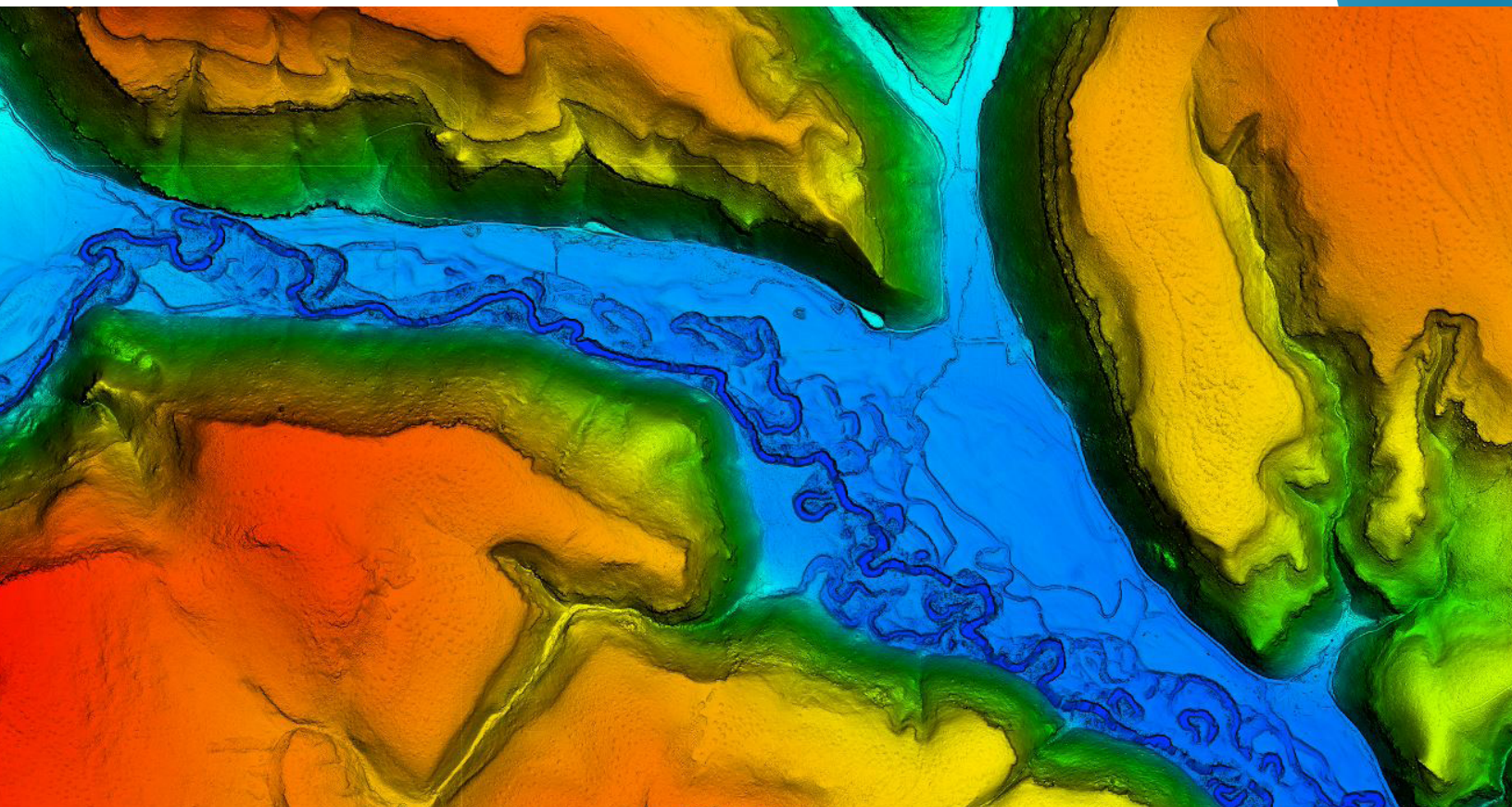# N|V|5 GEOSPATIAL

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OR_NRCSUSGS_2019_D19
LIDAR PROCESSING REPORT

Work Package: 183621
Work Unit: 219333

2020

Submitted: June 23, 2021

Prepared for:

≋USGS
science for a changing world

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Appendix A: Flight Logs

1. Summary / Scope

1.1. Summary

This report contains a summary of the OR_NRCSUSGS_2019_D19, Work Unit 219333 LiDAR acquisition task order, issued by USGS under their Contract G16PC00016 on September 12, 2019. The work unit yielded an area covering approximately 1,934 square miles over Oregon. The intent of this document is only to provide specific validation information for the data acquisition/ collection, processing, and production of deliverables completed as specified in the task order.

1.2. Scope

Aerial topographic LiDAR was acquired using state of the art technology along with the necessary surveyed ground control points (GCPs) and airborne GPS and inertial navigation systems. The aerial data collection was designed with the following specifications listed in Table 1 below.

Table 1. Originally Planned LiDAR Specifications

Average Point Density	Flight Altitude (AGL)	Field of View	Minimum Side Overlap	RMSEz
8 pts / m²	2085 m	58.5°	55%	≤ 10 cm

1.3. Coverage

The work unit covers approximately 1,934 square miles over Oregon. Project extents are shown in Figure 1.

1.4. Duration

LiDAR data was acquired from October 30, 2019 to July 29, 2020 in twenty-five total lifts. See "Section: 2.4. Time Period" for more details.

1.5. Issues

There were no major issues to report for this project.

OR_NRCSUSGS_2019_D19 Work Unit 219333 Projected Coordinate System: Oregon Statewide Lambert Horizontal Datum: NAD83(2011) Vertical Datum: NAVD88 (GEOID 12b) Units: International Feet	
Lidar Point Cloud	Classified Point Cloud in .LAS 1.4 format
Rasters	• 3-foot Hydro-flattened Bare Earth Digital Elevation Model (DEM) in GeoTIFF format • 3-foot Intensity images in GeoTIFF format
Vectors	Shapefiles (*.shp) • Project Boundary • LiDAR Tile Index Geodatabase (*.gdb) • Continuous Hydro-flattened Breaklines
Reports	Reports in PDF format • Focus on Delivery • Processing Report • Survey Report
Metadata	XML Files (*.xml) • Breaklines • Classified Point Cloud • DEM • Intensity Imagery

OR_NRCSUSGS_2019_D19
Work Unit 219333 Boundary
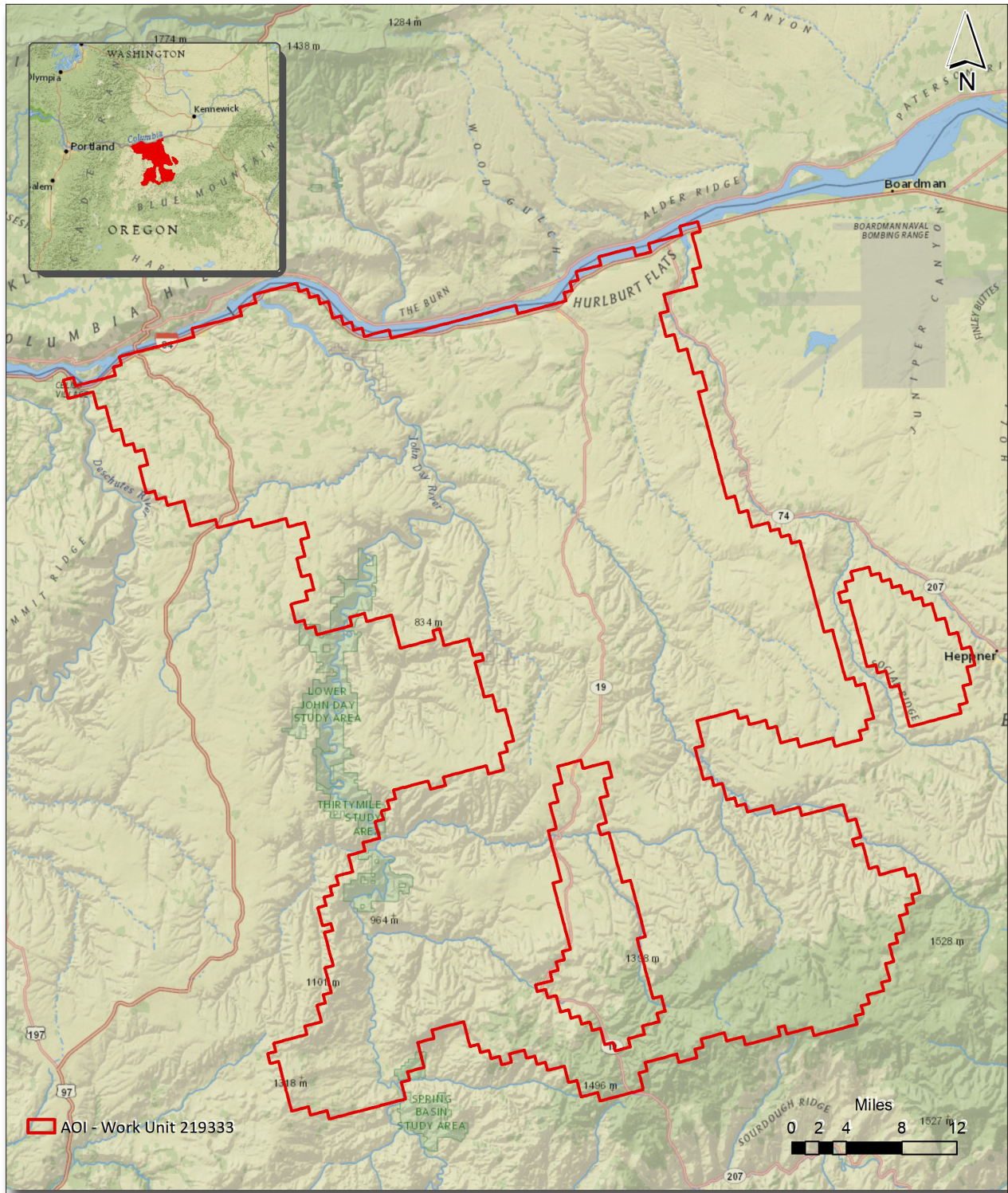
Figure 1. Work Unit Boundary

2. Planning / Equipment

2.1. Flight Planning

Flight planning was based on the unique project requirements and characteristics of the project site. The basis of planning included: required accuracies, type of development, amount / type of vegetation within project area, required data posting, and potential altitude restrictions for flights in project vicinity.

Detailed project flight planning calculations were performed for the project using FMS Planner planning software. Planned flight lines are shown in Figure 2.

2.2. LiDAR Sensor

NV5 Geospatial utilized the following lidar sensors (Figure 3) for data acquisition:

- Optech Orion H-300
- Optech Galaxy Prime

The Optech Galaxy Prime systems are capable of collecting data at a maximum frequency of 550 kHz. These systems utilize a Multi-Pulse in the Air option (MPIA). These sensors are also equipped with the ability to measure up to 8 returns per outgoing pulse

The Optech Orion H-300 is an ultra-compact system that has a range capture of up to 4 range measurements (including 1st, 2nd, 3rd, and last returns) and an intensity capture of up to 4 intensity returns for each pulse. The laser repetition rate is programmable from 35-300 kHz and the scan frequency is programmable from 0-90 Hz.

A brief summary of the aerial acquisition parameters for the project are shown in the LiDAR System Specifications in Table 2.

