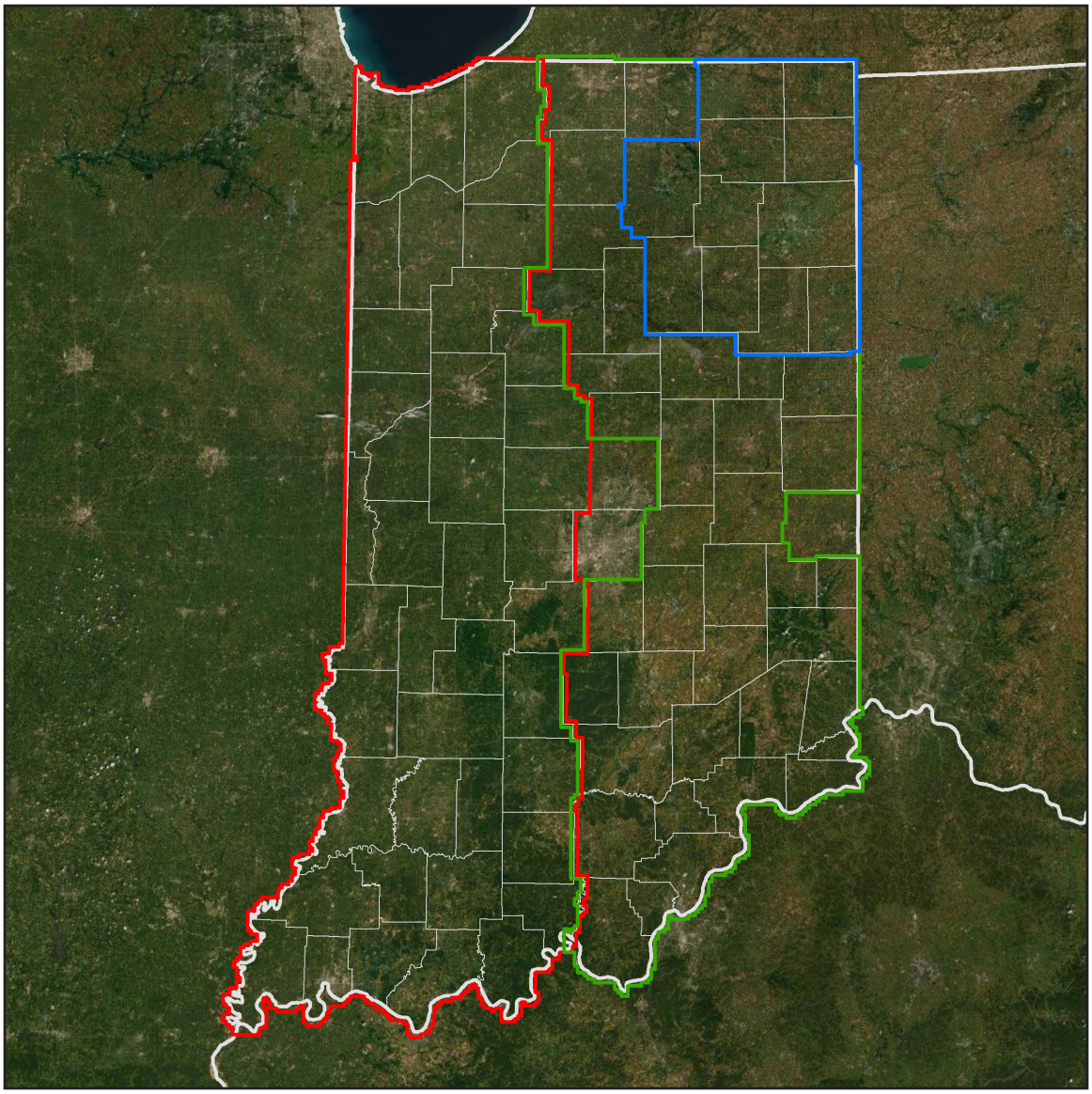
IN Indiana Statewide LiDAR 2017 B17 - East

Airborne Lidar Report

December 2020



Contract # G16PC00022
Task Order # G17PD00269

Contractor Woolpert
Project # 77391

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1. Overview

About

This project contains a comprehensive outline of the G17PD00269 IN Indiana Statewide LiDAR 2017 B17 task order issued by the United States Geological Survey's National Geospatial Technical Operations Center (USGS-NGTOC). This task order called for the acquisition and processing of QL2 data covering approximately 36,344 square miles across the state of Indiana.

This report encompasses the eastern area of interest. This eastern AOI totals approximately 18,270 square miles and includes the following counties:

- Adams
- Allen
- Bartholomew
- Blackford
- Brown
- Cass
- Clark
- Dearborn
- Decatur
- DeKalb
- Delaware
- Elkhart
- Fayette
- Floyd
- Franklin
- Fulton
- Grant
- Hancock
- Harrison
- Henry
- Howard
- Huntington
- Jackson
- Jay
- Jefferson
- Jennings
- Johnson
- Kosciusko
- LaGrange
- Madison
- Marshall
- Miami
- Noble
- Ohio
- Randolph
- Ripley
- Rush
- Scott
- Shelby
- St. Joseph
- Steuben
- Switzerland
- Tipton
- Union
- Wabash
- Washington
- Wells
- Whitley

Purpose

This project will support the state of Indiana and the Natural Resources Conservation Service (NRCS) in Indiana.

Specifications

Data for this task order was acquired and produced to meet USGS Lidar Base Specification 1.2 standards and the American Society of Photogrammetry and Remote Sensing (ASPRS) Positional Accuracy Standards for Digital Geospatial Data (Edition 1, Version 1.0).

Spatial Reference

Geospatial data products were produced using the following horizontal and vertical spatial data reference system.

Table 1-1. Spatial Reference System

Horizontal	**EPSG Code**	2967
	Datum	NAD (HARN)
	Projection	State Plane Indiana East (FIPS 1301)
	Units	US Survey Feet
Vertical	**Datum**	NAVD88
	Geoid	GEOID12B
	Units	US Survey Feet
	Height Type	Orthometric

Task Order Deliverables

All data products produced as part of this task order are listed below. All tiled deliverables had a tile size of 5,000-feet x 5,000-feet. Tile names are based on the existing Indiana statewide Ortho-Lidar tile grid.

Table 1-2. Deliverables

Lidar Data	
Classified lidar point cloud data	Tiles in .las v1.4 format Classes • 1 – Processed, not Classified • 2 – Ground • 7 – Noise • 9 – Water • 10 – Ignored Ground • 17 – Bridge Decks • 18 – High Noise

Breaklines used for hydro-flattening	• Lake and River features as feature classes in an Esri file geodatabase
	  • Water bodies greater than 2 acres as polygon features
	  • Rivers 30.5 meters / 100 feet and greater in width as polyline features
	• Bridges used in DEM generation as point features in Esri shapefile format

Hydro-flattened bare earth digital elevation model (DEM)	2.5 pixel size, 32-bit floating-point; no bridges or overpass structures ERDAS .img format
Intensity Imagery	2.5 pixel size, 8-bit gray-scale (linear rescaling from 16-bit intensity) GeoTIFF format
Flight Line Index	Polygon features in an Esri file geodatabase
Control Data	
Lidar calibration points	Esri shapefile format
Lidar NVA checkpoints	Esri shapefile format
Lidar VVA checkpoints	Esri shapefile format
Other Data	
Tile Index	Esri shapefile format
Metadata and Reports	
Metadata	Project, deliverable, and lift-level FGDC CSDGM/USGS MetaParser Compliant metadata in .xml format
Lidar Project Report	Project report with flight logs in .pdf format
Survey Report	Survey report in .pdf format

