

Check Point Survey Report

IA EasternIA 2019 B19 QL2 LDAR Project
USGS Contract: G16PC00020
Task Order Number: 140G0219F0101

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 476 Check Points in the state of Iowa. 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 October 30, 2019 thru January 10, 2020.

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 Albers Equal Area, NAD83 (2011) in meters. Final Vertical elevations are referenced to NAVD88 in meters using Geoid model 2012B (Geoid12B).

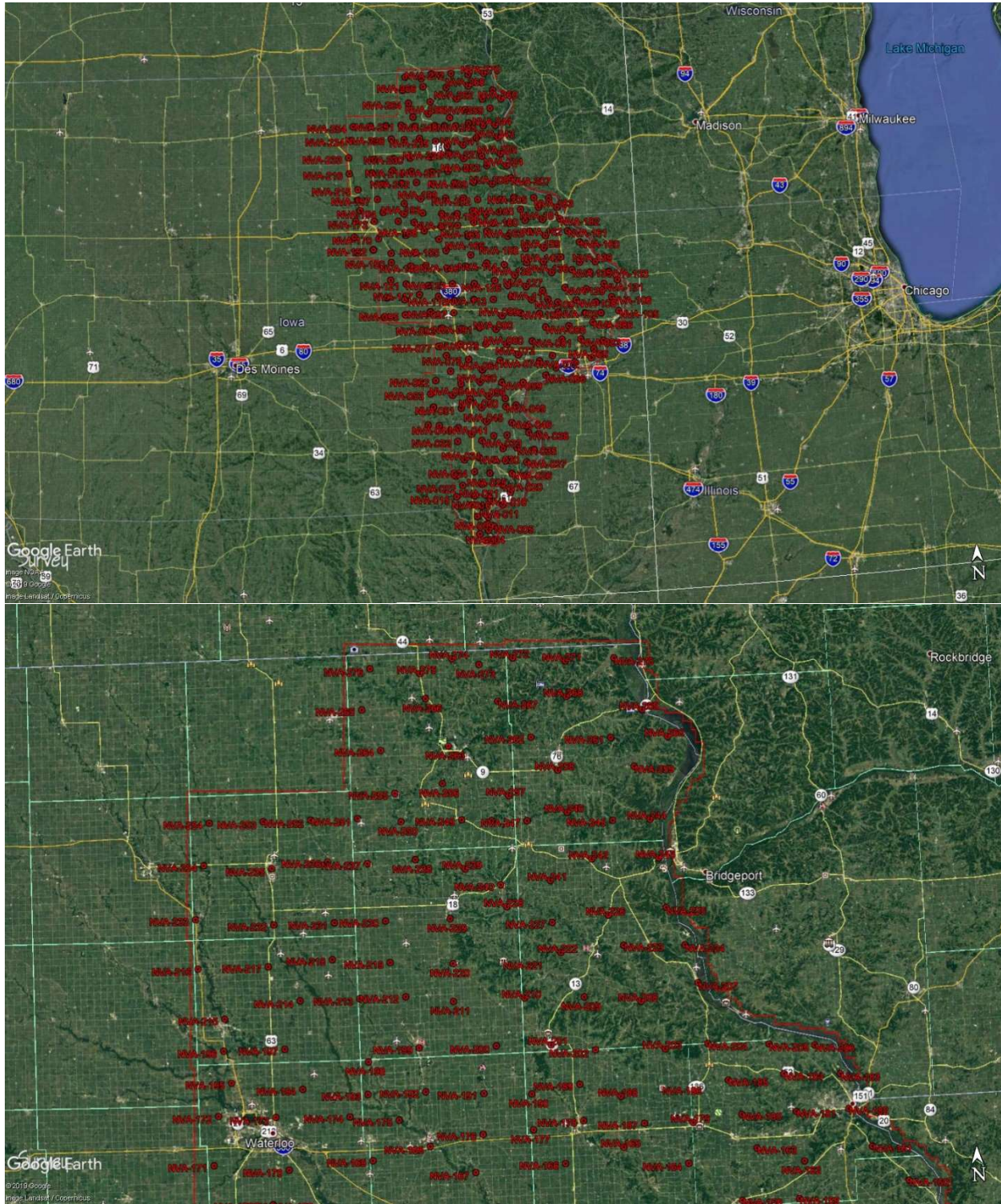
1.2 *Points of Contact*

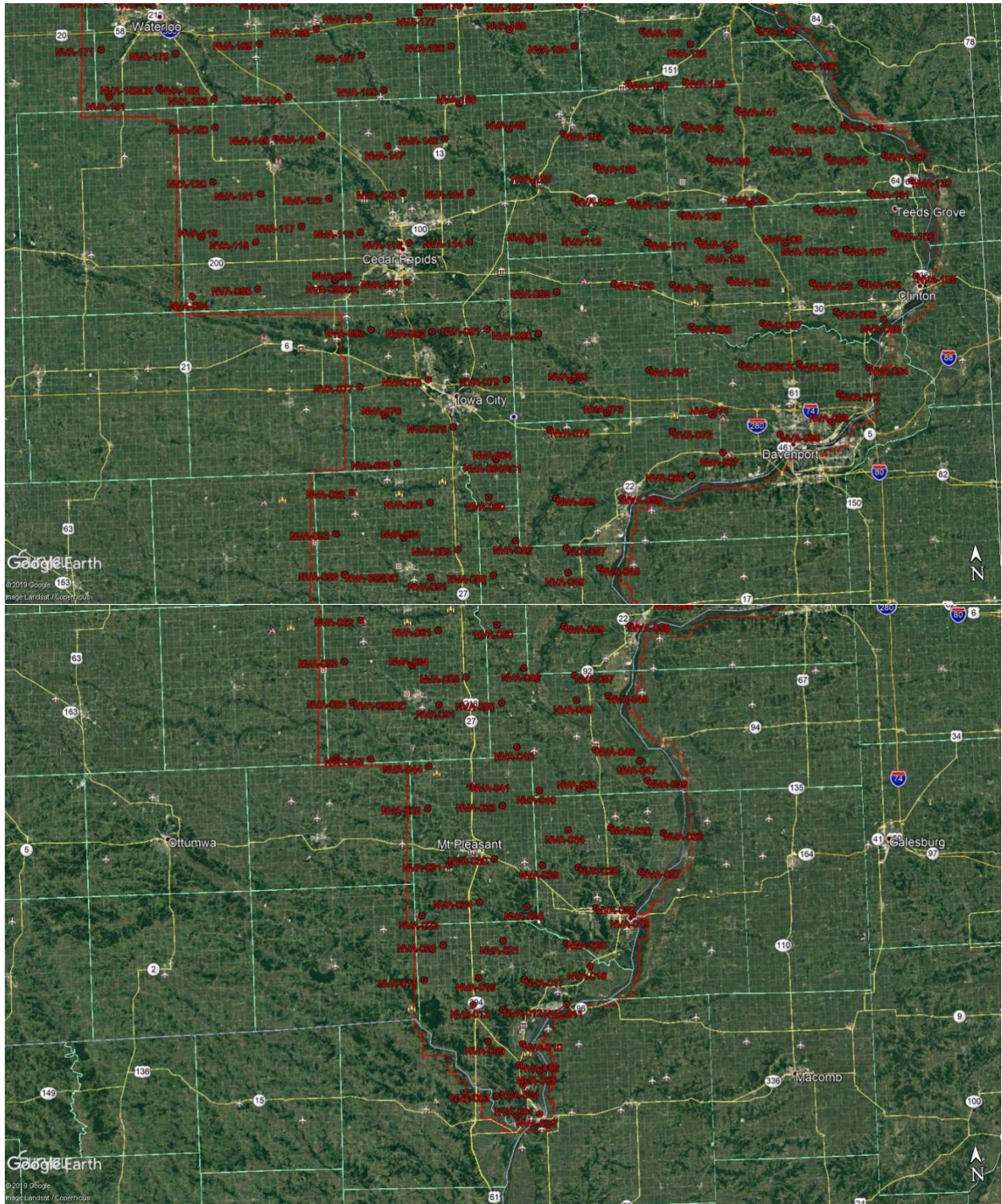
Questions regarding the technical aspects of this report should be addressed to:

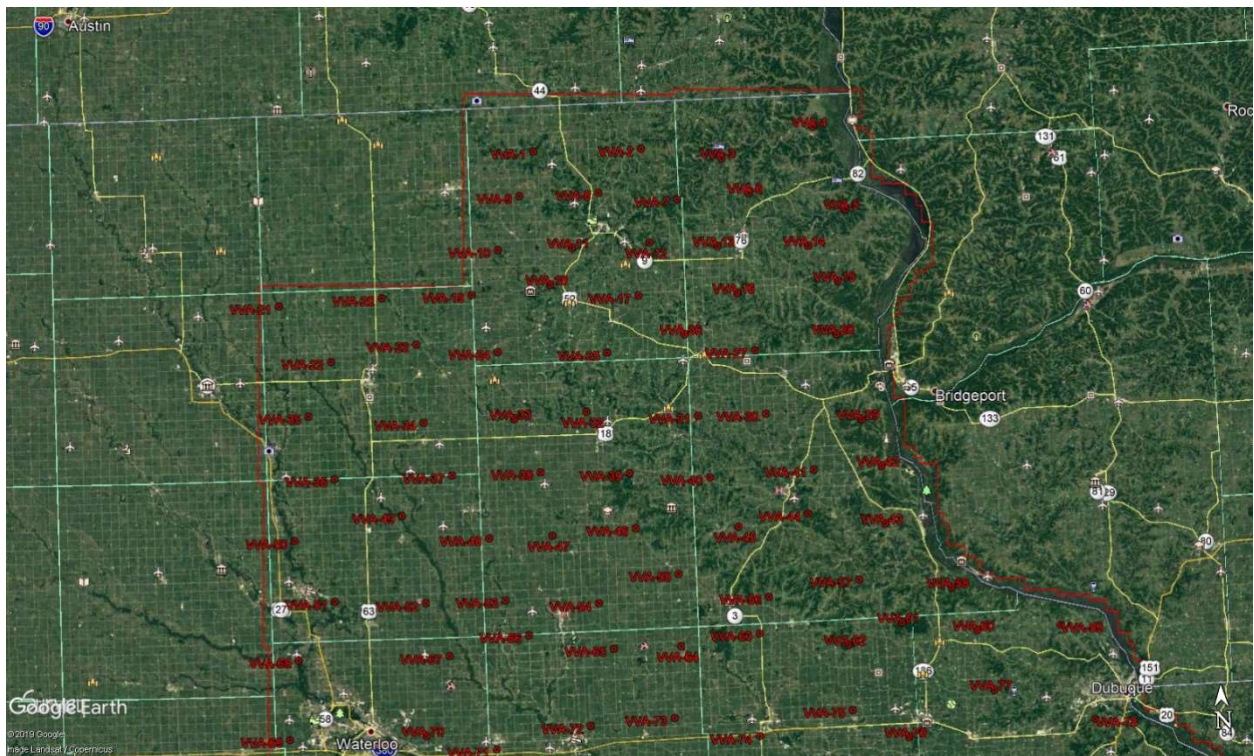
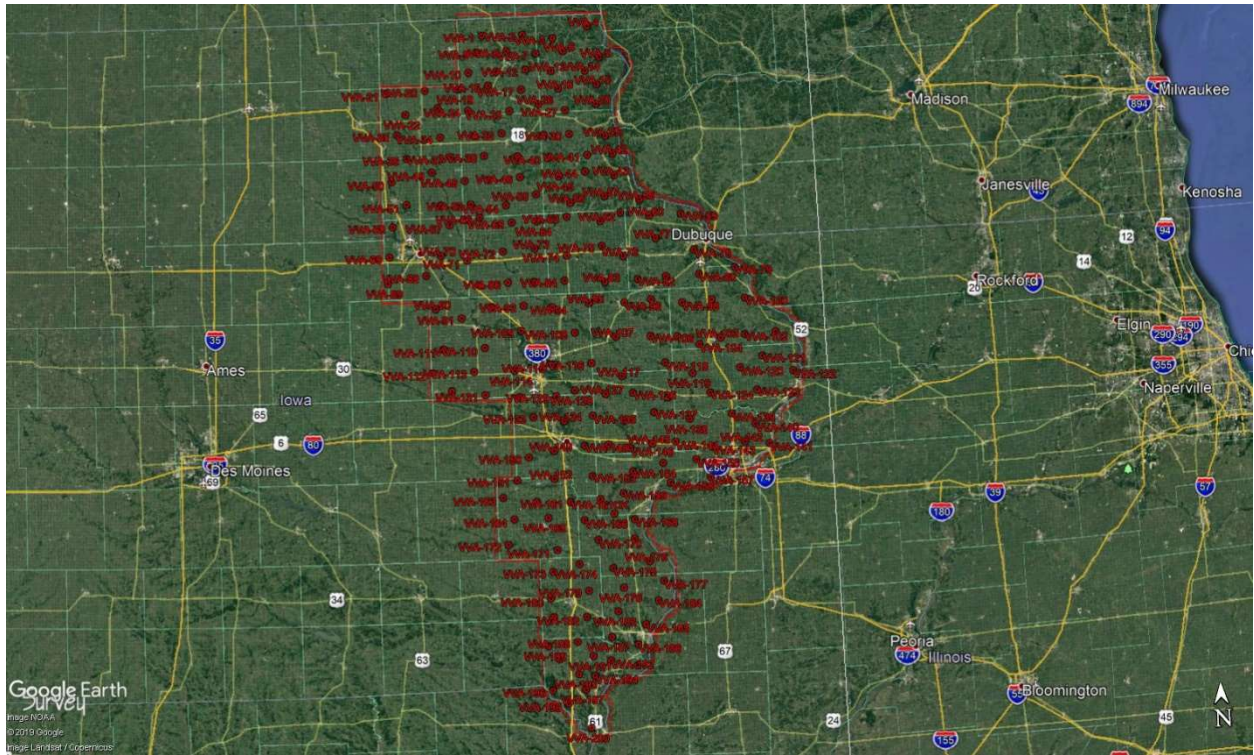
Dewberry Engineers Inc.

