

APPENDIX B

LEG COLLECTED GROUND CONTROL POINTS

Leading Edge Geomatics conducted a survey for 183 ground control points (GCPs) which were used to test the accuracy of the calibrated swath data. These 183 GCPs were available to use as control in case the swath data exhibited any biases which would need to be adjusted or removed.

Table 1. GCPs used for LEG’s calibration process and preliminary vertical accuracy assessment.

Number	NAD83(2011) Albers Conus, m		NAVD88 Geoid 12B, m		Delta Z (m)
	Easting (X)	Northing (Y)	Survey Z	Lidar Z	
101	1473270.34	426309.18	0.67	0.67	0.00
102	1473268.42	426321.26	0.67	0.66	0.01
103	1473264.82	426345.28	0.66	0.63	0.03
104	1473260.58	426371.71	0.73	0.75	-0.02
105	1473256.07	426402.19	0.75	0.77	-0.02
106	1473253.04	426423.28	0.8	0.77	0.03
107	1473249.13	426446.94	0.82	0.79	0.03
108	1473245.02	426474.62	0.79	0.76	0.03
109	1473241.46	426498.33	0.74	0.72	0.02
110	1473237.57	426521.35	0.74	0.77	-0.03
111	1473234.48	426545.46	0.72	0.73	-0.01
112	1473231.3	426562.8	0.7	0.72	-0.02
113	1473226.23	426591.13	0.75	0.74	0.01
114	1473222.12	426617.15	0.69	0.72	-0.03
115	1473215.78	426659.61	0.83	0.80	0.03
116	1473210.14	426696.65	0.8	0.83	-0.03
117	1473205.14	426729.59	0.74	0.74	0.00
118	1473196.57	426786.07	0.64	0.64	0.00
119	1473188.17	426841.09	0.81	0.85	-0.04
120	1473180.25	426893.57	0.88	0.95	-0.07
121	1473168.7	426970.5	1.08	1.17	-0.09
122	1473106.31	424992.94	0.71	0.74	-0.03
123	1473103.16	425015.62	0.78	0.80	-0.02
124	1473098.84	425045.65	0.75	0.80	-0.05
125	1473093.79	425081.82	0.71	0.72	-0.01
126	1473088.64	425117.69	0.76	0.79	-0.03
127	1473084.52	425148.05	0.67	0.68	-0.01
128	1473079.84	425178.47	0.77	0.78	-0.01
129	1473075.18	425209.97	0.83	0.84	-0.01
130	1473070.88	425239.48	0.84	0.84	0.00
131	1473066.85	425267.46	0.88	0.90	-0.02
132	1473062.34	425298.95	0.8	0.77	0.03
133	1473058.03	425327.45	0.84	0.83	0.01
134	1473053.82	425355.93	0.79	0.85	-0.06
135	1473048.35	425392.76	0.79	0.85	-0.06

Number	NAD83(2011) Albers Conus, m		NAVD88 Geoid 12B, m		Delta Z (m)
	Easting (X)	Northing (Y)	Survey Z	Lidar Z	
136	1473043.11	425428.43	0.84	0.84	0.00
137	1473037.3	425466.9	0.78	0.80	-0.02
138	1473032.5	425499.83	0.81	0.81	0.00
139	1473027.2	425536.21	0.83	0.85	-0.02
140	1473022.48	425571.35	0.94	0.94	0.00
141	1473017.14	425603.46	0.82	0.84	-0.02
142	1473011.87	425639.77	0.8	0.83	-0.03
201	1476203.63	420901.63	1.02	0.92	0.10
202	1476200.61	420918.45	1.11	1.14	-0.03
203	1476194.3	420952.6	1.48	1.52	-0.04
204	1476195.92	420980.31	2.64	2.66	-0.02
205	1476210.2	421030.16	2.76	2.78	-0.02
206	1476217.07	421063.5	2.34	2.40	-0.06
207	1476221.28	421088.31	2.21	2.28	-0.07
208	1476229	421123.06	2.16	2.24	-0.08
209	1476234.09	421145.67	2.18	2.23	-0.05
210	1476236.57	421170.29	2.09	2.16	-0.07
211	1476238.74	421212.95	1.76	1.84	-0.08
212	1476241.55	421244.95	1.6	1.66	-0.06
213	1476245.74	421282.39	1.29	1.37	-0.08
214	1476249.5	421308.02	1.16	1.23	-0.07
215	1476258.75	421343.07	0.97	1.06	-0.09
301	1496470.93	430477.67	1.96	1.92	0.04
302	1496495.47	430478.87	1.98	2.01	-0.03
303	1496534.68	430480.7	2.05	2.03	0.02
304	1496568.68	430482.24	2.04	2.01	0.03
305	1496624.95	430484.82	2.04	2.08	-0.04
306	1496692.12	430488.01	2.04	1.99	0.05
307	1496741.85	430490.29	2.08	2.00	0.08
308	1496803.46	430493.11	2.1	2.18	-0.08
309	1496861.38	430495.77	2.08	2.08	0.00
310	1496917.09	430498.41	2.05	1.93	0.12
311	1496986.12	430501.73	2.1	1.97	0.13
312	1497060.46	430505.12	2.11	2.00	0.11
313	1497096.07	430506.74	2.15	2.10	0.05
314	1497155.72	430509.32	2.13	2.13	0.00
315	1497196.14	430511.18	2.13	2.09	0.04
316	1499512.06	430618.7	2.5	2.38	0.12
317	1499548.59	430620.42	2.44	2.34	0.10
319	1499613.76	430623.49	2.54	2.37	0.17
321	1499667.57	430626.01	2.52	2.50	0.02