Figure 1-1. Project Area

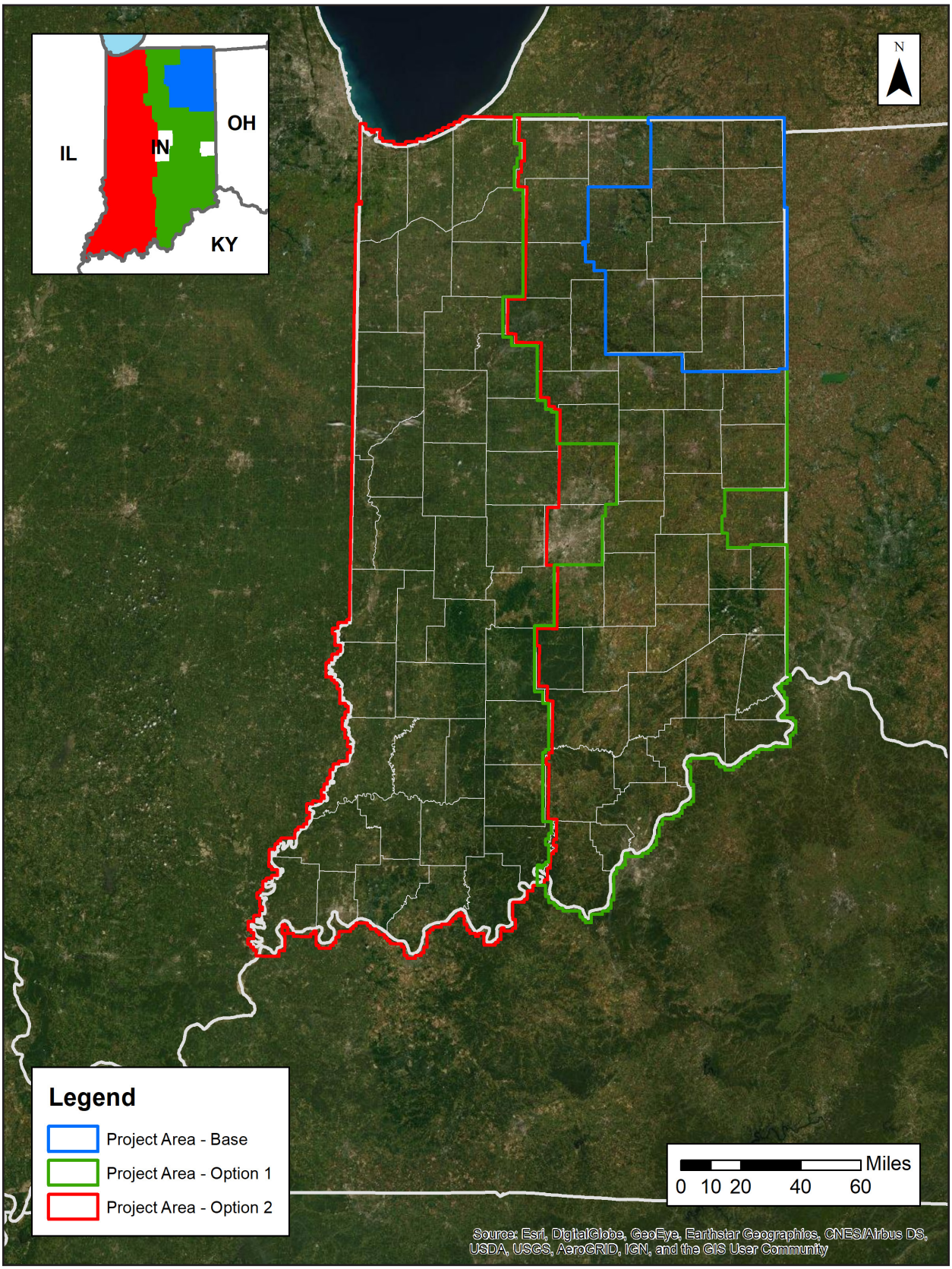
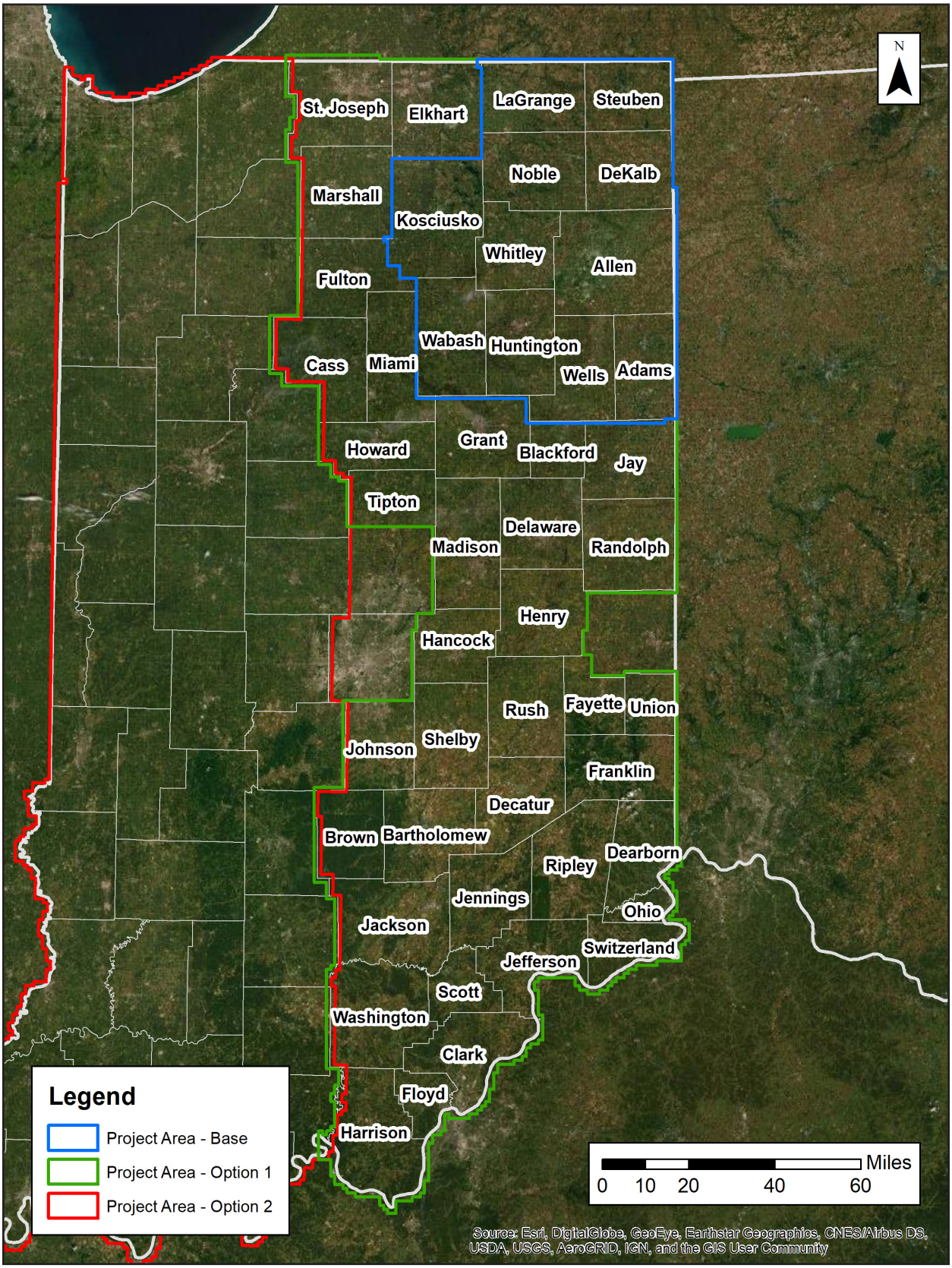


Figure 1-2. Project Area - East AOI



2. Acquisition

Flight Planning

Aerial lidar data for this project was collected using the specifications listed below.

Table 2-1. Acquisition Requirements

Specification	Target
Resolution	• 2 points per square meter • 0.7-meter nominal point spacing
Overlap	At contractor's discretion, but enough to ensure there are no data gaps between usable portions of the swath and nominal point density is achieved
Acquisition Window	Base AOI: Spring 2017 through April 30, 2017 Option 1: fall/winter 2017 Option 2: spring 2018
Data Voids	Not allowed except • Where caused by water bodies • Where caused by areas of low near infra-red (NIR) reflectivity (i.e. asphalt or composition roofing) • Where appropriately filled-in by another swath
Acquisition Conditions	• Cloud and fog-free between the aircraft and ground • Ground is snow free • Ground has no unusual flooding or inundation, except in cases where the goal of the collection is to map the inundation • Preference of vegetation is leaf-off • Time of day is not of concern
Control	Airborne Global Positioning System (ABGPS) and Inertial Measurement Unit (IMU) data to be used along with differentially-corrected GPS ground control points

Lidar Sensor Information

Aerial lidar data was acquired for this project using the Leica ALS80 and Optech Galaxy Prime lidar sensor systems. A total of 692 flight lines were collected for this project.

Table 2-2. Leica ALS80 Sensor Info

Sensor Specifications	
Operating Altitude (m AGL)	100 - 3,500 at 10% reflective target
Maximum Measurement Rate (kHz)	1,000
Field of view (degrees, full angle, user adjustable)	0 - 72
Roll stabilization (automatic adaptive, degrees)	72 - active FOV
Scan patterns (user selectable)	sine, triangle raster
Maximum Scan Rate (Hz) • Scan • Triangle • Raster	 • 200 • 158 • 120
Number of Returns	unlimited
Number of intensity measurements	3 (first, second, third)
Pulse Mode(s)	2 - 6 pulses in air
Laser Specifications	
Laser Beam Divergence	Dual Divergence: 0.20-0.26 mrad (1/e) and 0.8 mrad (1/e) nominal
Laser Classification	Class IV laser product (FDA CFR 21)
Eye Safe Range	400m single shot depending on laser repetition rate
Accuracy	
Range Resolution	Better than 1 cm
Elevation Accuracy	6 - 19 cm single shot (one standard deviation)
Horizontal Accuracy	1/5,500 x altitude (m AGL)
Physical Specifications	
Size (cm), Weight (kg) • Scanner • Control Electronics	 • 37 W x 68 L x 26 H cm, 47 kg • 45 W x 47 D x 25 H cm, 33 kg
Operating Temperature • Scanner • Control Electronics	 • 0 - 40°C cabin-side temperature • 0 - 40°C
Flight Management	Leica FlightPro
Power Consumption	922 W @ 22.0 – 30.3 VDC

Source: Leica ALS80-HP Product Specifications
https://w3.leica-geosystems.com/downloads123/zz/airborne/als80/product-specification/leica_als80_hp_productspec_en.pdf

Table 2-3. Optech Galaxy PRIME Sensor Info

Sensor Performance	
Performance envelope [1, 2, 3, 4]	150-6000 m AGL, nominal
Absolute horizontal accuracy [2, 3]	1/10,000 × altitude; 1 σ
Absolute elevation accuracy [2, 3]	< 0.03-0.25 m RMSE from 150-6000 m AGL
Laser Configuration	
Topographic laser	1064-nm near-infrared
Laser classification	Class IV (US FDA 21 CFR 1040.10 and 1040.11; IEC/EN 60825-1)
Pulse repetition frequency (effective)	Programmable, 50-1000 kHz
Beam divergence	0.25 mrad (1/e)
Laser range precision [5]	< 0.008 m, 1 σ
Minimum target separation distance	< 0.7 m (discrete)
Range capture	Up to 8 range measurements, including last
Intensity capture	Up to 8 intensity measurements, including last (12-bit)
Sensor Configuration	
Position and orientation system	POS AV™ AP60 (OEM); 220-channel dual frequency GNSS receiver; GNSS airborne antenna with Iridium filters; high-accuracy AIMU (Type 57); non-ITAR
Scan angle (FOV)	10-60°
Swath width	10-115% of altitude AGL
Scan frequency	0-120 Hz advertised (0-240 scan lines/sec)
Scan product	2000 maximum
Flight management system	Optech FMS (Airborne Mission Manager and Nav) with operator console
SwathTRAK™	Dynamic FOV for fixed-width data swaths in variable terrain
PulseTRAK™	Multipulse tracking algorithm with no density loss across PIA transition zones
Roll compensation	±5° minimum
Data storage	Removable SSD (primary); internal SSD (spare)
Power requirements	28 V; 400 W
Dimensions and weight	Sensor: 0.34 × 0.34 × 0.25 m, 27 kg PDU: 0.42 × 0.33 × 0.10 m, 6.5 kg
Operating temperature	0 to +35°C

1. Target reflectivity ≥20%; 99% detection probability
2. Dependent on selected operational parameters; assumes nominal FOV of up to 40° in standard atmospheric conditions (i.e. 23-km visibility) and use of Optech LMS Professional software suite
3. Angle of incidence ≤20°
4. Target size ≥ laser footprint
5. Under Teledyne Optech test conditions, 1 sigma

Source: Optech Galaxy PRIME Airborne Lidar Terrain Mapper Specification Sheet
http://info.teledyneoptech.com/acton/attachment/19958/f-0278/1/-/-/-/-/Galaxy%20PRIME%20Brochure.pdf

GNSS and IMU Equipment

Prior to mobilizing to the project site, flight crews coordinated with the necessary air traffic control personnel to ensure airspace access. Crews were on-site, operating a Global Navigation Satellite System (GNSS) Base Station for the airborne GPS support.