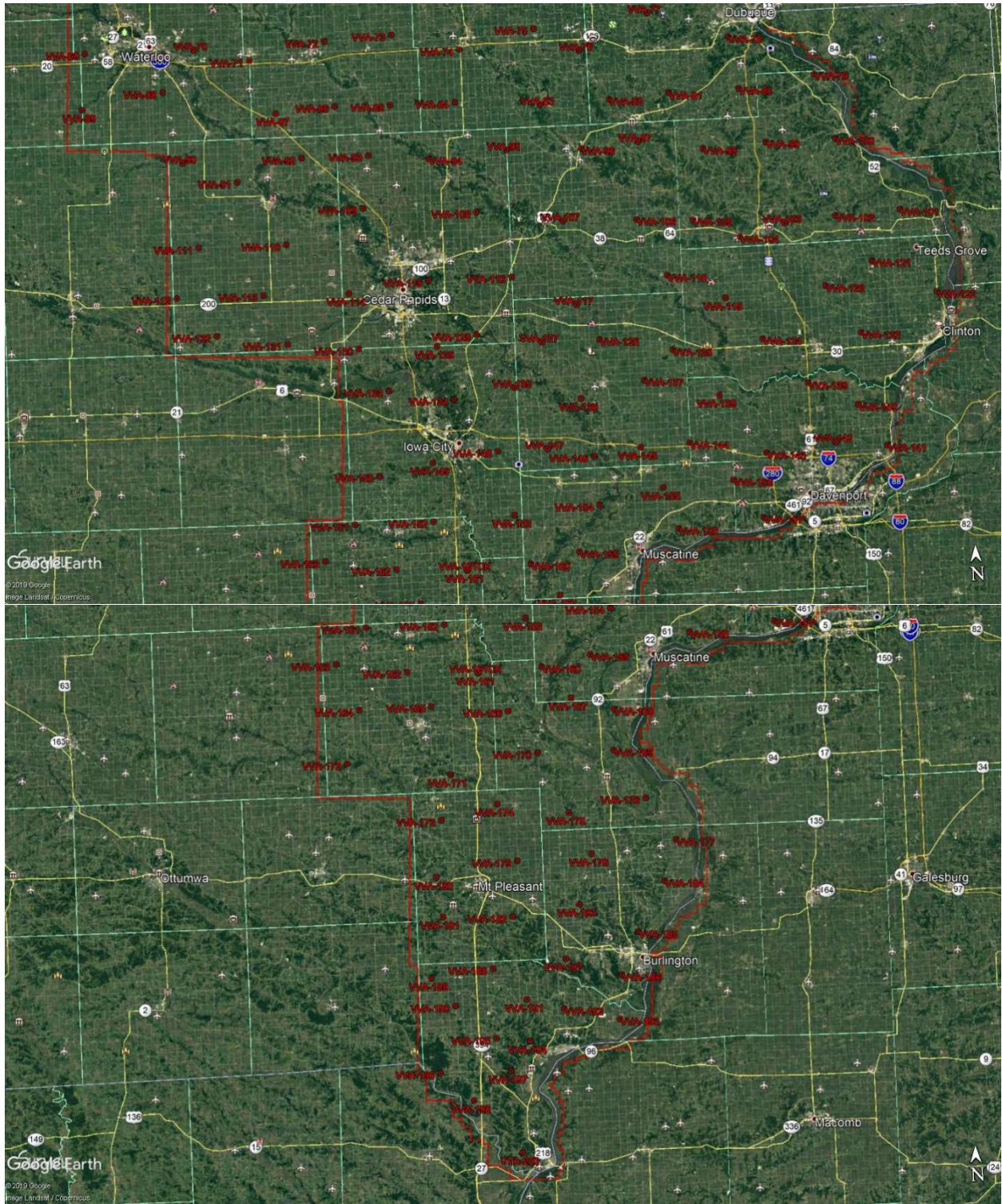
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1.3 Project Area









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 476 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 IaRTN. 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.

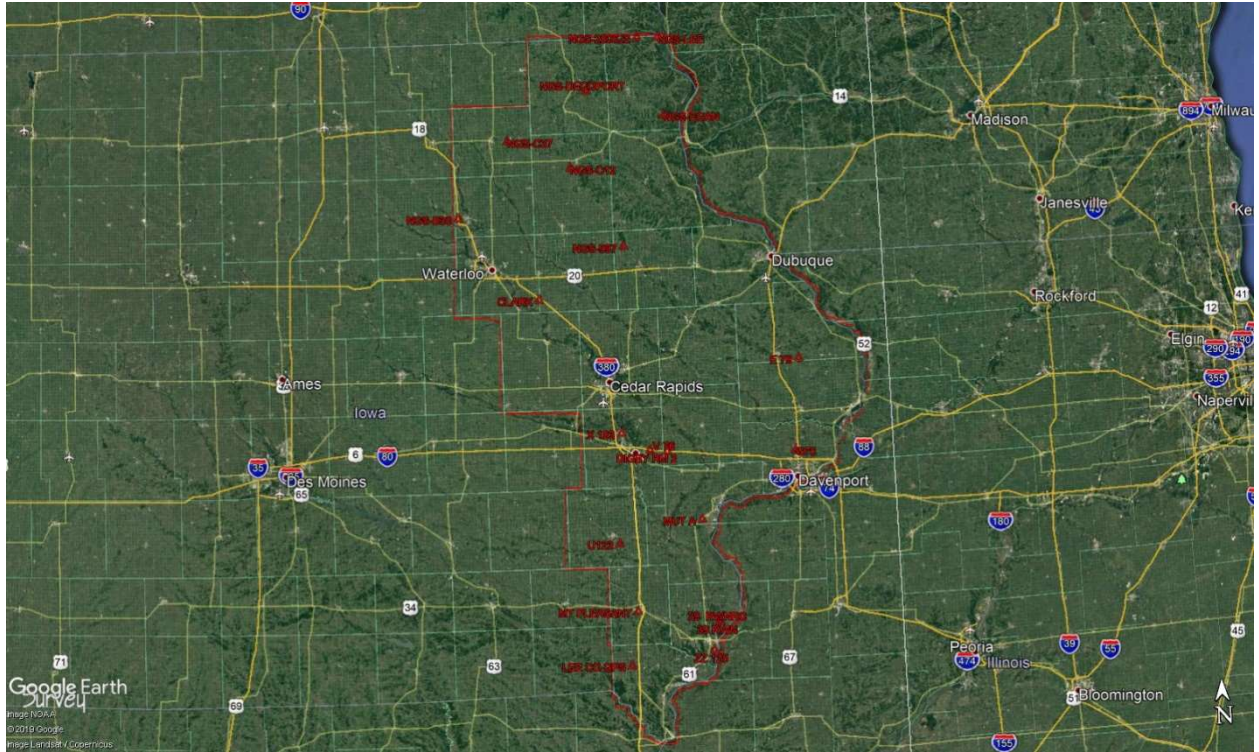
Field GPS observations are detailed on the “Control Point Documentation Reports” submitted as part of this report.

Fourteen (14) 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 designated as AE9186, AB9853, AE2146, AJ8263 DK6836, LD0627, MGo328, MGo495, NJo599, NJo606, NJo232, NKO164, ONo828, and OOo226. The results are as follows:

PT. #	Observed Values			Data Sheet Values			ΔX	ΔY	ΔZ
	NORTHING	EASTING	ELEVS.	NORTHING	EASTING	ELEVS.			
X 183	4623738.032	615808.502	238.807	4623738.022	615808.514	238.839	0.010	-0.012	-0.032
U123	4569578.672	613542.936	228.088	4569578.670	613542.931	228.102	0.002	0.005	-0.014
LEE	4817861.104	638804.442	197.228	4817861.143	638804.447	197.248	-0.039	-0.005	-0.020
EGAN	4779299.333	640536.491	353.666	4779299.335	640536.496	353.690	-0.002	-0.005	-0.024
C37	4768236.497	563142.902	351.737	4768236.488	563142.900	351.776	0.009	0.002	-0.039
C12	4754284.028	593848.566	359.636	4754284.041	593848.558	359.629	-0.013	0.008	0.007
B30	4730930.731	538040.261	285.480	4730930.745	538040.251	285.504	-0.014	0.010	-0.024
2806J2	4818072.054	628387.524	348.769	4818072.039	628387.527	348.815	0.015	-0.003	-0.046
997	4715132.862	619243.643	304.090	4715132.855	619243.673	304.112	0.007	-0.030	-0.022
MUT A	4580470.864	654500.783	165.989	4580470.848	654500.769	166.000	0.016	0.014	-0.011
MT PLEASANT	4536045.024	621642.510	224.291	N/A	N/A	224.308	N/A	N/A	-0.017
39 RWN	4530095.552	662022.127	215.767	4530095.574	662022.126	215.800	-0.022	0.001	-0.033
E 79	4658389.312	704045.995	269.759	4658389.300	704046.008	269.781	0.012	-0.013	-0.022
G70	4613270.251	701462.137	237.734	4613270.245	701462.154	237.776	0.006	-0.017	-0.042

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 IaRTN 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)
ALBERS EQUAL AREA, NAD83 (2011), NAVD 88, Meters, Geoid 12B			
NVA			
NVA-001	1940986.535	382335.788	155.876
NVA-002	1941426.499	387621.635	180.040
NVA-003	1945666.526	377414.297	180.510
NVA-004	1948276.709	383674.239	203.987
NVA-005	1951688.772	387577.643	202.398
NVA-006	1953140.250	382791.664	207.518
NVA-007	1954446.715	372318.965	203.316
NVA-008	1957548.744	362792.303	167.233
NVA-009	1958647.695	375404.588	211.229
NVA-010	1958099.883	383555.306	167.531
NVA-011	1967508.037	393839.064	170.674
NVA-012	1966255.368	378775.268	206.836
NVA-013	1967394.828	371854.301	214.071
NVA-014	1966426.465	364879.087	205.972
NVA-015	1973238.365	360296.798	222.225
NVA-016	1973823.763	373173.874	210.413
NVA-017	1973469.949	383844.383	215.274
NVA-018	1976574.841	399381.078	172.606
NVA-019	1988972.764	409391.029	202.431
NVA-020	1982039.919	393793.682	192.254
NVA-021	1982611.215	378816.898	219.989
NVA-022	1981606.437	364765.691	220.557
NVA-023	1988501.916	359709.983	219.851
NVA-024	1991777.665	373246.846	175.165
NVA-025	1990759.088	384475.260	219.221
NVA-026	1990529.936	400581.494	215.177
NVA-027	1999104.218	411261.259	214.662
NVA-028	2000119.796	396487.187	211.265
NVA-029	2000589.302	388015.043	220.412
NVA-030	2002138.153	376715.862	217.778
NVA-031	2000532.444	365999.836	180.042
NVA-032	2014091.148	360962.872	216.483
NVA-033	2014796.024	378579.874	225.933