Number	NAD83(2011) Albers Conus, m		NAVD88 Geoid 12B, m		Delta Z (m)
	Easting (X)	Northing (Y)	Survey Z	Lidar Z	
322	1499696.89	430627.37	2.52	2.36	0.16
323	1499730.22	430628.93	2.5	2.39	0.11
324	1499764.92	430630.61	2.49	2.42	0.07
325	1499814.8	430632.96	2.49	2.41	0.08
326	1499872.82	430635.68	2.44	2.54	-0.10
327	1499912.5	430637.57	2.51	2.38	0.13
328	1499955.75	430639.62	2.5	2.37	0.13
329	1500000.2	430641.72	2.55	2.49	0.06
330	1500053.54	430644.31	2.58	2.56	0.02
331	1500107.99	430646.94	2.56	2.41	0.15
332	1500221.14	430653.11	2.53	2.54	-0.01
333	1500260.8	430654.13	2.54	2.55	-0.01
334	1500311.83	430656.48	2.53	2.52	0.01
401	1535986.77	362982.56	0.97	0.88	0.09
402	1535967.96	362965.56	0.96	0.81	0.15
403	1535933.59	362934.14	1.12	1.07	0.05
404	1535901.47	362904.79	1.04	1.04	0.00
405	1535885.76	362890.39	1.05	0.93	0.12
408	1535817.93	362827.87	1.07	0.98	0.09
409	1535786.14	362798	1.13	1.00	0.13
410	1535759.8	362773.05	1.08	1.03	0.05
411	1535730.43	362744.97	1.15	1.00	0.15
412	1535704.2	362719.37	1.15	1.09	0.06
413	1535671.89	362687.52	1.16	1.10	0.06
414	1535644.22	362659.95	1.16	1.03	0.13
415	1535619.69	362635.34	1.12	1.05	0.07
416	1535589.24	362604.54	1.16	1.06	0.10
501	1533873.67	360738.18	1.05	1.09	-0.04
502	1533890.49	360764.3	1.01	1.02	-0.01
503	1533907.37	360790.57	1.01	1.02	-0.01
504	1533922.6	360813.74	1.05	0.99	0.06
505	1533940.69	360840.92	1.02	1.07	-0.05
506	1533954.24	360861.2	1.06	1.09	-0.03
507	1533967.46	360880.78	1.04	1.05	-0.01
508	1533979.55	360898.46	1.02	1.03	-0.01
509	1533994.35	360920.05	1.05	1.06	-0.01
510	1534012.11	360945.81	1.07	1.05	0.02
511	1534029.61	360971.1	1.06	0.97	0.09
512	1534040.83	360987.16	1.02	1.01	0.01
513	1534048.37	360997.84	1.02	1.01	0.01
514	1534070.98	361029.65	1.03	1.04	-0.01