OR_NRCSUSGS_2019_D19
Work Unit 219333 Planned Flight Lines
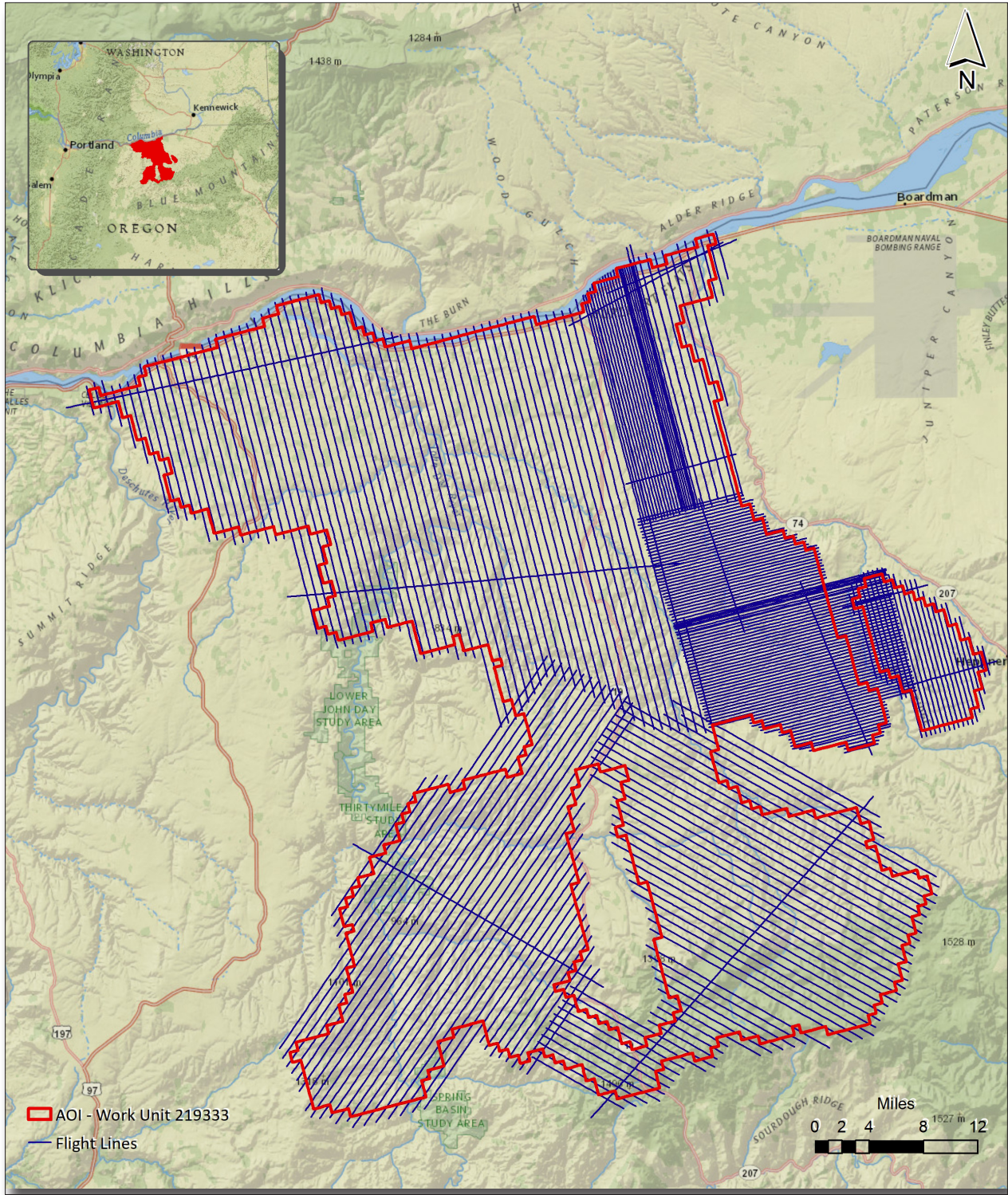
Figure 2. Planned Flight Lines

Table 2. LiDAR System Specifications

		Optech Galaxy Prime	Optech Orion H300
Terrain and Aircraft Scanner	Flying Height	2300 m	1500 m
	Recommended Ground Speed	130 kts	120 kts
Scanner	Field of View	50°	28°
	Scan Rate Setting Used	70 Hz	62 Hz
Laser	Laser Pulse Rate Used	800 kHz	275 kHz
	Multi Pulse in Air Mode	yes	2PiA
Coverage	Full Swath Width	2145 m	748 m
	Line Spacing	858 m	300 m
Point Spacing and Density	Average Point Spacing	0.35 m	0.35
	Average Point Density	8 pts / m²	8 pts / m²

Figure 3. Optech Galaxy Prime and Optech Orion H300 Lidar Sensors

2.3. Aircraft

All flights for the project were accomplished through the use of customized planes. Plane type and tail numbers are listed below.

LiDAR Collection Planes
- Cessna 310 (twin-piston), Tail Number: N777Q
- Cessna Centurion (piston-single), Tail Number: N777JK

These aircraft provided an ideal, stable aerial base for LiDAR acquisition. These aerial platforms have relatively fast cruise speeds, which are beneficial for project mobilization / demobilization while maintaining relatively slow stall speeds, proving ideal for collection of high-density, consistent data posting using a state-of-the-art Riegl VQ1560i LiDAR system. Some of NV5 Geospatial's operating aircraft can be seen in Figure 4 below.

Figure 4. Some of Quantum Spatial's Planes

2.4. Time Period

Project specific flights were conducted between October 30, 2019 and July 29, 2020. Twenty-five aircraft lifts were completed. Accomplished lifts are listed below.

- 10302019A (H-300-Orion,N777Q)
- 11012019A (H-300-Orion,N777Q)
- 11022019A (H-300-Orion,N777Q)
- 11062019A (H-300-Orion,N777Q)
- 11082019A (H-300-Orion,N777Q)
- 11202019A (H-300-Orion,N777Q)
- 01032020A (Prime,N777JK)
- 02122020A (Prime,N777JK)
- 02192020A (Prime,N777JK)
- 02252020A (Prime,N777JK)
- 02282020A (Prime,N777JK)
- 02282020B (Prime,N777JK)
- 03012020A (Prime,N777JK)
- 03042020A (Prime,N777JK)
- 03052020A (Prime,N777JK)
- 03052020B (Prime,N777JK)
- 03052020C (Prime,N777JK)
- 03122020A (Prime,N777JK)
- 03212020A (Prime,N777JK)
- 03212020B (Prime,N777JK)
- 04072020A (Prime,N777JK)
- 04102020A (Prime,N777JK)
- 04102020B (Prime,N777JK)
- 07292020A (Prime,N777JK)

3. Processing Summary

3.1. Flight Logs

Flight logs were completed by LIDAR sensor technicians for each mission during acquisition. These logs depict a variety of information, including:

- Job / Project #
- Flight Date / Lift Number
- FOV (Field of View)
- Scan Rate (HZ)
- Pulse Rate Frequency (Hz)
- Ground Speed
- Altitude
- Base Station
- PDOP avoidance times
- Flight Line #
- Flight Line Start and Stop Times
- Flight Line Altitude (AMSL)
- Heading
- Speed
- Returns
- Crab

Notes: (Visibility, winds, ride, weather, temperature, dew point, pressure, etc).

3.2. LiDAR Processing

Applanix + POSPac software was used for post-processing of airborne GPS and inertial data (IMU), which is critical to the positioning and orientation of the LiDAR sensor during all flights. Applanix POSPac combines aircraft raw trajectory data with stationary GPS base station data yielding a "Smoothed Best Estimate Trajectory" (SBET) necessary for additional post processing software to develop the resulting geo-referenced point cloud from the LiDAR missions.

During the sensor trajectory processing (combining GPS & IMU datasets) certain statistical graphs and tables are generated within the Applanix POSPac processing environment which are commonly used as indicators of processing stability and accuracy. This data for analysis include: max horizontal / vertical GPS variance, separation plot, altitude plot, PDOP plot, base station baseline length, processing mode, number of satellite vehicles, and mission trajectory.

Point clouds were created using Optech LMS software. The generated point cloud is the mathematical three dimensional composite of all returns from all laser pulses as determined from the aerial mission. The point cloud is imported into GeoCue distributive processing software. Imported data is tiled and then calibrated using TerraMatch and proprietary software. Using TerraScan, the vertical accuracy of the surveyed ground control is tested and any bias is removed from the data. TerraScan and TerraModeler software packages are then used for automated data classification and manual cleanup. The data are manually reviewed and any remaining artifacts removed using functionality provided by TerraScan and TerraModeler.

DEMs and Intensity Images are then generated using proprietary software. In the bare earth surface model, above-ground features are excluded from the data set. Global Mapper is used as a final check of the bare earth dataset.

Finally, proprietary software is used to perform statistical analysis of the LAS files.

Software	Version
Applanix + POSPac	8.6
Optech LMS	4.4
GeoCue	2020.1.22.1
Global Mapper	19.1;20.1
TerraModeler	21.008
TerraScan	21.016
TerraMatch	21.007

3.3. LAS Classification Scheme

The classification classes are determined by the USGS Version 1.3 specifications and are an industry standard for the classification of LIDAR point clouds. All data starts the process as Class 1 (Unclassified), and then through automated classification routines, the classifications are determined using TerraScan macro processing.

The classes used in the dataset are as follows and have the following descriptions:

Table 3. LAS Classifications

	Classification Name	Description
1	Processed, but Unclassified	Laser returns that are not included in the ground class, or any other project classification
2	Bare earth	Laser returns that are determined to be ground using automated and manual cleaning algorithms
7	Low Noise	Laser returns that are often associated with scaterring from reflective surfaces, or artificial points below the ground surface
9	Water	Laser returns that are found inside of hydro features
17	Bridge Deck	Laser returns falling on bridge decks
18	High Noise	Laser returns that are often associated with birds or artificial points above the ground surface
20	Ignored Ground	Ground points that fall within the given threshold of a collected hydro feature.

3.4. Classified LAS Processing

The bare earth surface is then manually reviewed to ensure correct classification on the Class 2 (Ground) points. After the bare- earth surface is finalized; it is then used to generate all hydro-breaklines through heads-up digitization.

All ground (ASPRS Class 2) LiDAR data inside of the Lake Pond and Double Line Drain hydro flattening breaklines were then classified to water (ASPRS Class 9) using TerraScan macro functionality. A buffer of 3 feet was also used around each hydro flattened feature to classify these ground (ASPRS Class 2) points to Ignored ground (ASPRS Class 20). All Lake Pond Island and Double Line Drain Island features were checked to ensure that the ground (ASPRS Class 2) points were reclassified to the correct classification after the automated classification was completed.

Any noise that was identified either through manual review or automated routines was classified to the appropriate class (ASPRS Class 7 and/or ASPRS Class 18) followed by flagging with the withheld bit.

All data was manually reviewed and any remaining artifacts removed using functionality provided by TerraScan and TerraModeler. Global Mapper is used as a final check of the bare earth dataset. GeoCue was then used to create the deliverable industry-standard LAS files for all point cloud data. NV5 Geospatial's proprietary software was used to perform final statistical analysis of the classes in the LAS files, on a per tile level to verify final classification metrics and full LAS header information.

3.5. Hydro-Flattened Breakline Processing

Class 2 LiDAR was used to create a bare earth surface model. The surface model was then used to heads-up digitize 2D breaklines of Inland Streams and Rivers with a 100 foot nominal width and Inland Ponds and Lakes of 2 acres or greater surface area.

Elevation values were assigned to all Inland streams and rivers using NV5 Geospatial's proprietary software.

All ground (ASPRS Class 2) LiDAR data inside of the collected inland breaklines were then classified to water (ASPRS Class 9) using TerraScan macro functionality. A buffer of 3 feet was also used around each hydro flattened feature. These points were moved from ground (ASPRS Class 2) to Ignored Ground (ASPRS Class 20).

The breakline files were then translated to Esri file geodatabase format using Esri conversion tools.

Breaklines are reviewed against lidar intensity imagery to verify completeness of capture. All breaklines are then compared to TINs (triangular irregular networks) created from ground only points prior to water classification. The horizontal placement of breaklines is compared to terrain features and the breakline elevations are compared to lidar elevations to ensure all breaklines match the lidar within acceptable tolerances. Some deviation is expected between breakline and lidar elevations due to monotonicity, connectivity, and flattening rules that are enforced on the breaklines. Once completeness, horizontal placement, and vertical variance is reviewed, all breaklines are reviewed for topological consistency and data integrity using a combination of Esri Data Reviewer tools and proprietary tools.

3.6. Hydro-Flattened Raster DEM Processing

Class 2 LiDAR in conjunction with the hydro breaklines were used to create a 3-foot Raster DEM. Using automated scripting routines within proprietary software, a GeoTIFF file was created for each tile. Each surface is reviewed using Global Mapper to check for any surface anomalies or incorrect elevations found within the surface.

3.7. Intensity Image Processing

GeoCue software was used to create the deliverable intensity images. All withheld points were ignored during this process. This helps to ensure a more aesthetically pleasing image. The GeoCue software was then used to verify full project coverage as well. GeoTIFF files with a cell size of 3-foot were then provided as the deliverable for this dataset requirement.