NVA-034	2009006.066	394048.475	232.125
NVA-035	2009689.047	404047.463	235.252
NVA-036	2008373.217	416546.205	160.656
NVA-037	2019911.500	419791.770	167.005
NVA-038	2020840.520	412742.677	165.058
NVA-039	2018861.595	396852.660	226.310
NVA-040	2018416.615	387238.700	219.259
NVA-041	2019479.847	371040.716	223.195
NVA-042	2026163.527	339353.502	226.712
NVA-043	2025765.842	347502.267	226.290
NVA-044	2024086.917	361259.444	222.121
NVA-045	2028757.610	381949.437	220.109
NVA-046	2028133.757	400359.953	177.103
NVA-047	2025546.586	410932.933	205.882
NVA-048	2041047.738	403454.135	164.013
NVA-049	2039933.981	395881.772	197.286
NVA-050	2039199.086	378317.296	215.324
NVA-051	2038722.200	363518.749	228.005
NVA-052	2039320.217	343216.145	235.860
NVA-053	2049001.833	341151.495	239.351
NVA-054	2048107.642	357137.890	237.670
NVA-055	2045369.974	369841.400	218.429
NVA-056	2047572.325	383536.744	185.493
NVA-057	2045860.958	395438.884	198.175
NVA-058	2057751.333	408519.529	218.590
NVA-059	2057664.324	392940.002	182.811
NVA-060	2057877.533	377106.919	194.674
NVA-061	2056516.083	363288.413	228.812
NVA-062	2058889.252	344896.835	229.447
NVA-063	2065799.702	355573.297	239.425
NVA-064	2066930.035	378762.793	208.098
NVA-065	2067663.356	396300.829	197.210
NVA-066	2063056.465	424966.319	181.601
NVA-067	2068581.277	432296.367	242.170
NVA-068	2072810.897	445867.689	210.562
NVA-069	2075866.994	458095.830	210.603
NVA-070	2082595.921	459865.039	232.663
NVA-071	2077542.788	429827.920	220.112
NVA-072	2073588.198	420366.130	229.065

NVA-073	2077939.676	404895.402	206.157
NVA-074	2073942.334	391486.081	213.508
NVA-075	2074549.304	368679.632	218.314
NVA-076	2077328.705	352513.355	210.361
NVA-077	2083994.103	346678.763	245.750
NVA-078	2085814.941	362758.617	239.204
NVA-079	2085808.119	381110.669	248.899
NVA-080	2085660.267	396434.557	240.372
NVA-081	2088176.955	414842.242	236.116
NVA-082	2089492.279	436638.324	229.207
NVA-083	2089694.778	450321.623	237.853
NVA-084	2088801.825	466832.078	192.711
NVA-085	2100268.877	470299.064	179.725
NVA-086	2102105.215	459066.735	189.928
NVA-087	2099376.620	441567.321	197.290
NVA-088	2098486.161	424758.543	234.357
NVA-089	2095135.351	401942.465	246.847
NVA-090	2096748.095	388657.190	233.300
NVA-091	2097780.604	376541.582	251.440
NVA-092	2097171.056	363621.151	218.840
NVA-093	2097573.682	349237.356	243.903
NVA-094	2105318.386	306911.984	252.342
NVA-095	2107136.435	322471.134	262.694
NVA-096	2109357.036	340723.288	235.889
NVA-097	2108854.495	357786.502	253.821
NVA-098	2110269.976	376712.119	252.296
NVA-099	2106702.097	392957.395	261.707
NVA-100	2108658.177	406516.747	258.501
NVA-101	2108438.104	420224.039	237.401
NVA-102	2109535.346	433803.372	213.593
NVA-103	2108981.245	453386.266	212.564
NVA-104	2108975.226	465100.098	220.680
NVA-105	2110636.241	478085.423	215.337
NVA-106	2120837.605	472814.046	239.171
NVA-107	2116873.444	461388.672	202.668
NVA-108	2118397.502	446950.412	231.371
NVA-109	2116826.018	433440.545	250.253
NVA-110	2118849.860	426261.076	226.749
NVA-111	2118451.830	414390.928	227.487

NVA-112	2120910.040	399470.109	231.113
NVA-113	2118689.197	386569.965	268.711
NVA-114	2118533.889	372355.691	251.493
NVA-115	2118176.722	358057.575	231.131
NVA-116	2120705.026	346609.494	258.563
NVA-117	2122048.447	332768.946	267.408
NVA-118	2118330.570	321910.167	287.561
NVA-119	2119499.864	309037.653	275.028
NVA-120	2132549.638	311715.169	293.892
NVA-121	2129745.078	323005.596	253.412
NVA-122	2128695.818	339186.188	235.332
NVA-123	2130028.720	356653.423	267.999
NVA-124	2130202.308	372606.949	273.453
NVA-125	2132583.686	387621.938	247.808
NVA-126	2128890.107	397090.446	269.719
NVA-127	2128155.616	410378.239	247.164
NVA-128	2125251.142	422320.971	249.029
NVA-129	2127620.769	438681.975	216.782
NVA-130	2126507.418	454432.390	242.962
NVA-131	2130405.413	467018.634	243.003
NVA-132	2133368.893	476924.093	193.437
NVA-133	2139421.088	470444.684	251.311
NVA-134	2138885.750	456855.581	227.694
NVA-135	2140643.587	443732.765	271.472
NVA-136	2138559.484	429026.006	286.771
NVA-137	2137242.828	418239.275	237.693
NVA-138	2136459.192	402176.377	285.550
NVA-139	2146559.798	460867.751	183.948
NVA-140	2146092.779	449222.753	284.407
NVA-141	2149978.689	435560.807	312.364
NVA-142	2146443.625	422970.308	300.579
NVA-143	2145874.458	410679.951	237.799
NVA-144	2144228.298	394403.933	253.420
NVA-145	2145287.157	381543.586	310.538
NVA-146	2142956.323	366479.989	255.867
NVA-147	2141150.826	353001.020	268.861
NVA-148	2143483.216	337417.314	275.094
NVA-149	2142905.450	326533.461	249.797
NVA-150	2145586.322	312127.225	263.556

NVA-151	2152691.210	286939.239	309.045
NVA-152	2154793.311	298897.907	281.549
NVA-153	2152302.299	311890.171	251.425
NVA-154	2152777.360	329472.942	275.169
NVA-155	2154474.728	351962.677	269.101
NVA-156	2151392.061	369891.779	286.001
NVA-157	2153730.916	388146.614	278.425
NVA-158	2156219.620	409672.791	264.012
NVA-159	2156654.228	423188.725	283.549
NVA-160	2161006.558	449216.321	320.797
NVA-161	2169139.810	440402.044	338.368
NVA-162	2165652.805	424329.063	305.328
NVA-163	2168713.013	413019.529	311.159
NVA-164	2165072.434	396951.658	278.316
NVA-165	2168873.816	381587.869	320.174
NVA-166	2164972.030	367872.449	317.339
NVA-167	2162780.595	346729.676	269.638
NVA-168	2168930.943	335956.849	282.180
NVA-169	2165477.554	322448.003	285.226
NVA-170	2163098.886	302670.231	268.532
NVA-171	2164023.419	284891.236	302.251
NVA-172	2175775.725	285932.322	299.489
NVA-173	2175662.636	299462.015	265.303
NVA-174	2175854.231	316996.105	296.799
NVA-175	2175136.575	328589.892	280.216
NVA-176	2171841.502	348412.725	325.330
NVA-177	2172992.094	360300.189	306.257
NVA-178	2175180.554	372071.204	290.253
NVA-179	2174797.278	397953.856	283.441
NVA-180	2176743.782	409384.718	335.003
NVA-181	2177410.547	422304.213	343.489
NVA-182	2178105.152	434756.136	246.909
NVA-183	2186409.743	432702.379	193.409
NVA-184	2186426.427	419294.703	273.794
NVA-185	2184890.168	406149.636	363.048
NVA-186	2182825.904	390469.164	338.875
NVA-187	2174599.524	386417.146	303.301
NVA-188	2180991.283	380885.743	325.722
NVA-189	2183830.148	371161.096	310.441

NVA-190	2181506.321	359862.153	322.420
NVA-191	2181584.682	348547.731	328.787
NVA-192	2181924.025	334857.354	316.248
NVA-193	2181217.294	321205.730	301.654
NVA-194	2182366.089	305821.947	289.195
NVA-195	2183709.728	288977.187	267.886
NVA-196	2191315.867	287097.512	279.330
NVA-197	2191859.222	301531.247	309.650
NVA-198	2188964.098	321317.559	297.831
NVA-199	2192352.298	333262.496	320.258
NVA-200	2192896.360	351436.837	337.328
NVA-201	2193153.065	364357.030	339.595
NVA-202	2192038.805	374803.431	359.238
NVA-203	2192282.880	391264.685	356.172
NVA-204	2193574.880	401302.900	365.282
NVA-205	2193497.824	415747.277	351.458
NVA-206	2193218.607	426592.390	273.686
NVA-207	2207983.817	398939.861	187.370
NVA-208	2203553.766	385517.921	201.935
NVA-209	2204561.279	372091.895	240.238
NVA-210	2204252.834	358036.441	384.269
NVA-211	2203413.879	341305.983	350.319
NVA-212	2204441.362	330051.861	353.905
NVA-213	2203943.363	319174.090	312.728
NVA-214	2203389.705	305139.820	319.158
NVA-215	2198940.317	287309.420	281.112
NVA-216	2210766.392	280924.593	294.990
NVA-217	2211419.653	297564.598	326.646
NVA-218	2213201.373	312692.468	333.900
NVA-219	2212543.801	326338.160	346.499
NVA-220	2212378.913	341173.598	312.359
NVA-221	2212790.810	352864.251	266.147
NVA-222	2215072.158	366543.015	328.976
NVA-223	2216841.398	381364.192	314.026
NVA-224	2216978.479	395812.625	311.406
NVA-225	2225844.227	391340.412	192.163
NVA-226	2223943.869	377761.528	337.677
NVA-227	2222194.584	364484.479	243.706
NVA-228	2225859.018	353772.264	250.358

NVA-229	2223004.673	340433.835	339.428
NVA-230	2222376.909	325205.405	369.679
NVA-231	2221920.266	313167.397	352.345
NVA-232	2221365.508	298849.431	327.921
NVA-233	2222480.865	280325.149	305.206
NVA-234	2235314.687	282206.178	325.648
NVA-235	2234719.220	298295.855	350.141
NVA-236	2236356.612	311493.285	340.412
NVA-237	2235958.565	320871.846	322.754
NVA-238	2236961.297	332163.654	363.610
NVA-239	2234805.114	343927.191	294.346
NVA-240	2231077.453	352322.367	261.482
NVA-241	2232136.887	364009.237	310.309
NVA-242	2237267.133	373726.944	370.441
NVA-243	2237531.617	389537.746	192.447
NVA-244	2246711.110	387468.221	315.014
NVA-245	2246434.183	378651.049	224.587
NVA-246	2248298.388	367914.704	252.215
NVA-247	2246253.716	358458.156	295.016
NVA-248	2246268.970	350163.867	339.468
NVA-249	2246433.946	343041.093	384.097
NVA-250	2245909.516	328746.958	311.648
NVA-251	2246631.820	318489.881	366.414
NVA-252	2246223.312	307415.438	353.678
NVA-253	2245834.316	296230.165	382.190
NVA-254	2245415.773	283474.910	344.262
NVA-255	2252646.847	327248.063	323.906
NVA-256	2255004.755	338457.817	362.923
NVA-257	2252169.481	354133.762	371.671
NVA-258	2258270.420	365659.397	371.558
NVA-259	2259264.491	383651.589	317.119
NVA-260	2266339.405	391568.784	319.294
NVA-261	2266049.788	378137.268	229.611
NVA-262	2266049.608	359300.309	385.242
NVA-263	2263885.115	339823.803	269.025
NVA-264	2262792.302	323871.418	365.948
NVA-265	2272390.961	319367.214	360.763
NVA-266	2275103.603	334389.983	359.039
NVA-267	2274560.657	351446.579	335.796