Flight navigation during acquisition was performed using IGI CCNS (Computer Controlled Navigation System). The pilots are skilled at maintaining their planned trajectory, while holding the aircraft steady and level. If atmospheric conditions are such that the trajectory, ground speed, roll, pitch and/or heading cannot be properly maintained, the mission is aborted until suitable conditions occur.

Base stations were set by acquisition staff and was used to support the aerial data acquisition. See the table below for stations operated during acquisition.

Table 2-4. GNSS Base Stations - East AOI

Station Name	Latitude (DMS)	Longitude (DMS)	Ellipsoid Height L1 Phase Center (Meters)
INAB_CORS	40° 17' 53.68807"	-85° 12' 41.20138"	267.181
INFW_CORS	41° 07' 40.81793"	-85° 10' 39.13790"	230.466
INGG_CORS	39° 21' 35.41596"	-85° 30' 53.73708"	254.669
INMO_CORS	40° 43' 33.35270"	-86° 45' 09.94410"	167.294
INNC_CORS	41° 22' 59.52564"	-85° 25' 23.09052"	264.151
INPD_CORS	39° 58' 23.49336"	-85° 46' 10.77263"	235.442
INSB_CORS	39° 52' 01.86063"	-84° 56' 27.05027"	292.098
INTP_CORS	40° 16' 49.30695"	-86° 03' 19.84558"	236.799
INWB_CORS	40° 49' 29.02329"	-85° 48' 11.62170"	216.56
INWR_CORS	41° 16' 12.93199"	-85° 53' 40.69339"	230.554
IUCO_CORS	39° 10' 26.60590"	-86° 30' 23.18241"	230.719

Timeline

Lidar data for the East AOI was collected from March 5, 2017 through April 21, 2018. Acquisition specifications are listed in the table below. An initial quality control process was immediately performed on to review the data coverage, airborne GPS data, and trajectory solution.

For more information, see the Flight Logs in Appendix 1.

Table 2-5. Project Acquisition Specifications

Settings	Leica ALS80	Optech Galaxy Prime
Max. Number of Returns	infinite	8
Nominal Point Spacing	0.7 m	0.7 m
Nominal Point Density	2.3 ppsm	2.3 ppsm
Flying Height Above Ground Level	2,377 m	1,846 m
Flight Speed	150 knots	135 knots
Scan Angle	40°	45°
Scan Rate Used	35.5 Hz	49.01 Hz
Pulse Rate Used	346kHz	250 kHz
Multi-Pulse in Air	Enabled	Enabled
Swath Width	1,731 m	1,529 m
Swath Overlap	25%	30%

Acquisition Quality Assurance

Woolpert developed a quality assurance and validation plan to ensure the acquired lidar data meets the USGS Base Specification Version 1.2. For quality assurance purposes, the lidar data was processed immediately following acquisition to verify the coverage has appropriate density, distribution, and no unacceptable data voids. Accompanying GPS data was post processed using differential and Kalman filter algorithms to derive a best estimate of trajectory. The quality of the solution was verified to be consistent with the accuracy requirements of the task order. Any required re-flights were scheduled at the earliest opportunity.

The spatial distribution of the geometrically usable first return lidar points was reviewed for density requirements as well as regular and uniform point distribution - verifying the lidar data is spaced so that 90% of the cells in a 2*NPS grid placed over the data contain at least one lidar point. The NPS assessment is made against single swath, first return data located within the geometrically usable center portion (typically ~90%) of each swath. Additionally, the data was reviewed for unacceptable data voids – verifying no area greater than or equal to $(4 \times ANPS)^2$ exhibited data coverage gaps.

3. Processing

Processing Summary

Once the lidar data passed initial QC, the dataset was corrected for aircraft orientation and movement. This process used airborne inertial, orientation, and GPS data collected during acquisition along with ground-based GPS data. The data went through a geometric calibration that further corrected each laser point. This calibrated data set was used to create the LAS point cloud. The LAS point data was initially classified into “ground” and “non-ground”, then further refined using the classes specified in this task order. Breaklines were drawn to denote hydrological features. After the hydro-flattening process, the final deliverables products were created.

GNSS-IMU Trajectory Processing

Kinematic corrections for the aircraft position were resolved using aircraft GPS and static ground GPS (1-Hz) for each geodetic control (base station) for three subsystems: inertial measurement unit (IMU), sensor orientation information, and airborne GPS data.

Post-processing of the IMU system data and aircraft position with attitude data was completed to compute an optimally accurate, blended navigation solution based on Kalman filtering technology, or the smoothed best estimate of trajectory (SBET).

Software: POSPac Software v. 5.3, IPAS Pro v.1.35., Novatel Inertial Explorer v8.60.6129

Trajectory Quality

The GNSS trajectory and high-quality IMU data are key factors in determining the overall positional accuracy of the final sensor data. Within the trajectory processing, there are many factors that affect the overall quality, but the most indicative are the combined separation, the estimated positional accuracy, and the positional dilution of precision (PDOP).

Combination Separation

Combined separation is a measure of the difference between the forward-run and the backward-run solution of the trajectory. The Kalman filter was processed in both directions to remove the combined directional anomalies. In general, when these two solutions match closely, an optimally accurate and reliable solution is achieved.

The data for this task order was processed with a goal to maintain a combined separation difference of less than ten (10) centimeters.

Estimated Positional Accuracy

Estimated positional accuracy plots the standard deviations of the east, north, and vertical directions along a time scale of the trajectory. It illustrates loss of satellite lock issues, as well as issues arising from long baselines, noise, and/or other atmospheric interference.

PDOP

The PDOP measures the precision of the GPS solution in regard to the geometry of the satellites acquired and used for the solution.

The data for this task order was processed with a goal to maintain an average PDOP value below 3.0. Brief periods of PDOP over 3.0 are acceptable due to the calibration and control process if other metrics are within specification.

Geometric Calibration

After the initial phase was complete, a formal reduction process was performed on the data. Laser point position was calculated by associating the SBET position to each laser point return time, scan angle, intensity, etc. Raw laser point cloud data was created for the whole project area in LAS format. Automated line-to-line calibrations were then performed for system attitude parameters (pitch, roll, heading), mirror flex (scale) and GPS/IMU drift. Statistical reports were generated for comparison and used to make the necessary adjustments to remove any residual systematic error.

Software: Proprietary Software, TerraMatch v20, Leica CloudPro 1.2.4

Lidar Data Classification

LAS data was classified as ground and non-ground points with additional filters created to meet the task order classification specifications. Statistical absolute accuracy was assessed via direct comparisons of ground classified points to ground RTK survey data. Based on the statistical analysis, the lidar data was then adjusted to reduce the vertical bias when compared to the survey ground control of higher accuracy.

Calibrated LAS files were imported into the task order tiles and initially filtered to create a ground and non-ground class. Then additional classes were filtered as necessary to meet the following client-specified classes:

- Class 1 – Default / Processed, but not Classified
- Class 2 – Bare Earth Ground
- Class 7 – Low Noise
- Class 9 – Water
- Class 10 – Ignored Ground
- Class 17 – Bridge Decks
- Class 18 – High Noise

Classified LAS files were evaluated through a series of manual QA/QC steps as well as a peer-based review to eliminate remaining artifacts from the ground class. This included a review of the DEM surface to remove artifacts and ensure topographic quality.

Software: Proprietary Software, TerraScan v20

Hydrologic Flattening

The lidar task order required compilation of breaklines defining the following types of water body features:

Lakes, reservoirs, ponds	Minimum of 2-acres or greater Compiled as closed polygons, collected at a constant elevation
Rivers, streams	Nominal width of 30.5 meters / 100 feet Compiled in direction of flow, with both sides maintaining an equal elevation gradient
Bridge breaklines	Breaklines used to enforce a logical terrain surface below a bridge

Woolpert utilized the following steps to hydrologically flatten the water bodies and for gradient hydrologic flattening of the double line streams within the existing lidar data:

1. The newly acquired lidar data was utilized to manually compile the hydrologic features in a 2D environment using the lidar intensity and bare earth surface. Open Source imagery was used as reference when necessary.

2. An integrated software approach was applied to combine the lidar data and 2D breaklines. This process “drapes” the 2D breaklines onto the 3D lidar surface model to assign an elevation. A monotonic process is performed to ensure the streams are consistently flowing in a gradient manner. A secondary step within the program verifies an equally matching elevation of both stream edges. The breaklines that characterize the closed water bodies are draped onto the 3D lidar surface and assigned a constant elevation at or just below ground elevation.

3. All classified ground points from inside the hydrologic feature polygons were reclassified to water, class nine (9).

4. All classified ground points were reclassified from within a buffer along the hydrologic feature breaklines to buffered ground, class ten (10). The buffer distance was approximately the task order designed nominal pulse spacing distance.

5. Breaklines used for bridge removal during the hydrologic flattening were included with the hydrologic breakline geodatabase deliverable. The purpose of these breaklines is for a more aesthetically pleasing DEM appearance.