OR_NRCSUSGS_2019_D19
Work Unit 219333 Tile Layout
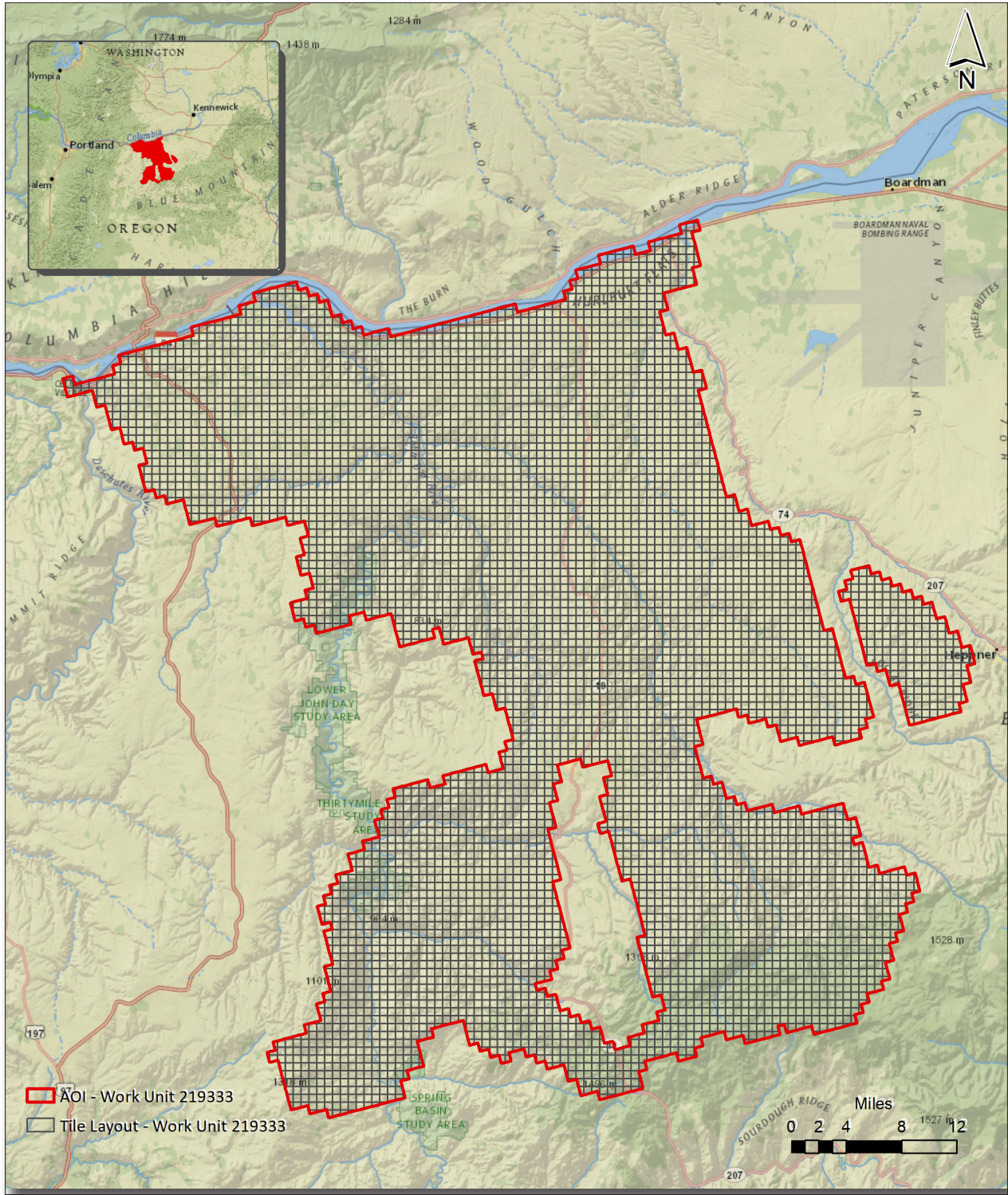
Figure 5. Lidar Tile Layout

4. Project Coverage Verification

Coverage verification was performed by comparing coverage of processed .LAS files captured during project collection to generate project shape files depicting boundaries of specified project areas. Please refer to Figure 6.

OR_NRCSUSGS_2019_D19
Work Unit 219333 Lidar Coverage
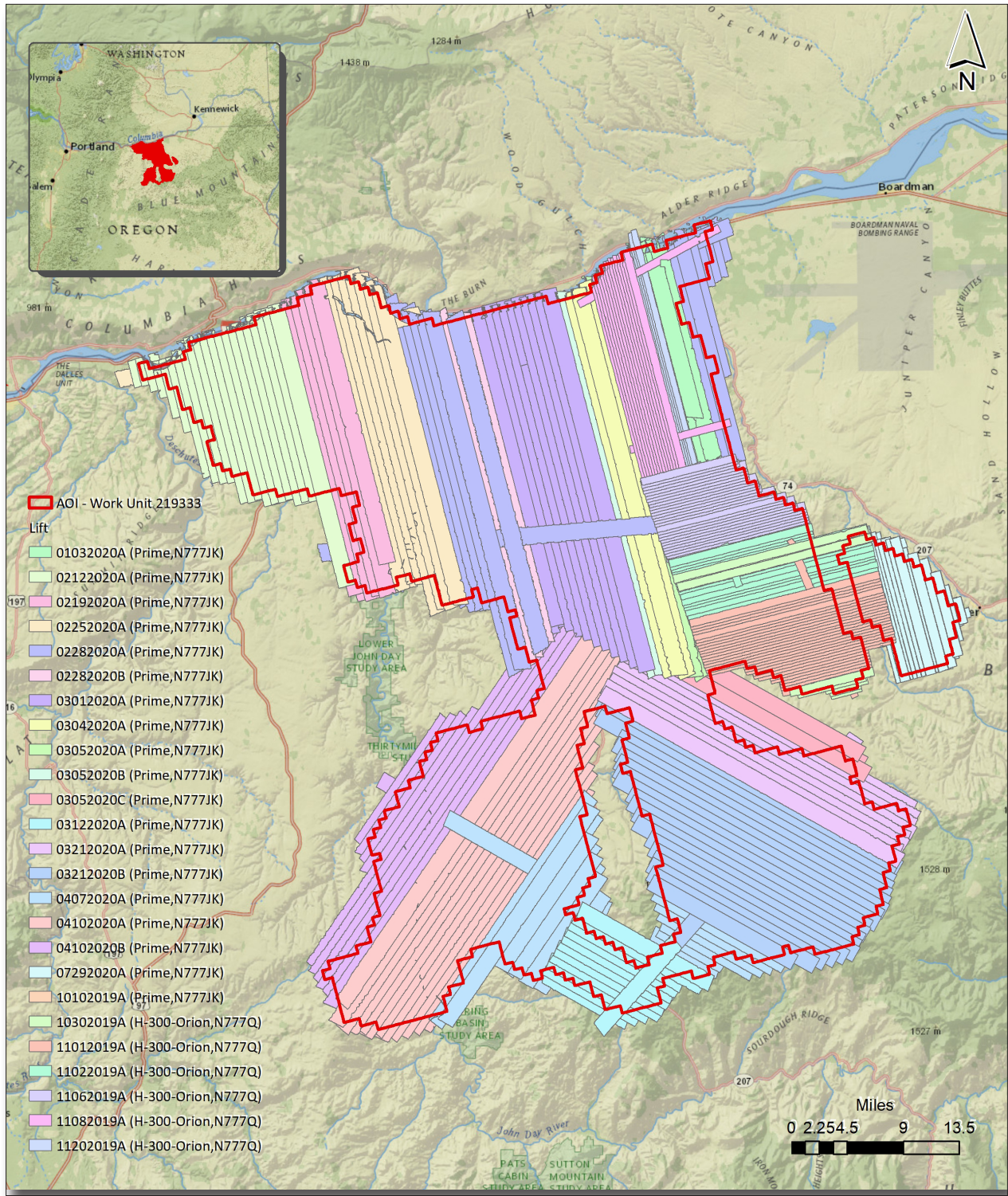
Figure 6. Lidar Coverage

5. Ground Control and Check Point Collection

NV5 Geospatial completed a field survey of 172 ground control (calibration) points along with 272 blind QA points in Non-Vegetated and Vegetated land cover classifications as an independent test of the accuracy of this project.

The required accuracy testing was performed on the lidar dataset (both the lidar point cloud and derived DEM's) according to the USGS Lidar Base Specification Version 1.3. See the "Survey Report of Lidar Calibration & Quality Control Points" for more information.

5.1. Calibration Control Point Testing

Figure 7 shows the location of each bare earth calibration point for the project area. TerraScan was used to perform a quality assurance check using the lidar bare earth calibration points. The results of the surface calibration are not an independent assessment of the accuracy of these project deliverables, but the statistical results do provide additional feedback as to the overall quality of the elevation surface.

5.2. Point Cloud Testing

The project specifications require that only Non-Vegetated Vertical Accuracy (NVA) be computed for raw lidar point cloud swath files. The required accuracy (ACCz) is: 19.6 cm at a 95% confidence level, derived according to NSSDA, i.e., based on RMSE of 10 cm in the "bare earth" and "urban" land cover classes. The NVA was tested with 136 checkpoints located in bare earth and urban (non-vegetated) areas. These check points were not used in the calibration or post processing of the lidar point cloud data. The checkpoints were distributed throughout the project area and were surveyed using GPS techniques. See survey report for additional survey methodologies.

Elevations from the unclassified lidar surface were measured for the x,y location of each check point. Elevations interpolated from the lidar surface were then compared to the elevation values of the surveyed control points. AccuracyZ has been tested to meet 19.6 cm or better Non-Vegetated Vertical Accuracy at 95% confidence level using RMSE(z) x 1.9600 as defined by the National Standards for Spatial Data Accuracy (NSSDA); assessed and reported using National Digital Elevation Program (NDEP)/ASRPS Guidelines.

5.3. Digital Elevation Model (DEM) Testing

The project specifications require the accuracy (ACCz) of the derived DEM be calculated and reported in two ways:

> 1. The required NVA is: 19.6 cm at a 95% confidence level, derived according to NSSDA, i.e., based on RMSE of 10 cm in the "bare earth" and "urban" land cover classes. This is a required accuracy. The NVA was tested with 136 checkpoints located in bare earth and urban (non-vegetated) areas. See Figure 8.

2. Vegetated Vertical Accuracy (VVA): VVA shall be reported for "brushlands/low trees" and "tall weeds/crops" land cover classes. The target VVA is: 29.4 cm at the 95th percentile, derived according to ASPRS Guidelines, Vertical Accuracy Reporting for Lidar Data, i.e., based on the 95th percentile error in all vegetated land cover classes combined. This is a target accuracy. The VVA was tested with 116 checkpoints located in tall weeds/crops and brushlands/low trees (vegetated) areas. The checkpoints were distributed throughout the project area and were surveyed using GPS techniques. See Figure 9.

AccuracyZ has been tested to meet 19.6 cm or better Non-Vegetated Vertical Accuracy at 95% confidence level using RMSE(z) x 1.9600 as defined by the National Standards for Spatial Data Accuracy (NSSDA); assessed and reported using National Digital Elevation Program (NDEP)/ ASRPS Guidelines.

A brief summary of results are listed below.

	Target	Measured	Point Count
Raw NVA	0.196 m	0.08242 m	136
NVA	0.196 m	0.0820 m	136
VVA	0.294 m	0.1671 m	116

OR_NRCSUSGS_2019_D19
Calibration Points
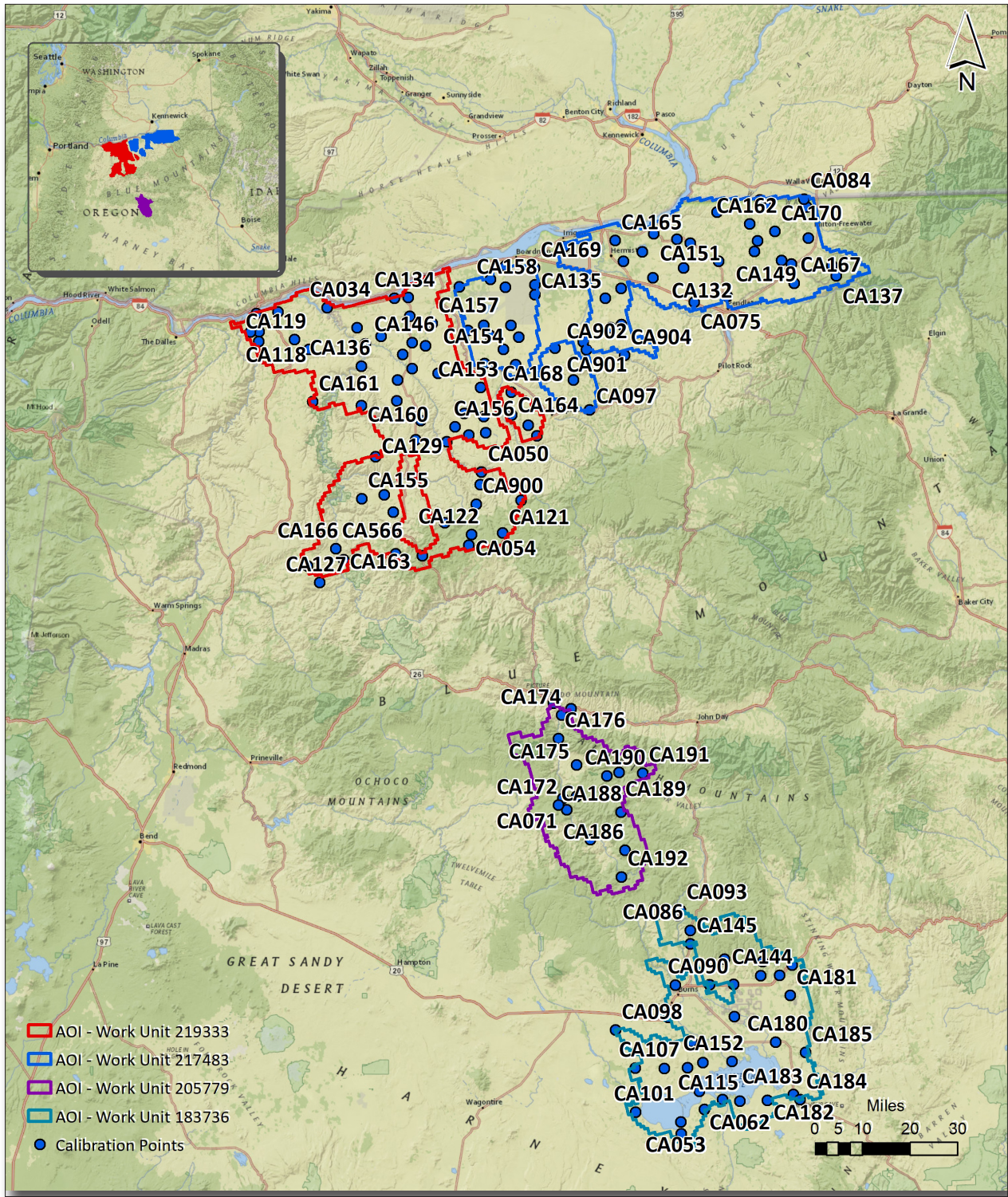
Figure 7. Calibration Control Point Locations