NVA-268	2275704.535	367605.875	324.375
NVA-269	2272715.239	385509.216	202.775
NVA-270	2285011.253	378860.578	196.208
NVA-271	2284136.556	367341.868	332.934
NVA-272	2284826.897	354915.601	372.899
NVA-273	2283241.059	346972.502	351.332
NVA-274	2284591.077	340578.246	409.889
NVA-275	2281027.539	333033.695	383.271
NVA-276	2282156.82	321251.664	365.022
VVA			
VVA-1	2277547.640	327771.212	354.603
VVA-2	2278093.546	347236.766	349.494
VVA-3	2276400.843	361772.051	228.913
VVA-4	2282216.362	378381.537	261.568
VVA-5	2267230.558	384237.364	197.271
VVA-6	2270076.840	366722.607	330.930
VVA-7	2268935.789	353802.593	316.304
VVA-8	2270072.639	339537.269	347.538
VVA-9	2269391.203	325279.993	369.130
VVA-10	2259609.131	321433.656	330.098
VVA-11	2259995.100	334820.202	339.299
VVA-12	2261074.156	348889.388	344.218
VVA-13	2260403.935	361130.001	376.107
VVA-14	2260576.946	377503.987	349.822
VVA-15	2254155.432	382935.843	312.360
VVA-16	2251894.373	364750.234	330.364
VVA-17	2251443.491	346854.729	378.078
VVA-18	2253296.737	330935.203	355.430
VVA-19	2251403.249	316744.887	362.297
VVA-20	2250787.972	300485.784	357.610
VVA-21	2249227.014	281824.311	344.059
VVA-22	2239158.126	291314.882	332.274
VVA-23	2242401.341	306756.869	352.960
VVA-24	2241093.336	321477.538	339.674
VVA-25	2241039.746	341274.746	358.184
VVA-26	2244377.939	355206.141	328.248
VVA-27	2241550.220	367950.571	324.247
VVA-28	2244497.744	382712.403	223.573
VVA-29	2229037.507	387316.664	213.699

VVA-30	2230054.062	370013.864	324.390
VVA-31	2229619.137	357746.964	310.538
VVA-32	2230288.226	337562.886	352.393
VVA-33	2228859.043	324477.493	325.367
VVA-34	2228190.628	308146.857	331.561
VVA-35	2229210.937	287271.029	340.556
VVA-36	2217850.758	292045.887	333.902
VVA-37	2218643.663	313336.671	339.779
VVA-38	2219286.780	329310.164	345.975
VVA-39	2219169.141	345377.190	353.396
VVA-40	2218462.988	359933.869	352.400
VVA-41	2219917.159	378728.667	306.843
VVA-42	2220551.207	390935.742	313.839
VVA-43	2210095.198	391690.724	298.036
VVA-44	2211888.968	377718.347	283.624
VVA-45	2209507.239	365162.344	255.836
VVA-46	2209143.384	346571.273	340.931
VVA-47	2207743.285	331491.368	333.176
VVA-48	2207225.414	320101.425	328.982
VVA-49	2211216.028	304286.917	305.555
VVA-50	2206538.296	284909.994	280.742
VVA-51	2195569.551	292182.611	301.218
VVA-52	2195360.833	308658.495	314.736
VVA-53	2195956.211	323046.937	303.483
VVA-54	2195509.311	339972.709	363.448
VVA-55	2200887.159	354316.372	343.257
VVA-56	2196770.348	370672.041	364.824
VVA-57	2199943.041	387000.435	235.907
VVA-58	2198451.127	403750.974	292.688
VVA-59	2191707.434	423607.412	295.826
VVA-60	2190673.631	408388.395	346.881
VVA-61	2192074.000	394753.581	259.361
VVA-62	2188023.531	385138.469	323.259
VVA-63	2190080.564	369059.361	348.235
VVA-64	2187729.641	354863.341	319.039
VVA-65	2187220.452	342684.979	326.399
VVA-66	2189619.496	327329.451	318.576
VVA-67	2185768.686	312998.584	303.537
VVA-68	2184766.624	285628.045	264.848

VVA-69	2170242.370	284110.386	295.460
VVA-70	2171095.512	308855.560	282.176
VVA-71	2168763.436	321571.061	288.400
VVA-72	2173133.118	338552.405	293.223
VVA-73	2174618.661	353746.626	318.816
VVA-74	2171362.403	369162.006	302.265
VVA-75	2176142.518	385964.929	306.406
VVA-76	2171150.502	396215.449	300.849
VVA-77	2179782.758	411597.129	362.191
VVA-78	2174470.006	430050.166	276.894
VVA-79	2166049.299	449572.863	207.774
VVA-80	2162642.817	432438.898	301.199
VVA-81	2161612.737	416584.727	315.285
VVA-82	2160078.267	403105.091	276.806
VVA-83	2158738.857	387457.048	254.562
VVA-84	2159302.110	368173.037	308.286
VVA-85	2158655.390	353544.970	298.153
VVA-86	2158310.506	341024.117	297.470
VVA-87	2156700.456	327629.985	282.032
VVA-88	2161427.143	301936.112	274.530
VVA-89	2157405.444	283567.639	273.974
VVA-90	2145306.456	306544.983	266.549
VVA-91	2140987.898	319017.981	264.297
VVA-92	2146486.368	333531.016	274.626
VVA-93	2147166.294	348638.799	281.781
VVA-94	2146457.503	362279.385	256.757
VVA-95	2148447.075	379898.692	289.318
VVA-96	2148898.615	396801.062	272.057
VVA-97	2150465.431	409590.833	252.255
VVA-98	2148986.985	424361.137	292.939
VVA-99	2150460.960	438580.767	245.923
VVA-100	2151347.317	454391.353	252.354
VVA-101	2135250.414	469128.980	232.027
VVA-102	2133788.675	454451.818	202.441
VVA-103	2132055.311	442942.071	208.996
VVA-104	2128905.644	432754.217	228.563
VVA-105	2132706.806	422082.686	251.792
VVA-106	2132791.591	409380.608	293.826
VVA-107	2132359.020	392792.975	266.014

VVA-108	2134324.639	373149.798	286.557
VVA-109	2135135.219	347515.011	287.581
VVA-110	2126818.777	330183.306	275.266
VVA-111	2126015.143	310367.674	279.243
VVA-112	2114470.063	305397.148	256.735
VVA-113	2115227.721	325134.046	279.751
VVA-114	2115758.734	344416.121	247.693
VVA-115	2118773.880	362387.241	234.064
VVA-116	2119627.222	381139.255	280.696
VVA-117	2113391.163	395845.464	251.573
VVA-118	2120056.423	416367.840	219.348
VVA-119	2115004.803	429531.025	225.552
VVA-120	2117820.712	452241.927	214.058
VVA-121	2123475.796	462825.814	229.132
VVA-122	2116518.242	477611.967	215.755
VVA-123	2107099.347	460395.103	212.137
VVA-124	2105663.101	438012.873	221.144
VVA-125	2103116.737	417674.731	258.636
VVA-126	2105429.641	401054.344	252.694
VVA-127	2104831.302	388085.123	260.313
VVA-128	2106497.318	373304.433	210.168
VVA-129	2103769.473	364414.777	216.172
VVA-130	2103155.850	346736.105	235.197
VVA-131	2104138.574	330583.021	250.555
VVA-132	2105928.615	314558.817	280.083
VVA-133	2093539.460	353541.165	215.001
VVA-134	2091697.018	368225.179	249.172
VVA-135	2094418.994	381992.845	255.647
VVA-136	2092021.505	396972.504	245.423
VVA-137	2096187.635	411215.542	243.318
VVA-138	2092864.053	428223.526	211.292
VVA-139	2095625.397	448376.892	192.440
VVA-140	2090715.866	459764.111	225.812
VVA-141	2081417.337	466471.102	194.314
VVA-142	2082142.402	454741.411	234.054
VVA-143	2079680.059	439044.718	219.617
VVA-144	2081991.611	421541.676	220.420
VVA-145	2080954.298	410440.181	222.672
VVA-146	2078911.350	399989.848	199.084

VVA-147	2080492.534	389429.745	232.864
VVA-148	2079943.861	378172.961	236.453
VVA-149	2077304.270	363514.410	237.292
VVA-150	2074183.508	351465.805	208.067
VVA-151	2063101.181	345942.485	233.475
VVA-152	2063852.967	363686.875	233.611
VVA-153	2065403.168	382032.812	214.561
VVA-154	2067699.505	401241.665	189.189
VVA-155	2071755.628	415632.387	228.079
VVA-156	2073559.103	431550.240	225.237
VVA-157	2064934.154	438427.408	210.767
VVA-158	2062392.153	419199.777	216.605
VVA-159	2057099.940	396693.086	208.162
VVA-160	2054225.079	385739.357	187.535
VVA-161	2052807.228	371411.698	230.996
VVA-162	2052906.884	355380.908	241.529
VVA-163	2054644.863	339304.164	247.935
VVA-164	2044235.001	344608.781	236.699
VVA-165	2045096.113	360838.135	227.032
VVA-166	2044076.866	378201.609	215.346
VVA-167	2047160.002	392369.776	214.104
VVA-168	2044601.043	402168.456	164.497
VVA-169	2035259.958	402075.093	191.532
VVA-170	2034555.516	384903.654	215.537
VVA-171	2029554.702	365223.511	220.697
VVA-172	2031941.423	341869.767	187.978
VVA-173	2019097.247	363194.479	223.298
VVA-174	2022882.888	375788.154	216.830
VVA-175	2020963.033	391948.556	244.396
VVA-176	2024342.775	409301.179	189.158
VVA-177	2014935.451	416262.526	161.416
VVA-178	2011542.898	397134.126	234.565
VVA-179	2009962.744	380382.857	218.794
VVA-180	2006111.859	362143.224	175.493
VVA-181	1997090.641	363649.618	217.916
VVA-182	1997272.031	379419.047	194.531
VVA-183	2000051.717	394473.698	200.180
VVA-184	2005459.745	413674.542	172.083
VVA-185	1993834.190	407796.505	204.038

VVA-186	1984081.440	404077.244	204.933
VVA-187	1987637.276	391478.013	214.146
VVA-188	1985305.069	375028.467	212.054
VVA-189	1983080.825	361110.066	212.183
VVA-190	1976806.388	366576.146	217.709
VVA-191	1978319.004	382673.069	223.774
VVA-192	1976250.071	391078.225	208.473
VVA-193	1973954.875	403714.708	161.246
VVA-194	1968821.701	383450.017	215.171
VVA-195	1969444.971	375809.906	192.059
VVA-196	1961493.268	363244.123	215.244
VVA-197	1962040.426	379152.327	184.884
VVA-198	1955192.844	370803.606	207.384
VVA-199	1951352.881	379352.157	200.882
VVA-200	1943399.315	381841.261	185.022