6. The lidar ground points and breaklines were used to generate a digital elevation model (DEM).

7. QA/QC for this task was performed by reviewing the hydrologically flattened DEM and hydrologic breakline features. Additionally, a combined approach utilizing commercial off the shelf software and proprietary methods were used to review the overall connectivity of the hydrologic breaklines.

TerraScan was used to add the hydrologic breakline vertices and export the lattice models.

Breaklines defining the water bodies greater than 2-acres were provided as polygon features. Rivers and streams with a nominal minimum width of 30.5 meters (100 feet) were provided as polyline features. All lake and river breaklines compiled as part of the flattening process were provided in an Esri file geodatabase.

Breaklines used for DEM generation were provided as point features in Esri shapefile format.

Software: TerraScan v20, TerraModeler v20, Esri ArcMap v10.7, LP360 v2019.1.30.4

Digital Elevation Model

TerraScan was used to add the hydrologic breakline vertices and export the lattice models. Class 2 (ground) lidar points in conjunction with the hydro breaklines and bridge breaklines were used to create 2.5-foot hydro-flattened bare-earth raster DEM files. Using automated scripting routines within ArcMap, an 32-bit floating point raster ERDAS .img 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.

Software: TerraScan v20, Esri ArcMap v10.7, Global Mapper v20.0

Intensity Imagery

Lidar intensity data derived from the acquired lidar data was linearly rescaled from 16-bit intensity and provided as 2.5-foot pixel, 8-bit, 256 gray scale GeoTIFF format intensity imagery files.

Software: TerraScan v20, Esri ArcMap v10.7

Metadata

FGDC CSDGM/USGS MetaParser-compliant metadata was produced in XML format. The metadata includes a complete description of the task order client information, contractor information, project purpose, lidar acquisition and ground survey collection parameters, lidar acquisition and ground survey collection dates, spatial reference system information, data processing including acquisition quality assurance procedures, GPS and base station processing, geometric calibration, lidar classification, hydrologic flattening, intensity imagery development, and final product development.

Other metadata deliverables included Esri shapefiles of the ground control and QA/QC points, data extent, and delivery tile index. A georeferenced, polygonal representation of the detailed extents of each acquired lidar swath was produced as a polygon feature class in an Esri file geodatabase.

4. Accuracy Assessment

Horizontal Accuracy

The data sets was produced to meet ASPRS “Positional Accuracy Standards for Digital Geospatial Data” (2014) for a 0.16 cm RMSEx / RMSEy Horizontal Accuracy Class which equates to Positional Horizontal Accuracy = +/- 0.38 cm at a 95% confidence level.

Raw Lidar Swath Testing

This project required Non-Vegetated Vertical Accuracy (NVA) to be tested on the raw lidar point cloud swath data. The dataset was required to meet a target value of 19.6 cm at a 95% confidence level using an RMSEz target value of 10 cm x 1.9600. Testing was assessed and reported using guidelines developed by the National Digital Elevation Program (NDEP) and the American Society for Photogrammetry and Remote Sensing (ASPRS).

The raw NVA was to be calculated with independent checkpoints that were not used in the calibration or post processing of the lidar point cloud data. Checkpoints were to be distributed throughout the project area and located in bare earth and urban (non-vegetated) land cover classes.

Testing was performed using TINs created from the final calibrated and controlled swath data. For each NVA checkpoint, an elevation value was derived from the TIN at the point’s x,y location. This value was compared to the checkpoint’s surveyed elevation value.

The raw NVA was tested using 415 checkpoints. These checkpoints were surveyed using GPS techniques. See the survey report for acquisition methodologies. This dataset was tested to be 0.072 meters using an RMSEz of 0.037 meters x 1.9600.

Digital Elevation Model Testing

This project required Non-Vegetated Accuracy (NVA) and Vegetated Vertical Accuracy (VVA) testing of the digital elevation model (DEM) dataset. The calculated NVA value was required to meet 19.6 cm at a 95% confidence level using an RMSEz target value of 10 cm x 1.9600. VVA was required to meet 0.294 cm at the 95th percentile error. Testing was assessed and reported using guidelines developed by the National Digital Elevation Program (NDEP) and the American Society for Photogrammetry and Remote Sensing (ASPRS).

Testing was performed using the bare earth DEM created as part of this task order. For each checkpoint, an elevation value was derived from the DEM at the point’s x,y location. This value was compared to the checkpoint’s surveyed elevation value.

The NVA was to be calculated with checkpoints falling on bare earth and urban (non-vegetated) classes. VVA was to be calculated with independent checkpoints falling in brush/tall grass/weeds (vegetated) land cover classes. These points were not used in the calibration or post processing of the lidar point cloud data and distributed throughout the project area. Checkpoints were surveyed using GPS techniques. See the survey report for acquisition methodologies.

The DEM NVA measured 0.074 meters using an RMSEz of 0.038 meters x 1.9600 using 415 checkpoints. VVA tested 0.169 meters at the 95th percentile using 311 checkpoints.

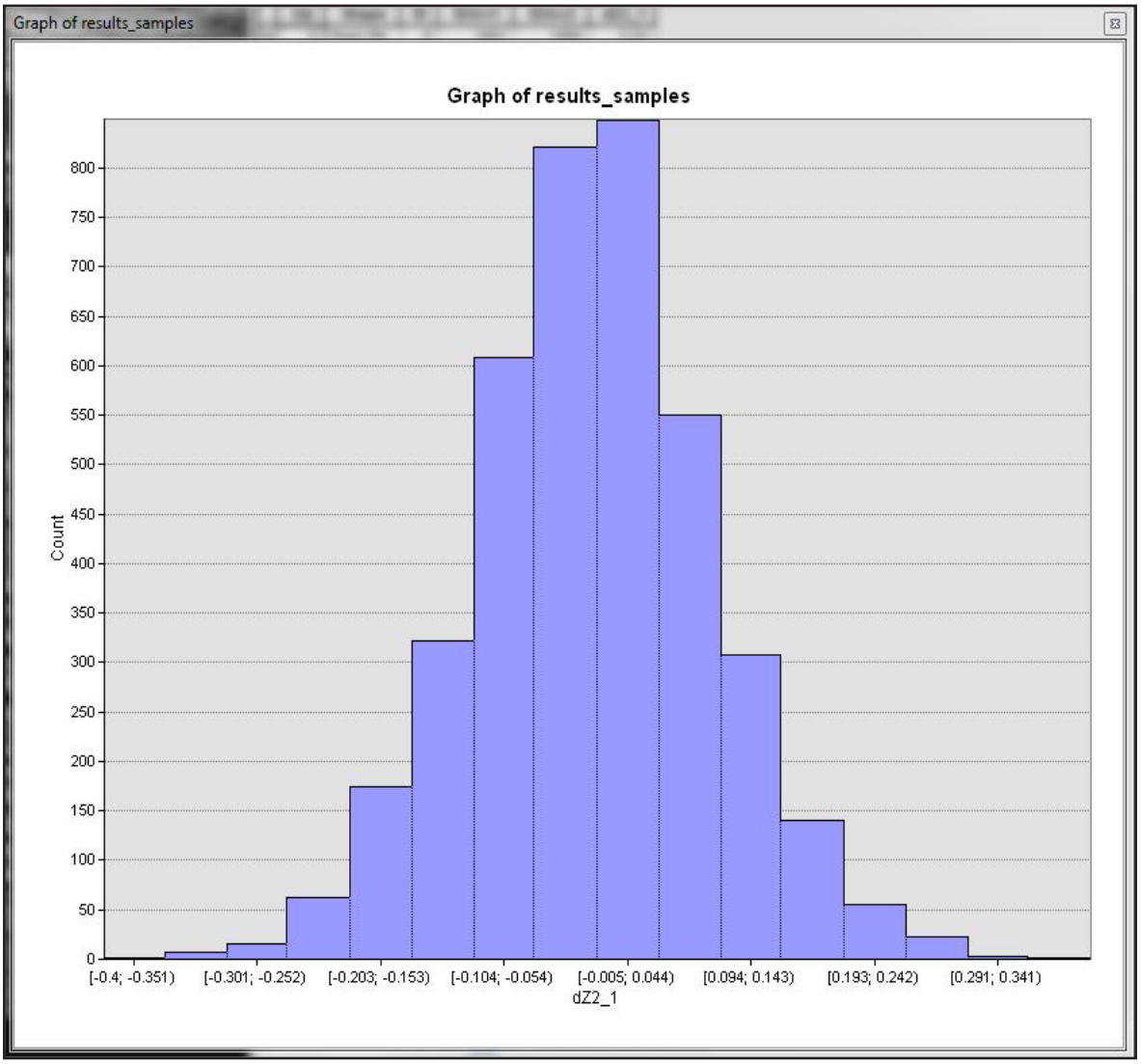
VVA errors larger than the 95th percentile are listed below. All values are in US survey feet.

Table 4-1. VVA Errors

Point ID	Easting	Northing	Z-Error
3031	229374.19	2174307.72	0.183
3051	199263.62	2224386.7	0.171
3063	330011.74	1968612.02	0.207
3083	278927.8	2246630.07	0.207
3085	424676.68	2202091.38	0.201
3218	374937.87	1362772.43	0.213
3236	269064.51	1189674.06	0.174
3238	266522.48	1095030.53	0.25
3260	239912.23	1351922.43	0.274
3271	338290.39	1136531.03	0.265
3282	190473.29	1121677.77	0.188
3285	262411.78	1020963.22	0.234
3294	173805.99	1218283.07	0.179

Inter-Swath Testing

Inter-swath accuracy for the East AOI was tested against well-distributed flight line overlap locations. The relative accuracy for the lidar measured at 0.097 feet RMSE.



Values are in US Survey Feet.