OR_NRCSUSGS_2019_D19
NVA Points
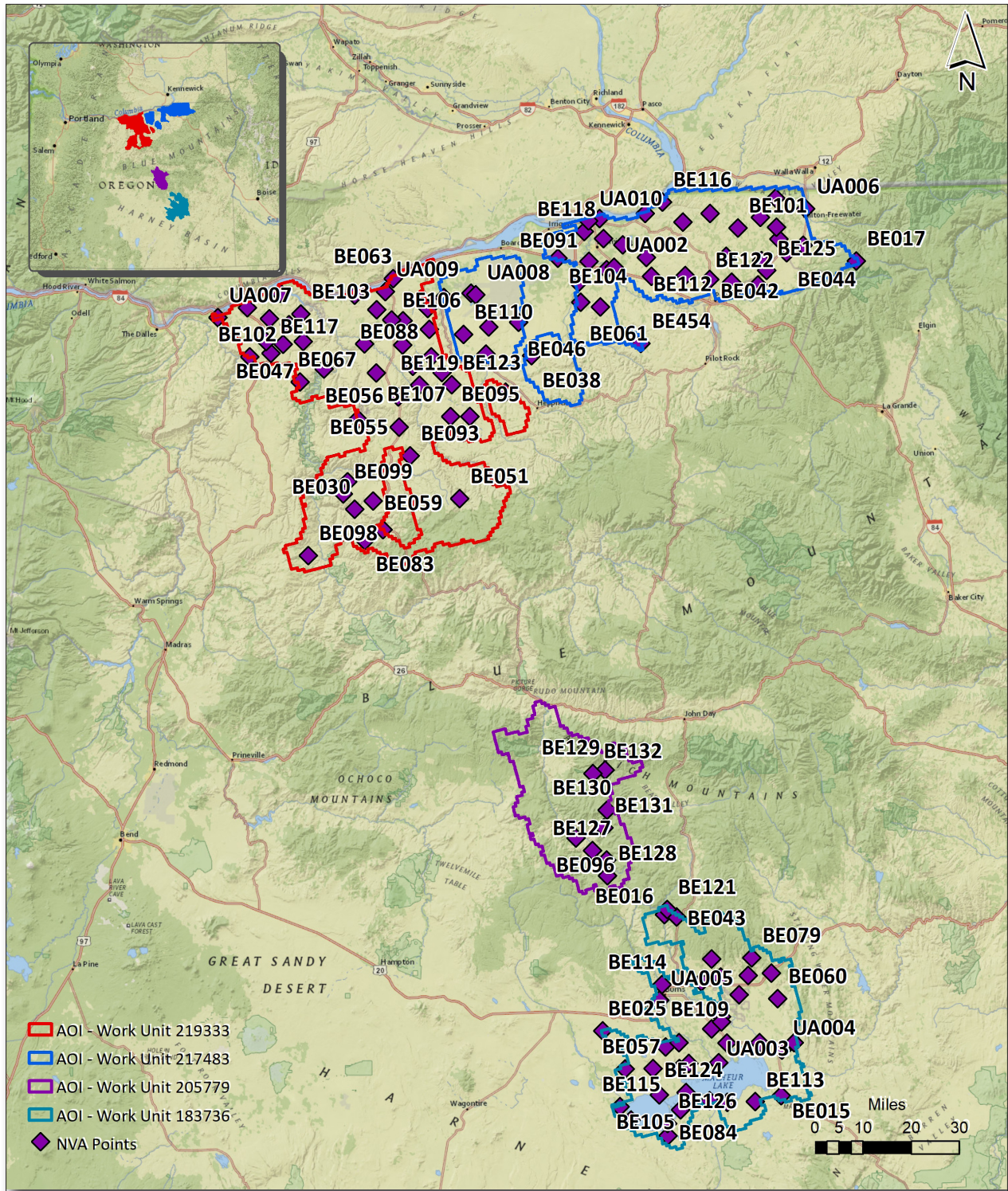
Figure 8. QC Checkpoint Locations - NVA

OR_NRCSUSGS_2019_D19
VVA Points
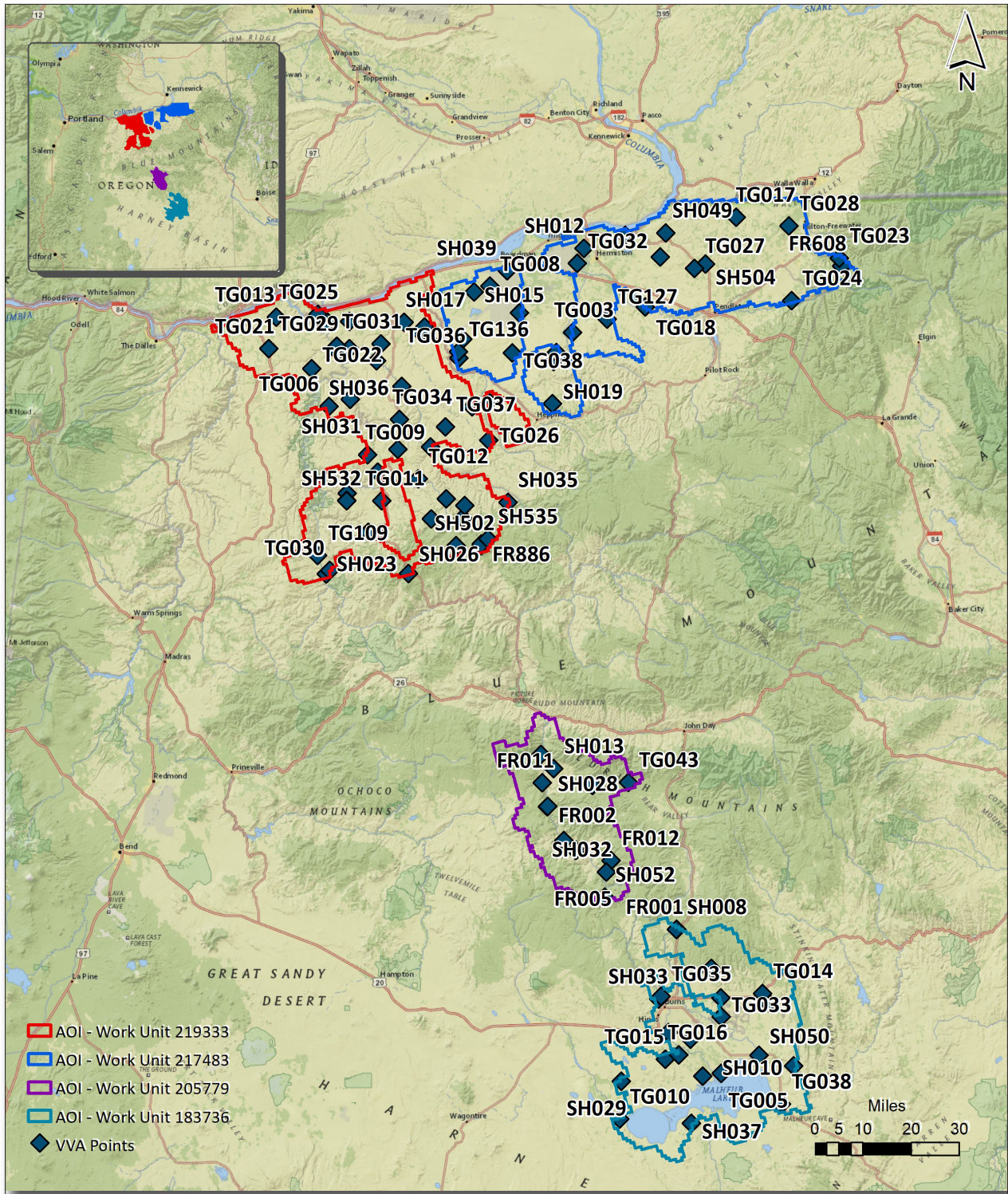
Figure 9. QC Checkpoint Locations - VVA

6. Geometric Accuracy

6.1. Horizontal Accuracy

Lidar horizontal accuracy is a function of Global Navigation Satellite System (GNSS) derived positional error, flying altitude, and INS derived attitude error. The obtained $RMSE_r$ value is multiplied by a conversion factor of 1.7308 to yield the horizontal component of the National Standards for Spatial Data Accuracy (NSSDA) reporting standard where a theoretical point will fall within the obtained radius 95% of the time. Based on a flying altitude of 2300 meters, an IMU error of 0.002 decimal degrees, and a GNSS positional error of 0.015 meters, this project was compiled to meet 0.25 meter horizontal accuracy at the 95% confidence level. A summary is shown below.

Horizontal Accuracy	
$RMSE_r$	0.14 m
	0.47 ft
ACC_r	0.25 m
	0.82 ft

6.2. Relative Vertical Accuracy

Relative vertical accuracy refers to the internal consistency of the data set as a whole: the ability to place an object in the same location given multiple flight lines, GPS conditions, and aircraft attitudes. When the lidar system is well calibrated, the swath-to-swath vertical divergence is low (<0.10 meters). The relative vertical accuracy was computed by comparing the ground surface model of each individual flight line with its neighbors in overlapping regions. The average (mean) line to line relative vertical accuracy for the OR_NRCSUSGS_2019_D19 project was 0.144 feet (0.044 meters). A summary is shown below.

Relative Vertical Accuracy	
Sample	301 flight line surfaces
Average	0.144 ft
	0.044 m
Median	0.145 ft
	0.044 m
RMSE	0.141 ft
	0.043 m
Standard Deviation (1σ)	0.020 ft
	0.006 m
1.96σ	0.040 ft
	0.012 m

Oregon Lot 6D, Oregon Relative Vertical Accuracy (ft)
Total Compared Points (n = 87,047,005,888)
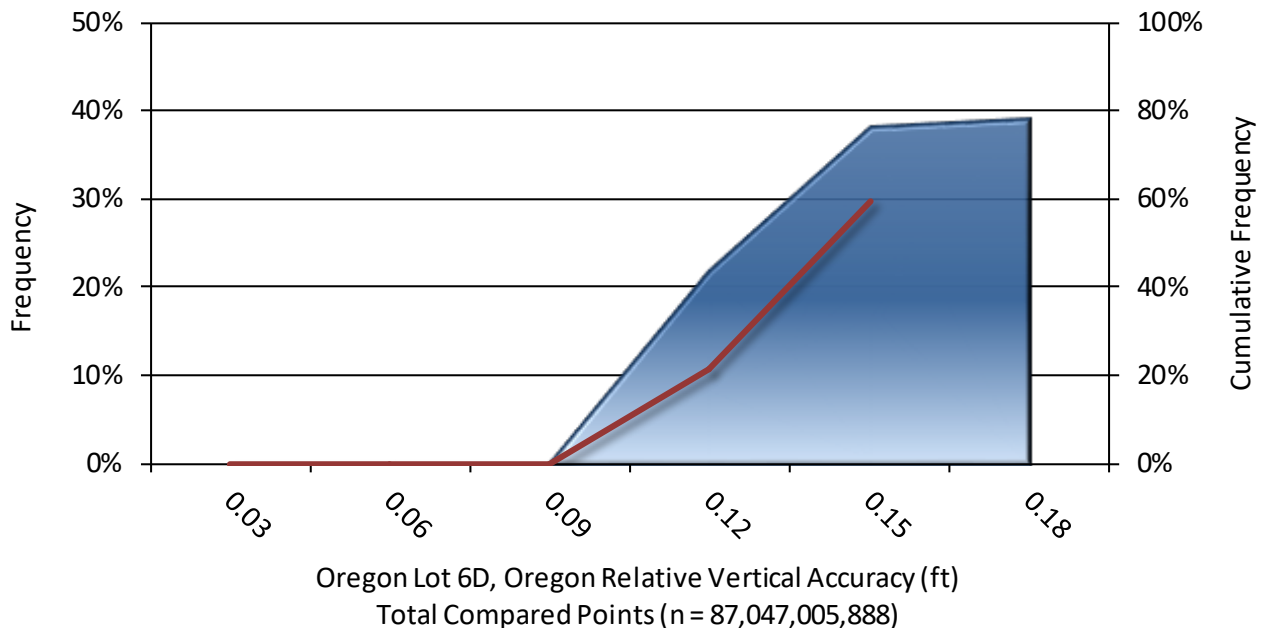
Processing Report Appendices

The following section contains the appendices as listed in

the OR_NRCSUSGS_2019_D19 Lidar Processing Report.