4. GPS OBSERVATIONS

POINT ID	OBSERV. DATE	JULIAN DATE	TIME OF DAY (AST)	RE-OBSERV. DATE	RE-OBSERV. TIME
NVA-001	10/30/2019	303	11:56	N/A	N/A
NVA-002	10/30/2019	303	9:01	N/A	N/A
NVA-003	10/30/2019	303	12:48	N/A	N/A
NVA-004	10/30/2019	303	13:40	10/31/2019	14:13
NVA-005	10/30/2019	303	13:56	10/31/2019	14:30
NVA-006	10/30/2019	303	14:14	10/31/2019	14:56
NVA-007	1/10/2020	10	13:33	N/A	N/A
NVA-008	1/10/2020	10	12:25	N/A	N/A
NVA-009	11/1/2019	305	8:50	11/2/2019	8:10
NVA-010	10/30/2019	303	14:35	N/A	N/A
NVA-011	11/1/2019	305	9:32	11/2/2019	9:40
NVA-012	11/1/2019	305	11:12	11/2/2019	8:40
NVA-013	11/1/2019	305	11:35	11/1/2019	18:00
NVA-014	1/10/2020	10	11:50	N/A	N/A
NVA-015	11/1/2019	305	12:45	11/1/2019	17:05
NVA-016	11/1/2019	305	13:18	N/A	N/A
NVA-017	11/1/2019	305	13:55	N/A	N/A
NVA-018	11/1/2019	305	14:48	11/2/2019	10:00
NVA-019	11/1/2019	305	13:49	11/2/2019	10:42
NVA-020	11/1/2019	305	15:20	N/A	N/A
NVA-021	11/1/2019	305	15:50	N/A	N/A
NVA-022	11/1/2019	305	16:35	11/2/2019	11:05
NVA-023	10/31/2019	304	12:17	11/1/2019	8:16
NVA-024	10/31/2019	304	13:48	11/1/2019	7:55
NVA-025	10/31/2019	304	14:30	N/A	N/A
NVA-026	10/31/2019	304	15:23	N/A	N/A
NVA-027	11/1/2019	305	15:28	11/2/2019	10:20
NVA-028	11/1/2019	305	11:26	11/2/2019	8:25
NVA-029	11/1/2019	305	10:52	11/2/2019	7:56
NVA-030	11/1/2019	305	9:48	N/A	N/A
NVA-031	10/31/2019	304	11:36	11/1/2019	8:38
NVA-032	11/2/2019	306	11:52	11/3/2019	7:05
NVA-033	11/1/2019	305	17:48	N/A	N/A
NVA-034	11/1/2019	305	16:26	N/A	N/A
NVA-035	11/1/2019	305	15:23	N/A	N/A
NVA-036	11/1/2019	305	14:55	N/A	N/A

NVA-037	11/2/2019	306	11:27	N/A	N/A
NVA-038	11/2/2019	306	11:52	11/3/2019	8:00
NVA-039	11/1/2019	305	16:50	11/3/2019	7:33
NVA-040	11/1/2019	305	17:23	11/2/2019	17:19
NVA-041	11/2/2019	306	12:15	11/3/2019	7:25
NVA-042	11/2/2019	306	17:20	N/A	N/A
NVA-043	11/2/2019	306	17:40	11/3/2019	8:15
NVA-044	11/2/2019	306	12:35	11/3/2019	7:45
NVA-045	11/2/2019	306	16:17	N/A	N/A
NVA-046	11/2/2019	306	12:46	11/3/2019	9:13
NVA-047	11/2/2019	306	12:06	11/3/2019	8:38
NVA-048	11/2/2019	306	13:40	11/3/2019	10:13
NVA-049	11/2/2019	306	14:02	11/3/2019	10:37
NVA-050	11/2/2019	306	15:33	N/A	N/A
NVA-051	11/2/2019	306	14:45	11/3/2019	9:42
NVA-052	11/2/2019	306	16:45	11/3/2019	8:42
NVA-053	11/2/2019	306	16:20	11/3/2019	10:55
NVA-054	11/2/2019	306	15:48	11/3/2019	10:33
NVA-055	11/2/2019	306	15:20	11/3/2019	10:05
NVA-056	11/2/2019	306	15:01	N/A	N/A
NVA-057	11/2/2019	306	14:19	11/3/2019	10:51
NVA-058	11/3/2019	307	12:24	N/A	N/A
NVA-059	11/3/2019	307	11:23	N/A	N/A
NVA-060	11/3/2019	307	15:02	11/4/2019	7:41
NVA-061	11/3/2019	307	15:10	N/A	N/A
NVA-062	11/3/2019	307	11:18	11/4/2019	7:45
NVA-063	11/3/2019	307	12:40	11/4/2019	8:25
NVA-064	11/3/2019	307	14:40	11/4/2019	8:03
NVA-065	11/3/2019	307	13:47	11/4/2019	9:14
NVA-066	11/4/2019	308	10:55	N/A	N/A
NVA-067	11/4/2019	308	11:25	N/A	N/A
NVA-068	11/4/2019	308	13:10	11/5/2019	8:39
NVA-069	11/4/2019	308	14:09	11/5/2019	9:21
NVA-070	11/5/2019	309	9:41	11/5/2019	14:22
NVA-071	11/4/2019	308	12:02	11/4/2019	16:55
NVA-072	11/4/2019	308	10:29	11/4/2019	16:29
NVA-073	11/4/2019	308	9:44	11/4/2019	15:45
NVA-074	11/4/2019	308	8:29	11/4/2019	15:12
NVA-075	11/3/2019	307	13:30	11/4/2019	9:10

NVA-076	11/4/2019	308	10:28	N/A	N/A
NVA-077	11/4/2019	308	10:50	N/A	N/A
NVA-078	11/4/2019	308	12:15	11/5/2019	7:35
NVA-079	11/4/2019	308	13:10	11/5/2019	8:20
NVA-080	11/4/2019	308	14:05	11/5/2019	9:05
NVA-081	11/4/2019	308	14:57	N/A	N/A
NVA-082	11/4/2019	308	15:55	N/A	N/A
NVA-083	11/5/2019	309	13:40	N/A	N/A
NVA-084	11/5/2019	309	10:41	N/A	N/A
NVA-085	11/5/2019	309	11:15	N/A	N/A
NVA-086	11/5/2019	309	1:09	N/A	N/A
NVA-087	11/5/2019	309	11:00	11/6/2019	9:50
NVA-088	11/5/2019	309	11:48	11/6/2019	9:15
NVA-089	1/8/2020	8	11:44	N/A	N/A
NVA-090	11/5/2019	309	13:40	N/A	N/A
NVA-091	11/5/2019	309	14:12	N/A	N/A
NVA-092	11/5/2019	309	14:45	N/A	N/A
NVA-093	11/5/2019	309	15:25	N/A	N/A
NVA-094	11/7/2019	311	11:05	11/8/2019	8:35
NVA-095	11/7/2019	311	10:40	11/8/2019	9:00
NVA-096	11/5/2019	309	16:15	N/A	N/A
NVA-097	11/7/2019	311	9:42	11/8/2019	9:45
NVA-098	1/8/2020	8	13:32	N/A	N/A
NVA-099	11/6/2019	310	12:50	N/A	N/A
NVA-100	11/6/2019	310	12:20	11/7/2019	8:10
NVA-101	11/6/2019	310	10:10	N/A	N/A
NVA-102	11/6/2019	310	10:41	N/A	N/A
NVA-103	11/6/2019	310	8:55	11/6/2019	13:01
NVA-104	11/6/2019	310	9:18	11/6/2019	13:24
NVA-105	11/5/2019	309	12:01	11/6/2019	9:37
NVA-106	11/6/2019	310	10:03	11/8/2019	10:52
NVA-107	11/6/2019	310	10:40	11/8/2019	10:15
NVA-108	11/6/2019	310	12:01	N/A	N/A
NVA-109	11/8/2019	312	14:20	N/A	N/A
NVA-110	11/8/2019	312	13:30	11/9/2019	9:15
NVA-111	11/8/2019	312	13:10	N/A	N/A
NVA-112	11/8/2019	312	12:20	N/A	N/A
NVA-113	11/8/2019	312	11:50	N/A	N/A
NVA-114	11/8/2019	312	10:55	11/9/2019	8:00

NVA-115	11/8/2019	312	10:10	11/9/2019	7:28
NVA-116	11/10/2019	314	7:29	11/10/2019	11:35
NVA-117	11/10/2019	314	8:43	N/A	N/A
NVA-118	11/7/2019	311	14:15	N/A	N/A
NVA-119	11/7/2019	311	13:25	N/A	N/A
NVA-120	11/12/2019	316	9:14	N/A	N/A
NVA-121	11/10/2019	314	9:15	11/12/2019	8:53
NVA-122	11/10/2019	314	10:12	N/A	N/A
NVA-123	11/13/2019	317	7:58	N/A	N/A
NVA-124	11/12/2019	316	8:20	N/A	N/A
NVA-125	11/12/2019	316	12:23	11/13/2019	11:35
NVA-126	11/9/2019	313	12:20	11/10/2019	8:15
NVA-127	11/9/2019	313	11:50	11/10/2019	8:35
NVA-128	11/9/2019	313	10:42	N/A	N/A
NVA-129	11/9/2019	313	10:09	11/10/2019	9:08
NVA-130	11/8/2019	312	8:52	11/9/2019	8:22
NVA-131	11/8/2019	312	9:47	11/9/2019	9:08
NVA-132	11/8/2019	312	11:34	N/A	N/A
NVA-133	11/8/2019	312	12:07	11/9/2019	9:29
NVA-134	11/8/2019	312	12:44	N/A	N/A
NVA-135	11/9/2019	313	12:46	N/A	N/A
NVA-136	11/10/2019	314	13:20	N/A	N/A
NVA-137	1/9/2020	9	12:08	N/A	N/A
NVA-138	11/12/2019	316	11:38	11/13/2019	12:42
NVA-139	11/9/2019	313	9:50	N/A	N/A
NVA-140	11/9/2019	313	12:24	N/A	N/A
NVA-141	11/10/2019	314	9:55	N/A	N/A
NVA-142	11/10/2019	314	11:34	N/A	N/A
NVA-143	11/12/2019	316	11:10	11/13/2019	13:25
NVA-144	11/12/2019	316	13:15	N/A	N/A
NVA-145	11/13/2019	317	11:10	N/A	N/A
NVA-146	11/13/2019	317	9:05	N/A	N/A
NVA-147	11/13/2019	317	8:26	N/A	N/A
NVA-148	11/12/2019	316	15:22	N/A	N/A
NVA-149	11/12/2019	316	15:00	11/13/2019	13:22
NVA-150	11/12/2019	316	10:16	N/A	N/A
NVA-151	11/12/2019	316	11:50	11/13/2019	11:56
NVA-152	11/12/2019	316	11:25	11/13/2019	12:17
NVA-153	11/12/2019	316	10:55	N/A	N/A

NVA-154	11/12/2019	316	14:40	N/A	N/A
NVA-155	11/13/2019	317	8:57	N/A	N/A
NVA-156	11/13/2019	317	9:35	N/A	N/A
NVA-157	1/9/2020	9	11:13	N/A	N/A
NVA-158	11/12/2019	316	10:32	N/A	N/A
NVA-159	11/10/2019	314	11:10	N/A	N/A
NVA-160	11/9/2019	313	10:50	N/A	N/A
NVA-161	11/9/2019	313	11:08	N/A	N/A
NVA-162	11/12/2019	316	9:22	N/A	N/A
NVA-163	11/12/2019	316	10:00	11/13/2019	14:45
NVA-164	11/12/2019	316	15:15	11/13/2019	14:10
NVA-165	11/12/2019	316	16:20	N/A	N/A
NVA-166	11/12/2019	316	16:52	11/13/2019	10:12
NVA-167	11/13/2019	317	9:45	N/A	N/A
NVA-168	11/9/2019	313	11:54	N/A	N/A
NVA-169	11/12/2019	316	14:01	11/13/2019	10:42
NVA-170	11/12/2019	316	13:13	11/13/2019	11:11
NVA-171	11/12/2019	316	12:29	N/A	N/A
NVA-172	11/11/2019	315	10:14	11/14/2019	8:56
NVA-173	11/10/2019	314	9:33	N/A	N/A
NVA-174	11/9/2019	313	10:26	11/12/2019	9:34
NVA-175	11/9/2019	313	16:21	N/A	N/A
NVA-176	11/8/2019	312	17:21	11/18/2019	13:09
NVA-177	11/8/2019	312	16:33	N/A	N/A
NVA-178	11/8/2019	312	15:31	N/A	N/A
NVA-179	11/7/2019	311	12:55	11/18/2019	10:14
NVA-180	11/7/2019	311	11:39	N/A	N/A
NVA-181	11/7/2019	311	9:54	11/7/2019	17:16
NVA-182	11/6/2019	310	9:04	11/8/2019	8:42
NVA-183	11/6/2019	310	9:44	N/A	N/A
NVA-184	11/7/2019	311	10:23	N/A	N/A
NVA-185	11/7/2019	311	10:59	11/7/2019	16:22
NVA-186	11/5/2019	309	17:14	N/A	N/A
NVA-187	11/7/2019	311	13:58	11/18/2019	10:38
NVA-188	11/7/2019	311	14:43	N/A	N/A
NVA-189	11/8/2019	312	15:11	11/18/2019	12:07
NVA-190	11/9/2019	313	14:15	11/18/2019	12:32
NVA-191	11/9/2019	313	13:13	N/A	N/A
NVA-192	11/9/2019	313	15:57	N/A	N/A