Approved By	Name	Signature	Date
Associate Member, Lidar Specialist Certified Photogrammetrist #1381	Qian Xiao		December 2020

Appendix 1: Flight Logs

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/5/2017	64	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N7268P				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 314				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed	AGL	MSL	Waveform Used				Waveform Mode	Pre-Trigger Dist.
135 Kts	6,057 Ft	Ft	Yes		No		@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
181		17:54:53	18:08:36	0:13:43				
180		18:13:19	18:29:58	0:16:39				
179		18:40:09	18:54:11	0:14:02				
178		19:01:44	19:19:55	0:18:11				
177		19:24:46	19:38:59	0:14:13				
176		19:44:00	20:01:09	0:17:09				
175		20:07:10	20:21:00	0:13:50				
174		20:24:42	20:41:48	0:17:06				
173		20:45:49	20:59:32	0:13:43				
172		21:02:29	21:19:17	0:16:48				
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments:

Drive #

Mission ID 10570 - Area1

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/5/2017	64	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N7268P				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 314				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
135	Kts	6,057	Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission	Yes X No
171		23:38:50	23:57:43	0:18:53					
170		0:01:02	0:15:02	0:14:00					
169		0:18:23	0:39:39	0:21:16					
168		0:42:35	0:56:08	0:13:33					
167		1:00:36	1:21:04	0:20:28					
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission	Yes X No

Additional Comments:	Drive #
Mission ID 10571 - Area 1	

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/8/2017	67	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	Zulu Start Time	Base
SMITH	N404CP	5898.1	9:23:00	14:23:00	
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
RADER	ALS 8191	5901.4	12:41:00	17:41:00	

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud		
240/17	10			7	-2	3013		Departing	day
								Arriving	day

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	x	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
150	Kts	7800	Ft	8346	Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	
↕ Times entered are Zulu / GMT ↕								Verify S-Turns Before Mission	Yes x No
126	n	14:50:00	15:07:00	0:17:00	21	0.6	1		
125	s	15:09:00	15:26:00	0:17:00	21	0.6	1.1		
124	n	15:28:00	15:45:00	0:17:00	20	0.6	1.2		
123	s	15:47:00	16:04:00	0:17:00	19	0.6	1.2		
122	n	16:06:00	16:23:00	0:17:00	20	0.6	1		
121	s	16:25:00	16:42:00	0:17:00	17	0.6	1.1	cld wp 40	
120	n	16:44:00	17:01:00	0:17:00	18	0.6	1	cld wp 51.50,17-15	
119	s	17:04:00	17:20:00	0:16:00	16	0.6	1.3	cld wp 4	

↑ Times entered are Zulu / GMT ↑		Page	1	Verify S-Turns After Mission	Yes x No

Additional Comments: Drive #

block 2

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/9/2017	68	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N7268P				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 314				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
135	Kts	6,057	Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
166		18:58:52	19:14:52	0:16:00				
165		19:19:58	19:34:01	0:14:03				
139		19:47:18	20:02:36	0:15:18				
140		20:06:20	20:23:04	0:16:44				
141		20:26:13	20:41:11	0:14:58				
142		20:44:37	21:00:54	0:16:17				
143		21:04:04	21:19:41	0:15:37				
144		21:23:11	21:39:14	0:16:03				
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Mission ID 10585 - Area 1

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/9/2017	68	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	Zulu Start Time	Base
SMITH	N404CP	5901.4	9:03:00	14:03:00	
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
RADER	ALS 8191	5908.6	4:09:00	21:09:00	

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud		
080/3	10			2	-3	3016		Departing	day
								Arriving	day

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	x	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode	Pre-Trigger Dist.	
150	Kts	7800	Ft	8346	Ft	Yes		No		@ NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	
↕ Times entered are Zulu / GMT ↕								Verify S-Turns Before Mission	Yes x No
118	n	14:32:00	14:49:00	0:17:00	19	0.6	1.1		
117	s	14:51:00	15:07:00	0:16:00	20	0.6	1.1		
116	n	15:09:00	15:26:00	0:17:00	19	0.6	1.2		
115	s	15:28:00	15:45:00	0:17:00	17	0.6	1.4		
114	n	15:47:00	16:03:00	0:16:00	18	0.6	1.2		
113	s	16:05:00	16:22:00	0:17:00	19	0.6	1		
112	n	16:24:00	16:40:00	0:16:00	16	0.6	1.2		
111	s	16:42:00	16:59:00	0:17:00	17	0.6	1.1		
110	n	17:01:00	17:17:00	0:16:00	16	0.6	1.3		
109	s	17:19:00	17:36:00	0:17:00	18	0.6	1.1		
108	n	17:38:00	17:54:00	0:16:00	17	0.6	1.2		
107	s	17:57:00	18:14:00	0:17:00	16	0.6	1.6		
106	n	18:16:00	18:32:00	0:16:00	19	0.6	1.1		
105	s	18:34:00	18:51:00	0:17:00	18	0.6	1.2		
104	n	18:53:00	19:09:00	0:16:00	18	0.6	1.1		
103	s	19:11:00	19:28:00	0:17:00	19	0.6	1.1		
102	n	19:30:00	19:47:00	0:17:00	19	0.6	1.1		
101	s	19:49:00	20:05:00	0:16:00	19	0.6	1.1		
100	n	20:07:00	20:24:00	0:17:00	19	0.6	1.1		
99	s	20:26:00	20:43:00	0:17:00	18	0.6	1.2		
↑ Times entered are Zulu / GMT ↑				Page		1		Verify S-Turns After Mission	Yes x No

Additional Comments:

Drive #

block 2

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/9/2017	68	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N72582				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 5060382				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
135	Kts	6,057	Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
131		0:04:45	0:19:32	0:14:47				
130		0:22:44	0:37:57	0:15:13				
129		0:41:20	0:56:15	0:14:55				
128		0:59:16	1:14:27	0:15:11				
127		1:17:29	1:32:11	0:14:42				
126		1:36:03	1:51:08	0:15:05				
125		1:54:41	2:09:24	0:14:43				
124		2:15:32	2:25:25	0:09:53				
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Mission ID 10578 - Area 1

WooLidar Flight Loglpert

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/9/2017	68	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N72582				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 5060382				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
135	Kts	6,057	Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
183		16:45:03	17:06:12	0:21:09				
182		17:21:18	17:33:01	0:11:43				
184		17:40:57	17:48:46	0:07:49				
148		18:04:53	18:18:36	0:13:43				
147		18:22:01	18:39:17	0:17:16				
146		18:42:05	18:57:01	0:14:56				
145		19:00:18	19:15:04	0:14:46				
144		19:17:45	19:33:31	0:15:46				
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Mission ID 10587 - Tie 1

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/10/2017	69	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N7268P				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 314				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
135	Kts	6,057	Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission	Yes X No
99		23:41:54	0:00:20	0:18:26					
100		0:07:05	0:25:41	0:18:36					
101		0:29:24	0:44:41	0:15:17					
102		0:48:52	1:06:24	0:17:32					
103		1:10:45	1:25:17	0:14:32					
104		1:29:50	1:46:01	0:16:11					
105		1:49:41	2:03:28	0:13:47					
106		2:07:55	2:23:57	0:16:02					
107		2:27:00	2:41:13	0:14:13					
108		2:44:38	3:00:36	0:15:58					
109		3:03:36	3:17:46	0:14:10					
98		3:26:50	3:50:30	0:23:40					
97		3:55:30	4:16:18	0:20:48					
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission	Yes X No

Additional Comments:

Drive #

Mission ID 10590 - Area 2

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/11/2017	70	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N8268P				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 314				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
135	Kts	6,057	Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission	Yes X No
96		16:36:34	16:54:32	0:17:58					
95		16:57:48	17:17:32	0:19:44					
94		17:21:44	17:40:07	0:18:23					
93		17:44:22	18:04:16	0:19:54					
92		18:07:38	18:25:47	0:18:09					
91		18:29:20	18:48:39	0:19:19					
90		18:52:00	19:10:38	0:18:38					
89		19:14:17	19:34:26	0:20:09					
88		19:37:14	19:56:46	0:19:32					
87		20:01:08	20:21:41	0:20:33					
110		20:31:43	20:45:55	0:14:12					
111		20:50:03	21:04:48	0:14:45					
112		21:08:13	21:21:56	0:13:43					
113		21:25:08	21:39:32	0:14:24					
114		21:42:32	21:55:42	0:13:10					
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission	Yes X No

Additional Comments:	Drive #
Mission ID 10594 - Area 2	

Woolpert Flight Log

Leica ALS80	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/11/2017	70	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Stanton	N6255Q	517.0	16:23:00	21:23:00	CORS
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
LaRocque	ALS 8170	521.5	21:08:00	2:08:00	INFW

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KFWA
310/9	10+	15K	75	0	-13	30.39	CLR	Arriving	KFWA

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain	X	Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	3	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
150	Kts	7,800	Ft	8450	Ft	Yes		No	X	@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
122	N	21:47:36	21:54:48	0:07:12	21	0.6	1.2	Clear below 15K
121	S	21:59:46	22:07:56	0:08:10	21	0.6	1.3	Cut line at 24 mi from S end for clouds
120	N	22:10:57	22:23:35	0:12:38	21	0.6	1.2	Clear
119	S	22:26:45	22:38:22	0:11:37	21	0.6	1.2	Clear
118	N	22:41:45	22:54:12	0:12:27	21	0.6	1.1	Clear
117	S	22:57:22	23:09:10	0:11:48	19	0.7	1.4	Clear
116	N	23:12:35	23:24:51	0:12:16	19	0.7	1.3	Clear
115	S	23:28:10	23:39:48	0:11:38	20	0.7	1.2	Clear
114	N	23:43:11	23:55:25	0:12:14	18	0.7	1.2	Clear
121	S	23:59:06	0:03:26	0:04:20	16	0.8	1.4	complete N end of line, now clear
113	S	0:12:59	0:24:38	0:11:39	17	0.7	1.2	Clear
112	N	0:27:59	0:40:10	0:12:11	19	0.7	1.1	Clear
111	S	0:43:31	0:55:07	0:11:36	18	0.7	1.1	Clear
110	N	0:58:26	1:10:33	0:12:07	18	0.7	1.2	clds 0 to 3 and 7 mi from N end
109	S	1:13:49	1:25:30	0:11:41	19	0.7	1.2	clds 0 to 7 mi from N end
108	N	1:28:54	1:37:00	0:08:06	20	0.7	1.1	Cut line at 23 mi from S end for clouds
107	S	1:40:59	1:48:26	0:07:27	19	0.7	1.2	Cut line at 23 mi from S end for clouds
								end mission for clouds
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Block 1

