VVA-56 CK	N/A	N/A	N/A
VVA-57	VVA-57 CK	N/A	N/A	N/A
VVA-58	VVA-58 CK	N/A	N/A	N/A
VVA-59	VVA-59 CK	0.027	-0.009	-0.010
VVA-60	VVA-60 CK	-0.012	0.016	-0.033
VVA-61	VVA-61 CK	N/A	N/A	N/A
VVA-62	VVA-62 CK	N/A	N/A	N/A
VVA-63	VVA-63 CK	N/A	N/A	N/A
VVA-64	VVA-64 CK	0.012	-0.025	-0.014
VVA-65	VVA-65 CK	0.011	0.006	-0.022
VVA-66	VVA-66 CK	N/A	N/A	N/A
VVA-67	VVA-67 CK	N/A	N/A	N/A
VVA-68	VVA-68 CK	-0.012	0.013	0.021
VVA-69	VVA-69 CK	0.013	-0.002	-0.003
VVA-70	VVA-70 CK	N/A	N/A	N/A
VVA-71	VVA-71 CK	N/A	N/A	N/A
VVA-72	VVA-72 CK	N/A	N/A	N/A
VVA-73	VVA-73 CK	-0.016	-0.022	-0.020
VVA-74	VVA-74 CK	N/A	N/A	N/A
VVA-75	VVA-75 CK	N/A	N/A	N/A
VVA-76	VVA-76 CK	-0.005	0.009	0.040
VVA-77	VVA-77 CK	-0.024	-0.003	0.003
VVA-78	VVA-78 CK	N/A	N/A	N/A
VVA-79	VVA-79 CK	N/A	N/A	N/A
VVA-80	VVA-80 CK	N/A	N/A	N/A
VVA-81	VVA-81 CK	0.006	-0.001	-0.017
VVA-82	VVA-82 CK	0.009	-0.004	-0.017
VVA-83	VVA-83 CK	0.015	0.018	0.027
VVA-84	VVA-84 CK	-0.016	0.023	-0.008
VVA-85	VVA-85 CK	N/A	N/A	N/A
VVA-86	VVA-86 CK	-0.001	0.012	0.031
VVA-87	VVA-87 CK	N/A	N/A	N/A
VVA-88	VVA-88 CK	N/A	N/A	N/A
VVA-89	VVA-89 CK	-0.010	-0.003	0.026
VVA-90	VVA-90 CK	N/A	N/A	N/A
VVA-91	VVA-91 CK	N/A	N/A	N/A
VVA-92	VVA-92 CK	-0.009	0.005	-0.014
VVA-93	VVA-93 CK	0.005	0.016	-0.022
VVA-94	VVA-94 CK	0.002	-0.004	-0.027
VVA-95	VVA-95 CK	-0.017	-0.006	0.001

VVA-96	VVA-96 CK	0.025	0.012	0.044
VVA-97	VVA-97 CK	-0.016	0.004	-0.039
VVA-98	VVA-98 CK	0.014	0.013	0.018
VVA-99	VVA-99 CK	-0.012	-0.004	-0.036
VVA-100	VVA-100 CK	-0.009	-0.017	0.021
VVA-101	VVA-101 CK	0.004	0.025	-0.015
VVA-102	VVA-102 CK	N/A	N/A	N/A
VVA-103	VVA-103 CK	N/A	N/A	N/A
VVA-104	VVA-104 CK	N/A	N/A	N/A
VVA-105	VVA-105 CK	N/A	N/A	N/A