aero-graphics

Aerial LiDAR 2020 Check Point Survey Report

For

Dewberry Engineers Inc.

Aero-Graphics, Inc.

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November 2020

Table of Contents

1.   Introduction

1.1 Project Summary:

Aero-Graphics Inc. is under contract to Dewberry Engineers to provide surveyed ground check points to support the acquisition of aerial lidar for 9,170 sq. miles in eastern Utah. The survey field work was conducted August 5, 2020 thru November 16, 2020. The check point locations were well distributed across the project areas as evenly as the terrain would allow.

Existing NGS control points were located and surveyed as part of the field work to verify the accuracy of survey. The results are shown in section 2.4 of this report.

As a verification of field procedures, approximately 50% of the check points surveyed were re-observed with the results shown in section 5 of this report.

The final horizontal coordinates are referenced to NAD83(2011) UTM Zone 12 meters, EPSG Code 6341. The final vertical elevations are referenced to NAVD88 meters using Geoid model 2018 (Geoid18).

1.2 Surveyor:

Questions regarding this report can be addressed to:

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Surveying Manager
Aero-Graphics, Inc
40 W Oakland Ave
Salt Lake City, Utah 84115
801-487-3273
801-891-2779 direct

Utah Licensed Professional Land Surveyor #7643406, exp date 3/31/2021
Colorado Licensed Professional Land Surveyor #PLS-0038527, exp date 10/31/2021
ASPRS Certified Photogrammetrist, exp date 9/17/2023

1.3 Project Areas:

Flaming Gorge (QL1)
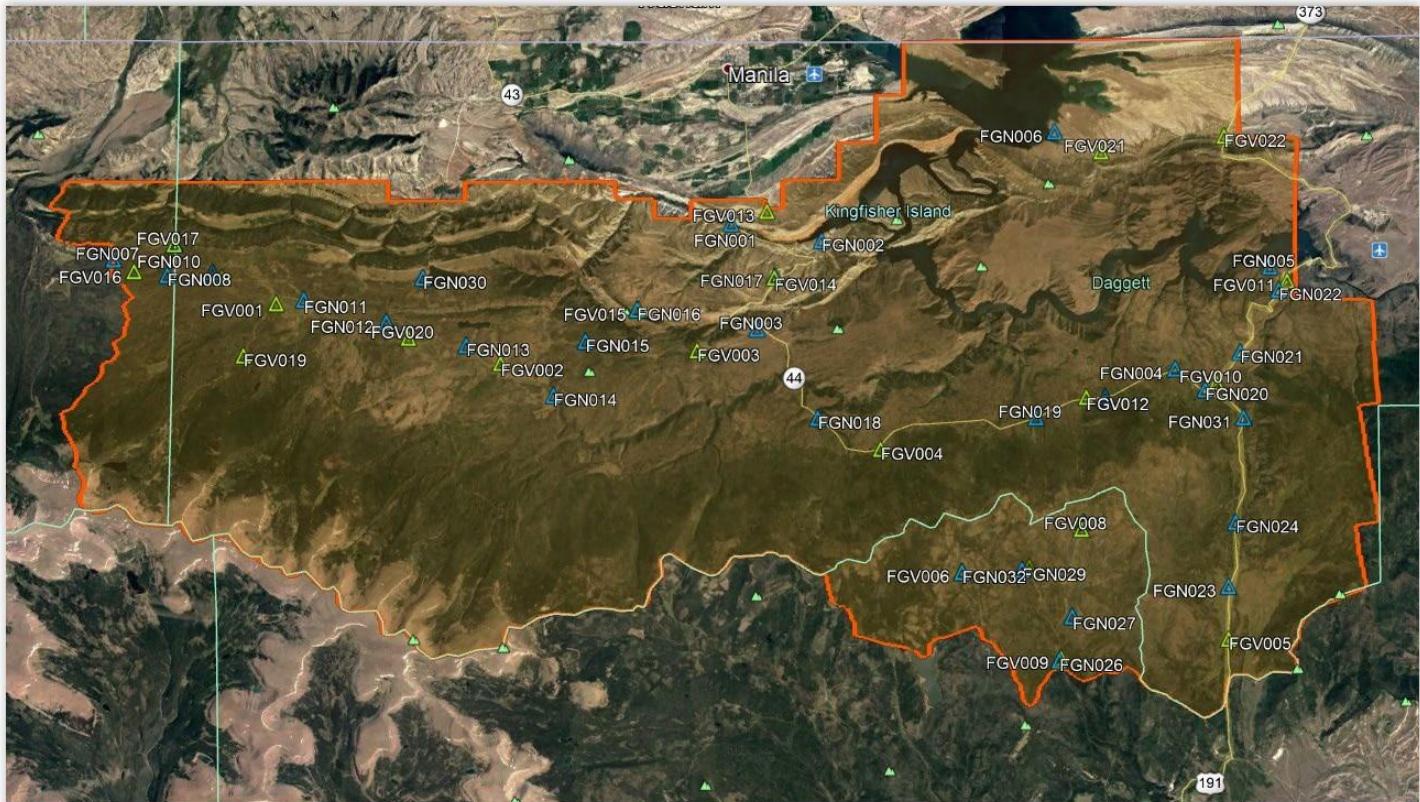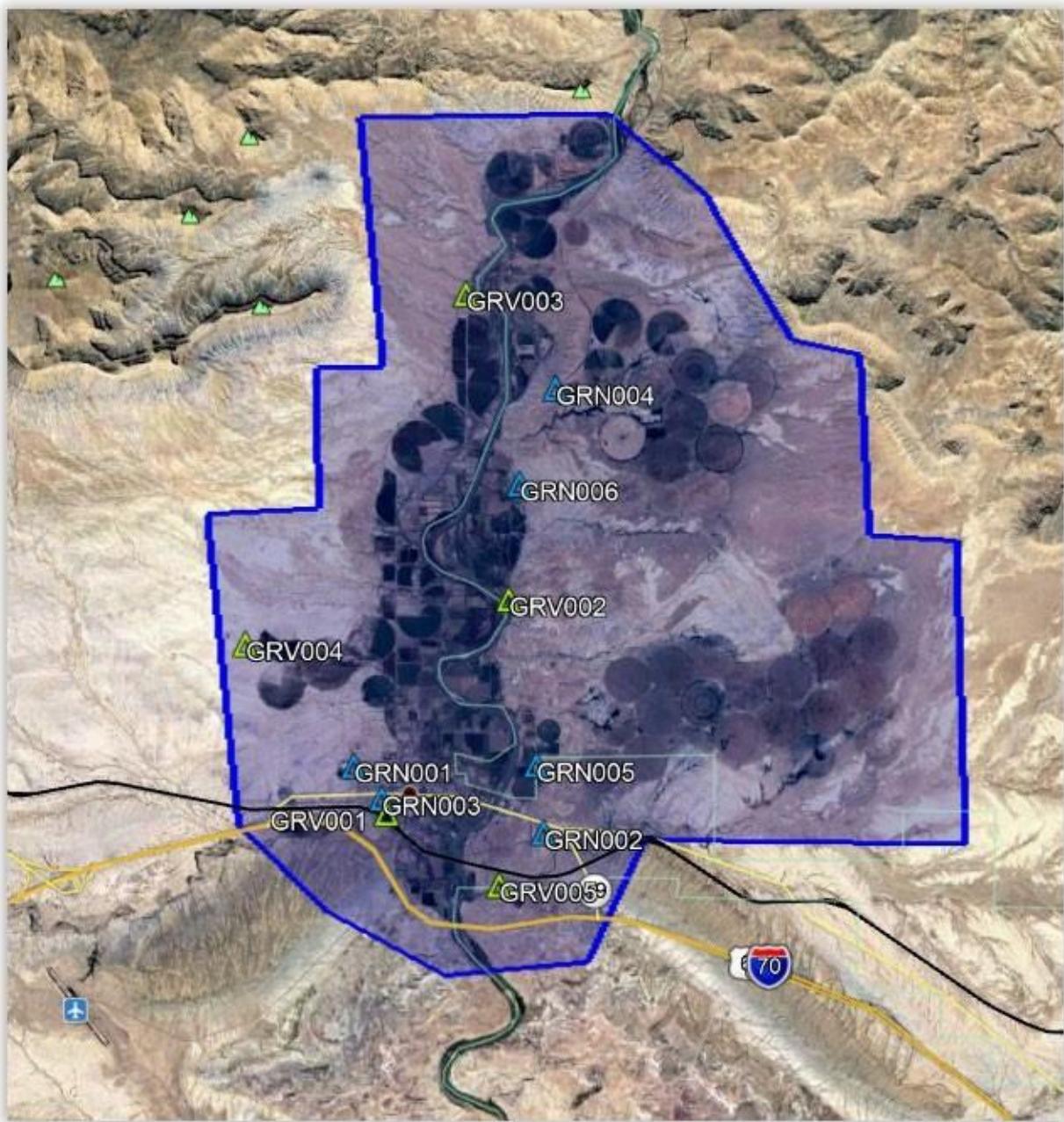
Muddy Creek (QL1)
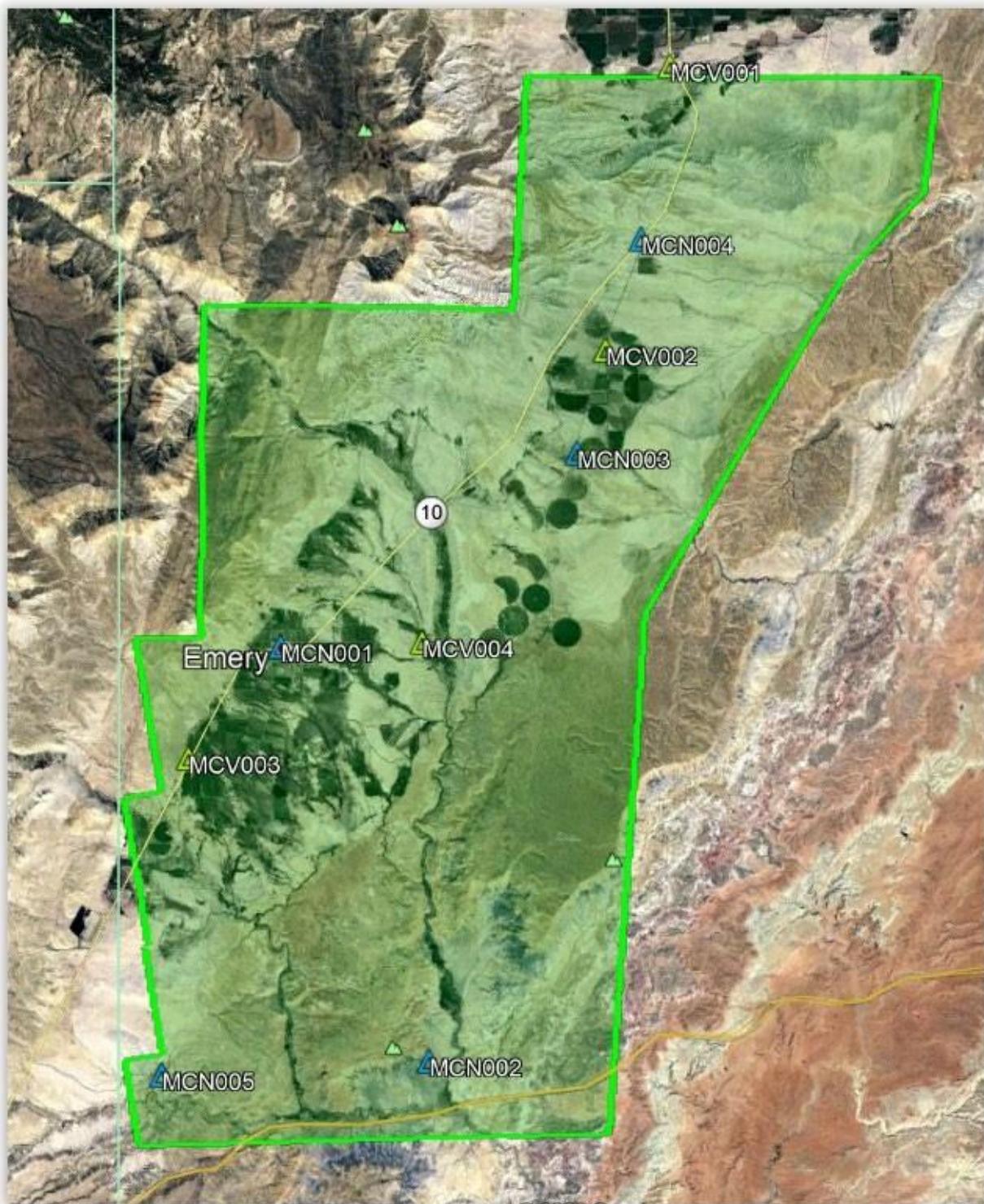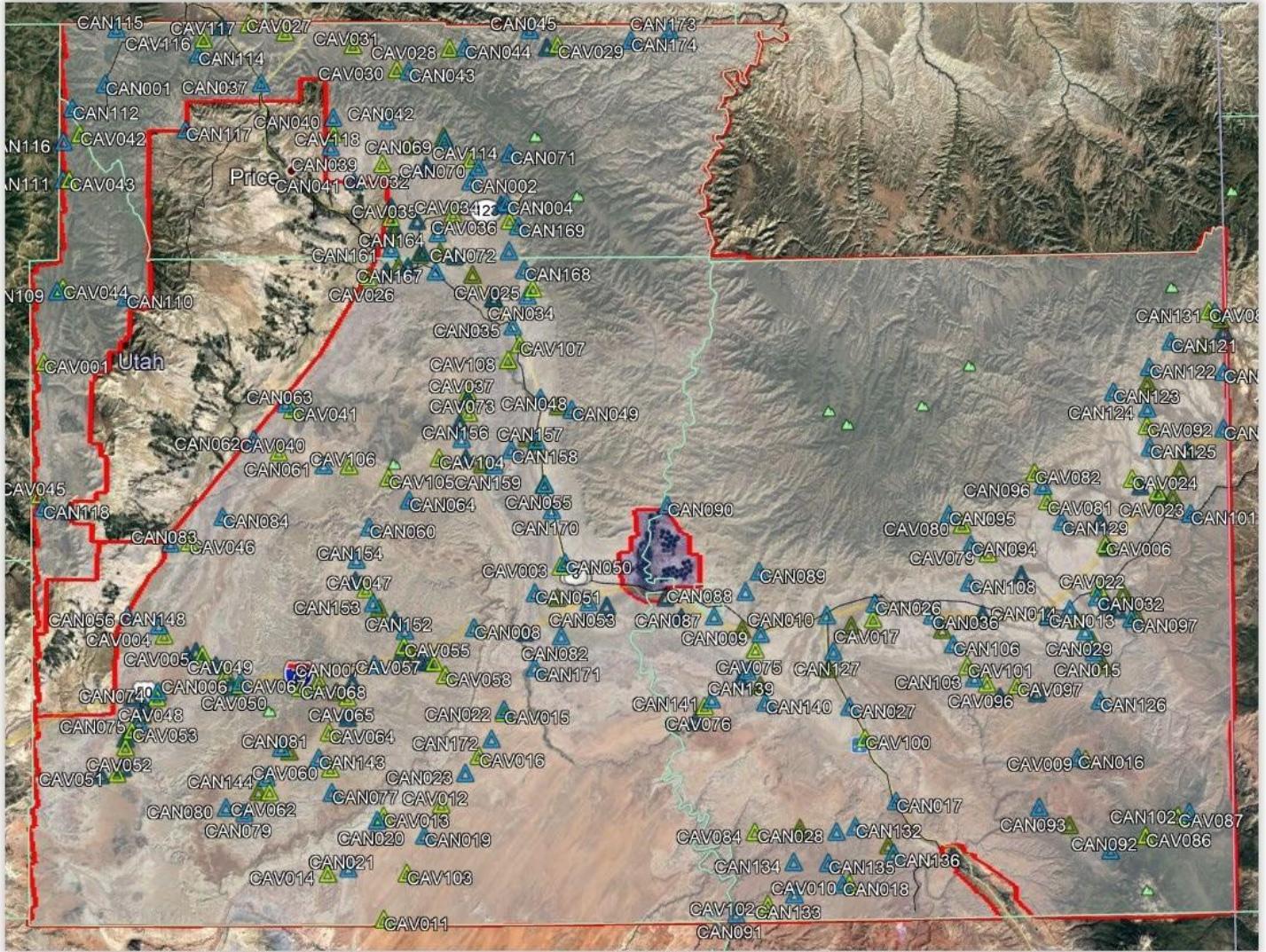
2. Project Details