Appendix A

Flight Logs

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 10/30/19	Sensor: ORION #	Take Off #1: 10:52 / UAO	Land #1: 14:18 / KDLS
Crew: MB/EW	Computer: DELL 6530	Take Off #2: 15:05 / KDLS	Land #2: 15:43 / UAO
Aircraft: 210JK	Mount: Short (Double) Other	Take Off #3:	Land #3:
AGPS: (PPP) CORS GRD N/A	Flight/Equipment Notes: #190455 OR NRCS		Flight Time: 4.6
Page: 1 of 1	+D700 LIDAR		Max Speed:

FLT Line	DIR	Start Time	End Time	Altitude (AMSL)	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, conditions, clouds, etc.)
TEST	E	18:42	18:43	8900								100% dropout CAMERA
TEST	E	18:45	18:45	8700								" " DOOR CLOSED LOL
TEST	E	18:48	18:48	8400								3% drop PDOP 1.3
10	S	18:56	19:03	7953	111							wavy rt edge [crossline]
1	W	19:08	19:09	8402	115							
2	E	19:12	19:12	8379								off line - aborted X
2	E	19:17	19:18		115							
3	W	19:23	19:24	8363	111							
4	E	19:29	19:32	8340	107							PDOP 1.42 SATS 14
5	W	19:36	19:40	8294	115							*needs refly West end aborted - air traffic
		19:40	19:40									misfire X
49	W	19:59	20:07	7411	111							
50	E	20:10	20:18	7418	111							20% drop
47	W	20:22	20:22	7425	111							aborted - offline X
47	W	20:33	20:41		107							PDOP 1.05 SATS 20
48	E	20:44	20:44	7425	115							aborted - offline X
48	E	20:51	20:53		111							9% drop - aborted offline *needs refly
												20
												25
												27

	ABGPS	START	END	# SATELLITES / NOTES	Deliverables:
PPP/POS:		18:01 / UAO	21:20 / KDLS		__"AsFlown" Folder
CORS:					__ FMS NAV Out.
CORS:					__ POS Files
Other Notes:					__ POS Log File __ LIDAR Drive __ Imagery Drive __ Completed Flight Log

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 11/1/2019	Sensor: ORION #266	Take Off #1: 1741 / UAO	Land #1: 1608 KDLS
Crew: TVH / KL	Computer: DELL 6530	Take Off #2: 1625 / DLS	Land #2: 1653 UAO
Aircraft: N777Q	Mount: Short ⟨Double⟩ Other	Take Off #3:	Land #3:
AGPS: ⟨PPP⟩ CORS GRD N/A	Flight/Equipment Notes:		Flight Time: 5.6 & 0.5
Page: 1 of 2	#190455 - NRCS LIFT 3 - AREA 2 SOUTH		Max Speed: 6.1

FLT Line	DIR	Start Time	End Time	Altitude (AMSL)	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, conditions, clouds, etc.)
19	S	1835	1841	7953		CROSSLINE						HIGH SCATTERED, SMOOTH, LT HAZE 16 SATS, POS ✓, S-TURNS
6	E	1847	1850	8287	122							
7	W	1852	1855	8258	126							
8	E	1858	1901	8248	119							POS ✓, QTR ✓
9	W	1903	1906	8235	121							
10	E	1908	1911	8202	121							
11	W	1913	1917	8169	121							POS ✓, QTR ✓
12	E	1919	1922	8143	121							
13	W	1924	1928	8123	121							
14	E	1930	1935	8084	119							POS ✓, QTR ✓
15	W	1937	1942	8074	117							CREEK/STREAM ON EAST SIDE
16	E	1944	1949	8045	117							
17	W	1951	1956	8025	119							
18	E	1958	2003	7999	115							POS ✓, QTR ✓
19	W	2005	2012	7966	115							
20	E	2014	2021	7946	115							
21	W	2022	2029	7930								POS ✓, QTR ✓
22	E	2031	2038	7930	115							
23	W	2039	2046	7910	121							
24	E	2047	2054	7881	115							TIGHT TURN AT START? POS ✓, QTR ✓
25	W	2056	2102	7858	124							
26	E	2105	2111	7831	122							
27	W	2113	2120	7812	117							POS ✓, QTR ✓
28	E	2121	2128	7792	117							
29	W	2130	2137	7766	122							
30	E	2138	2145	7740	115							POS ✓, QTR ✓, 18 SATS
31	W	2147	2154	7720								

ABGPS	START	END	# SATELLITES / NOTES
PPP/POS:	1755 / UAO	2309 / DLS	
CORS:			
CORS:			
Other Notes:			

Deliverables:
- "AsFlown" Folder
- FMS NAV Out.
- POS Files
- POS Log File
- LIDAR Drive
- Imagery Drive
- Completed Flight Log

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 11/1/2019	Sensor: ORIOP #266	Take Off #1: See Pg 1	Land #1: See Pg 1
Crew: TVH/KL	Computer: DELL 6530	Take Off #2: X	Land #2: X
Aircraft: N777Q	Mount: Short (Double) Other	Take Off #3:	Land #3:
AGPS: (PPP) CORS GRD N/A	Flight/Equipment Notes:		Flight Time: X
Page: 2 of 2			Max Speed:

FLT Line	DIR	Start Time	End Time	Altitude (AMSL)	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, conditions, clouds, etc.)
32	E	2155	2202	7697	119							POS ✓, QTR ✓, 20 SATS
33	W	2204	2211	7671	122							
34	E	2213	2219	7654	117							
35	W	2221	2228	7635	124							POS ✓, QTR ✓, 18 SATS
36	E	2230	2237	7618	117							
37	W	2238	2245	7605								POS ✓, QTR ✓

	ABGPS	START	END	# SATELLITES / NOTES	Deliverables:
PPP/POS:		See Pg 1	See Pg 1		__"AsFlown" Folder
CORS:					__ FMS NAV Out.
CORS:					__ POS Files
					__ POS Log File
Other Notes:					__ LIDAR Drive __ Imagery Drive __ Completed Flight Log

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 11/2/2019	Sensor: ORION #2606	Take Off #1: 09:46/UAO	Land #1: 15:27/KDLS 5.7
Crew: TVH/EW	Computer: DELL 6530	Take Off #2: 15:43/OLS	Land #2: 16:18/UAO .06
Aircraft: 310	Mount: Short Double Other	Take Off #3:	Land #3:
AGPS: (PPP) CORS GRD N/A	Flight/Equipment Notes: #190455 OR NRCS	Flight Time: 6.5
Page: 1 of 2	D800 (LIFT 4) AREA 2-SOUTH	Max Speed:

FLT Line	DIR	Start Time	End Time	Altitude (AMSL)	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, conditions, clouds, etc.)
TEST	E	17:20	17:30	7737	150							QTR=BAD "Layer Cake"
TEST	S	17:44	17:45	7922	152							QTR ✓ OK
19	S	18:02	18:04	7935	122							FMS lost communication
TEST 19	S	18:22	18:23	7935	113							QTR ✓ OK SATS=15 PDOP=1.39
19	S	18:40	18:43	7935	124							QTR ✓ 25% drop CROSSLINE
38	E	18:48	18:55	7572	122							QTR ✓
39	W	18:57	19:04	7569	122							QTR ✓
40	E	19:06	19:13	7552								QTR ✓ SATS=16 PDOP=1.24
41	W	19:14	19:22	7539	115							QTR ✓
42	E	19:23	19:30	7523	117							QTR ✓
43	W	19:32	19:39	7513	115							QTR ✓
44	E	19:41	19:48	7483	121							QTR ✓ POS ✓ SATS=19 PDOP=1.27
45	W	19:50	19:56	7497	119							QTR ✓
46	E	19:58	20:05	7487	122							QTR ✓
47	W	20:07	20:13	7474	115							QTR ✓
48	E	20:15	20:22	7441	124							QTR ✓ POS ✓ SATS=19 PDOP=1.18
49	W	20:24	20:31	7441	119							QTR ✓
50	E	20:32	20:39	7425								QTR ✓
51	W	20:41	20:48	7421	111							QTR ✓
52	E	20:50	20:57	7421	121							QTR ✓ SATS=19 PDOP=1.20
53	W	20:59	21:06	7415	121							QTR ✓
54	E	21:07	21:14	7418								QTR ✓
55	W	21:17	21:18	7484	142							ABORTED Entrance speed too fast
55	W	21:20	21:25	7484	117							QTR ✓ (AUTO START LASER OFF) STARTED LATE
20	N	21:29	21:31	7133	121							QTR ✓ SATS=18 PDOP=1.30
56	E	21:35	21:40	7451	126							QTR ✓
55	W	21:42	21:42	7484	105							QTR ✓ JUST COVERAGE OVER EAST END FROM —

ABGPS		START		END		# SATELLITES / NOTES		Deliverables:
PPP/POS:		16:55 /UAO		17:33 /@site		Bad data ☹		_"AsFlown" Folder _ FMS NAV Out.
CORS: PPP#2		17:43 /@site		18:26 /@site		FMS comm lost ☹		_ POS Files _ POS Log File
CORS: PPP#3		18:20 /@site		22:28/DLS		USE THIS ONE! ✓		_ LIDAR Drive _ Imagery Drive
Other Notes:								_ Completed Flight Log

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 11/2/2019	Sensor: ORION # 266	Take Off #1 09:46 / UAO	Land #1: 15:27/DLS 59
Crew: TVH /EW	Computer:	Take Off #2: 15:43/DLS	Land #2: /UAO
Aircraft: 318	Mount: Short Double Other	Take Off #3:	Land #3:
AGPS: (PPP) CORS GRD N/A	Flight/Equipment Notes: #190455 OR NRCS		Flight Time:
Page: 2 of 2			Max Speed:

57	W	21:45	21:50	121								QTR ✓		SATS= 19 PDOP= 1.07
58	E	21:52	21:57	122								QTR ✓ POS ✓		
59	W	21:58	22:03	121								QTR ✓		
														5
														10
														15
														20
														25
														27

	UTC Time / Location	UTC Time / Location			Deliverables:
PPP/POS:					_"AsFlown" Folder
					_ FMS NAV Out.
CORS:					_ POS Files
CORS: PPP#3	18:20 /@ site	22:28 / DLS	✓✓		_ POS Log File
					_ LiDAR Drive
Other Notes:					_ Imagery Drive
					_ Completed Flight Log

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 11/6/2019	Sensor: ORION #2610
Crew: TVH/MB/EW	Computer: DELL 6530
Aircraft: 310	Mount: Short Double Other
AGPS: (PPP) CORS GRD N/A	
Page: 1 of ____	Flight/Equipment Notes: D700 #190455 OR NRCS AREA 2 - SOUTH

Take Off #1: 1152/UAO	Land #1: 1632/UAO
Take Off #2:	Land #2:
Take Off #3:	Land #3:
	Flight Time: 4.7
	Max Speed:

FLT Line	DIR	Start Time	End Time	Altitude (AMSL)	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, conditions, clouds, etc.)
TEST	E	20:05	20:05	7438	167							
TEST	E	20:35	20:35	7161	135							QTR✓ POS✓ PDOP=1.22 SATS=18
TEST	E	20:37	20:37	7134	124							QTR — layer separating @ corners only
20	S	20:41	20:45	7133	122	CROSSLINE						QTR✓
60	E	20:50	20:55	7375	124							QTR✓ PPOP=1.51 SATS=15
61	W	20:56	21:02	7359	124							QTR✓ POS✓
62	E	21:03	21:09	7349	119							QTR✓
63	W	21:10	21:16	7343	124							QTR✓
64	E	21:17	21:23	7310	111							QTR✓ PDOP=1.34 SATS=18
65	W	21:24	21:30	7283	130							QTR✓
66	E	21:31	21:36	7267	113							QTR✓ POS✓
67	W	21:38	21:43	7254	124							QTR✓
68	E	21:45	21:50	7247	115							QTR✓
69	W	21:52	21:57	7238	128							QTR✓ PDOP=1.03 SATS=18
70	E	21:58	22:03	7221	117							QTR✓
71	W	22:05	22:10	7205	122							QTR✓ POS✓
72	E	22:11	22:16	7185	113							QTR✓
73	W	22:18	22:22	7178	126							QTR✓
74	E	22:24	22:29	7156	109							QTR✓ PDOP=1.26 SATS=17
75	W	22:30	22:35	7133	128							QTR✓ POS✓
76	E	22:36	22:41	7156	111							QTR✓
77	W	22:42	22:46	7126	122							QTR✓
78	E	22:48	22:52	7100	107							QTR✓
79	W	22:54	22:57	7077	126							QTR✓ PDOP=0.97 SATS=18
80	E	22:59	23:03	7057	124							QTR✓ POS✓
81	W	23:05	23:09	7031								QTR✓
82	E	23:10	23:14	6998	113							QTR✓

ABGPS	START	END	# SATELLITES / NOTES
PPP/POS:	20:01 / UAO	00:34 / UAO	
CORS:			
CORS:			
Other Notes:			

Deliverables:
- __ "AsFlown" Folder
- __ FMS NAV Out.
- __ POS Files
- __ POS Log File
- __ LIDAR Drive
- __ Imagery Drive
- __ Completed Flight Log