Woolpert Flight Log

Leica ALS80	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/12/2017	71	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Stanton	N6255Q	521.5	9:42:00	13:42:00	CORS
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
LaRocque	ALS 8170	523.9	12:22:00	16:22:00	INFW

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KFWA
5/5	10+	CLR	0	-7	-13	30.46	CLR	Arriving	KFWA

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain	X	Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	3	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
150	Kts	7,800	Ft	8450	Ft	Yes		No	X	@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
106	N	14:08:31	14:20:55	0:12:24	21	0.6	1	Clear
110	S	14:24:16	14:27:41	0:03:25	22	0.6	1	Refly N 10 mi, Clear
109	N	14:31:03	14:34:40	0:03:37	22	0.7	1.1	Refly N 10 mi, Clear
108	S	14:38:02	14:42:29	0:04:27	23	0.7	1.1	complete N end of line, now clear
107	N	14:45:58	14:51:16	0:05:18	22	0.7	1.2	complete N end of line, now clear
105	S	14:54:32	15:06:28	0:11:56	23	0.7	1.2	Clear
104	N	15:09:46	15:22:00	0:12:14	23	0.8	1.3	Clear
103	S	15:25:20	15:37:09	0:11:49	22	0.8	1.3	Clear
102	N	15:40:14	15:52:23	0:12:09	23	0.8	1.2	Clouds 3, 6 and 6.5 mi from N end
								end mission for clouds
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Block 1

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/12/2017	71	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
SMITH	N404CP	5910.0	9:38:00	13:38:00	
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
RADER	ALS 8191	5913.2	12:51:00	16:51:00	

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud		
360/9	10			-7	-12	3042		Departing	day
								Arriving	day

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	x	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode	Pre-Trigger Dist.	
150	Kts	7800	Ft	8346	Ft	Yes		No		@ NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments				
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:				
↕ Times entered are Zulu / GMT ↕								Verify S-Turns Before Mission	Yes	x	No	
121	n	14:05:00	14:22:00	0:17:00	20	0.6	1					
120	s	14:25:00	14:41:00	0:16:00	19	0.6	1					
119	n	14:44:00	15:01:00	0:17:00	19	0.6	1.2					
98	s	15:09:00	15:25:00	0:16:00	20	0.6	1.3					
97	n	15:27:00	15:44:00	0:17:00	19	0.6	1.2	cld wp 5				
96	s	15:46:00	16:03:00	0:17:00	20	0.6	1.1	cld wp 66-75				
95	n	16:05:00	16:16:00	0:11:00	18	0.6	1.1	clds throughout, stopped				
								flew over ksmb				
↑ Times entered are Zulu / GMT ↑				Page		1		Verify S-Turns After Mission	Yes	x	No	

Additional Comments: Drive #

block 2

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/12/2017	71	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	Zulu Start Time	Base
GALAMBOS	N475RC	838.7	10:41:00	14:41:00	CORS
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
GEBHART	ALS 8194	841.5	12:08:00	16:08:00	INBF

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KDAY
030 3	10	few 250		16	7	30.44		Arriving	KDAY

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain	255	Mode		Threshold Values	
40	35.5	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi		B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode	Pre-Trigger Dist.	
150	Kts	7800	Ft	8450	Ft	Yes		No	X	@ NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	13:56:12
↕ Times entered are Zulu / GMT ↕								Verify S-Turns Before Mission	Yes X No
								8194	
								takeoff:14:04z	
79	N	14:41:13	14:56:43	0:15:30	22	0.7	1.2	Block 2	
78	S	14:58:55	15:13:51	0:14:56	22	0.7	1.2		
77	N	15:16:24	15:31:55	0:15:31	22	0.7	1.2		
76	S	15:34:16	15:49:38	0:15:22	22	0.7	1.2		
75	N	15:52:00	16:08:02	0:16:02	22	0.7	1.2	Clouds wpt 1-26	
								Hobbs 841.0/FWA	
111	S	16:30:37	16:44:55	0:14:18	19	0.7	1.1	Block 3 east end	
								CORS INBF Wasbash KIWH	
								Text from Jonas--Block 3 not open	
								Hobbs:841.5 end	
↑ Times entered are Zulu / GMT ↑			Page		1			Verify S-Turns After Mission	Yes X No

Additional Comments:

Block 2

Drive #

155

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/12/2017	71	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N7268P				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 314				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
135	Kts	6,057	Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission	Yes X No
121		1:02:06	1:11:57	0:09:51					
120		1:15:05	1:25:53	0:10:48					
119		1:29:11	1:40:46	0:11:35					
118		1:43:58	1:55:58	0:12:00					
117		2:00:01	2:13:20	0:13:19					
116		2:16:21	2:29:37	0:13:16					
115		2:32:45	2:46:02	0:13:17					
86		2:57:09	3:16:49	0:19:40					
85		3:20:13	3:39:48	0:19:35					
84		3:42:51	4:02:22	0:19:31					
83		4:05:27	4:25:21	0:19:54					
82		4:28:01	4:47:16	0:19:15					
81		4:50:12	5:08:55	0:18:43					
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission	Yes X No

Additional Comments:

Drive #

Mission ID 10596 - Area 2

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/12/2017	71	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N7268P				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 314				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed	AGL	MSL	Waveform Used				Waveform Mode	Pre-Trigger Dist.
135 Kts	6,057 Ft	Ft	Yes		No		@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
80		16:15:40	16:33:13	0:17:33				
79		16:37:51	16:56:38	0:18:47				
78		16:59:26	17:17:44	0:18:18				
77		17:20:49	17:40:55	0:20:06				
76		17:43:46	18:01:59	0:18:13				
75		18:04:50	18:25:02	0:20:12				
74		18:27:28	18:45:11	0:17:43				
73		18:48:14	19:07:10	0:18:56				
72		19:10:27	19:28:14	0:17:47				
71		19:31:10	19:49:53	0:18:43				
70		19:53:19	20:10:05	0:16:46				
69		20:13:28	20:31:31	0:18:03				
68		20:34:43	20:51:33	0:16:50				
67		20:55:17	21:12:45	0:17:28				
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Mission ID 10596 - Area 2

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/13/2017	72	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N7268P				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 314				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
135	Kts	6,057	Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission	Yes X No
122		0:31:04	0:45:00	0:13:56					
62		0:51:42	0:56:10	0:04:28					
63		1:06:34	1:11:24	0:04:50					
64		1:18:28	1:32:43	0:14:15					
65		1:35:55	1:51:21	0:15:26					
66		1:54:46	2:09:17	0:14:31					
123		2:19:54	2:37:36	0:17:42					

		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission	Yes X No

Additional Comments: Drive #

Mission ID 10601 - Tie 5

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/16/2017	75	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
SMITH	N404CP	5913.2	9:01:00	13:01:00	
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
ALBERS	ALS 8191	5919.8	2:49:00	18:49:00	

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	day
270/8	10			-8	-11	3032		Arriving	day

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	x	B	

Air Speed	AGL	MSL	Waveform Used				Waveform Mode	Pre-Trigger Dist.
150 Kts	7800 Ft	8504 Ft	Yes		No		@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
↕ Times entered are Zulu / GMT ↕								Verify S-Turns Before Mission Yes X No
110	n	13:19:00	13:33:00	0:14:00	20	0.6	1	
109	s	13:35:00	13:48:00	0:13:00	20	0.6	1	
108	n	13:51:00	14:04:00	0:13:00	19	0.6	1	
107	s	14:06:00	14:20:00	0:14:00	19	0.6	1	
106	n	14:22:00	14:36:00	0:14:00	20	0.6	1	
105	s	14:38:00	14:51:00	0:13:00	19	0.6	1.1	
104	n	14:54:00	15:07:00	0:13:00	18	0.6	1.2	
103	s	15:10:00	15:23:00	0:13:00	18	0.6	1.2	
102	n	15:26:00	15:39:00	0:13:00	19	0.6	1.1	
101	s	15:41:00	15:55:00	0:14:00	19	0.6	1	
100	n	15:57:00	16:10:00	0:13:00	17	0.6	1.1	
99	s	16:12:00	16:25:00	0:13:00	18	0.6	1	
98	n	16:27:00	16:42:00	0:15:00	16	0.6	1.3	
97	s	16:44:00	16:57:00	0:13:00	18	0.6	1.1	
96	n	17:00:00	17:13:00	0:13:00	17	0.6	1.2	
95	s	17:16:00	17:30:00	0:14:00	17	0.6	1.2	
94	n	17:32:00	17:46:00	0:14:00	16	0.6	1.4	
93	s	17:48:00	18:02:00	0:14:00	16	0.6	1.3	
92	n	18:04:00	18:17:00	0:13:00	18	0.6	1.1	
91	s	18:20:00	18:33:00	0:13:00	19	0.6	1	
↑ Times entered are Zulu / GMT ↑				Page		1		Verify S-Turns After Mission Yes X No

Additional Comments: Drive #

block 3

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/16/2017	75	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	Zulu Start Time	Base
GALAMBOS	N475RC	841.5	9:45:00	13:45:00	CORS
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
GEBHART	ALS 8194	847.9	2:59:00	18:59:00	INAB

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KDAY
280 9	10	Clear		-6	-10	30.33		Arriving	KDAY