2.1 Survey Equipment

The equipment listed below was used to survey the ground points for this LiDAR project.

TOPCON Dual Frequency/ Dual Constellation GNSS Receivers:
>HiPER Ga, S/N: 498-00418   HiPER Ga, S/N: 457-02513
>HiPER SR, S/N: 1064-16270   HiPER SR, S/N: 1209-11478
>HiPER SR, S/N: 1209-10832   HiPER SR, S/N: 1209-14758
>HiPER SR, S/N: 1209-18284   HiPER SR, S/N: 1209-18273

Spectra Precision Ranger 3 Data Collector

Two meter fixed height range pole for each Topcon GNSS HiPER receiver with attached bipod legs for stability.

2.2 Surveyed Point Details

The 377 ground check points were well distributed throughout the project areas. Five (5) photographs were taken of each point, looking north, east, south, west, and close on the point\nail. A paint mark, mag nail, or spike was set at each location where possible. Some points were surveyed at photo\lidar identifiable locations.

Check point locations are detailed in the "Check Point Documentation Report" sheets attached to this report.

2.3 Surveyed Point Network

Multiple methods were used during the field survey to observe the check points. Each method is detailed below.

LiDAR identifiable features were observed as NVA check points where available.

STATIC:

Static (or Rapid-Static) Surveying is a method that Aero-Graphics has employed for many years to collect ground check points. A base station location is selected, usually at one or more control locations, and a GNSS receiver is left there for the duration of the day to complete the survey. The other GNSS receivers are then used as rovers to survey the other point locations.

The duration of the rover receivers will vary depending upon the distance from the base receiver. Normally the rover will not be further than 10 km from the base. The greater the distance the rover is from the base receiver, the longer the recording duration of the rover needs to be. Each rover location is surveyed for a minimum of 20 minutes or greater.

Static Surveying was used to collect the check points.

The individual point locations are post-processed after the field survey is completed. The GNSS data collected by the receivers is downloaded and processed in NovaTel's Waypoint GravNET software. The base station coordinates are used to differentially correct the other point's locations.

The NGS Online Positioning User Service (OPUS) was used to process the base station location data. A minimum of 2+ hours of GNSS data was collected for base stations to be processed through OPUS.

THE UTAH REFERENCE NETWORK (VRS):

The Utah Reference Network Virtual Reference Station (VRS) was used to survey check points where a cell phone signal was available. The field surveyor's data collector and roving GNSS receiver utilized the real-time broadcast positional correction to observe and survey the points.

The maximum baseline restriction for the roving receiver is 70km while using this method.

2.4 Field Procedures and Analysis

All check points were observed once and 50% of the locations were surveyed a second time on a different day or with 4 hours between observations. Each observation for static surveying occupied the point for a minimum of 20 minutes in duration. Each observation with the VRS occupied the points for a minimum of three (3) minutes in duration.

Fourteen (14) NGS monuments were surveyed as part of the field procedures. Monuments were researched and located prior to field work commencing. While the highest order of monuments was preferred for surveying, this area does not have an abundance to pick from. Monuments that were surveyed were chosen for accessibility and probable existence. Although all results

are shown below, some are less than desirable due to imprecise data from the NGS datasheets. All surveyed GNSS data has been provided to the NGS to assist with updating these monuments.

The NGS monuments were occupied to provide a QC\QA for the survey methods used. Ten (10) of the monuments were occupied twice, seven (7) of the monuments were occupied three times, and 1 monument was occupied four times. The observed values and data sheet values are shown below along with the differences. The latitude and longitude from the data sheets were converted to UTM zone 12 meters.

NGS Monuments

POINT		OBSERVED VALUES			DATASHEET VALUES			DIFFERENCE		
ID	NGS PID	NORTHING	EASTING	ELEVATION	NORTHING	EASTING	ELEVATION	NORTHING	EASTING	VERTICAL
44FMK	KM0398	4341055.075	662775.106	1440.426	4341056.165	662772.831	1440.334	-1.090	2.275	0.092
44FMK-1	KM0398	4341055.068	662775.117	1440.418	4341056.165	662772.831	1440.334	-1.097	2.286	0.084
44FMK-2	KM0398	4341055.078	662775.109	1440.400	4341056.165	662772.831	1440.334	-1.087	2.278	0.066
72FMK	KM0430	4324357.325	647686.329	1395.379	4324358.934	647695.630	1395.312	-1.609	-9.301	0.067
72FMK-1	KM0430	4324357.336	647686.330	1395.382	4324358.934	647695.630	1395.312	-1.598	-9.300	0.070
BOYD	JN0392	4314817.474	576947.927	1317.218	4314817.488	576947.905	1317.300	-0.014	0.022	-0.082
BOYD-VRS1	JN0392	4314817.505	576947.920	1317.218	4314817.488	576947.905	1317.300	0.017	0.015	-0.082
BOYD-VRS2	JN0392	4314817.478	576947.919	1317.233	4314817.488	576947.905	1317.300	-0.010	0.014	-0.067
C41	KN0222	4346820.698	487026.428	1891.903	4346811.883	487036.884	1891.834	8.815	-10.456	0.069
CISCO	JM0489	4313638.010	647041.201	1356.867	4313638.030	647041.189	1356.815	-0.020	0.012	0.052
CISCO-1	JM0489	4313638.000	647041.198	1356.860	4313638.030	647041.189	1356.815	-0.030	0.009	0.045
D379	LN0468	4516540.994	629058.015	2489.041	4516509.511	629062.796	2488.892	31.483	-4.781	0.149
HORSE	KN0487	4363459.122	550035.126	1705.073	4363459.101	550035.088	1704.100	0.021	0.038	0.973
HORSE-1	KN0487	4363459.126	550035.139	1705.099	4363459.101	550035.088	1704.100	0.025	0.051	0.999
HORSE-VRS	KN0487	4363459.110	550035.127	1705.062	4363459.101	550035.088	1704.100	0.009	0.039	0.962
J18	JM0287	4313524.465	610474.871	1549.417	4313530.051	610472.310	1549.256	-5.586	2.561	0.161
K112	JN0110	4251626.787	526667.822	1349.310	4251626.806	526667.813	1349.299	-0.019	0.009	0.011
Q18	JM0293	4303759.957	603115.146	1416.787	4303761.683	603111.177	1416.619	-1.726	3.969	0.168
Q18-1	JM0293	4303759.975	603115.101	1416.831	4303761.683	603111.177	1416.619	-1.708	3.924	0.212
R40	KN0249	4322207.534	488670.713	1820.101	4322208.464	488675.824	1820.046	-0.930	-5.111	0.055
R40-1	KN0249	4322207.536	488670.709	1820.107	4322208.464	488675.824	1820.046	-0.928	-5.115	0.061
R40-VRS	KN0249	4322207.536	488670.711	1820.052	4322208.464	488675.824	1820.046	-0.928	-5.113	0.006
VVCEM	AI5829	4377903.354	551489.032	1957.946	4377903.359	551489.033	1957.929	-0.005	-0.001	0.017
VVCEM-1	AI5829	4377903.359	551489.042	1957.959	4377903.359	551489.033	1957.929	0.000	0.009	0.030
VVCEM-2	AI5829	4377903.350	551489.041	1957.952	4377903.359	551489.033	1957.929	-0.009	0.008	0.023
Y385	LN0441	4527154.531	609020.782	2343.157	4527157.844	609019.346	2343.096	-3.313	1.436	0.061
Y385-1	LN0441	4527154.532	609020.780	2343.143	4527157.844	609019.346	2343.096	-3.312	1.434	0.047
Y385-2	LN0441	4527154.534	609020.779	2343.146	4527157.844	609019.346	2343.096	-3.310	1.433	0.050
Y385-3	LN0441	4527154.533	609020.777	2343.157	4527157.844	609019.346	2343.096	-3.311	1.431	0.061
Y386	LN0463	4523635.617	629608.308	2414.070	4523582.581	629595.129	2414.015	53.036	13.179	0.055
Y386-1	LN0463	4523635.613	629608.298	2414.105	4523582.581	629595.129	2414.015	53.032	13.169	0.090
Y386-2	LN0463	4523635.624	629608.280	2414.072	4523582.581	629595.129	2414.015	53.043	13.151	0.057