NVA-193	11/9/2019	313	16:44	11/12/2019	9:54
NVA-194	11/10/2019	314	10:04	11/12/2019	18:00
NVA-195	11/11/2019	315	10:58	N/A	N/A
NVA-196	11/10/2019	314	16:34	11/11/2019	11:17
NVA-197	11/10/2019	314	10:28	11/11/2019	17:34
NVA-198	11/10/2019	314	11:35	N/A	N/A
NVA-199	11/10/2019	314	12:29	11/12/2019	10:55
NVA-200	11/9/2019	313	15:04	N/A	N/A
NVA-201	11/8/2019	312	14:29	N/A	N/A
NVA-202	11/18/2019	322	11:26	N/A	N/A
NVA-203	11/5/2019	309	16:54	11/6/2019	15:33
NVA-204	11/6/2019	310	16:16	N/A	N/A
NVA-205	11/6/2019	310	11:19	N/A	N/A
NVA-206	11/6/2019	310	10:46	N/A	N/A
NVA-207	11/6/2019	310	12:43	N/A	N/A
NVA-208	11/5/2019	309	16:17	11/6/2019	14:45
NVA-209	11/8/2019	312	13:06	N/A	N/A
NVA-210	11/12/2019	316	12:31	N/A	N/A
NVA-211	11/12/2019	316	11:45	N/A	N/A
NVA-212	11/12/2019	316	16:19	N/A	N/A
NVA-213	11/10/2019	314	14:10	11/12/2019	16:36
NVA-214	11/10/2019	314	15:07	11/11/2019	17:12
NVA-215	11/10/2019	314	16:02	11/14/2019	10:18
NVA-216	11/11/2019	315	13:09	N/A	N/A
NVA-217	11/11/2019	315	16:52	11/13/2019	9:54
NVA-218	11/12/2019	316	17:09	11/13/2019	10:59
NVA-219	11/12/2019	316	15:44	N/A	N/A
NVA-220	11/4/2019	308	15:25	11/12/2019	14:00
NVA-221	11/12/2019	316	13:15	N/A	N/A
NVA-222	11/5/2019	309	14:47	11/8/2019	12:16
NVA-223	11/5/2019	309	10:42	11/8/2019	11:45
NVA-224	11/6/2019	310	13:32	N/A	N/A
NVA-225	11/5/2019	309	9:36	N/A	N/A
NVA-226	11/5/2019	309	11:26	11/8/2019	11:21
NVA-227	11/5/2019	309	13:54	N/A	N/A
NVA-228	11/4/2019	308	16:27	N/A	N/A
NVA-229	11/4/2019	308	14:42	11/12/2019	14:29
NVA-230	11/12/2019	316	15:04	N/A	N/A
NVA-231	11/13/2019	317	11:29	N/A	N/A

NVA-232	11/11/2019	315	16:10	11/13/2019	17:28
NVA-233	11/11/2019	315	13:30	11/14/2019	11:08
NVA-234	11/11/2019	315	14:37	N/A	N/A
NVA-235	11/11/2019	315	15:44	11/14/2019	11:55
NVA-236	11/14/2019	318	12:58	N/A	N/A
NVA-237	11/13/2019	317	12:27	N/A	N/A
NVA-238	11/2/2019	306	12:05	11/4/2019	13:54
NVA-239	11/2/2019	306	13:01	N/A	N/A
NVA-240	11/4/2019	308	17:02	11/5/2019	12:52
NVA-241	11/5/2019	309	13:24	N/A	N/A
NVA-242	11/2/2019	306	17:34	N/A	N/A
NVA-243	11/3/2019	307	9:13	11/3/2019	16:15
NVA-244	11/3/2019	307	16:50	11/4/2019	11:02
NVA-245	11/3/2019	307	10:51	N/A	N/A
NVA-246	11/2/2019	306	16:46	11/4/2019	12:18
NVA-247	11/2/2019	306	15:37	11/4/2019	12:35
NVA-248	11/2/2009	306	14:26	11/4/2019	13:06
NVA-249	11/2/2019	306	13:46	11/4/2019	13:20
NVA-250	11/2/2019	306	11:15	11/14/2019	16:59
NVA-251	11/13/2019	317	13:10	11/14/2019	13:28
NVA-252	11/13/2019	317	14:09	N/A	N/A
NVA-253	11/13/2019	317	16:17	N/A	N/A
NVA-254	11/13/2019	317	15:57	N/A	N/A
NVA-255	11/2/2019	306	10:44	11/14/2019	16:43
NVA-256	11/2/2019	306	9:56	N/A	N/A
NVA-257	11/2/2019	306	15:56	N/A	N/A
NVA-258	11/1/2019	305	12:21	11/1/2019	18:07
NVA-259	11/3/2019	307	12:17	11/4/2019	10:06
NVA-260	11/3/2019	307	14:01	N/A	N/A
NVA-261	11/3/2019	307	13:01	11/4/2019	9:36
NVA-262	11/1/2019	305	11:38	N/A	N/A
NVA-263	11/1/2019	305	9:09	11/2/2019	9:06
NVA-264	10/31/2019	304	10:06	11/14/2019	16:20
NVA-265	10/31/2019	304	12:17	11/14/2019	14:21
NVA-266	10/31/2019	304	13:53	11/14/2019	15:43
NVA-267	10/31/2019	304	16:52	N/A	N/A
NVA-268	11/1/2019	305	13:28	N/A	N/A
NVA-269	11/1/2019	305	17:06	11/3/2019	14:50
NVA-270	11/1/2019	305	15:51	N/A	N/A

NVA-271	10/30/2019	303	16:50	11/1/2019	14:00
NVA-272	10/31/2019	304	15:01	N/A	N/A
NVA-273	10/31/2019	304	14:34	N/A	N/A
NVA-274	10/30/2019	303	15:27	N/A	N/A
NVA-275	10/30/2019	303	15:03	10/31/2019	13:39
NVA-276	10/30/2019	303	14:36	11/14/2019	14:42
VVA					
VVA-1	10/31/2019	304	13:16	10/31/2019	13:20
VVA-2	10/31/2019	304	17:13	10/31/2019	17:17
VVA-3	10/31/2019	304	15:52	N/A	N/A
VVA-4	11/1/2019	305	16:19	N/A	N/A
VVA-5	11/3/2019	307	13:34	11/4/2019	9:20
VVA-6	11/1/2019	305	13:10	N/A	N/A
VVA-7	11/1/2019	305	11:06	N/A	N/A
VVA-8	10/30/2019	303	18:10	10/31/2019	17:33
VVA-9	10/31/2019	304	10:37	11/14/2019	16:06
VVA-10	10/31/2019	304	9:24	10/31/2019	10:33
VVA-11	10/31/2019	304	8:55	10/31/2019	9:59
VVA-12	11/1/2019	305	10:20	11/1/2019	23:29
VVA-13	11/1/2019	305	12:00	N/A	N/A
VVA-14	11/3/2019	307	12:40	11/4/2019	9:53
VVA-15	11/3/2019	307	11:54	11/4/2019	10:21
VVA-16	11/2/2019	306	16:28	11/4/2019	12:04
VVA-17	11/2/2019	306	14:05	N/A	N/A
VVA-18	11/2/2019	306	10:24	N/A	N/A
VVA-19	11/13/2019	317	13:27	11/14/2019	13:41
VVA-20	11/13/2019	317	14:30	11/13/2019	15:35
VVA-21	11/13/2019	317	15:41	N/A	N/A
VVA-22	11/11/2019	315	15:00	N/A	N/A
VVA-23	11/13/2019	317	16:41	11/13/2019	17:44
VVA-24	11/13/2019	317	12:51	11/14/2019	17:15
VVA-25	11/2/2019	306	13:21	11/4/2019	13:35
VVA-26	11/2/2019	306	14:56	N/A	N/A
VVA-27	11/2/2019	306	17:11	11/2/2019	18:15
VVA-28	11/3/2019	307	10:19	N/A	N/A
VVA-29	11/5/2019	309	9:17	11/8/2019	10:59
VVA-30	11/5/2019	309	11:58	N/A	N/A
VVA-31	11/5/2019	309	12:36	N/A	N/A
VVA-32	11/2/2019	306	12:32	11/4/2019	14:26

VVA-33	11/13/2019	317	11:58	N/A	N/A
VVA-34	11/14/2019	318	12:16	N/A	N/A
VVA-35	11/11/2019	315	14:17	11/14/2019	11:32
VVA-36	11/11/2019	315	16:33	N/A	N/A
VVA-37	11/13/2019	317	11:13	N/A	N/A
VVA-38	11/12/2019	316	15:25	11/12/2019	16:30
VVA-39	11/4/2019	308	16:03	N/A	N/A
VVA-40	11/5/2019	309	14:20	N/A	N/A
VVA-41	11/5/2019	309	11:07	11/8/2019	11:33
VVA-42	11/5/2019	309	9:58	11/6/2019	13:50
VVA-43	11/6/2019	310	14:23	N/A	N/A
VVA-44	11/8/2019	312	12:34	N/A	N/A
VVA-45	11/12/2019	316	13:43	11/8/2019	12:38
VVA-46	11/12/2019	316	16:04	N/A	N/A
VVA-47	11/12/2019	316	16:04	N/A	N/A
VVA-48	11/10/2019	314	14:32	N/A	N/A
VVA-49	11/13/2019	317	10:40	N/A	N/A
VVA-50	11/11/2019	315	12:39	11/14/2019	10:34
VVA-51	11/10/2019	314	15:41	N/A	N/A
VVA-52	11/10/2019	314	11:06	11/12/2019	17:40
VVA-53	11/10/2019	314	13:41	11/10/2019	14:51
VVA-54	11/12/2019	316	11:25	N/A	N/A
VVA-55	11/12/2019	316	12:10	11/12/2019	13:14
VVA-56	11/8/2019	312	13:34	11/18/2019	14:38
VVA-57	11/6/2019	310	15:04	11/6/2019	16:08
VVA-58	11/6/2019	310	12:03	11/6/2019	13:07
VVA-59	11/6/2019	310	10:26	N/A	N/A
VVA-60	11/6/2019	310	16:36	N/A	N/A
VVA-61	11/6/2019	310	15:50	N/A	N/A
VVA-62	11/7/2019	311	15:30	11/18/2019	11:04
VVA-63	11/8/2019	312	14:50	11/18/2019	11:50
VVA-64	11/9/2019	313	13:35	N/A	N/A
VVA-65	11/9/2019	313	15:29	N/A	N/A
VVA-66	11/10/2019	314	12:08	11/12/2019	10:40
VVA-67	11/9/2019	313	17:10	N/A	N/A
VVA-68	11/10/2019	314	16:56	N/A	N/A
VVA-69	11/11/2019	315	9:42	11/14/2019	8:41
VVA-70	11/9/2019	313	10:01	11/12/2019	9:15
VVA-71	11/9/2019	313	11:08	N/A	N/A