FLT LINE	DIR	START TIME	END TIME	ALT	GROUND SPD	NOTES	
83	W	23:16	23:20	6972	128	QTR ✓	
84	E	23:22	23:25	6955	111	QTR ✓	PDOP = 1.08 SATS = 18
85	W	23:27	23:31	6946	119	QTR ✓ POS ✓	
86	E	23:32	23:36	6932	115	QTR ✓	
87	W	23:38	23:41	6916	122	QTR ✓	
88	E	23:43	23:47	6900	117	QTR ✓	
89	W	23:48	23:52	6877	124	QTR ✓ POS ✓	PDOP = 1.33 SATS = 16

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 11/8/2019	Sensor: ORION #266	Take Off #1: 1128/UAO	Land #1: 1650/UAO
Crew: TVH / KL	Computer: DELL 6530	Take Off #2:	Land #2:
Aircraft: N777Q	Mount: Short (Double) Other	Take Off #3:	Land #3:
AGPS: (PPP) CORS GRD N/A	Flight/Equipment Notes:		Flight Time: 5.5
Page: 1 of ___	#190455 NRCS ORION 310 AREA 1		Max Speed:

FLT Line	DIR	Start Time	End Time	Altitude (AMSL)	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, conditions, clouds, etc.)
139	E	2010	2013	6686	126							HIGH OC, SMOOTH, S-TURNS, 18 SATS POS ✓, QTR ✓, LT. HAZE
140	W	2021	2027	6286	121							69% DROP @ EAST END - RIVER / SI048 FIFO 304 ERROR
138	S	2029	20	6562	117							↑ DROP @ (N) END - RIVER
												RESTART
												LOST COMMUNICATION DURING LINE
												CABLES CHECKED - ALL GOOD
												* NO POS GREEN LIGHTS AFTER 9 MINS...
139	E	2113	2116	6686	122							19 SATS, POS ✓, QTR ✓
140	W	2124	2129	6286								RIVER @ (E) END
138	S	2132	2140	6562	122							RIVER @ (N)
137	N	2142	2150	6565	113							RIVER @ (N)
136	S	2152	2159	6535								
135	N	2201	2209	6581	111							
134	S	2211	2219	6568								
133	N	2221	2229	6562	113							
132	S	2231	2239	6545								LT. TURB, POS ✓
131	N	2241	2249	6522	121							
130	S	2251	2259	6490	122							
129	N	2301	2309	6444	119							
128	S	2311	2319	6453	122							
127	N	2321	2329	6476	115							
126	S	2331	2339	6503	126							
125	N	2341	2349	6516	119							
124	S	2351	2359	6519	126							, S-TURNS, POS ✓

ABGPS		START	END	# SATELLITES / NOTES	Deliverables:
PPP/POS: #1		1945 / MT. HOOD	2038 / BOARDMAN	DO NOT USE! RESTARTED	___ "AsFlown" Folder ___ FMS NAV Out. ___ POS Files ___ POS Log File
~~CORS~~ PPP #2		2052 / BOARDMAN	0051 / UAO TAXI		___ LIDAR Drive ___ Imagery Drive
CORS:					___ Completed Flight Log
Other Notes:					

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 11/20/2019	Sensor: ORION # 266	Take Off #1: 09:51 /UAO — Land #1: 14:04 /UAO
Crew: TVH / EW	Computer: DELL 6530	Take Off #2: — Land #2:
Aircraft: 310	Mount: Short (Double) Other	Take Off #3: — Land #3:
AGPS: (PPP) (CORS) GRD N/A	Flight/Equipment Notes:	Flight Time: 4.5
Page: 1 of 1	#190455 NRCS	Max Speed:

	FLT Line	DIR	Start Time	End Time	Altitude (AMSL)	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, conditions, clouds, etc.)
1	TEST	E	18:03	18:04	7538	150							T zero DROP OUT PIA ZONE 3.7 QTR X layer cake ERROR?
	TEST	E	18:12	18:12	7362	130							QTR X worse layer cake "
	136	E	18:44	18:48	5190	128	CROSSLINE(N)						#190455 – NRCS ✓ PDOP=1.26 QTR✓ POS✓ SATS=18
X	135	W	18:57	18:58	5794	128	CROSSLINE(S)						Pilot display error ABORTED
Xs	135	W	19:02	19:02		128	"		"				clouds @ ALT ABORTED
	135	W	19:05	19:07	5350-5230	130	"		"				QTR✓ flew ~500ft lower bc clouds
	134	N	19:10	19:18	5190	119							QTR✓
	133	S	19:20	19:28		124							QTR✓ POS✓ PDOP=1.14 SATS=18
	132	N	19:30	19:38		105							QTR✓
10	131	S	19:40	19:48		122							QTR✓
	130	N	19:51	19:59		97							QTR✓
X	129	S	20:05	20:06									T zero drop – LINE STARTS OVER WATER
X	129	S	20:08	20:09									" "
	129	S	20:11	20:20		130							manually started line early QR 43% drop out – over water ✓
15	128	N	20:23	20:31		121							QTR✓ POS✓
	127	S	20:32	20:41									" "

ABGPS	START	END	# SATELLITES / NOTES	Deliverables:
PPP/POS:	17:59 / Milwaukie	22:05 / UAO		__ 'AsFlown' Folder __ FMS NAV Out.
CORS:	21:14 / P412	21:58 / P412	16 SATS	__ POS Files __ POS Log File
CORS:				__ LIDAR Drive __ Imagery Drive
Other Notes:				__ Completed Flight Log
Ask Kyung how to split surveys				

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 1/3/20	Sensor: GAL #351	Take Off #1: 10:56/UAO	Land #1: 12:22 / DLS
Crew: MB/EW	Computer: DELL 2018	Take Off #2: 13:21/DLS	Land #2: 16:09/UAO
Aircraft: 210JK	Mount: Short (Double) Other	Take Off #3:	Land #3:
AGPS: (PPP) CORS GRD N/A	Flight/Equipment Notes:		Flight Time: 5.4
Page: 1 of 1	#190455 OR NRCS - GAL NORTH "rest		Max Speed:

FLT Line	DIR	Start Time	End Time	Altitude (AMSL)	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, conditions, clouds, etc.)
TEST	W	19:35	19:36	8100								QTR✓ POS✓ PDOP=0.87 SATS=22
79	E	19:39	19:39	8428	134	CROSSLINE						aborted - no ppp yet
79	E	19:49	19:49			"		"				aborted, operator reference offline, values incorrect
79	E	20:02	20:03			"		"				aborted → offline
												#190455 OR NRCS - Boardman
TEST		21:36	21:37	6395	183					PILOT DISPLAY		→ predicted traj POS PDOP=0.93 QTR✓ POS✓ SATS=21
13	E	21:46	21:46	8291		CROSSLINE						SAME PILOT DISPLAY ISSUE
		21:51				pilot display speed fixed itself → meredith says no more tailwind						
13	W	21:53	21:58		95?	PILOT DISPLAY zooming range @						range normal ✓ 28% drop QTR ✓
				ground speed	air speed			4000 Range 1000 tolerance				← worked (doubled #s)
12	S	22:06	22:15	8875	111	119	warning - target angle beyond boundary SN297?					range✓ ✓water→QTRX ✓QTR✓ 65% drop on entry 2% rest
11	W	22:15				critical - ENO51 Recover: Query sync timeout @						range ✓ PDOP=0.9 sats=22 QTR ✓
11	N	22:20	22:27	8871	140	*target angle warning (+/-30) @22:20						V(kt)=140~ 80% drop over water
10	S	22:31	22:37	8789	101	*target warning @ 22:35						91% drop over water 2% rest QTR✓ south of river POS✓ [PILOT FELL OFFLINE]
10	S	22:38	22:40		115	*target warning @22:38						2% drop
9	N	22:44	22:52	8806	132	*target warning @ 22:44						PDOP=0.98 sats=20 2% drop most 99% drop over water
10	S	22:54	23:01	8789	103→109							*PATCH 3% drop range✓
8	S			8842								

ABGPS	START	END	# SATELLITES / NOTES	Deliverables:
PPP/POS:	19:26 / DALLES	20:14 / DALLES		_"AsFlown" Folder _ FMS NAV Out. _ POS Files _ POS Log File
CORS:	21:27 / DALLES	01:11 / UAO		_ LIDAR Drive _ Imagery Drive
CORS:				_ Completed Flight Log
Other Notes:				
1st 2 power on - IMU failure in POS view + no POS green light in FMS				

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 2/12/20	Sensor: GAL #351	Take Off #1: 11:42/ UAO	Land #1: 15:38 / DLS 4.1
Crew: TVH/EW	Computer: DELL 18	Take Off #2: 16:04/ DLS	Land #2: 16:39/ UAO 0.7
Aircraft: 210JK	Mount: Short (Double) Other	Take Off #3:	Land #3:
AGPS: (PPP) CORS GRD N/A	Flight/Equipment Notes: #190455 OR NRCS		Flight Time: 4.8
Page: 1 of ___	D800		Max Speed:

FLT Line	DIR	Start Time	End Time	Altitude (AMSL)	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, conditions, clouds, etc.)
1 TEST	E	1956	1956	8500	128							PDOP 0.89 SATS 23 QTR✓ 11% drop Range✓
79	W	2032	2042	9226	130	CROSSLINE						DROP 48-65% over river QTR✓
78	S	2046	2047	8337	142							PDOP 0.88 SATS 23 QTR✓
77	N	2049	2050	8120	124							QTR✓ 39% drop over river
5 76	S	2052	2053	7851	132	*Target angle warning 2053		+/- 30°				POS✓ QTR✓ 66% drop " " 5
75	N	2055	2057	8117	128							QTR✓ 98% " "
74	S	2058	2100	8461	134							QTR✓ 94% " "
73	N	2102	2105	8609	121							QTR✓ 44% " "
72	S	2106	2111	8698	138							QTR✓ 69% " "
10 71	N	2113	2117	8711	122							QTR✓ 90% " " 10
70	S	2119	2124	8757	136							POS✓ PDOP 0.84 SATS 24 QTR✓ 94% " "
69	N	2126	2131	8825	122	*Target angle warning 2127		+/- 30°				QTR✓ 94% " "
68	S	2132	2138	8921	132							QTR✓
67	N	2140	2145	8927	130							QTR✓ 97% " "
15 66	S	2147	2152	8914	136							QTR✓ 100% " " 15
65	N	2154	2200	8930	124							POS✓ PDOP 0.9 SATS 23 QTR✓ 92% " "
64	S	2202	2208	8934	138	*Target angle warning 2207		+/- 30°				QTR✓ 83% " "
63	N	2210	2216	8914	124							QTR✓ 80% " "
62	S	2217	2223	8868	138							QTR✓ 93% " "
20 61	N	2225	2231	8868	126							QTR✓ 84% 20
60	S	2233	2239	8865	134							POS✓ PDOP 0.91 SATS 24 QTR✓ 80% " "
59	N	2241	2247	8878	132				+/- 30°			QTR✓ 91% " "
58	S	2249	2258	9121	136	*Target angle warning 2257						QTR✓
24 80	E	2301	2313	9226	136	*Target angle warning 2301		+/- 30°				QTR 18% " " CROSSLINE
												25
												27

ABGPS	START	END	# SATELLITES / NOTES	Deliverables:
PPP/POS:	19:54 / Troutdale	23:40 / DLS		__ "AsFlown" Folder __ FMS NAV Out.
CORS:				__ POS Files __ POS Log File
CORS:				__ LIDAR Drive __ Imagery Drive
Other Notes:				__ Completed Flight Log

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 2/19/20	Sensor: GAL #351	Take Off #1: 8:48/UAO — Land #1: 11:20/DLS
Crew: MB/EW	Computer: DELL 2018	Take Off #2: 12:37/DLS — Land #2: 15:39/UAO
Aircraft: 210JK	Mount: Short (Double) Other	Take Off #3: — Land #3:
AGPS: (PPP) CORS GRD N/A	Flight/Equipment Notes: KUEBLER + AVERY PIT + OR NRCS	Flight Time: 6.2
Page: 1 of 2	D800	Max Speed:

FLT Line	DIR	Start Time	End Time	Altitude (AMSL)	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, conditions, clouds, etc.)
TEST		1708	1708			10?	12					CANBY P1 TEST
1	S	1706	1708	1842	126	13	19		1600	8	1/1000	QTR✓ PDOP 0.94 SATS 21
1	S	1723	1724	6083	121							KUEBLER 190522 QTR✓ 1.0
2	N	1730	1731	6129	121							QTR✓
3	S	1737	1739	6188	121							QTR✓
4	N	1744	1745	6234	119							QTR✓
5	S	1751	1752	6194	119							QTR✓ range >20?
6	E	1756	1757	6047	122				CROSSLINE			QTR✓
TEST						20	31	>30	1600	8	1/1000	AVERY PIT 200032 2.0 AUTO SHOT OVER JOBSITE PDOP 0.87 SATS 20
1	E	1839	1839	6155	144	32	38					ABORTED - OFFLINE
1	E	1846	1847		140	39	45					QTR✓ 45% drop over river
2	W	1851	1852	6168	146	46	52					QTR✓ 37% drop " "
3	E	1857	1857	6437	138	53	59					QTR✓ 17% drop
4	S	1902	1903	6135	138	-	-		CROSSLINE			QTR✓ 100% drop " "
TEST	E	20:				*EYE SAFE WARNING Test fire ONLY allowed on line						OR NRCS 190455 3.2 PDOP 0.89 SATS 24
80	W	2112	2113	9226	130	CROSSLINE						PILOT FELL OFF LINE
80	W	2113	2122		136	CROSSLINE						HOPPED BACK ON POS✓ QTR✓
57	N	2128	2137	9094	138	*TARGET ANGLE WARNING +/-30	2129					QTR✓ 71% drop over river
56	G	2142	2149	9124	130	* "	" 2144					QTR✓ 56% " " ABORTED pilot fell off line
56	S	2149	2149									Misfire
56	S	2153	2157		128	* "	" 2153					QTR✓
55	N	2202	2212	9137	122	* "	" 2203					QTR✓ 74% " "
54	S	2217	2227	9147	130	* "	" 2219					QTR✓
53	N	2231	2242	9094	130	* "	" 2231					89% " "