NGS Monuments

Flaming Gorge
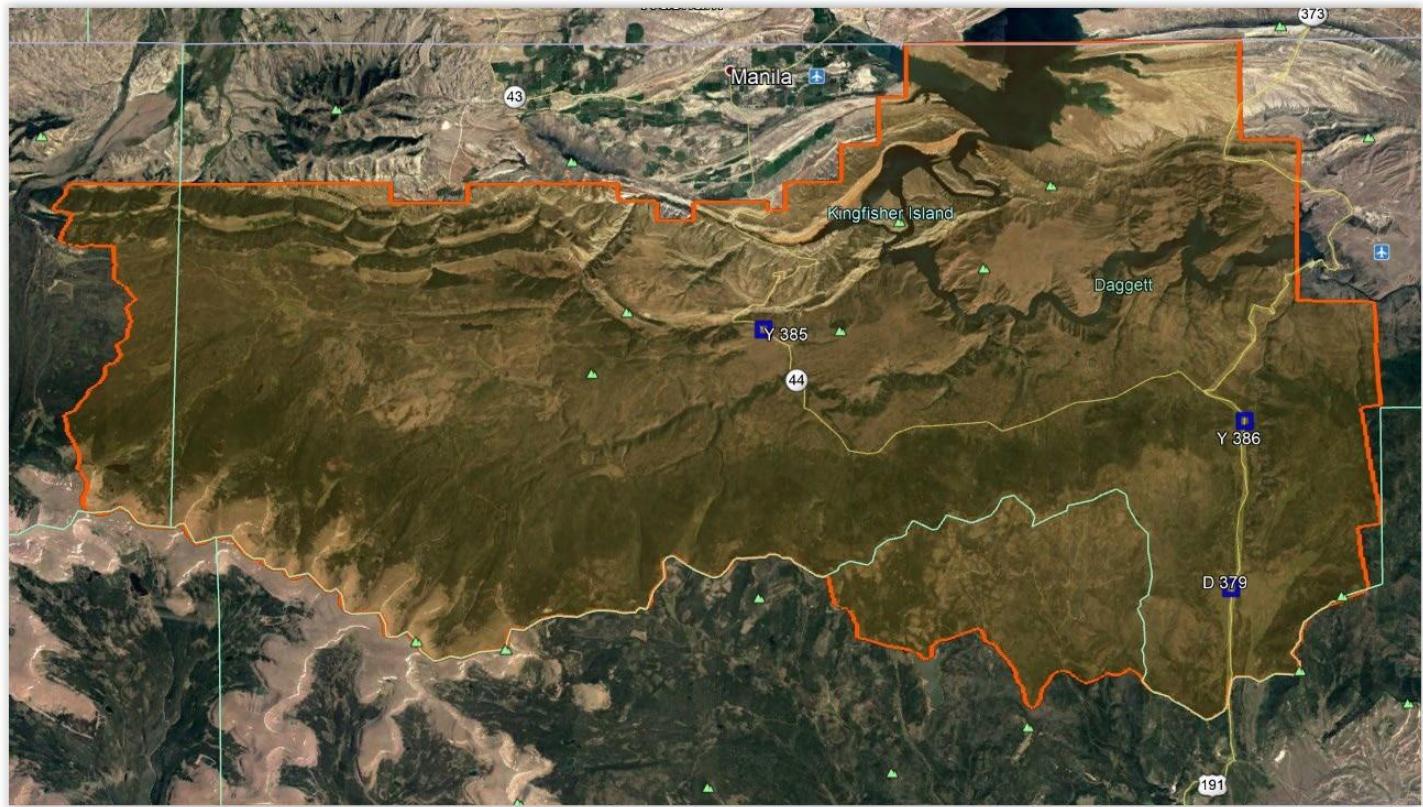
NGS Monuments

Green River
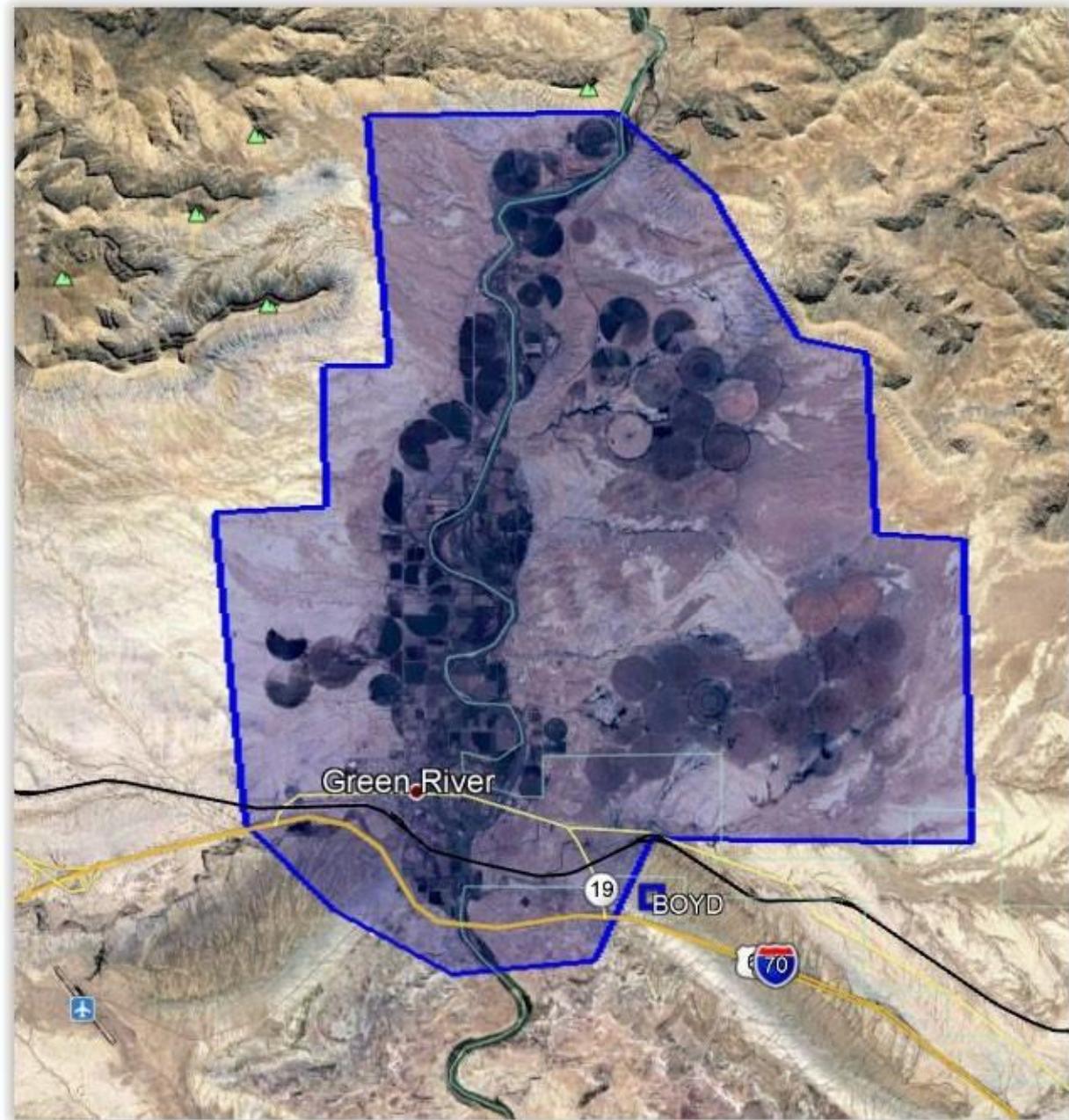
NGS Monuments

Muddy Creek
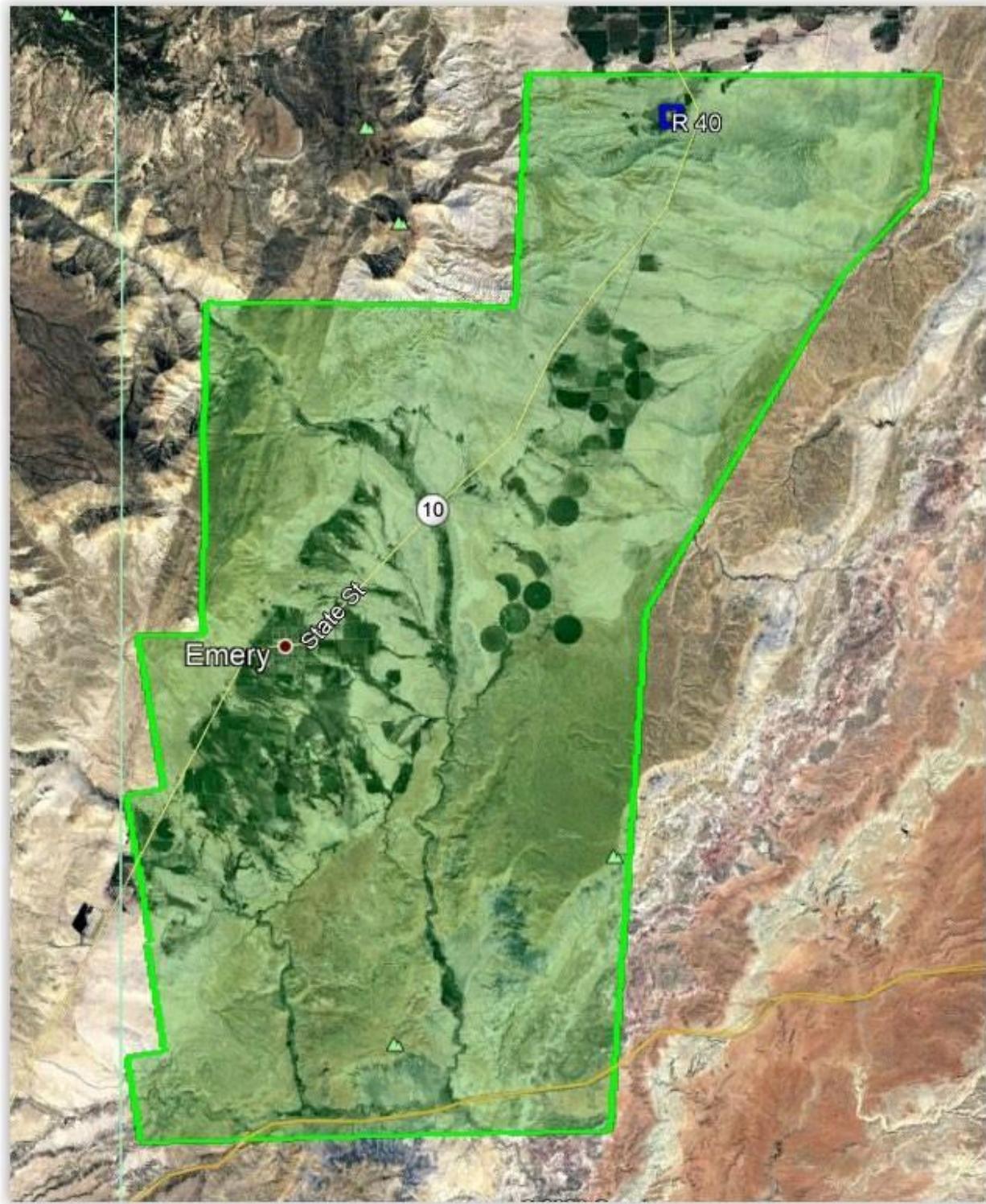
NGS Monuments

Carbon, Emery, Grand Counties
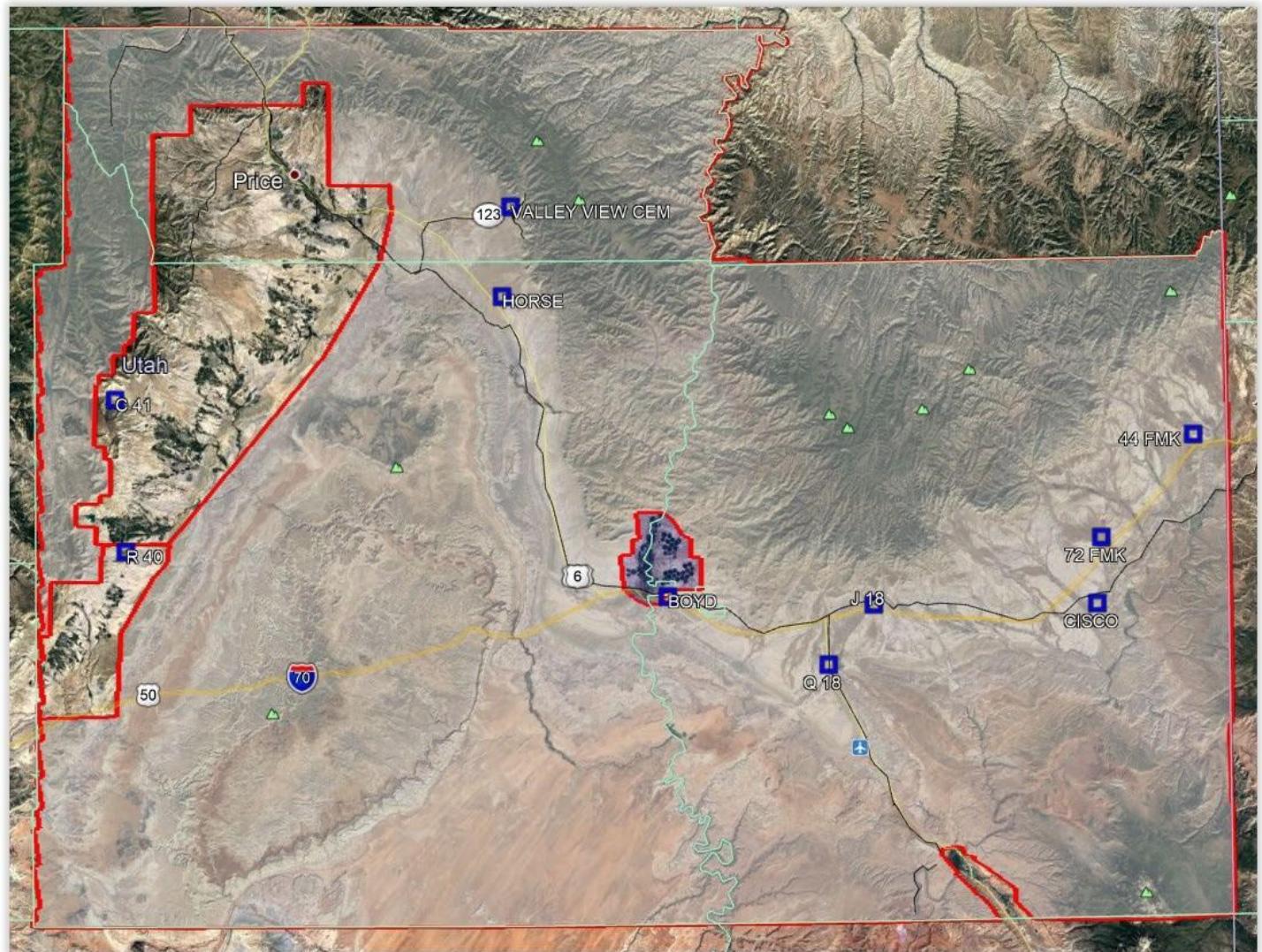
2.5 Data Processing Procedures

The data from the data collector for the points that were surveyed with VRS was downloaded each day and emailed to the office. The data from the static GNSS receivers was downloaded each day and a copy was uploaded to the office FTP server.

Base station observations were uploaded to OPUS only after the rapid ephemeras was available for processing. Whether the base station was located on an NGS monument or a at new point location, all GNSS data sets with a duration longer than two (2) hours were processed through OPUS.

The static surveyed points were post-processed using NovaTel's Waypoint software. Some of the static check point observations of less than two (2) hours in duration were processed with OPUS Rapid Static (OPUS-RS) as a QA\QC on the static post processing.

After receiving the check points surveyed with the VRS system from the field crew, the points were converted to UTM zone 12 meters coordinates and merged with the static surveyed control points.

3.   Final Coordinates

Point ID	NAD83(2011) UTM12 NORTHING Meter	NAD83(2011) UTM12 EASTING Meter	ORTHO HGT (Geoid18) Meter
NVA			
CAN001	4397368.488	486164.291	2345.652
CAN002	4381234.486	545074.953	1870.960
CAN003	4377647.424	550393.314	1926.145
CAN004	4377885.261	551259.982	1950.784
CAN005	4362652.933	549007.421	1667.230
CAN006	4300704.685	507970.096	2175.955
CAN007	4303547.299	529663.406	2020.171
CAN008	4309450.279	545777.081	1653.603
CAN009	4308207.590	592028.595	1399.139
CAN010	4311334.430	602939.195	1492.288
CAN011	4337844.216	661682.667	1481.950
CAN012	4322265.276	648626.758	1371.527
CAN013	4311076.651	638932.416	1337.416
CAN014	4312205.918	642509.396	1340.865
CAN015	4305215.728	646407.935	1276.230
CAN016	4288450.984	643883.039	1269.409
CAN017	4281277.097	614145.226	1372.528
CAN018	4267824.365	605418.793	1884.808
CAN019	4275844.347	537647.995	1515.591
CAN020	4278366.438	530075.604	1609.938

CAN021	4270547.150	525217.015	1501.728
CAN022	4296136.941	550605.640	1328.774
CAN023	4285893.616	544224.308	1435.190
CAN024	4300700.130	507438.789	2160.851
CAN025	4298214.655	490259.811	1804.737
CAN026	4313225.951	610706.774	1558.178
CAN027	4296565.020	606606.135	1442.582
CAN028	4276391.245	604463.445	1669.177
CAN029	4308641.132	645007.850	1323.956
CAN030	4312109.913	650301.352	1302.613
CAN031	4312957.226	648690.441	1318.258
CAN032	4314207.322	646948.449	1348.151
CAN033	4330646.837	657131.548	1372.200
CAN034	4363060.780	554625.100	1678.704
CAN035	4358152.816	552142.669	1530.014
CAN036	4311175.686	620031.054	1474.641
CAN037	4397515.410	511390.835	1869.668
CAN038	4377415.813	532419.098	1750.538
CAN039	4387127.415	522639.642	1851.514