VVA-72	11/9/2019	313	12:40	N/A	N/A
VVA-73	11/8/2019	312	16:58	11/18/2019	12:52
VVA-74	11/8/2019	312	16:06	N/A	N/A
VVA-75	11/7/2019	311	14:21	11/18/2019	10:45
VVA-76	11/7/2019	311	13:26	N/A	N/A
VVA-77	11/7/2019	311	11:21	11/7/2019	16:36
VVA-78	11/7/2019	311	9:02	11/18/2019	9:21
VVA-79	11/17/2019	321	9:41	N/A	N/A
VVA-80	11/17/2019	321	16:02	11/18/2019	17:27
VVA-81	11/17/2019	321	16:37	N/A	N/A
VVA-82	11/17/2019	321	17:05	N/A	N/A
VVA-83	11/16/2019	320	14:48	N/A	N/A
VVA-84	11/16/2019	320	12:22	11/18/2019	14:25
VVA-85	11/16/2019	320	11:55	11/18/2019	14:01
VVA-86	11/16/2019	320	10:53	11/18/2019	13:36
VVA-87	11/15/2019	319	17:01	11/16/2019	10:26
VVA-88	11/16/2019	320	9:05	N/A	N/A
VVA-89	11/15/2019	319	9:43	N/A	N/A
VVA-90	11/15/2019	319	10:30	N/A	N/A
VVA-91	11/15/2019	319	10:59	11/16/2019	9:59
VVA-92	11/15/2019	319	16:27	N/A	N/A
VVA-93	11/16/2019	320	11:29	N/A	N/A
VVA-94	11/16/2019	320	12:54	11/18/2019	14:54
VVA-95	11/16/2019	320	14:14	11/18/2019	15:27
VVA-96	11/16/2019	320	15:20	11/18/2019	15:56
VVA-97	11/16/2019	320	17:10	11/18/2019	16:24
VVA-98	11/17/2019	321	14:55	N/A	N/A
VVA-99	11/17/2019	321	15:36	11/18/2019	17:07
VVA-100	11/17/2019	321	10:47	N/A	N/A
VVA-101	11/17/2019	321	11:21	N/A	N/A
VVA-102	11/17/2019	321	12:03	N/A	N/A
VVA-103	11/17/2019	321	12:39	11/17/2019	13:43
VVA-104	11/17/2019	321	13:39	11/17/2019	14:43
VVA-105	11/17/2019	321	14:11	11/17/2019	15:15
VVA-106	11/16/2019	320	16:45	11/16/2019	17:48
VVA-107	11/16/2019	320	16:05	11/17/2019	17:19
VVA-108	11/16/2019	320	13:42	11/16/2019	14:46
VVA-109	11/15/2019	319	15:43	11/15/2019	16:53
VVA-110	11/15/2019	319	15:04	N/A	N/A

VVA-111	11/15/2019	319	11:35	N/A	N/A
VVA-112	11/15/2019	319	12:11	N/A	N/A
VVA-113	11/15/2019	319	13:54	11/15/2019	14:57
VVA-114	11/15/2019	319	14:29	11/15/2019	15:33
VVA-115	11/17/2019	321	9:30	1/17/2019	10:33
VVA-116	11/17/2019	321	10:05	N/A	N/A
VVA-117	11/17/2019	321	13:22	N/A	N/A
VVA-118	11/17/2019	321	16:39	N/A	N/A
VVA-119	11/18/2019	322	8:45	11/18/2019	13:15
VVA-120	11/18/2019	322	12:35	11/18/2019	13:45
VVA-121	11/18/2019	322	12:05	N/A	N/A
VVA-122	11/18/2019	322	11:30	11/18/2019	12:38
VVA-123	11/18/2019	322	10:50	N/A	N/A
VVA-124	11/18/2019	322	9:15	11/18/2019	13:40
VVA-125	11/17/2019	321	3:10	N/A	N/A
VVA-126	11/17/2019	321	13:48	N/A	N/A
VVA-127	11/17/2019	321	12:55	N/A	N/A
VVA-128	11/17/2019	321	10:42	N/A	N/A
VVA-129	11/17/2019	321	11:12	11/17/2019	12:16
VVA-130	11/17/2019	321	8:40	11/17/2019	9:43
VVA-131	11/15/2019	319	13:05	11/15/2019	14:09
VVA-132	11/15/2019	319	12:38	11/15/2019	13:41
VVA-133	11/17/2019	321	7:57	11/17/2019	9:00
VVA-134	11/17/2019	321	11:54	N/A	N/A
VVA-135	11/17/2019	321	12:25	N/A	N/A
VVA-136	11/17/2019	321	14:12	11/17/2019	18:36
VVA-137	11/17/2019	321	14:42	11/17/2019	15:44
VVA-138	11/18/2019	322	8:14	N/A	N/A
VVA-139	11/18/2019	322	9:50	N/A	N/A
VVA-140	11/18/2019	322	10:20	11/18/2019	11:22
VVA-141	11/17/2019	321	13:35	N/A	N/A
VVA-142	11/17/2019	321	14:00	N/A	N/A
VVA-143	11/17/2019	321	14:30	11/18/2019	15:50
VVA-144	11/17/2019	321	11:50	N/A	N/A
VVA-145	11/17/2019	321	11:28	N/A	N/A
VVA-146	11/17/2019	321	9:18	N/A	N/A
VVA-147	11/17/2019	321	8:45	N/A	N/A
VVA-148	11/17/2019	321	8:25	11/17/2019	15:54
VVA-149	11/16/2019	320	10:28	N/A	N/A

VVA-150	11/16/2019	320	10:59	N/A	N/A
VVA-151	11/16/2019	320	11:46	N/A	N/A
VVA-152	11/16/2019	320	9:53	11/16/2019	14:56
VVA-153	11/16/2019	320	7:50	11/17/2019	8:54
VVA-154	11/17/2019	321	9:55	11/17/2019	10:59
VVA-155	11/17/2019	321	10:55	N/A	N/A
VVA-156	11/17/2019	321	12:25	N/A	N/A
VVA-157	11/17/2019	321	12:50	11/17/2019	13:52
VVA-158	11/17/2019	321	10:30	N/A	N/A
VVA-159	11/16/2019	320	12:50	11/16/2019	13:53
VVA-160	11/16/2019	320	13:10	N/A	N/A
VVA-161	11/16/2019	320	7:40	N/A	N/A
VVA-162	11/16/2019	320	21:15	11/16/2019	14:21
VVA-163	11/16/2019	320	12:26	N/A	N/A
VVA-164	11/16/2019	320	12:56	N/A	N/A
VVA-165	11/16/2019	320	8:43	11/16/2019	14:02
VVA-166	11/16/2019	320	8:00	11/16/2019	14:05
VVA-167	11/16/2019	320	12:15	N/A	N/A
VVA-168	11/16/2019	320	11:50	N/A	N/A
VVA-169	11/16/2019	320	11:23	N/A	N/A
VVA-170	11/16/2019	320	8:35	11/16/2019	14:30
VVA-171	11/15/2019	319	10:20	N/A	N/A
VVA-172	11/16/2019	320	13:24	N/A	N/A
VVA-173	11/15/2019	319	10:45	11/16/2019	20:09
VVA-174	11/15/2019	319	9:46	11/15/2019	14:38
VVA-175	11/16/2019	320	9:05	N/A	N/A
VVA-176	11/16/2019	320	10:50	N/A	N/A
VVA-177	11/15/2019	319	12:02	11/15/2019	16:04
VVA-178	11/15/2019	319	7:36	11/15/2019	12:53
VVA-179	11/15/2019	319	9:17	11/15/2019	14:15
VVA-180	11/15/2019	319	11:34	N/A	N/A
VVA-181	11/15/2019	319	12:06	11/16/2019	7:12
VVA-182	11/15/2019	319	8:15	11/15/2019	13:50
VVA-183	11/15/2019	319	8:18	N/A	N/A
VVA-184	11/16/2019	320	11:30	11/15/2019	15:30
VVA-185	11/15/2019	319	10:37	N/A	N/A
VVA-186	11/15/2019	319	10:00	11/15/2019	13:50
VVA-187	11/15/2019	319	8:55	N/A	N/A
VVA-188	11/15/2019	319	7:33	11/15/2019	13:22

VVA-189	11/15/2019	319	12:55	N/A	N/A
VVA-190	11/14/2019	318	12:50	N/A	N/A
VVA-191	11/14/2019	318	12:15	11/14/2019	13:18
VVA-192	11/14/2019	318	11:10	N/A	N/A
VVA-193	11/15/2019	319	9:30	N/A	N/A
VVA-194	11/14/2019	318	10:36	11/14/2019	14:40
VVA-195	11/14/2019	318	9:10	11/14/2019	13:20
VVA-196	11/14/2019	318	10:52	N/A	N/A
VVA-197	11/14/2019	318	9:34	11/14/2019	13:47
VVA-198	11/14/2019	318	11:24	11/14/2019	15:26
VVA-199	1/10/2020	10	14:08	N/A	N/A
VVA-200	11/14/2019	318	13:07	N/A	N/A

5. POINT COMPARISON

Point ID	Point CK	Delta North (M)	Delta East (M)	Vertical Difference (M)
NVA				
NVA-003	NVA-003 CK	-0.002	-0.002	0.003
NVA-004	NVA-004 CK	0.025	-0.007	-0.017
NVA-005	NVA-005 CK	0.021	0.011	0.018
NVA-006	NVA-006 CK	0.006	-0.006	0.000
NVA-009	NVA-009 CK	-0.009	0.011	0.011
NVA-011	NVA-011 CK	-0.011	0.005	-0.008
NVA-012	NVA-012 CK	-0.013	0.011	0.001
NVA-013	NVA-013 CK	-0.030	-0.021	-0.017
NVA-015	NVA-015 CK	0.006	-0.001	0.014
NVA-018	NVA-018 CK	0.007	-0.001	0.011
NVA-019	NVA-019 CK	-0.003	-0.008	0.031
NVA-022	NVA-022 CK	-0.011	0.003	0.002
NVA-023	NVA-023 CK	0.008	0.004	-0.003
NVA-024	NVA-024 CK	0.003	0.000	0.005
NVA-027	NVA-027 CK	0.007	-0.008	0.010
NVA-028	NVA-028 CK	-0.005	0.010	-0.005
NVA-029	NVA-029 CK	-0.002	-0.004	0.020
NVA-031	NVA-031 CK	-0.003	-0.004	0.008
NVA-032	NVA-032 CK	-0.011	-0.006	-0.010
NVA-038	NVA-038 CK	-0.010	-0.009	-0.021
NVA-039	NVA-039 CK	0.013	-0.002	-0.014
NVA-040	NVA-040 CK	0.010	0.024	-0.016
NVA-041	NVA-041 CK	0.004	-0.003	-0.017
NVA-043	NVA-043 CK	-0.011	0.014	0.002
NVA-044	NVA-044 CK	-0.017	-0.004	0.005
NVA-046	NVA-046 CK	0.005	0.006	0.008
NVA-047	NVA-047 CK	-0.018	-0.002	-0.010
NVA-048	NVA-048 CK	0.009	0.004	0.007
NVA-049	NVA-049 CK	0.022	0.000	0.012
NVA-051	NVA-051 CK	0.005	0.007	0.014
NVA-052	NVA-052 CK	-0.008	0.010	-0.009
NVA-053	NVA-053 CK	-0.007	0.009	0.021
NVA-054	NVA-054 CK	0.017	0.002	0.001
NVA-055	NVA-055 CK	-0.004	-0.009	-0.012
NVA-057	NVA-057 CK	0.007	0.010	0.010
NVA-060	NVA-060 CK	-0.007	0.008	-0.005
NVA-062	NVA-062 CK	-0.001	0.004	-0.018
NVA-063	NVA-063 CK	0.014	0.001	-0.013