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain	255	Mode		Threshold Values	
40	35.5	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi		B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode	Pre-Trigger Dist.	
150	Kts	7800	Ft	8450	Ft	Yes		No	X	@ NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	13:02:53
↕ Times entered are Zulu / GMT ↕								Verify S-Turns Before Mission	Yes X No
								Sensor 8194/ takeoff 1308z	
90	S	13:45:22	13:58:44	0:13:22	19	0.6	1	CORS INAB Butler County	
89	N	14:01:31	14:16:54	0:15:23	19	0.6	1	Over CORS 13:32:22	
88	S	14:19:24	14:32:53	0:13:29	19	0.6	1	Dusting of snow south end	
87	N	14:35:34	14:50:13	0:14:39	19	0.6	1		
86	S	14:53:18	15:06:50	0:13:32	18	0.7	1.2		
85	N	15:09:34	15:24:25	0:14:51	18	0.7	1.2		
84	S	15:26:48	15:40:40	0:13:52	18	0.7	1.2		
83	N	15:43:24	15:58:02	0:14:38	18	0.7	1.2		
82	S	16:00:18	16:14:06	0:13:48	18	0.7	1.2		
81	N	16:18:16	16:30:55	0:12:39	18	0.7	1.2		
80	S	16:33:22	16:45:35	0:12:13	16	0.7	1.4		
79	N	16:47:58	17:00:34	0:12:36	16	0.7	1.4		
78	S	17:03:02	17:15:16	0:12:14	16	0.7	1.4		
77	N	17:17:43	17:30:11	0:12:28	16	0.7	1.4		
76	S	17:32:34	17:44:31	0:11:57	16	0.7	1.4		
75	N	17:47:05	17:59:42	0:12:37	17	0.7	1.4		
74	S	18:02;19	`18:14:17	#VALUE!	17	0.8	1.2		
73	N	18:16:50	18:29:35	0:12:45	17	0.8	1.2		
72	S	18:31:47	18:43:01	0:11:14	17	0.8	1.2		
71	N	18:46:32	18:59:00	0:12:28	17	0.8	1.2	126 GB	
								Over CORS:19:06:39	
↑ Times entered are Zulu / GMT ↑			Page		1			Verify S-Turns After Mission	Yes X No

Additional Comments:

Drive #

Block 3

155

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/16/2017	75	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N72582				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 5060382				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed	AGL	MSL	Waveform Used				Waveform Mode	Pre-Trigger Dist.
135 Kts	6,057 Ft	Ft	Yes		No		@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
203		21:18:47	21:38:08	0:19:21				
202		21:41:15	21:51:29	0:10:14				
202		22:00:34	22:18:44	0:18:10				
201		22:21:19	22:37:45	0:16:26				
200		22:41:23	22:58:55	0:17:32				
199		23:02:03	23:18:43	0:16:40				
198		23:21:52	23:38:18	0:16:26				
197		23:41:14	23:57:12	0:15:58				
196		0:00:43	0:17:07	0:16:24				
195		0:19:59	0:35:49	0:15:50				
270		0:42:30	0:48:50	0:06:20				
267		0:58:45	1:05:15	0:06:30				
269		1:16:59	1:25:00	0:08:01				
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Mission ID 10609 - Area 3 North

Woolpert Flight Log

Leica ALS80	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/16/2017	75	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Stanton	N6255Q	523.9	8:14:00	12:14:00	WOOLPERT PIN
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
LaRocque	ALS 8170	528.5	13:02:00	17:02:00	KFWA

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KFWA
250/06	10+	CLR	0	-7	-11	30.31	CLR	Arriving	KFWA

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain	X	Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	3	B	

Air Speed	AGL	MSL	Waveform Used				Waveform Mode	Pre-Trigger Dist.
150 Kts	7,800 Ft	8510 Ft	Yes		No	X	@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
70	S	12:39:30	12:51:14	0:11:44	19	0.6	1.2	Clear, trace of snow shaded areas
69	N	12:54:40	13:07:23	0:12:43	19	0.6	1.2	
68	S	13:10:47	13:22:23	0:11:36	21	0.6	1	
67	N	13:26:25	13:38:57	0:12:32	19	0.6	1.1	
66	S	13:42:24	13:54:11	0:11:47	19	0.6	1	
65	N	13:58:04	14:12:28	0:14:24	20	0.6	1	
64	S	14:15:56	14:29:30	0:13:34	19	0.6	1	
63	N	14:33:08	14:47:25	0:14:17	19	0.7	1.1	
62	S	14:50:51	15:04:34	0:13:43	19	0.7	1.1	
61	N	15:08:01	15:22:10	0:14:09	18	0.7	1.2	
60	S	15:25:33	15:39:06	0:13:33	19	0.6	1.1	
59	N	15:42:36	15:56:46	0:14:10	19	0.6	1	
58	S	16:00:21	16:13:50	0:13:29	17	0.7	1.1	
57	N	16:19:40	16:36:28	0:16:48	17	0.7	1.2	
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Block 3 Lift 1

Woolpert Flight Log

Leica ALS80	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/16/2017	75	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Stanton	N6255Q	528.5	13:59:00	17:59:00	WOOLPERT PIN
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
LaRocque	ALS 8170	532.3	18:05:00	22:05:00	KFWA

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KFWA
250/06	10+	CLR	0	3	-9	30.33	CLR	Arriving	KFWA

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain	X	Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	3	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
150	Kts	7,800	Ft	8510	Ft	Yes		No	X	@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
56	S	18:23:57	18:40:49	0:16:52	18	0.7	1.1	
55	N	18:44:04	19:01:16	0:17:12	19	0.6	1.1	
54	S	19:04:15	19:20:56	0:16:41	19	0.6	1.1	
53	N	19:24:10	19:41:13	0:17:03	18	0.7	1.2	
52	S	19:44:36	20:01:00	0:16:24	19	0.6	1.1	
51	N	20:04:42	20:21:58	0:17:16	18	0.6	1.1	
50	S	20:25:17	20:41:44	0:16:27	17	0.6	1.5	
49	N	20:45:04	21:02:07	0:17:03	17	0.6	1.5	
48	S	21:05:25	21:21:49	0:16:24	19	0.6	1.2	
47	N	21:24:54	21:42:04	0:17:10	19	0.6	1.2	
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Block 3 Lift 2

Woolpert Flight Log

Leica ALS80	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/21/2017	80	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Stanton	N6255Q	532.6	13:01:00	17:01:00	WOOLPERT PIN
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
LaRocque	ALS 8170	537.6	18:09:00	22:09:00	KFWA

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KFWA
350/11	10	Few 130	50%	11	1	30.13	CLR	Arriving	KFWA

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain	X	Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	3	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
150	Kts	7,800	Ft	8510	Ft	Yes		No	X	@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
102	N	17:26:05	17:34:57	0:08:52	18	0.7	1.1	Reflew N 25 mi Clear
101	S	17:37:59	17:50:14	0:12:15	17	0.7	1.1	Clear
100	N	17:53:11	18:05:23	0:12:12	17	0.7	1.2	
99	S	18:08:25	18:20:24	0:11:59	19	0.6	1.1	
98	N	18:23:28	18:35:41	0:12:13	20	0.6	1.1	
97	S	18:38:53	18:50:45	0:11:52	20	0.6	1.1	
96	N	18:53:52	19:05:58	0:12:06	19	0.6	1.1	
95	S	19:09:01	19:20:58	0:11:57	19	0.7	1.2	
94	N	19:24:15	19:36:18	0:12:03	20	0.7	1.2	
93	S	19:39:22	19:51:24	0:12:02	20	0.6	1.1	
92	N	19:54:14	20:06:24	0:12:10	18	0.7	1.3	
91	S	20:09:30	20:21:28	0:11:58	17	0.7	1.5	
90	N	20:24:06	20:36:00	0:11:54	18	0.6	1.3	
89	S	20:38:08	20:50:59	0:12:51	17	0.7	1.3	
88	N	20:53:48	21:05:44	0:11:56	19	0.6	1.2	
87	S	21:08:41	21:20:50	0:12:09	21	0.6	1.2	
86	N	21:23:26	21:35:30	0:12:04	21	0.6	1.2	
85	N	21:38:28	21:50:27	0:11:59	21	0.6	1.2	
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Block 1

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/22/2017	81	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
SMITH	N404CP	5919.7	8:59:00	12:59:00	
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
RADER	ALS 8191	5926.4	4:14:00	20:14:00	

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud		
040/12	10			-5	-10	3042		Departing	day
								Arriving	day

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	x	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode	Pre-Trigger Dist.	
150	Kts	7800	Ft	8504	Ft	Yes		No		@ NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments				
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:				
↕ Times entered are Zulu / GMT ↕								Verify S-Turns Before Mission	Yes	x	No	
46	n	13:33:00	13:52:00	0:19:00	20	0.6	1	blk 3				
45	s	13:54:00	14:10:00	0:16:00	18	0.6	1.2					
44	n	14:12:00	14:30:00	0:18:00	19	0.6	1.1					
43	s	14:32:00	14:49:00	0:17:00	18	0.6	1.2					
42	n	14:51:00	15:09:00	0:18:00	18	0.6	1.2					
41	s	15:11:00	15:27:00	0:16:00	19	0.6	1.1					
40	n	15:29:00	15:47:00	0:18:00	18	0.6	1.1					
39	s	15:49:00	16:05:00	0:16:00	17	0.6	1.1					
38	n	16:07:00	16:24:00	0:17:00	16	0.6	1.3					
37	s	16:26:00	16:42:00	0:16:00	18	0.6	1.1					
36	n	16:44:00	16:59:00	0:15:00	17	0.6	1.2	cld wp 26				
35	s	17:02:00	17:10:00	0:08:00	16	0.6	1.1					
34	n	17:13:00	17:21:00	0:08:00	17	0.6	1.3	cld wp 35,34				
33	s	17:23:00	17:32:00	0:09:00	17	0.6	1.1	cld wp 30				
32	n	17:34:00	17:42:00	0:08:00	16	0.6	1.2	cld wp 24				
31	s	17:44:00	17:52:00	0:08:00	17	0.6	1.3					
96	n	18:08:00	18:24:00	0:16:00	18	0.6	1.1	blk 2				
95	s	18:27:00	18:43:00	0:16:00	19	0.6	1.1					
94	n	18:45:00	19:02:00	0:17:00	19	0.6	1.1					
93	s	19:04:00	19:21:00	0:17:00	18	0.6	1.2					
111	s	19:30:00	19:43:00	0:13:00	19	0.6	1.1	blk3				
107	n	19:48:00	19:50:00	0:02:00	18	0.6	1.2	reflt wp 45-42				
↑ Times entered are Zulu / GMT ↑				Page		1		Verify S-Turns After Mission	Yes	x	No	