CAN040	4391753.419	523103.692	2013.450
CAN041	4381575.149	526381.460	1694.275
CAN042	4391213.883	531724.332	1900.431
CAN043	4399180.053	535608.822	2209.359
CAN044	4403050.026	543277.172	2090.753
CAN045	4405931.691	554907.578	1867.757
CAN046	4403069.948	557767.624	2323.834
CAN047	4369483.905	542761.206	1631.643
CAN048	4346802.815	556590.281	1416.069
CAN049	4344625.032	561640.785	1397.315
CAN050	4319782.184	560593.973	1327.625

CAN051	4315030.108	555620.504	1359.870
CAN052	4312940.123	567210.490	1286.106
CAN053	4313513.011	564337.990	1302.751
CAN054	4308624.821	553993.142	1302.491
CAN055	4332529.656	557273.163	1423.574
CAN056	4311518.749	489581.666	1877.310
CAN057	4305805.455	500586.019	1833.209
CAN058	4310711.652	532955.536	1891.350
CAN059	4317095.552	526551.250	1776.902
CAN060	4325754.213	528844.175	1558.670
CAN061	4336353.118	522282.911	1720.750
CAN062	4340401.357	508987.856	1673.799
CAN063	4346052.926	514898.127	1773.191
CAN064	4330277.194	535202.280	1924.960
CAN065	4336806.157	544654.281	1621.335
CAN066	4341980.110	543194.985	1631.785
CAN067	4366868.875	531776.297	1606.854
CAN068	4383978.062	538170.825	1794.226
CAN069	4388071.385	541196.670	1942.521
CAN070	4383641.632	546662.273	1993.422
CAN071	4383975.376	553189.254	2215.873
CAN072	4370225.143	551562.162	1764.695
CAN073	4305410.457	499302.859	1796.749
CAN074	4309117.086	589274.038	1384.351
CAN075	4294272.739	491307.846	1648.041
CAN076	4285683.811	485053.249	1700.853
CAN077	4282842.835	522696.336	1947.291
CAN078	4294983.152	525344.719	2093.977
CAN079	4279586.993	508462.141	2008.309
CAN080	4280454.931	505475.416	1869.817

CAN081	4290165.692	514524.424	2082.749
CAN082	4308049.318	559873.746	1346.748
CAN083	4323577.622	495054.790	1763.464
CAN084	4329780.333	491236.659	1814.664
CAN085	4314201.007	576882.727	1269.946
CAN086	4311044.438	579373.551	1358.981
CAN087	4311293.015	584612.269	1333.924
CAN088	4315188.210	589766.190	1413.333
CAN089	4318442.468	591980.481	1512.466
CAN090	4329191.547	577088.953	1254.609
CAN091	4262981.643	588199.827	1519.453
CAN092	4273289.277	648917.092	1977.559
CAN093	4279378.694	637024.900	1370.164
CAN094	4322655.371	626405.525	1553.501
CAN095	4327661.127	622725.373	1734.233
CAN096	4332231.139	638131.650	1538.946
CAN097	4310718.447	652521.719	1293.746
CAN098	4326355.182	647523.948	1406.898
CAN099	4332065.455	654088.570	1406.180
CAN100	4335957.105	536521.183	1806.179
CAN101	4327697.978	662201.853	1323.582
CAN102	4279419.571	661645.045	2205.821
CAN103	4300985.400	627047.769	1420.130
CAN104	4298071.253	631083.370	1488.734
CAN105	4298675.848	637124.289	1587.032
CAN106	4306622.972	623459.495	1436.873
CAN107	4311467.481	628271.017	1396.140
CAN108	4316592.033	626088.118	1462.266
CAN109	4363823.906	478493.201	2602.058
CAN110	4362907.245	489571.643	2116.070
CAN111	4381866.717	479447.084	2704.132
CAN112	4393304.186	480969.381	2906.745
CAN113	4406705.242	505023.964	2166.472
CAN114	4401943.036	501134.660	2890.731
CAN115	4407263.750	488391.265	2336.359