NVA-064	NVA-064 CK	0.014	0.004	-0.011
NVA-065	NVA-065 CK	0.006	0.005	0.031
NVA-068	NVA-068 CK	-0.011	-0.002	-0.009
NVA-069	NVA-069 CK	0.011	0.011	-0.007
NVA-070	NVA-070 CK	-0.001	-0.002	0.007
NVA-071	NVA-071 CK	0.005	-0.034	0.020
NVA-072	NVA-072 CK	0.007	0.007	0.007
NVA-073	NVA-073 CK	-0.012	-0.013	0.022
NVA-074	NVA-074 CK	0.003	-0.008	0.027
NVA-075	NVA-075 CK	0.005	-0.005	0.024
NVA-078	NVA-078 CK	0.011	0.008	-0.022
NVA-079	NVA-079 CK	-0.002	-0.005	0.016
NVA-080	NVA-080 CK	0.006	0.002	-0.007
NVA-087	NVA-087 CK	-0.020	0.003	-0.019
NVA-088	NVA-088 CK	-0.007	-0.006	0.009
NVA-094	NVA-094 CK	-0.017	0.004	-0.019
NVA-095	NVA-095 CK	0.002	0.007	-0.002
NVA-097	NVA-097 CK	-0.006	0.004	-0.008
NVA-100	NVA-100 CK	0.011	-0.012	-0.013
NVA-103	NVA-103 CK	0.001	-0.002	-0.031
NVA-104	NVA-104 CK	-0.006	-0.003	-0.022
NVA-105	NVA-105 CK	0.011	0.000	-0.016
NVA-106	NVA-106 CK	-0.004	0.003	0.016
NVA-107	NVA-107 CK	0.003	0.000	-0.001
NVA-110	NVA-110 CK	0.007	0.018	0.031
NVA-114	NVA-114 CK	0.001	0.001	0.011
NVA-115	NVA-115 CK	0.006	0.000	0.009
NVA-116	NVA-116 CK	0.001	0.002	-0.007
NVA-121	NVA-121 CK	-0.007	0.001	0.007
NVA-125	NVA-125 CK	0.001	-0.007	-0.037
NVA-126	NVA-126 CK	0.007	0.000	-0.002
NVA-127	NVA-127 CK	-0.008	0.001	-0.013
NVA-129	NVA-129 CK	0.005	-0.007	-0.028
NVA-130	NVA-130 CK	-0.006	0.003	-0.032
NVA-131	NVA-131 CK	-0.006	-0.002	0.015
NVA-133	NVA-133 CK	-0.002	0.001	0.009
NVA-138	NVA-138 CK	0.003	-0.006	0.003
NVA-143	NVA-143 CK	0.007	-0.006	-0.008
NVA-149	NVA-149 CK	0.000	-0.006	0.018
NVA-151	NVA-151 CK	-0.007	0.006	0.002
NVA-152	NVA-152 CK	0.006	0.008	0.002

NVA-164	NVA-164 CK	-0.003	0.004	-0.013
NVA-166	NVA-166 CK	0.003	0.021	0.013
NVA-169	NVA-169 CK	0.006	-0.003	0.000
NVA-170	NVA-170 CK	-0.009	0.011	0.017
NVA-172	NVA-172 CK	0.002	0.000	0.008
NVA-174	NVA-174 CK	0.005	0.002	-0.015
NVA-176	NVA-176 CK	0.006	0.005	-0.034
NVA-179	NVA-179 CK	0.009	-0.001	0.016
NVA-181	NVA-181 CK	0.008	0.018	0.010
NVA-182	NVA-182 CK	-0.017	0.005	-0.007
NVA-185	NVA-185 CK	-0.009	0.010	-0.011
NVA-187	NVA-187 CK	-0.022	-0.019	0.027
NVA-189	NVA-189 CK	0.001	0.001	0.045
NVA-190	NVA-190 CK	0.009	0.006	-0.008
NVA-193	NVA-193 CK	0.034	0.007	-0.035
NVA-194	NVA-194 CK	-0.006	-0.001	-0.010
NVA-196	NVA-196 CK	0.006	0.000	-0.007
NVA-197	NVA-197 CK	-0.024	0.000	-0.020
NVA-199	NVA-199 CK	-0.010	-0.027	-0.005
NVA-203	NVA-203 CK	0.011	0.002	0.020
NVA-208	NVA-208 CK	-0.014	-0.014	0.008
NVA-213	NVA-213 CK	-0.009	0.007	0.024
NVA-214	NVA-214 CK	-0.014	0.004	-0.026
NVA-215	NVA-215 CK	0.025	0.012	-0.026
NVA-217	NVA-217 CK	-0.024	0.007	0.014
NVA-218	NVA-218 CK	0.000	0.005	-0.029
NVA-220	NVA-220 CK	0.031	0.008	-0.048
NVA-222	NVA-222 CK	-0.007	0.023	-0.003
NVA-223	NVA-223 CK	-0.015	-0.005	-0.019
NVA-226	NVA-226 CK	0.011	0.008	0.010
NVA-229	NVA-229 CK	0.007	0.011	-0.027
NVA-232	NVA-232 CK	0.006	-0.001	-0.005
NVA-233	NVA-233 CK	-0.003	0.019	-0.022
NVA-235	NVA-235 CK	-0.011	0.005	-0.007
NVA-238	NVA-238 CK	-0.017	-0.001	0.012
NVA-240	NVA-240 CK	-0.008	0.001	0.014
NVA-243	NVA-243 CK	0.000	0.007	-0.036
NVA-244	NVA-244 CK	0.015	-0.011	0.019
NVA-246	NVA-246 CK	0.000	-0.001	-0.010
NVA-247	NVA-247 CK	0.002	-0.002	-0.035
NVA-248	NVA-248 CK	0.007	0.012	-0.004

NVA-249	NVA-249 CK	-0.013	-0.001	-0.007
NVA-250	NVA-250 CK	0.003	-0.004	0.020
NVA-251	NVA-251 CK	-0.013	-0.014	0.004
NVA-255	NVA-255 CK	-0.028	0.000	0.019
NVA-258	NVA-258 CK	-0.003	0.020	-0.025
NVA-259	NVA-259 CK	0.003	0.022	0.014
NVA-261	NVA-261 CK	0.026	-0.020	-0.016
NVA-263	NVA-263 CK	0.006	0.009	0.025
NVA-264	NVA-264 CK	-0.004	0.022	0.005
NVA-265	NVA-265 CK	0.003	0.002	-0.001
NVA-266	NVA-266 CK	0.015	-0.007	0.013
NVA-269	NVA-269 CK	0.015	0.005	0.014
NVA-271	NVA-271 CK	0.021	-0.016	0.020
NVA-275	NVA-275 CK	-0.012	0.008	0.036
NVA-276	NVA-276 CK	0.010	0.007	0.006
VVA				
VVA-1	VVA-1 CK	0.005	0.010	-0.017
VVA-2	VVA-2 CK	-0.011	0.002	0.006
VVA-5	VVA-5 CK	0.034	0.002	-0.014
VVA-8	VVA-8 CK	-0.002	0.008	-0.022
VVA-9	VVA-9 CK	-0.004	0.006	-0.015
VVA-10	VVA-10 CK	0.012	0.014	-0.012
VVA-11	VVA-11 CK	-0.004	-0.005	0.008
VVA-12	VVA-12 CK	0.004	-0.005	-0.004
VVA-14	VVA-14 CK	-0.003	0.009	0.017
VVA-15	VVA-15 CK	0.001	0.007	0.033
VVA-16	VVA-16 CK	-0.003	0.006	0.005
VVA-19	VVA-19 CK	-0.011	-0.001	0.016
VVA-20	VVA-20 CK	0.019	-0.016	-0.016
VVA-23	VVA-23 CK	0.012	-0.002	-0.007
VVA-24	VVA-24 CK	-0.008	0.002	0.033
VVA-25	VVA-25 CK	-0.003	0.007	-0.003
VVA-27	VVA-27 CK	-0.014	-0.021	-0.010
VVA-29	VVA-29 CK	0.012	0.006	-0.007
VVA-32	VVA-32 CK	-0.009	0.000	0.023
VVA-35	VVA-35 CK	-0.018	-0.019	0.000
VVA-38	VVA-38 CK	0.008	-0.006	0.002
VVA-41	VVA-41 CK	0.002	-0.004	-0.023
VVA-42	VVA-42 CK	-0.016	0.012	0.014
VVA-45	VVA-45 CK	0.000	0.005	0.032
VVA-50	VVA-50 CK	0.005	-0.007	0.015

VVA-52	VVA-52 CK	-0.016	-0.008	0.023
VVA-53	VVA-53 CK	0.022	0.012	-0.005
VVA-55	VVA-55 CK	-0.011	0.007	0.009
VVA-56	VVA-56 CK	-0.004	-0.007	-0.013
VVA-57	VVA-57 CK	0.015	0.004	0.007
VVA-58	VVA-58 CK	0.022	-0.008	0.010
VVA-62	VVA-62 CK	0.018	0.009	0.017
VVA-63	VVA-63 CK	0.008	0.000	-0.002
VVA-66	VVA-66 CK	-0.002	0.004	-0.001
VVA-69	VVA-69 CK	-0.005	0.003	-0.011
VVA-70	VVA-70 CK	-0.001	-0.005	0.007
VVA-73	VVA-73 CK	-0.004	-0.001	0.030
VVA-75	VVA-75 CK	-0.017	-0.013	0.025
VVA-77	VVA-77 CK	-0.007	0.006	-0.015
VVA-78	VVA-78 CK	-0.006	0.002	-0.005
VVA-80	VVA-80 CK	0.002	0.012	0.003
VVA-84	VVA-84 CK	0.019	0.014	0.007
VVA-85	VVA-85 CK	0.026	-0.012	0.001
VVA-86	VVA-86 CK	-0.014	-0.009	0.008
VVA-87	VVA-87 CK	0.011	0.010	0.013
VVA-91	VVA-91 CK	-0.006	0.001	-0.006
VVA-94	VVA-94 CK	0.029	-0.032	-0.005
VVA-95	VVA-95 CK	0.011	-0.003	-0.008
VVA-96	VVA-96 CK	-0.013	0.016	0.030
VVA-97	VVA-97 CK	0.007	-0.002	-0.001
VVA-99	VVA-99 CK	-0.004	-0.002	0.006
VVA-103	VVA-103 CK	0.003	0.007	-0.004
VVA-104	VVA-104 CK	-0.009	-0.005	-0.005
VVA-105	VVA-105 CK	0.005	-0.006	0.004
VVA-106	VVA-106 CK	-0.008	-0.001	0.012
VVA-107	VVA-107 CK	0.008	0.017	0.009
VVA-108	VVA-108 CK	-0.005	-0.022	-0.008
VVA-109	VVA-109 CK	0.001	-0.010	0.029
VVA-113	VVA-113 CK	0.003	0.003	0.007
VVA-114	VVA-114 CK	0.007	0.002	-0.017
VVA-115	VVA-115 CK	0.007	0.008	-0.005
VVA-119	VVA-119 CK	0.008	0.006	0.014
VVA-120	VVA-120 CK	0.004	0.000	0.001
VVA-122	VVA-122 CK	-0.023	0.016	-0.038
VVA-124	VVA-124 CK	-0.014	-0.001	0.012
VVA-129	VVA-129 CK	-0.007	-0.011	-0.015

VVA-130	VVA-130 CK	-0.001	0.000	0.007
VVA-131	VVA-131 CK	-0.002	-0.007	0.003
VVA-132	VVA-132 CK	0.000	0.003	-0.030
VVA-133	VVA-133 CK	-0.014	0.004	-0.011
VVA-136	VVA-136 CK	-0.010	0.003	0.001
VVA-137	VVA-137 CK	0.000	-0.004	-0.001
VVA-140	VVA-140 CK	0.007	0.002	0.010
VVA-143	VVA-143 CK	0.010	0.000	0.009
VVA-148	VVA-148 CK	-0.006	-0.008	-0.009
VVA-152	VVA-152 CK	0.011	-0.003	0.020
VVA-153	VVA-153 CK	-0.002	0.000	0.004
VVA-154	VVA-154 CK	-0.002	0.008	0.048
VVA-157	VVA-157 CK	0.006	-0.008	0.006
VVA-159	VVA-159 CK	0.000	-0.002	-0.007
VVA-162	VVA-162 CK	-0.003	-0.001	-0.001
VVA-165	VVA-165 CK	0.005	0.001	0.005
VVA-166	VVA-166 CK	-0.004	0.003	0.016
VVA-170	VVA-170 CK	-0.009	0.007	0.001
VVA-173	VVA-173 CK	0.019	-0.003	0.024
VVA-174	VVA-174 CK	0.002	-0.004	0.023
VVA-177	VVA-177 CK	0.002	-0.018	-0.031
VVA-178	VVA-178 CK	0.013	-0.007	-0.017
VVA-179	VVA-179 CK	-0.004	0.001	0.016
VVA-181	VVA-181 CK	-0.029	0.002	0.031
VVA-182	VVA-182 CK	0.009	-0.005	-0.010
VVA-184	VVA-184 CK	0.012	0.015	-0.001
VVA-186	VVA-186 CK	0.003	0.007	0.007
VVA-188	VVA-188 CK	-0.003	-0.004	-0.015
VVA-191	VVA-191 CK	-0.002	0.000	0.001
VVA-194	VVA-194 CK	0.020	0.027	0.008
VVA-195	VVA-195 CK	0.002	-0.005	-0.038
VVA-197	VVA-197 CK	0.009	-0.003	-0.019
VVA-198	VVA-198 CK	0.016	-0.007	-0.032