Number	NAD83(2011) Albers Conus, m		NAVD88 Geoid 12B, m		Delta Z (m)
	Easting (X)	Northing (Y)	Survey Z	Lidar Z	
515	1534099.72	361069.63	1.03	0.99	0.04
516	1534128.63	361109.23	1	1.01	-0.01
517	1534151.86	361140.53	0.97	0.99	-0.02
518	1534172.02	361167.59	0.98	0.99	-0.01
519	1534196.2	361199.62	0.96	0.98	-0.02
520	1534213.69	361222.5	0.98	1.00	-0.02
521	1534229.24	361242.58	0.97	0.98	-0.01
522	1534251.31	361270.96	0.94	0.94	0.00
523	1534270.74	361295.78	0.98	0.94	0.04
601	1531476.76	355971.82	1.59	1.62	-0.03
602	1531468.5	355946.12	1.62	1.67	-0.05
603	1531460.67	355915.52	1.66	1.67	-0.01
604	1531455.9	355888.17	1.69	1.73	-0.04
605	1531452.44	355858.1	1.72	1.79	-0.07
606	1531450.89	355821.6	1.66	1.67	-0.01
607	1531451.17	355788.16	1.47	1.50	-0.03
608	1531451.91	355757.37	1.36	1.40	-0.04
609	1531452.23	355725.59	1.21	1.24	-0.03
610	1531452.18	355695.93	1.17	1.16	0.01
611	1531452	355667.05	1.11	1.13	-0.02
612	1531451.76	355642.18	1.13	1.17	-0.04
613	1531451.21	355615.45	1.16	1.18	-0.02
614	1531449.86	355582.75	1.21	1.22	-0.01
615	1531446.3	355544.01	1.21	1.21	0.00
616	1531441.13	355510.7	1.19	1.24	-0.05
617	1531434.32	355477.23	1.23	1.23	0.00
618	1531424.59	355441.91	1.29	1.35	-0.06
619	1531411.01	355403.33	1.31	1.31	0.00
620	1531893.65	356439.4	0.91	0.95	-0.04
621	1531914.36	356459.82	1	1.04	-0.04
622	1531936.99	356482.26	1.08	1.13	-0.05
623	1531961.06	356506.51	1.16	1.19	-0.03
624	1531984.08	356530.61	1.13	1.17	-0.04
625	1532019.89	356570.4	1.08	1.12	-0.04
626	1532034.52	356587.6	1.04	1.13	-0.09
627	1532056.56	356614.38	1.1	1.14	-0.04
628	1532077.2	356640.19	1.06	0.94	0.12
629	1532099.18	356669.03	1.09	1.15	-0.06
630	1532120.4	356698.16	1.05	1.14	-0.09
631	1532137.21	356721.74	1.06	0.92	0.14
632	1532164.96	356762.72	1.13	1.14	-0.01

Number	NAD83(2011) Albers Conus, m		NAVD88 Geoid 12B, m		Delta Z (m)
	Easting (X)	Northing (Y)	Survey Z	Lidar Z	
633	1532183.49	356791.72	1.09	1.10	-0.01
634	1532201.88	356822.18	1.09	1.10	-0.01
635	1532219.18	356851.76	1.12	1.11	0.01
636	1532236.82	356883.17	1.06	1.11	-0.05
637	1532252.57	356913.06	1.07	1.10	-0.03
638	1532265.83	356939.17	1.08	1.15	-0.07
639	1532286.01	356988.49	1.02	0.99	0.03
640	1532305.27	357024.02	1.07	1.05	0.02
708	716841.73	138690.4	0.92	0.96	-0.04
709	1537635.8	364482.44	1	0.94	0.06
711	1537717.13	364556.4	1.05	0.97	0.08
713	717066.92	138849.94	0.89	0.97	-0.08
715	717153.22	138911.28	0.79	0.91	-0.12
716	717207.82	138949.87	0.88	0.95	-0.07
717	717251.4	138980.89	0.91	0.97	-0.06
719	1538035.28	364846.8	1.05	0.89	0.16
720	717372.1	139066.82	0.91	0.99	-0.08
721	717421.57	139101.86	0.85	0.91	-0.06
722	1538160.09	364960.7	1.04	0.86	0.18
723	717512.36	139166.23	0.85	0.97	-0.12
724	1538268.27	365059.36	1.02	0.83	0.19
725	717649.37	139263.57	0.84	0.89	-0.05
728	1536307.2	363270.44	1.12	1.02	0.10
729	1536199.03	363171.76	1.1	0.95	0.15
730	1536137.61	363115.63	1.08	0.91	0.17