CAN116	4387977.195	479546.861	2618.044
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CAN118	4328962.292	476030.749	2349.624
CAN119	4328395.458	480187.903	1926.125
CAN120	4350655.025	667606.869	1517.926
CAN121	4355575.454	658924.924	1687.251
CAN122	4351390.870	655419.220	1621.359
CAN123	4347371.682	649610.410	1540.425
CAN124	4344717.561	655142.177	1536.879
CAN125	4338453.046	655557.322	1432.708
CAN126	4297451.779	647297.039	1259.943
CAN127	4305519.489	604019.728	1429.660
CAN128	4317842.620	634562.951	1452.927
CAN129	4326450.621	641159.224	1458.849
CAN130	4357138.753	667588.428	1605.544
CAN131	4360468.391	666115.567	1677.822
CAN132	4277237.924	607514.216	1559.369
CAN133	4266269.480	597616.301	1679.653
CAN134	4271480.816	597506.117	1715.547
CAN135	4271379.004	603110.786	1773.580
CAN136	4272838.392	613720.873	1499.587
CAN137	4300808.398	588944.924	1364.708
CAN138	4294773.611	581983.692	1294.224
CAN139	4302349.655	590051.379	1384.280
CAN140	4297291.020	592977.379	1394.716
CAN141	4297847.148	584603.073	1363.295
CAN142	4300640.992	526102.239	2060.116
CAN143	4288504.389	520593.055	2058.388
CAN144	4285363.529	512127.604	2062.685
CAN145	4297070.730	492267.277	1673.882
CAN146	4290952.033	489015.621	1635.572

CAN147	4286825.540	488677.554	1680.271
CAN148	4309573.244	494392.404	1817.664
CAN149	4303440.802	503921.050	1961.327
CAN150	4305693.385	534219.460	2041.132
CAN151	4304155.674	537035.114	2040.116
CAN152	4309027.169	534614.151	1974.670
CAN153	4313488.098	529449.115	1803.264
CAN154	4320486.981	526755.388	1653.283
CAN155	4346166.057	544891.482	1561.572
CAN156	4339389.089	544019.460	1645.156
CAN157	4339638.219	555960.194	1455.793
CAN158	4338177.860	551882.323	1565.099
CAN159	4335801.789	549116.534	1640.348
CAN160	4375272.281	536757.890	1683.888
CAN161	4370805.834	532389.859	1717.174
CAN162	4303888.944	538257.252	2027.832
CAN163	4374157.372	532897.247	1729.340
CAN164	4373175.297	539993.602	1716.854
CAN165	4370126.074	537471.159	1667.398
CAN166	4367787.319	535130.547	1667.586
CAN167	4366988.531	539662.145	1613.983
CAN168	4366883.826	554129.982	1873.914
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CAN170	4328372.005	558402.337	1378.336
CAN171	4302983.233	555599.149	1287.283
CAN172	4297839.015	552298.320	1315.661
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CAN173	4404841.983	576112.958	1610.801

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CAN184	4336538.968	556419.666	1458.143
CAN185	4364659.348	551475.719	1760.970
CAN186	4365417.688	552862.668	1813.076
FGN001	4531611.364	607695.444	1887.367
FGN002	4530955.071	611609.045	1844.765
FGN003	4527112.940	608862.544	2348.550
FGN004	4525670.498	626684.027	2256.382
FGN005	4530108.589	630902.076	1864.290
FGN006	4535689.782	621550.937	1856.850
FGN007	4529634.920	581575.805	2883.831
FGN008	4529002.157	583901.323	2888.262
FGN009	4529117.859	585748.949	2853.675
FGN010	4530285.321	584144.965	2696.169
FGN011	4528045.299	589640.618	2749.285
FGN012	4527172.501	593121.483	2650.978
FGN013	4526232.584	596508.755	2626.330
FGN014	4524149.543	600236.659	2532.150
FGN015	4526474.941	601570.860	2581.891
FGN016	4527783.309	603766.643	2574.931
FGN017	4529319.915	609568.201	2220.081
FGN018	4523300.524	611514.551	2366.280
FGN019	4523524.188	620773.672	2350.086
FGN020	4524810.675	628007.252	2280.947

FGN021	4526420.722	629514.725	2171.018
FGN022	4529116.557	631239.826	1913.458
FGN023	4516504.346	629046.583	2487.845
FGN024	4519215.470	629343.774	2474.970
FGN025	4524457.651	623780.853	2299.581
FGN026	4513336.348	621823.530	2724.199
FGN027	4515177.397	622360.423	2752.434
FGN028	4519169.101	622755.877	2849.498
FGN029	4517255.965	620450.049	2865.031
FGN030	4529059.217	594643.997	2642.671
FGN031	4523599.110	629618.100	2415.682
FGN032	4516997.451	617615.051	2978.480
GRN001	4317087.912	571793.228	1249.014
GRN002	4315947.555	575128.231	1261.392
GRN003	4316469.931	572352.044	1243.463
GRN004	4322738.163	574496.129	1249.068
GRN005	4317150.701	574996.304	1245.276
GRN006	4322018.764	574667.293	1247.107
MCN001	4308328.674	478384.085	1906.261
MCN002	4297367.910	482229.091	1748.322
MCN003	4313348.061	486190.308	1912.129
MCN004	4318991.627	487863.318	1904.618
MCN005	4297052.065	475237.296	1841.797
VVA			
CAV001	4352416.076	476185.981	2146.302
CAV002	4362567.840	549137.048	1667.911
CAV003	4319158.252	559628.281	1317.091
CAV004	4308695.261	494907.604	1825.042
CAV005	4305256.216	501586.129	1858.948

CAV006	4322886.844	648237.618	1385.320
CAV007	4311157.381	638879.824	1336.512
CAV008	4307282.692	646069.220	1308.217
CAV009	4288130.157	644486.233	1283.857
CAV010	4267972.867	606490.968	1877.177
CAV011	4264716.994	532210.550	1471.481
CAV012	4280114.933	539706.654	1487.247
CAV013	4278215.389	531249.834	1590.925
CAV014	4269625.464	521860.075	1449.227
CAV015	4295449.577	550503.685	1338.810
CAV016	4288658.994	546517.384	1450.029
CAV017	4310777.717	610424.369	1545.339
CAV018	4303455.878	603192.191	1411.551
CAV019	4310349.855	643656.825	1346.182
CAV020	4311367.188	653267.873	1278.542
CAV021	4314830.015	651151.646	1272.002
CAV022	4315656.014	647176.922	1327.315
CAV023	4331138.457	656897.934	1381.649
CAV024	4333311.631	652644.613	1425.008
CAV025	4364153.903	555431.557	1750.250
CAV026	4366095.515	528629.365	1626.950
CAV027	4405729.706	515400.539	2216.697
CAV028	4402917.353	542035.244	2104.531
CAV029	4403490.544	559505.818	2315.188
CAV030	4399555.897	533573.286	2228.973
CAV031	4403417.747	526328.287	2272.721
CAV032	4384327.316	531122.297	1748.525
CAV033	4387281.510	535756.537	1876.541
CAV034	4376294.941	542514.349	1764.958

CAV035	4375665.487	532384.881	1763.991
CAV036	4375131.441	551696.083	1863.555
CAV037	4347877.177	544689.057	1569.228
CAV038	4335916.665	547369.533	1655.289
CAV039	4345164.348	560418.479	1406.347
CAV040	4337896.189	514275.324	1735.298
CAV041	4344907.445	516446.320	1766.033
CAV042	4389103.585	482164.182	2927.142
CAV043	4381753.606	480424.492	2700.441
CAV044	4363942.073	479587.416	2632.357
CAV045	4330916.616	475465.906	2174.056
CAV046	4323555.473	499109.852	1803.610
CAV047	4315731.122	528247.833	1753.797
CAV048	4346802.815	556590.281	1416.069
CAV049	4302238.670	505889.714	2060.027
CAV050	4300239.296	507890.348	2186.502
CAV051	4285940.502	487629.276	1691.605
CAV052	4290209.458	489098.323	1638.448
CAV053	4292881.236	490122.169	1637.345
CAV054	4295528.955	491995.920	1659.845
CAV055	4306558.698	534459.314	2023.721
CAV056	4305180.924	535634.781	2055.305
CAV057	4303851.232	539298.972	2039.440
CAV058	4301840.391	541125.555	1948.592
CAV059	4317095.552	526551.250	1776.902
CAV060	4286819.865	522490.033	2072.972
CAV061	4283033.077	510775.424	2030.657
CAV062	4283022.613	512598.002	2036.101
CAV063	4289575.951	515872.064	2072.227
CAV064	4292689.703	522299.920	2056.794
CAV065	4298293.994	525314.204	2060.404
CAV066	4299194.635	523534.497	2072.395

CAV067	4300801.219	520748.111	2091.493
CAV068	4299864.637	517700.837	2150.555
CAV069	4314208.173	559289.638	1329.130
CAV070	4332465.966	557102.032	1418.917
CAV071	4338132.997	555925.251	1477.274
CAV072	4339758.184	555253.176	1462.453
CAV073	4344230.479	544996.039	1580.614
CAV074	4309117.086	589274.038	1384.351
CAV075	4305907.614	591421.201	1372.194
CAV076	4308192.329	592199.075	1398.375
CAV077	4300061.882	592113.811	1404.899
CAV078	4309734.148	606939.895	1483.345
CAV079	4321319.499	629125.663	1508.722
CAV080	4325884.585	624883.639	1640.110
CAV081	4329772.110	638807.411	1509.454
CAV082	4334369.129	636699.221	1567.336
CAV083	4276913.236	598541.272	1566.633
CAV084	4276312.028	591231.771	1565.598
CAV085	4277583.731	642213.541	1539.944
CAV086	4275614.168	654693.019	2592.578
CAV087	4278954.628	660340.510	2299.388
CAV088	4359052.137	667149.814	1635.486
CAV089	4360486.256	665044.354	1698.885
CAV090	4354870.521	664108.665	1597.778
CAV091	4348811.830	655102.919	1585.086
CAV092	4341894.827	655070.756	1471.418
CAV093	4330446.325	659265.480	1349.712
CAV094	4334539.019	660442.113	1412.778
CAV095	4309127.165	621593.530	1453.250
CAV096	4300061.015	628988.688	1465.351
CAV097	4299866.038	633783.797	1517.134
CAV098	4303187.691	647966.525	1261.801
CAV099	4274155.409	612870.770	1532.299