ABGPS	START	END	# SATELLITES / NOTES	Deliverables:
PPP/POS:	16:54 / CANBY	19:23 / KDLS		— "AsFlown" Folder
CORS:	18:29 / TDLS	19:13 / TDLS		— FMS NAV Out.
CORS: PPP	20:42 / KDLS	23:41 / UAO		— POS Files
				— POS Log File
Other Notes: BRING P1 HD?				— LIDAR Drive / — Imagery Drive / — Completed Flight Log

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 2/19/20	Sensor: CAL #351	Take Off #1:	Land #1:
Crew: MB/EW	Computer: DELL 2018	Take Off #2:	Land #2: 15:39
Aircraft: 210JK	Mount: Short (Double) Other	Take Off #3:	Land #3:
AGPS: PPP (CORS) GRD N/A	Flight/Equipment Notes:		Flight Time:
Page: 2 of 2	0800		Max Speed:

FLT Line	DIR	Start Time	End Time	Altitude (AMSL)	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, conditions, clouds, etc.)
52	S	21:46	21:57	8990	126	*"	"2148					QTR ✓ COMP LOST POWER + DIED
						*Critical Warning 2257						
						0809 OI Communication						POS seems ok
						Timeout						
												5
												10
												15
												20
												25
												27

ABGPS	START	END	# SATELLITES / NOTES
PPP/POS:			
CORS:			
CORS:			

Other Notes:

Deliverables:
- __"AsFlown" Folder
- __ FMS NAV Out.
- __ POS Files
- __ POS Log File
- __ LIDAR Drive
- __ Imagery Drive
- __ Completed Flight Log

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 2/25/2020	Sensor: GAL # 351	Take Off #1: 1106 /UAO	Land #1: 1514 /DLS
Crew: MB/KL	Computer: Dell 2018	Take Off #2: 1548 /DLS	Land #2: 1628 /UAO
Aircraft: N777JK	Mount: Short (Double) Other	Take Off #3:	Land #3:
AGPS: (PPP) CORS GRD N/A	Flight/Equipment Notes:		Flight Time:
Page: 1 of 1	#190455-OR NCRS - REST GALAXY North		Max Speed: 4.3 + 0.9 = 5.2

FLT Line	DIR	Start Time	End Time	Altitude (AMSL)	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, conditions, clouds, etc.)
79	E	1947	1957	8429	130	CROSSLINE - FULL						HIGH SCATTERED, LT. TURB 23 SATS, CO LEVEL 50-65 TAILWIND
80	W	2007	2012	9226	130	CROSSLINE - PARTIAL						GOOD FOR LINE 37 AND HIGHER, NO CO WARNING, HEADWIND
51	N	2020	2031	8953	124							24 SATS, POS ✓, QTR
50	S	2035	2045	8885	134							POS ✓, QTR
49	N	2049	2052	8842	124	PARTIAL						23 SATS, PARTIAL - DRIFTED OFF LINE
49	N	2055	2055	8842		MISSED APPROACH - AUTO START						
49	N	2056	2056			MISSED APPROACH - AUTO START						
49	N	216	2126	8842	134		CO WARNING 60-75					APPROACH WAS OFF, SO AUTO-START IS VERY CLOSE TO AO BOUNDARY SUDDEN TAIL WIND @ START OF LINE
48	S	2130	2141	8750	122							QTR
47	N	2149	2200	8842	136							QTR
46	S	2205	2217	8894	120							24 SATS, POS ✓, CO @ 50-75
45	N	2221	2232	8891	130							
44	S	2236	2248	8904	?							

	ABGPS	START	END	# SATELLITES / NOTES	Deliverables:
PPP/POS:		1924 / MT. HOOD	2315 / DLS TAXI		__ "AsFlown" Folder
CORS:					__ FMS NAV Out.
CORS:					__ POS Files
					__ POS Log File
Other Notes:					__ LIDAR Drive
					__ Imagery Drive
					__ Completed Flight Log

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 2/28/2020	Sensor: GAL #351	Take Off #1: 1018 /UAO	Land #1: 1414 /DLS
Crew: TVH /KL	Computer: Dell 2018	Take Off #2: 1440 /DLS	Land #2: 1712 /UAO
Aircraft: N777JK	Mount: Single (Double) Other	Take Off #3:	Land #3:
AGPS: (PPP) CORS GRD N/A	Flight/Equipment Notes:		Flight Time:
Page: 1 of 1	#190455 – NRCS Rest Galaxy North		4.1 + 2.6 = 6.7

FLT Line	DIR	Start Time	End Time	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, sky conditions, haze, turb, etc.)
79	E	1852	1902	142	CROSSLINE						HIGH OC, LT. TURB, 23 SATS, POS ✓ S-TURN – FLAPS 20 = 50 CO, TAILWIND
13	E	1908	1912	140	CROSSLINE						
1	N	1917	1919	132							RIVER @ Ⓝ END = 99% DROPS
2	S	1921	1923	122							
3	N	1925	1927								
4	S	1929	1931	130							23 SATS
5	N	1935	1940	128							
6	S	1942	1950	122							
7	N	1951	1958	134							
8	S	2000	2008	134							
											— FINISHED BOARDMAN SECTION
80	W	2010	2022	126	CROSSLINE						LT. HAZE
52	S	2025	2028	121	PARTIAL REFLIGHT PATCH						
43	N	2031	2041	132							LT. TURB
42	S	2043	2054	126							21 SATS
41	N	2056	2106	130							
40	S	2108	2118	130							
39	N	2122	2134	138							
38	S	2137	2148	136							
											END OF LIFT 1
80	E	2311	2319	119	CROSSLINE – PARTIAL						HIGH OC, MOD. TURB, LT. HAZE 24 SATS, POS ✓
37	N	2325	2337	130							
36	S	2340	2351	130							
35	N	2353	2404	132							22 SATS
34	S	0007	0018								

ABGPS	START	END	# SATELLITES / NOTES
PPP/POS:	1831 /Ⓔ OF UAO	2215 /DLS TAXI	
CORS:	2249 /Ⓔ OF DLS	0113 /UAO TAXI	
CORS:			

Other Notes: ~1840 SEVERE TURB WHILE PASSING MT. HOOD

Deliverables:
__ "AsFlown" Folder
__ FMS NAV Out.
__ POS Files
__ POS Log File

__ LIDAR Drive
__ Imagery Drive

__ Completed Flight Log

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 3/1/2020	Sensor: G L # 357	Take Off #1: 1134 /UAO	Land #1: 1549 /DLS
Crew: TJH/KL	Computer: DELL 2018	Take Off #2: 1616 /DLS	Land #2: 1652 /UAO
Aircraft: N777JK	Mount: Single (Double) Other	Take Off #3:	Land #3:
AGPS: (PPP) CORS GRD N/A	Flight/Equipment Notes:		Flight Time:
Page: 1 of 1	#190455 NRCS - AREA REST GIAL NORTH		4.4 + 0.7 = 5.1

FLT Line	DIR	Start Time	End Time	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, sky conditions, haze, turb, etc.)
80	V	2031	2037	132	CROSS LINE - PARTIAL						CLEAR, SMOOTH / 23 SATS, S-TURNS
33	N	2042	2052	132							
32	S	2054	2104	138							
31	N	2106	2117	134							
30	S	2119	2130	134							
29	N	2132	2143	140							
28	S	2144	2156	130							21 SATS
27	N	2158	22(?)	134	COMPUTER SCREENS WENT BLACK, FMS NAV SAYS LAST CONNECT. W/POS						PARTIAL LINE / POS STILL HAS 4 GREEN, /NO STATUS IS STILL WRITING /RT
27	N	2212	2215	130							
26	S	2217	2228	136							
25	N	2230	2242	128							
24	S	2244	2257	132							
23	N	2258	2311	140							
22	S	2312	2325	130							

ABGPS	START	END	# SATELLITES / NOTES
PPP/POS:	1945 /(E) OF UAO	2350 /DLS TAXI	
CORS:			
CORS:			
Other Notes:	SYSTEM POWERED ON FROM 0016 ~ 0046 TO WRITE APDU LOG FILE TO THUMB DRIVE. SEND ALL LOGS TO GOTECH RE: FMS NAV SHUTDOWN.		

Deliverables:
- __ "AsFlown" Folder
- __ FMS NAV Out.
- __ POS Files
- __ POS Log File
- __ LIDAR Drive
- __ Imagery Drive
- __ Completed Flight Log

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 3/4/2020	Sensor: GAL # 351	Take Off #1: 1055 /UAO	Land #1: 1418 /DLS
Crew: MB / KL	Computer: DELL 2018	Take Off #2: 1449 /DLS	Land #2: 1528 /UAO
Aircraft: N777JK	Mount: Single Double Other	Take Off #3:	Land #3:
AGPS: (PPP) CORS GRD N/A	Flight/Equipment Notes: (LIFT 15)		Flight Time:
Page: 1 of ___	#19D455 - NRCS REST GALAXY NORTH		3.6 + 0.8 = 4.4

FLT Line	DIR	Start Time	End Time	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, sky conditions, haze, turb, etc.)	
80	E	1935	1939	136	Crossline - Partial						LOW SCATTERED S OF AO, LT. TURB	POS
											23 SATS, S-TURN - ABORT FOR CLOUDS	QTR
80	W	1959	2003	142	Crossline Partial							POS
												QTR ✓
22		2004	2004								AUTO-START MISFIRE	POS
												QTR
15	N	2021	2035	124							VERY THIN CLOUDS @ START OF LINE	POS
												QTR ✓
16	S	2039	2052	130							144 KTS	POS
												QTR ✓
17	N	2057	2110	130							24 SATS	POS
												QTR ✓
18	S	2114	2127	126								POS
												QTR ✓
19	N	2132	2146	132							18 min w/ turn	POS
											END LIFT 15	QTR
												POS
												QTR

	ABGPS	START	END	# SATELLITES / NOTES	Deliverables:
PPP/POS:		1904 / CLACKAMAS	2219 / DLS TAXI		__"AsFlown" Folder __ FMS NAV Out. __ POS Files __ POS Log File
CORS:					__ LIDAR Drive __ Imagery Drive
CORS:					__ Completed Flight Log
Other Notes:					

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 3/12/2020	Sensor: GAL # 351	Take Off #1: 0940 /UAO	Land #1: 1110 /DLS
Crew: MB/KL	Computer: DELL 2018	Take Off #2: 1246 /DLS	Land #2: 1608 /UAO
Aircraft: N777JK	Mount: Single (Double) Other	Take Off #3:	Land #3:
AGPS: (PPP) CORS GRD N/A	Flight/Equipment Notes: (LIFT 18)		Flight Time:
Page: 1 of 1	#190455 - NCRS REST - GALAXY SOUTH		1.7 + 3.5 = 5.2

FLT Line	DIR	Start Time	End Time	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, sky conditions, haze, turb, etc.)
113	NW	1737	1740	126	CROS SLINE - PARTIAL						LOW SCATTERED, LT. HAZE 22 POS QTR
											— ABORTING — TOO MANY PUFFBALLS —
162	SW	2025	2023	126	CROS SLINE - PARTIAL						LT. HAZE - SHORT DUE TO CLOUDS /25 POS GOOD TO LINE 154 QTR
161	SE	2037	2040	134							STRONG TAILWIND - 100' LOW, 10 KTS FAST QTR
160	NW	2045	2049	126							POS QTR
159	SE	2053	2057	142							TAILWIND = FAST, LOW QTR
158	NW	2102	2106	124							SLOWING DOWN FOR DENSITY QTR
157	SE	2110	2114	142							TAILWIND POS SNOW SPOTS QTR
156	NW	2119	2123	124							23 POS SMALL PATCHES OF SNOW ON GROUND QTR
155	SE	2128	2132	130							SNOW SPOTS QTR
154	NW	2136	2141	126							POS QTR
153	SE	2144	2148	142							TAILWIND QTR
152	NW	2153	2158	128							POS QTR
151	SE	2202	2207	136							TAILWIND QTR
162	SW	2211	2211	155	* ACCIDENTAL START CROS SLINE - PARTIAL - REFLY						REFLIGHT - FIRST DID NOT INTERCEPT ALL PRODUCTION QTR
162	SW	2212	2216	124	"	"	"	"	"	"	LINES DUE TO CLOUDS " QTR
											POS QTR
											POS QTR
											POS QTR
											POS QTR
											POS QTR
											POS QTR
											POS QTR
											POS QTR
											POS QTR
											POS QTR