CAV100	4291222.987	609149.014	1386.490
CAV101	4303079.266	625795.048	1460.889
CAV102	4264630.049	593314.734	1551.784
CAV103	4269586.827	534727.958	1529.501
CAV104	4336749.759	541475.726	1700.401
CAV105	4333302.055	532687.904	1883.087
CAV106	4335314.453	526846.262	1826.290
CAV107	4355179.302	553242.140	1489.554
CAV108	4352860.706	552269.499	1477.569
CAV109	4369715.471	536992.746	1641.954
CAV110	4367867.582	533396.856	1643.413
CAV111	4372575.136	532833.293	1707.129
CAV112	4370090.153	540366.734	1666.362
CAV113	4366461.818	545635.705	1619.626
CAV114	4384930.988	545516.405	1993.508
CAV115	4388675.545	541083.078	1973.969
CAV116	4404084.129	502134.308	2648.475
CAV117	4407064.712	509429.904	2209.027
CAV118	4389269.097	523179.472	1931.023
CAV120	4334508.550	556772.457	1440.511
CAV121	4359338.505	547936.679	1582.094
CAV122	4363546.218	550267.988	1710.580
FGV001	4527849.319	588482.459	2752.248
FGV002	4525483.550	598014.702	2595.883
FGV003	4526125.382	606287.530	2524.886
FGV004	4522155.800	614156.925	2462.295
FGV005	4514254.055	628992.045	2504.687
FGV006	4517062.020	617703.028	2970.311
FGV007	4517260.124	620480.263	2864.494
FGV008	4518644.657	622725.197	2830.910
FGV009	4513379.475	621947.365	2718.096
FGV010	4525158.242	628507.272	2242.415
FGV011	4529494.982	631652.589	1890.689
FGV012	4524413.137	622931.052	2314.332
FGV013	4532151.954	609224.471	2026.761
FGV014	4529345.706	609596.889	2219.819

FGV015	4527807.445	603788.158	2576.598
FGV016	4529124.038	582510.339	2899.446
FGV017	4530307.818	584116.073	2692.937
FGV018	4528939.045	586169.792	2837.620
FGV019	4525729.162	587250.146	2885.323
FGV020	4526453.512	594042.967	2639.043
FGV021	4534756.547	623614.918	1927.324
FGV022	4535501.520	628767.710	1998.827
GRV001	4316254.823	572376.138	1242.480
GRV002	4320013.633	574489.961	1240.553
GRV003	4325301.122	573736.095	1249.769
GRV004	4318020.270	570194.843	1269.774
GRV005	4314846.331	574383.393	1252.100
MCV001	4323596.156	488720.115	1809.294
MCV002	4316116.449	486947.882	1907.344
MCV003	4305393.881	475929.656	1916.820
MCV004	4308435.515	482098.547	1863.293

4. GNSS Observations

POINT ID	DATE SURVEYED	JULIAN DATE	POINT ID	RESURVEYED DATE	JULIAN DATE
CAN001	September 10, 2020	253	CAN001-CK	September 14, 2020	257
CAN002	September 19, 2020	262	CAN002-CK	September 20, 2020	263
CAN003	September 11, 2020	254	CAN003-CK	September 20, 2020	263
CAN004	September 11, 2020	254	CAN004-CK	September 20, 2020	263
CAN005	September 19, 2020	262	CAN005-CK	October 27, 2020	300
CAN006	November 4, 2020	308	CAN006-CK	November 6, 2020	310
CAN007	October 31, 2020	304	CAN007-CK	November 5, 2020	309
CAN008	November 2, 2020	306	CAN008-CK	November 5, 2020	309
CAN009	October 13, 2020	286			
CAN010	October 13, 2020	286	CAN010-CK	November 7, 2020	311
CAN011	August 20, 2020	232			
CAN012	August 22, 2020	234	CAN012-CK	August 23, 2020	235
CAN013	August 24, 2020	236	CAN013-CK	August 24, 2020	236
CAN014	August 24, 2020	236	CAN014-CK	August 24, 2020	236
CAN015	August 24, 2020	236	CAN015-CK	October 11, 2020	284
CAN016	October 11, 2020	284			
CAN017	November 2, 2020	306	CAN017-CK	November 4, 2020	308
CAN018	November 3, 2020	307	CAN018-CK	November 4, 2020	308
CAN019	November 5, 2020	309	CAN019-CK	November 6, 2020	310
CAN020	November 5, 2020	309	CAN020-CK	November 6, 2020	310
CAN021	November 5, 2020	309	CAN021-CK	November 6, 2020	310
CAN022	November 5, 2020	309	CAN022-CK	November 6, 2020	310
CAN023	November 5, 2020	309	CAN023-CK	November 6, 2020	310
CAN024	November 4, 2020	308	CAN024-CK	November 6, 2020	310
CAN025	November 4, 2020	308			
CAN026	October 13, 2020	286	CAN026-CK	November 7, 2020	311
CAN027	November 2, 2020	306	CAN027-CK	November 7, 2020	311
CAN028	November 2, 2020	306	CAN028-CK	November 4, 2020	308
CAN029	August 24, 2020	236	CAN029-CK	October 11, 2020	284
CAN030	August 23, 2020	235	CAN030-CK	August 24, 2020	236
CAN031	August 23, 2020	235	CAN031-CK	August 24, 2020	236
CAN032	August 24, 2020	236			
CAN033	August 22, 2020	234	CAN033-CK	August 23, 2020	235
CAN034	September 20, 2020	263			
CAN035	September 20, 2020	263	CAN035-CK	October 27, 2020	300
CAN036	August 26, 2020	238			
CAN037	September 5, 2020	248	CAN037-CK	September 14, 2020	257
CAN038	September 8, 2020	251	CAN038-CK	September 9, 2020	252
CAN039	September 9, 2020	252			
CAN040	September 9, 2020	252			
CAN041	September 9, 2020	252			

CAN042	September 7, 2020	250			
CAN043	September 7, 2020	250			
CAN044	September 7, 2020	250			
CAN045	September 6, 2020	249			
CAN046	September 6, 2020	249			
CAN047	September 19, 2020	262	CAN047-CK	September 20, 2020	263
CAN048	October 26, 2020	299			
CAN049	October 26, 2020	299			
CAN050	October 14, 2020	287			
CAN051	October 30, 2020	303	CAN051-CK	November 5, 2020	309
CAN052	October 14, 2020	287			
CAN053	October 30, 2020	303	CAN053-CK	November 5, 2020	309
CAN054	October 30, 2020	303	CAN054-CK	November 5, 2020	309
CAN055	October 30, 2020	303	CAN055-CK	November 5, 2020	309
CAN056	November 3, 2020	307			
CAN057	November 6, 2020	310	CAN057-CK	November 7, 2020	311
CAN058	October 31, 2020	304	CAN058-CK	November 5, 2020	309
CAN059	October 31, 2020	304	CAN059-CK	November 6, 2020	310
CAN060	October 31, 2020	304	CAN060-CK	November 6, 2020	310
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CAN062	October 27, 2020	300			
CAN063	October 27, 2020	300			
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CAN065	October 26, 2020	299			
CAN066	October 26, 2020	299			
CAN067	September 8, 2020	251			
CAN068	September 11, 2020	254			
CAN069	September 11, 2020	254			
CAN070	September 19, 2020	262	CAN070-CK	September 20, 2020	263
CAN071	September 11, 2020	254			
CAN072	September 19, 2020	262	CAN072-CK	November 16, 2020	320
CAN073	November 6, 2020	310	CAN073-CK	November 7, 2020	311
CAN074	November 4, 2020	308			
CAN075	November 4, 2020	308			
CAN076	November 4, 2020	308			
CAN077	November 1, 2020	305	CAN077-CK	November 6, 2020	310
CAN078	November 1, 2020	305	CAN078-CK	November 6, 2020	310
CAN079	November 2, 2020	306	CAN079-CK	November 6, 2020	310
CAN080	November 2, 2020	306	CAN080-CK	November 6, 2020	310
CAN081	November 1, 2020	305	CAN081-CK	November 6, 2020	310
CAN082	October 30, 2020	303	CAN082-CK	November 5, 2020	309
CAN083	October 27, 2020	300			
CAN084	October 27, 2020	300			
CAN085	October 10, 2020	283	CAN085-CK	October 14, 2020	287
CAN086	October 14, 2020	287	CAN086-CK	November 7, 2020	311

CAN087	October 13, 2020	286			
CAN088	November 5, 2020	309			
CAN089	November 5, 2020	309			
CAN090	October 10, 2020	283			
CAN091	November 3, 2020	307	CAN091-CK	November 4, 2020	308
CAN092	October 12, 2020	285			
CAN093	October 11, 2020	284			
CAN094	August 25, 2020	237			
CAN095	August 25, 2020	237			
CAN096	August 22, 2020	234			
CAN097	August 23, 2020	235	CAN097-CK	August 24, 2020	236
CAN098	August 22, 2020	234	CAN098-CK	August 23, 2020	235
CAN099	August 22, 2020	234	CAN099-CK	August 23, 2020	235
CAN100	October 27, 2020	300			
CAN101	August 20, 2020	232			
CAN102	October 12, 2020	285			
CAN103	August 26, 2020	238			
CAN104	August 26, 2020	238			
CAN105	August 26, 2020	238			
CAN106	August 26, 2020	238			
CAN107	August 25, 2020	237			
CAN108	August 25, 2020	237			
CAN109	September 21, 2020	264			
CAN110	September 21, 2020	264			
CAN111	September 10, 2020	253			
CAN112	September 10, 2020	253			
CAN113	September 5, 2020	248	CAN113-CK	September 14, 2020	257
CAN114	September 5, 2020	248			
CAN115	September 10, 2020	253	CAN115-CK	September 14, 2020	257
CAN116	September 10, 2020	253			
CAN117	September 5, 2020	248	CAN117-CK	September 14, 2020	257
CAN118	September 13, 2020	256			
CAN119	September 13, 2020	256			
CAN120	August 17, 2020	229	CAN120-CK	August 19, 2020	231
CAN121	August 17, 2020	229	CAN121-CK	August 19, 2020	231
CAN122	August 19, 2020	231			
CAN123	August 20, 2020	232			
CAN124	August 19, 2020	231			
CAN125	August 20, 2020	232			
CAN126	October 11, 2020	284			
CAN127	October 13, 2020	286			
CAN128	August 25, 2020	237			
CAN129	August 22, 2020	234	CAN129-CK	August 23, 2020	235
CAN130	August 17, 2020	229	CAN130-CK	August 19, 2020	231
CAN131	August 17, 2020	229	CAN131-CK	August 19, 2020	231

CAN132	November 3, 2020	307	CAN132-CK	November 4, 2020	308
CAN133	November 3, 2020	307	CAN133-CK	November 4, 2020	308
CAN134	November 3, 2020	307	CAN134-CK	November 4, 2020	308
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CAN136	November 3, 2020	307	CAN136-CK	November 4, 2020	308
CAN137	October 13, 2020	286			
CAN138	October 13, 2020	286			
CAN139	October 13, 2020	286			
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CAN141	October 13, 2020	286			
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CAN145	November 4, 2020	308			
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CAN148	November 3, 2020	307			
CAN149	November 6, 2020	310	CAN149-CK	November 7, 2020	311
CAN150	October 31, 2020	304	CAN150-CK	November 5, 2020	309
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CAN152	October 31, 2020	304	CAN152-CK	November 5, 2020	309
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CAN155	October 26, 2020	299			
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CAN159	October 26, 2020	299			
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CAN163	September 9, 2020	252			
CAN164	September 8, 2020	251	CAN164-CK	September 9, 2020	252
CAN165	September 8, 2020	251			
CAN166	September 8, 2020	251	CAN166-CK	September 9, 2020	252
CAN167	September 19, 2020	262			
CAN168	September 20, 2020	263	CAN168-CK	November 16, 2020	320
CAN169	September 19, 2020	262	CAN169-CK	September 20, 2020	263
CAN170	October 30, 2020	303	CAN170-CK	November 5, 2020	309
CAN171	October 30, 2020	303	CAN171-CK	November 5, 2020	309
CAN172	November 5, 2020	309	CAN172-CK	November 6, 2020	310
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CAN173	September 6, 2020	249			
CAN174	September 6, 2020	249			
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FGN002	August 8, 2020	220	FGN002-CK	August 11, 2020	223
FGN003	August 8, 2020	220	FGN003-CK	August 11, 2020	223
FGN004	August 7, 2020	219	FGN004-CK	August 11, 2020	223
FGN005	August 6, 2020	218	FGN005-CK	August 11, 2020	223
FGN006	August 6, 2020	218	FGN006-CK	August 12, 2020	224
FGN007	August 10, 2020	222			
FGN008	August 10, 2020	222			
FGN009	August 10, 2020	222			
FGN010	August 10, 2020	222			
FGN011	August 10, 2020	222			
FGN012	August 9, 2020	221			
FGN013	August 9, 2020	221			
FGN014	August 9, 2020	221			
FGN015	August 8, 2020	220			
FGN016	August 8, 2020	220	FGN016-CK	August 11, 2020	223
FGN017	August 8, 2020	220	FGN017-CK	August 11, 2020	223
FGN018	August 7, 2020	219	FGN018-CK	August 11, 2020	223
FGN019	August 7, 2020	219	FGN019-CK	August 11, 2020	223
FGN020	August 7, 2020	219	FGN020-CK	August 11, 2020	223
FGN021	August 7, 2020	219			
FGN022	August 6, 2020	218	FGN022-CK	August 11, 2020	223
FGN023	August 5, 2020	217	FGN023-CK	August 12, 2020	224
FGN024	August 7, 2020	219	FGN024-CK	August 11, 2020	223
FGN025	August 7, 2020	219	FGN025-CK	August 11, 2020	223
FGN026	August 5, 2020	217	FGN026-CK	August 12, 2020	224
FGN027	August 5, 2020	217	FGN027-CK	August 12, 2020	224
FGN028	August 5, 2020	217			
FGN029	August 5, 2020	217			
FGN030	August 9, 2020	221			
FGN031	August 7, 2020	219	FGN031-CK	August 11, 2020	223
FGN032	August 5, 2020	217			
GRN001	October 10, 2020	283			
GRN002	October 10, 2020	283	GRN002-CK	October 10, 2020	283
GRN003	October 10, 2020	283			
GRN004	October 10, 2020	283	GRN004-CK	October 10, 2020	283
GRN005	October 10, 2020	283	GRN005-CK	October 10, 2020	283
GRN006	October 10, 2020	283	GRN006-CK	October 10, 2020	283
MCN001	September 12, 2020	255			

MCN002	September 13, 2020	256			
MCN003	September 12, 2020	255	MCN003-CK	September 13, 2020	256
MCN004	September 12, 2020	255			
MCN005	September 12, 2020	255	MCN005-CK	September 13, 2020	256
CAV001	September 21, 2020	264			
CAV002	September 19, 2020	262	CAV002-CK	September 20, 2020	263
CAV003	October 14, 2020	287			
CAV004	November 3, 2020	307			
CAV005	November 6, 2020	310	CAV005-CK	November 7, 2020	311
CAV006	August 22, 2020	234	CAV006-CK	August 23, 2020	235
CAV007	August 24, 2020	236	CAV007-CK	August 24, 2020	236
CAV008	August 24, 2020	236	CAV008-CK	October 11, 2020	284
CAV009	October 11, 2020	284			
CAV010	November 3, 2020	307	CAV010-CK	November 4, 2020	308
CAV011	November 5, 2020	309	CAV011-CK	November 6, 2020	310
CAV012	November 5, 2020	309	CAV012-CK	November 6, 2020	310
CAV013	November 5, 2020	309	CAV013-CK	November 6, 2020	310
CAV014	November 5, 2020	309	CAV014-CK	November 6, 2020	310
CAV015	November 5, 2020	309	CAV015-CK	November 6, 2020	310
CAV016	November 5, 2020	309	CAV016-CK	November 6, 2020	310
CAV017	October 13, 2020	286			
CAV018	November 2, 2020	306	CAV018-CK	November 7, 2020	311
CAV019	August 24, 2020	236	CAV019-CK	October 11, 2020	284
CAV020	August 23, 2020	235			
CAV021	August 23, 2020	235			
CAV022	August 24, 2020	236	CAV022-CK	October 11, 2020	284
CAV023	August 22, 2020	234	CAV023-CK	August 23, 2020	235
CAV024	August 22, 2020	234	CAV024-CK	August 23, 2020	235
CAV025	September 20, 2020	263			
CAV026	September 8, 2020	251			
CAV027	September 5, 2020	248			
CAV028	September 7, 2020	250			
CAV029	September 6, 2020	249			
CAV030	September 7, 2020	250			
CAV031	September 5, 2020	248			
CAV032	September 7, 2020	250			
CAV033	September 7, 2020	250			
CAV034	September 11, 2020	254	CAV034-CK	September 19, 2020	262
CAV035	September 9, 2020	252			
CAV036	September 19, 2020	262	CAV036-CK	September 20, 2020	263
CAV037	October 26, 2020	299			
CAV038	October 26, 2020	299			
CAV039	October 26, 2020	299			
CAV040	October 27, 2020	300			
CAV041	October 27, 2020	300			

CAV042	September 10, 2020	253			
CAV043	September 10, 2020	253			
CAV044	September 21, 2020	264			
CAV045	September 13, 2020	256			
CAV046	October 27, 2020	300			
CAV047	October 31, 2020	304	CAV047-CK	November 6, 2020	310
CAV048	November 4, 2020	308			
CAV049	November 6, 2020	310	CAV049-CK	November 7, 2020	311
CAV050	November 4, 2020	308			
CAV051	November 4, 2020	308			
CAV052	November 4, 2020	308			
CAV053	November 4, 2020	308			
CAV054	November 4, 2020	308			
CAV055	October 31, 2020	304	CAV055-CK	November 5, 2020	309
CAV056	November 1, 2020	305	CAV056-CK	November 6, 2020	310
CAV057	November 1, 2020	305	CAV057-CK	November 6, 2020	310
CAV058	November 1, 2020	305	CAV058-CK	November 6, 2020	310
CAV059	October 31, 2020	304	CAV059-CK	November 6, 2020	310
CAV060	November 1, 2020	305	CAV060-CK	November 6, 2020	310
CAV061	November 2, 2020	306	CAV061-CK	November 6, 2020	310
CAV062	November 2, 2020	306			
CAV063	November 1, 2020	305	CAV063-CK	November 6, 2020	310
CAV064	November 1, 2020	305	CAV064-CK	November 6, 2020	310
CAV065	November 1, 2020	305	CAV065-CK	November 6, 2020	310
CAV066	November 2, 2020	306	CAV066-CK	November 6, 2020	310
CAV067	November 2, 2020	306	CAV067-CK	November 6, 2020	310
CAV068	November 2, 2020	306	CAV068-CK	November 6, 2020	310
CAV069	October 30, 2020	303	CAV069-CK	November 5, 2020	309
CAV070	October 30, 2020	303	CAV070-CK	November 5, 2020	309
CAV071	October 26, 2020	299			
CAV072	October 26, 2020	299			
CAV073	October 26, 2020	299			
CAV074	October 13, 2020	286			
CAV075	October 13, 2020	286			
CAV076	November 5, 2020	309			
CAV077	October 13, 2020	286			
CAV078	October 13, 2020	286			
CAV079	August 25, 2020	237			
CAV080	August 25, 2020	237			
CAV081	August 22, 2020	234			
CAV082	August 22, 2020	234			
CAV083	November 3, 2020	307	CAV083-CK	November 4, 2020	308
CAV084	November 3, 2020	307	CAV084-CK	November 4, 2020	308
CAV085	October 11, 2020	284			
CAV086	October 12, 2020	285			

CAV087	October 12, 2020	285			
CAV088	August 17, 2020	229	CAV088-CK	August 19, 2020	231
CAV089	August 17, 2020	229	CAV089-CK	August 19, 2020	231
CAV090	August 17, 2020	229	CAV090-CK	August 19, 2020	231
CAV091	August 19, 2020	231			
CAV092	August 20, 2020	232			
CAV093	August 20, 2020	232			
CAV094	August 20, 2020	232			
CAV095	August 26, 2020	238			
CAV096	August 26, 2020	238			
CAV097	August 26, 2020	238			
CAV098	August 24, 2020	236	CAV098-CK	October 11, 2020	284
CAV099	November 3, 2020	307	CAV099-CK	November 4, 2020	308
CAV100	November 2, 2020	306	CAV100-CK	November 7, 2020	311
CAV101	August 26, 2020	238			
CAV102	November 3, 2020	307	CAV102-CK	November 4, 2020	308
CAV103	November 5, 2020	309	CAV103-CK	November 6, 2020	310
CAV104	October 27, 2020	300			
CAV105	October 27, 2020	300			
CAV106	October 27, 2020	300			
CAV107	October 26, 2020	299			
CAV108	October 26, 2020	299			
CAV109	September 8, 2020	251			
CAV110	September 8, 2020	251	CAV110-CK	September 9, 2020	252
CAV111	September 9, 2020	252			
CAV112	September 19, 2020	262			
CAV113	September 19, 2020	262	CAV113-CK	September 20, 2020	263
CAV114	September 19, 2020	262	CAV114-CK	September 20, 2020	263
CAV115	September 11, 2020	254			
CAV116	September 5, 2020	248			
CAV117	September 5, 2020	248			
CAV118	September 9, 2020	252			
CAV120	November 16, 2020	320	CAV120-CK	November 16, 2020	320
CAV121	November 16, 2020	320	CAV121-CK	November 16, 2020	320
CAV122	November 16, 2020	320	CAV122-CK	November 16, 2020	320
FGV001	August 10, 2020	222			
FGV002	August 9, 2020	221			
FGV003	August 8, 2020	220			
FGV004	August 7, 2020	219			
FGV005	August 5, 2020	217			
FGV006	August 5, 2020	217			
FGV007	August 5, 2020	217			
FGV008	August 5, 2020	217			
FGV009	August 5, 2020	217			
FGV010	August 7, 2020	219			

FGV011	August 6, 2020	218			
FGV012	August 7, 2020	219			
FGV013	August 8, 2020	220			
FGV014	August 8, 2020	220			
FGV015	August 8, 2020	220			
FGV016	August 10, 2020	222			
FGV017	August 10, 2020	222			
FGV018	August 10, 2020	222			
FGV019	August 10, 2020	222			
FGV020	August 9, 2020	221			
FGV021	August 6, 2020	218			
FGV022	August 6, 2020	218			
GRV001	October 10, 2020	283			
GRV002	October 10, 2020	283	GRV002-CK	October 10, 2020	283
GRV003	October 10, 2020	283			
GRV004	October 10, 2020	283			
GRV005	October 10, 2020	283	GRV005-CK	October 14, 2020	287
MCV001	September 12, 2020	255			
MCV002	September 12, 2020	255	MCV002-CK	September 13, 2020	256
MCV003	September 12, 2020	255			
MCV004	September 12, 2020	255	MCV004-CK	September 13, 2020	256