ABGPS	START	END	# SATELLITES / NOTES
PPP/POS:	1655 /CLACKAMAS	1309 / DLS	DO NOT USE
~~CORS~~: Version b	1956 / DLS	2310 /UAO TAXI	
CORS:			
Other Notes:			

Deliverables:
- __ "AsFlown" Folder
- __ FMS NAV Out.
- __ POS Files
- __ POS Log File
- __ LIDAR Drive
- __ Imagery Drive
- __ Completed Flight Log

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 3/21/2020	Sensor: GAL # 351	Take Off #1: 1636 /UAO	Land #1: 1945 /959LEX
Crew: TVH/KL	Computer: DELL 2OIB	Take Off #2: 2012 /959LEX	Land #2: 0044 /959LEX
Aircraft: N777JK	Mount: Single (Double) Other	Take Off #3: 1812 /959LEX /PDT	Land #3: 1833 /PDT
AGPS: (PPP) CORS GRD N/A	Flight/Equipment Notes:		Flight Time: 2010 /UAO
Page: 1 of 2	#190455 NRCS GALAXY SOUTH		3.3 + 4.6 + 0.4 + 1.3 = 9.6

FLT Line	DIR	Start Time	End Time	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, sky conditions, haze, turb, etc.)	
162	NE	1726	1734	132	CROSSLINE - PARTIAL						CLEAR, SMOOTH, LT. HAZE ↳COVERAGE TO LINE 141	POS QTR
117	SE	1743	1753	142							20 SATS SOME SNOW AREAS ON E END OF AO.	POS QTR
118	NW	1755	1806	124								POS QTR
119	SE	1808	1819	132							1-3% DROPOUT @ (E) END	POS QTR
120	NW	1821	1832	130							21	POS QTR
121	SE	1833	1844	122								POS QTR
122	NW	1846	1857	138								POS QTR
123	SE	1859	1910	128							31273 MB START 23	POS QTR
124	NW	1912	1923	142							OUT OF DATA CARTRIDGE SPACE	POS QTR
—											— END LIFT 1 —	POS QTR
162	NE	2041	2049	124	CROSSLINE - PARTIAL						23	POS QTR
125	SE	2058	2109	126							SNOWY SPOTS @ (E) END - 2-3% DO	POS QTR
126	NW	2111	2122									POS QTR
127	SE	2124	2135	130							1-5% DROPOUTS @ (E) END	POS QTR
128	NW	2137	2147	134								POS QTR
129	SE	2149	2159	132							1-10% DO @ (E)	POS QTR
130	NW	2201	2211	132								POS QTR
131	SE	2213	2223	128								POS QTR
132	NW	2225	2234	128							1-4% DO @ (E)	POS QTR
133	SE	2236	2246	140							FIELD BURNING @ (E) END 1-5% DO @ (E)	POS QTR
134	NW	2248	2257	128							DEBRIS FIRE @ X-LINE 1-11% DO (E) OF X-LINE	POS QTR
135	SE	2258	2307	126							DEBRIS FIRE SMOKE 1-10% DO (E) OF X-LINE	POS QTR
136	NW	2309	2317	124							DEBRIS FIRE SMOKE 1-12% DO (E) OF X-LINE	POS QTR
137	SE	2319	2327	134							DEBRIS FIRE SMOKE 1-11% DO (E) OF X-LINE	POS QTR
138	NW	2329	2337	121							DEBRIS FIRE SMOKE 1-10% DO (E) OF X-LINE	POS QTR
139	SE	2339	2346	130							DEBRIS FIRE SMOKE 21 1-11% DO (E) OF X-LINE	POS QTR

ABGPS	START	END	# SATELLITES / NOTES
PPP/POS:	1654 /MT. HOOD	1945 /LEXINGTON TAXI	
CORS:	2019 /LEXINGTON	0043 /LEXINGTON TAXI	
CORS:			
Other Notes:			

Deliverables:
- __ "AsFlown" Folder
- __ FMS NAV Out.
- __ POS Files
- __ POS Log File
- __ LIDAR Drive
- __ Imagery Drive
- __ Completed Flight Log

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 3/21/2020	Sensor: GAL # 351	Take Off #1: See Pg 1	Land #1: See Pg 1
Crew: TVH/KL	Computer: DELL 2018	Take Off #2:	Land #2:
Aircraft: N777JK	Mount: Single (Double) Other	Take Off #3:	Land #3:
AGPS: (PPP) CORS GRD N/A	Flight/Equipment Notes:		Flight Time:
Page: 2 of 2			

FLT Line	DIR	Start Time	End Time	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, sky conditions, haze, turb, etc.)
140	NW	2348	2355	130							DEBRIS FIRE SMOKE IN AREA 1-16% DROP OUTS Ⓔ OF X-LINE POS ✗ QTR ✗
141	SE	2356	2403	136							DEBRIS FIRE SMOKE 1-11% DO Ⓔ OF X-LINE 21 POS ✗ QTR ✗
142	NW	0005	0011	126							1-11% DO " POS ✗ QTR ✗
143	SE	0013	0018	136							1-8% DO " 23 POS ✗ QTR ✗
											POS QTR
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ABGPS	START	END	# SATELLITES / NOTES
PPP/POS:	See Pg 1		
CORS:			
CORS:			
Other Notes:			

Deliverables:
- __ "AsFlown" Folder
- __ FMS NAV Out.
- __ POS Files
- __ POS Log File
- __ LIDAR Drive
- __ Imagery Drive
- __ Completed Flight Log

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date:	4/7/2020	Sensor:	GAL #351	Take Off #1:	1010/UAO	Land #1:	1413/LEXINGTON 959
Crew:	DB/KL	Computer:	Dell 2019	Take Off #2:	1452/959	Land #2:	1549/UAO
Aircraft:	N777JK	Mount: Single (Double) Other		Take Off #3:		Land #3:	
AGPS: (PPP) CORS GRD N/A		Flight/Equipment Notes: PHASEONE ON GRABHORN			LD IMAGES SAVED TO DROGON	Flight Time:	
Page: 1 of 2						4.2+1.0 = 5.2	

FLT Line	DIR	Start Time	End Time	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, sky conditions, haze, turb, etc.)	
TEST					1	3		1000	6.3-14	800-1600	LOW SCATTERED, LT. HAZE, SMOOTH	POS QTR
4	N	1728	1729	121	—	—	CROSSLINE				#190551-GRABHORN —DISKS REFORMAT	POS QTR
4	S	1731	1732	121	CROSSLINE							22 POS QTR ✓
1	E	1734	1734	124	4	9	1734 HR				NEW EXHAUST PIPE ON JK— PHOTOS CLEAR?	POS QTR ✓
2	W	1737	1737	121	10	16	1737 HR					POS QTR ✓
3	E	1740	1740	121	17	23	1740 HR					POS QTR ✓ 5
											END GRABHORN/START NRCS	POS QTR
113	SE	1832	1837		CROSSLINE— PARTIAL /SW SECT.						#190455 NRCS REST	24 POS QTR 6
162	SW	1843	1845	132	CROSSLINE— PARTIAL /SE SECT.						HIGH SCATTERED, LT. HAZE, SMOOTH	POS QTR
150	NW	1850	1853	130							STILL SOME SNOW ON GROUND	POS QTR ✓
149	SE	1855	1857	136								POS QTR ✓
148	NW	1859	1902	128							LIFT 21	24 POS QTR 10
147	SE	1904	1907	132								POS QTR ✓
146	NW	1909	1913	128							SNOW PATCHES @ (E) END	POS QTR
145	SE	1915	1919	132								POS QTR
144	NW	1921	1926	128	END OF SE SECTION						↓	24 POS QTR
80	SW	1928	1932	128	START OF SW SECTION							POS QTR 15
79	NE	1934	1938	128							LINE MANUALLY EXTENDED TO MEET W/ CROSS LINE	POS QTR ✓
82	SW	1942	1947	130								POS QTR ✓
81	NE	1949	1953	130								POS QTR ✓
84	SW	1955	2000	134								POS QTR
83	NE	2002	2006	132								POS QTR ✓ 20
86	SW	2009	2009		MISSED APPROACH						DELETE BOTH	POS QTR 21
88	SW	2009	2009		MISSED APPROACH							POS QTR 22
86	SW	2014	2020	122								23 POS QTR ✓ 23
85	NE	2022	2027	132								POS QTR

ABGPS		START	END	# SATELLITES / NOTES	Deliverables:
PPP/POS:		1717/HILLSBORO	2113/L		__ "AsFlown" Folder
CORS:		1717/JIME	1750/JIME	GRABHORN	__ FMS NAV Out.
CORS:					__ POS Files
					__ POS Log File

Deliverables (cont.): __ LIDAR Drive, __ Imagery Drive, __ Completed Flight Log

Other Notes: POS FILE NUMBERING OFF — YESTERDAY ENDED @ 115, TODAY STARTED @ 083; ALSO #090 IS ONE BIG FILE, SIMILAR TO WHAT HAPPENED WITH #999

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 4/7/2020	Sensor: GAL # 351	Take Off #1: See Pg 1	Land #1: See Pg 2
Crew: DB /KL	Computer: DELL 2013	Take Off #2:	Land #2:
Aircraft: N777JK	Mount: Single (Double) Other	Take Off #3:	Land #3:
AGPS: (PPP) CORS GRD N/A	Flight/Equipment Notes:		Flight Time:
Page: 2 of 2			

FLT Line	DIR	Start Time	End Time	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, sky conditions, haze, turb, etc.)	
88	SW	2030	2039	126							#190455 - NCRS (CONT.)	POS QTR ✓ES
87	NE	2041	2050	130								POS QTR
												POS QTR
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												POS QTR
												POS QTR
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	ABGPS	START	END	# SATELLITES / NOTES	Deliverables:
PPP/POS:		See Pg 1			__ "AsFlown" Folder
CORS:					__ FMS NAV Out.
CORS:					__ POS Files
Other Notes:					__ POS Log File
					__ LIDAR Drive
					__ Imagery Drive
					__ Completed Flight Log

GeoTerra, Inc — Lidar + PhaseOne Flight Log

Date: 4/10/2020	Sensor: GAL # 357	Take Off #1: 0926/MAO	Land #1: 1354/Lexington 959
Crew: DB/KL	Computer: DELL 2718	Take Off #2: 1427/959	Land #2: 1807/MAO
Aircraft: N 777 JK	Mount: Single **Double** Other	Take Off #3:	Land #3:
AGPS: **PPP** CORS GRD N/A	Flight/Equipment Notes:		Flight Time: 4.6 + 3.8 = 8.4
Page: 1 of 1			

FLT Line	DIR	Start Time	End Time	Ground Spd(kts)	Start Counter	End Counter	Sun Angle	ISO Range	F-stop Range	Shuttr Range	Collection Notes (Job#, Flight plan, sky conditions, haze, turb, etc.)
113	SE	1708	1715	132	CROSSLINE – PARTIAL						#190455 NRCS, S-TURNS 23 POS QTR
89	NE	1723	1733	124							HIGH SCATTERED, SMOOTH, LT. HAZE 23 POS QTR
90	SW	1735	1746								POS QTR
91	NE	1748	1759	124							POS QTR
92	SW	1801	1812	130							7% DROPS NEAR CROSSLINE LO RIVER 21 POS QTR
93	NE	1815	1830	126							POS QTR
94	SW	1832	1847								POS QTR 22
95	NE	1849	1904	134							POS QTR
96	SW	1906	1921	130							POS QTR
97	NE	1923	1938	136							POS QTR 23
98	SW	1941	1956	136							CO = 0-15 POS QTR
99	NE	1958	2013	130							CO = NORMAL POS QTR
100	SW	2015	2030								CO = 0-15 25 POS QTR
											END LIFT 1 / START LIFT 2
113	NW	2158	2203	126	CROSSLINE PARTIAL						HIGH SCATTERED, SMOOTH LT. HAZE 21 POS QTR
110	SW	2207	2212								#190455 NRCS POS QTR
109	NE	2214	2219	128							CO = NORMAL POS QTR
108	SW	2221	2227	119							VARIABLE WINDS POS QTR
107	NE	2230	2236	121							CO = 0-10 144 KTS NEAR CROSSLINE 20 POS QTR
106	SW	2241	2255	140							POS QTR
105	NE	2257	2311	124							CO = NORMAL, LT. TURB, 146 KTS WIND BURST POS QTR
104	SW	2314	2328	134							POS QTR 18
103	NE	2330	2344	128							140 KT BURST POS QTR
102	SW	2346	0000	130							POS QTR
101	NE	0003	0017	128							146 KT BURST 21 POS QTR
										QUE BUENO	¡NO MAS! ARRIBA POS QTR

	ABGPS	START	END	# SATELLITES / NOTES	Deliverables:
PPP/POS:		1642 / MT. HOOD	2055 / LEXINGTON		__ "AsFlown" Folder
CORS:		2136 / LEXINGTON	0109 / MAO TAXI		__ FMS NAV Out.
CORS:					__ POS Files
Other Notes:					__ POS Log File
					__ LIDAR Drive
					__ Imagery Drive
					__ Completed Flight Log