5.   Check Point Comparison

		N DELTA	E DELTA	Z DELTA
Point ID	Point ID	Meter	Meter	Meter
CAN001	CAN001-CK	0.017	-0.003	-0.021
CAN002	CAN002-CK	-0.002	-0.008	0.040
CAN003	CAN003-CK	0.007	0.001	-0.018
CAN004	CAN004-CK	-0.001	0.000	-0.018
CAN005	CAN005-CK	-0.007	0.019	0.038
CAN006	CAN006-CK	0.024	0.056	0.066
CAN007	CAN007-CK	0.006	-0.018	-0.053
CAN008	CAN008-CK	0.000	-0.001	0.000
CAN010	CAN010-CK	0.008	-0.012	0.029
CAN012	CAN012-CK	0.001	0.005	0.016
CAN013	CAN013-CK	0.011	-0.005	-0.006
CAN014	CAN014-CK	-0.011	0.001	0.007
CAN015	CAN015-CK	0.020	-0.005	-0.018
CAN017	CAN017-CK	-0.015	-0.051	0.084
CAN018	CAN018-CK	0.047	-0.005	-0.002
CAN019	CAN019-CK	-0.020	0.014	0.010
CAN020	CAN020-CK	0.012	0.000	-0.013
CAN021	CAN021-CK	-0.017	0.007	-0.003
CAN022	CAN022-CK	-0.017	-0.042	0.035
CAN023	CAN023-CK	0.025	0.006	-0.108
CAN024	CAN024-CK	-0.008	-0.021	-0.076
CAN026	CAN026-CK	-0.006	-0.015	0.006
CAN027	CAN027-CK	-0.013	-0.007	-0.035
CAN028	CAN028-CK	0.025	-0.030	0.018
CAN029	CAN029-CK	0.012	-0.005	0.004
CAN030	CAN030-CK	-0.015	0.005	0.023
CAN031	CAN031-CK	-0.017	0.011	0.028
CAN033	CAN033-CK	0.002	0.001	-0.033
CAN035	CAN035-CK	0.013	-0.001	-0.048
CAN037	CAN037-CK	0.005	0.003	-0.004
CAN038	CAN038-CK	-0.003	0.009	0.015
CAN047	CAN047-CK	-0.004	-0.003	-0.015
CAN051	CAN051-CK	0.007	0.006	-0.014
CAN053	CAN053-CK	-0.022	0.014	-0.020
CAN054	CAN054-CK	0.014	0.017	-0.018
CAN055	CAN055-CK	-0.001	-0.010	0.000
CAN057	CAN057-CK	-0.120	-0.014	0.086
CAN058	CAN058-CK	0.022	-0.035	-0.009
CAN059	CAN059-CK	0.019	-0.008	-0.066
CAN060	CAN060-CK	0.021	0.001	-0.007

CAN070	CAN070-CK	-0.010	0.003	0.034
CAN072	CAN072-CK	0.010	-0.017	0.024
CAN073	CAN073-CK	-0.046	0.044	-0.002
CAN077	CAN077-CK	-0.007	0.003	-0.077
CAN078	CAN078-CK	-0.002	-0.019	-0.066
CAN079	CAN079-CK	0.193	-0.214	0.015
CAN080	CAN080-CK	-0.039	-0.139	0.029
CAN081	CAN081-CK	0.020	0.009	0.002
CAN082	CAN082-CK	0.009	0.019	-0.009
CAN085	CAN085-CK	0.013	0.002	-0.011
CAN086	CAN086-CK	-0.011	-0.090	-0.066
CAN091	CAN091-CK	0.057	-0.028	0.053
CAN097	CAN097-CK	-0.019	-0.005	0.023
CAN098	CAN098-CK	0.003	-0.001	0.002
CAN099	CAN099-CK	0.006	-0.002	-0.019
CAN113	CAN113-CK	0.002	0.001	0.004
CAN115	CAN115-CK	-0.003	0.006	-0.003
CAN117	CAN117-CK	-0.004	0.009	0.021
CAN120	CAN120-CK	-0.005	-0.018	0.048
CAN121	CAN121-CK	-0.048	-0.084	0.148
CAN129	CAN129-CK	0.007	0.011	0.006
CAN130	CAN130-CK	0.004	-0.010	-0.008
CAN131	CAN131-CK	0.000	-0.023	0.008
CAN132	CAN132-CK	0.026	0.003	-0.030
CAN133	CAN133-CK	0.033	-0.007	0.001
CAN134	CAN134-CK	0.022	0.010	-0.007
CAN135	CAN135-CK	0.033	0.004	-0.043
CAN136	CAN136-CK	0.038	-0.017	-0.030
CAN142	CAN142-CK	-0.020	0.003	-0.023
CAN143	CAN143-CK	-0.025	-0.008	-0.038
CAN144	CAN144-CK	-0.014	-0.003	-0.007
CAN149	CAN149-CK	-0.019	0.027	-0.058
CAN150	CAN150-CK	0.022	-0.026	-0.031
CAN151	CAN151-CK	0.008	-0.011	-0.018
CAN152	CAN152-CK	-0.011	-0.007	-0.022
CAN153	CAN153-CK	0.044	0.038	0.003
CAN154	CAN154-CK	-0.001	-0.004	-0.020
CAN157	CAN157-CK	0.042	0.010	0.000
CAN160	CAN160-CK	0.000	0.003	0.009
CAN161	CAN161-CK	0.003	0.003	0.003
CAN162	CAN162-CK	0.023	-0.014	-0.016
CAN164	CAN164-CK	-0.015	-0.001	0.004
CAN166	CAN166-CK	0.003	0.007	-0.010
CAN168	CAN168-CK	0.024	-0.006	0.044
CAN169	CAN169-CK	0.006	-0.009	0.023

CAN170	CAN170-CK	-0.002	0.004	-0.004
CAN171	CAN171-CK	0.014	0.009	-0.021
CAN172	CAN172-CK	-0.013	-0.018	-0.037
CAN180	CAN180-CK	0.001	-0.003	0.015
CAN181	CAN181-CK	0.000	0.002	0.004
CAN182	CAN182-CK	0.003	0.003	-0.003
CAN183	CAN183-CK	0.003	0.009	0.020
CAN184	CAN184-CK	-0.003	0.004	-0.010
CAN185	CAN185-CK	-0.023	-0.007	0.031
CAN186	CAN186-CK	0.008	-0.003	-0.052
FGN001	FGN001-CK	0.000	-0.018	-0.016
FGN002	FGN002-CK	-0.001	0.007	0.023
FGN003	FGN003-CK	-0.004	-0.024	-0.036
FGN004	FGN004-CK	-0.011	-0.010	-0.009
FGN005	FGN005-CK	-0.015	0.025	-0.015
FGN006	FGN006-CK	-0.010	0.069	0.011
FGN016	FGN016-CK	-0.004	-0.007	-0.046
FGN017	FGN017-CK	-0.006	0.003	-0.022
FGN018	FGN018-CK	-0.017	-0.014	0.003
FGN019	FGN019-CK	0.004	-0.010	-0.052
FGN020	FGN020-CK	0.010	-0.030	0.021
FGN022	FGN022-CK	-0.013	-0.003	-0.015
FGN023	FGN023-CK	-0.006	-0.014	0.011
FGN024	FGN024-CK	0.027	-0.027	0.018
FGN025	FGN025-CK	-0.012	-0.043	-0.130
FGN026	FGN026-CK	-0.008	-0.015	0.032
FGN027	FGN027-CK	0.013	0.006	-0.015
FGN031	FGN031-CK	0.010	-0.032	0.012
GRN002	GRN002-CK	-0.015	-0.003	0.024
GRN004	GRN004-CK	-0.019	-0.006	-0.006
GRN005	GRN005-CK	-0.015	-0.004	0.019
GRN006	GRN006-CK	-0.018	0.003	-0.027
MCN003	MCN003-CK	0.001	-0.004	-0.028
MCN005	MCN005-CK	-0.010	0.004	-0.025
CAV002	CAV002-CK	-0.007	0.014	0.044
CAV005	CAV005-CK	-0.052	-0.011	0.003
CAV006	CAV006-CK	-0.003	-0.003	-0.012
CAV007	CAV007-CK	-0.004	-0.009	0.026
CAV008	CAV008-CK	-0.017	-0.017	-0.004
CAV010	CAV010-CK	0.033	-0.012	0.007
CAV011	CAV011-CK	0.008	0.009	0.029
CAV012	CAV012-CK	-0.003	-0.010	0.010
CAV013	CAV013-CK	-0.009	-0.005	0.023
CAV014	CAV014-CK	-0.010	0.001	0.008
CAV015	CAV015-CK	0.026	-0.031	0.019

CAV016	CAV016-CK	-0.011	-0.003	-0.052
CAV018	CAV018-CK	-0.103	-0.118	0.055
CAV019	CAV019-CK	-0.004	0.000	0.021
CAV022	CAV022-CK	0.003	0.007	0.005
CAV023	CAV023-CK	-0.023	0.003	0.099
CAV024	CAV024-CK	0.000	0.006	-0.026
CAV034	CAV034-CK	0.013	-0.014	-0.059
CAV036	CAV036-CK	0.001	-0.002	0.014
CAV047	CAV047-CK	-0.005	0.006	-0.062
CAV049	CAV049-CK	-0.039	-0.022	-0.051
CAV055	CAV055-CK	0.016	-0.001	-0.020
CAV056	CAV056-CK	0.022	-0.012	-0.017
CAV057	CAV057-CK	0.006	-0.008	-0.033
CAV058	CAV058-CK	0.015	0.001	-0.025
CAN059	CAN059-CK	0.019	-0.008	-0.066
CAV060	CAV060-CK	0.009	0.011	-0.040
CAV061	CAV061-CK	-0.017	0.029	0.018
CAV063	CAV063-CK	-0.025	0.005	0.003
CAV064	CAV064-CK	-0.029	0.025	-0.035
CAV065	CAV065-CK	-0.002	0.007	-0.040
CAV066	CAV066-CK	-0.007	0.004	-0.009
CAV067	CAV067-CK	0.000	0.004	-0.012
CAV068	CAV068-CK	-0.017	-0.001	0.007
CAV069	CAV069-CK	-0.003	0.007	-0.020
CAV070	CAV070-CK	0.011	0.015	0.011
CAV083	CAV083-CK	0.029	-0.004	-0.025
CAV084	CAV084-CK	0.027	-0.013	0.000
CAV088	CAV088-CK	0.020	-0.028	-0.029
CAV089	CAV089-CK	-0.005	-0.008	0.012
CAV090	CAV090-CK	-0.015	-0.003	0.033
CAV098	CAV098-CK	0.007	-0.013	-0.006
CAV099	CAV099-CK	0.031	-0.023	-0.017
CAV100	CAV100-CK	0.028	0.010	-0.079
CAV102	CAV102-CK	0.039	-0.001	0.012
CAV103	CAV103-CK	-0.020	-0.004	0.008
CAV110	CAV110-CK	-0.018	0.011	0.010
CAV113	CAV113-CK	-0.003	0.006	0.012
CAV114	CAV114-CK	0.000	0.004	0.045
CAV120	CAV120-CK	-0.003	0.000	-0.033
CAV121	CAV121-CK	0.014	0.001	0.035
CAV122	CAV122-CK	-0.004	-0.002	0.034
GRV002	GRV002-CK	-0.006	0.012	0.002
GRV005	GRV005-CK	0.022	-0.005	-0.017
MCV002	MCV002-CK	0.011	-0.003	-0.028
MCV004	MCV004-CK	-0.007	-0.005	-0.009

6.   Deliverables

Along with this report, the deliverables to Dewberry Engineers include the Check Point Documentation Report sheets and an Excel Spreadsheet including all check point data.