Additional Comments:	Drive #
Blocks 3, 2	

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/22/2017	81	77391	2	Indiana Statewide

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Denham	N475RC	847.9	8:38:00	12:38:00	CORS
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
Gebhart	ALS-8194	855.1	4:14:00	20:14:00	INAB

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KDAY
020/11	10		CLEAR	-5	10	30.42		Arriving	KDAY

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
40	35.5	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi		B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
150	Kts		Ft	8510	Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	PDOP	Kts	Alt.	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕							Verify S-Turns Before Mission Yes X No
112	W	13:34:00	X		X	X	TDC Error		Take Off:
112	W	14:03:00	14:23:00	0:20:00	21	1.1			
30	S	14:31:00	14:40:00	0:09:00	21	1.2			
29	N	14:43:00	14:52:00	0:09:00	21	1.2			
28	S	14:54:00	15:02:00	0:08:00	21	1.2			
27	N	15:05:00	15:14:00	0:09:00	21	1.1			
26	S	15:16:00	15:24:00	0:08:00	21	1			
25	N	15:27:00	15:36:00	0:09:00	20	1.1			
24	S	15:38:00	15:46:00	0:08:00	17	1.2			
23	N	15:48:00	15:58:00	0:10:00	18	1.1			
22	S	16:00:00	16:08:00	0:08:00	17	1.3			
21	N	16:10:00	16:19:00	0:09:00	17	1.3			
20	S	16:21:00	16:30:00	0:09:00	18	1.2			
19	N	16:32:00	16:41:00	0:09:00	18	1.2			
18	S	16:43:00	16:51:00	0:08:00	18	1.2			
17	N	16:54:00	17:03:00	0:09:00	18	1.2			
16	S	17:05:00	17:13:00	0:08:00	16	1.4			
15	N	17:16:00	17:24:00	0:08:00	18	1.3			
14	S	17:27:00	17:35:00	0:08:00	17	1.1			
13	N	17:37:00	17:46:00	0:09:00	18	1.2			
12	S	17:48:00	18:00:00	0:12:00	17	1.3			
11	N	17:59:00	18:07:00	0:08:00	19	1.1			
10	S	18:09:00	18:18:00	0:09:00	19	1.1			
9	N	18:20:00	18:28:00	0:08:00	21	1.1			
8	S	18:30:00	18:35:00	0:05:00	22	1.1			
7	N	18:37:00	18:42:00	0:05:00	21	1.1			
6	S	18:44:00	18:49:00	0:05:00	21	1.1			
5	N	18:51:00	18:56:00	0:05:00	21	1.2			
4	S	18:58:00	19:03:00	0:05:00	20	1.2			
3	N	19:05:00	19:09:00	0:04:00	20	1.2			
2	S	19:11:00	19:15:00	0:04:00	21	1.2			
↑ Times entered are Zulu / GMT ↑				Page		1			Verify S-Turns After Mission Yes X No

Additional Comments: Drive #

BLOCK 3

TDC Error on Line 112.

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/22/2017	81	77391	2	Indiana Statewide

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Denham	N475RC	847.9	8:38:00	12:38:00	CORS
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
Gebhart	ALS-8194	855.1	4:14:00	20:14:00	INAB

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud		
020/11	10		CLEAR	-5	10	30.42		Departing	KDAY
								Arriving	KDAY

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
40	35.5	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi		B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
150	Kts		Ft	8510	Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	PDOP	Kts	Alt.	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	n/a	GPS Began Logging At:
↕ Times entered are Zulu / GMT ↕									Verify S-Turns Before Mission: Yes **X** No
									Take Off:
1	**N**	**19:17:00**	**19:21:00**	**0:04:00**	**22**	**1.2**			

↑ Times entered are Zulu / GMT ↑		**Page**	**1**	Verify S-Turns After Mission: Yes **X** No

Additional Comments:

Drive #

Woolpert Flight Log

Leica ALS80	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/22/2017	81	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Stanton	N6255Q	537.6	8:16:00	12:16:00	WOOLPERT PIN
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
LaRocque	ALS 8170	542.6	13:35:00	17:35:00	KFWA

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KFWA
030/10	10	CLR	0%	-6	-12	30.48	CLR	Arriving	KFWA

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain	X	Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	3	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
150	Kts	7,800	Ft	8510	Ft	Yes		No	X	@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
84	N	12:43:27	12:55:40	0:12:13	21	0.6	1	Clear
83	S	12:59:07	13:11:04	0:11:57	21	0.6	1.1	
82	N	13:14:40	13:26:43	0:12:03	21	0.6	1.1	
81	S	13:30:15	13:42:01	0:11:46	22	0.6	1.1	
80	N	13:45:28	13:57:30	0:12:02	21	0.6	1	
79	S	14:01:01	14:12:50	0:11:49	21	0.7	1.2	
78	N	14:16:11	14:28:09	0:11:58	22	0.7	1.1	
77	S	14:31:33	14:43:18	0:11:45	22	0.7	1.1	
76	N	14:46:52	14:58:51	0:11:59	21	0.7	1.2	
75	S	15:02:31	15:14:09	0:11:38	21	0.7	1.1	
74	N	15:17:25	15:29:30	0:12:05	21	0.6	1	
73	S	15:32:55	15:44:32	0:11:37	18	0.7	1.2	
72	N	15:47:55	15:59:57	0:12:02	18	0.7	1.1	
71	S	16:03:22	16:15:01	0:11:39	17	0.7	1.3	
70	N	16:17:59	16:30:01	0:12:02	18	0.7	1.2	
69	S	16:33:19	16:44:28	0:11:09	18	0.7	1.2	
68	N	16:47:22	16:58:39	0:11:17	18	0.7	1.2	
67	N	17:02:08	17:13:29	0:11:21	17	0.7	1.3	
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Block 1 Lift 1

Woolpert Flight Log

Leica ALS80	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/22/2017	81	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Stanton	N6255Q	542.6	14:27:00	18:27:00	WOOLPERT PIN
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
LaRocque	ALS 8170	546.6	18:46:00	22:46:00	KFWA

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KFWA
100/09	10	CLR	0%	1	-10	30.56	CLR	Arriving	KFWA

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain	X	Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	3	B	

Air Speed	AGL	MSL	Waveform Used				Waveform Mode	Pre-Trigger Dist.
150 Kts	7,800 Ft	8510 Ft	Yes		No	X	@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
66	N	18:56:00	19:07:25	0:11:25	20	0.7	1.2	Clear
65	S	19:10:50	19:22:18	0:11:28	22	0.6	1.1	
64	N	19:25:22	19:36:41	0:11:19	21	0.6	1.1	
63	S	19:39:58	19:51:29	0:11:31	21	0.6	1.1	
62	N	19:56:41	20:10:34	0:13:53	18	0.7	1.6	
61	S	20:13:59	20:28:00	0:14:01	18	0.7	1.5	
60	N	20:31:12	20:45:05	0:13:53	18	0.7	1.3	
59	S	20:48:26	21:05:34	0:17:08	20	0.6	1.1	
58	N	21:08:50	21:25:50	0:17:00	19	0.6	1.2	
57	S	21:28:57	21:46:13	0:17:16	19	0.6	1.1	
56	N	21:49:18	22:06:04	0:16:46	21	0.6	1	
55	S	22:09:33	22:26:52	0:17:19	19	0.7	1.3	
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Block 1 Lift 2

Woolpert Flight Log

Leica ALS80	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/23/2017	82	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Denham	N475Rc	855.1	8:48:00	12:48:00	CORS
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
Gebhart	ALS-8194	862.2	4:12:00	20:12:00	INAB

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KDAY
100 / 10	10	25000		4	-10	30.47		Arriving	KDAY

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain	X	Mode		Threshold Values	
40	35.5	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	3	B	

Air Speed	AGL	MSL	Waveform Used				Waveform Mode	Pre-Trigger Dist.
150 Kts	7,800 Ft	8350 Ft	Yes		No	X	@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
								Take Off: 9:00
107	S	13:40:00	13:42:00	0:02:00	20		1	BLOCK 3 Reflight (Manual Capture)
99	N	14:01:00	14:18:00	0:17:00	19		1.1	
92	S	14:22:00	14:39:00	0:17:00	19		1.2	
91	N	14:41:00	14:59:00	0:18:00	18		1.2	
90	S	15:01:00	15:18:00	0:17:00	20		1	
89	N	15:21:00	15:38:00	0:17:00	18		1	
88	S	15:41:00	15:58:00	0:17:00	17		1	
87	N	16:00:00	16:17:00	0:17:00	16		1.6	
86	S	16:19:00	16:37:00	0:18:00	18		1.2	
85	N	16:39:00	16:56:00	0:17:00	17		1.2	
84	S	16:59:00	17:17:00	0:18:00	16		1.4	
83	N	17:19:00	17:35:00	0:16:00	17		1.2	
82	S	17:38:00	17:56:00	0:18:00	18		1.3	
81	N	17:58:00	18:16:00	0:18:00	18		1.2	
80	S	18:18:00	18:37:00	0:19:00	19		1.2	
75	N	18:41:00	18:57:00	0:16:00	18		1.2	
128	E	19:08:00	19:23:00	0:15:00	18		1.2	
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

BLOCK 2

Woolpert Flight Log

Leica ALS80	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/22/2017	81	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Stanton	N6255Q	546.6	8:43:00	12:43:00	WOOLPERT PIN
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
LaRocque	ALS 8170	551.9	14:12:00	18:12:00	KFWA

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KFWA
080/07	10	OVC 110	100%	-4	-9	30.49	Lt Haxe	Arriving	KFWA

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain	X	Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	3	B	

Air Speed	AGL	MSL	Waveform Used				Waveform Mode	Pre-Trigger Dist.
150 Kts	7,800 Ft	8510 Ft	Yes		No	X	@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
54	N	13:10:23	13:27:28	0:17:05	19	0.6	1.1	Clear below 11K
53	S	13:30:52	13:47:55	0:17:03	19	0.6	1.1	
52	N	13:51:05	14:08:15	0:17:10	20	0.6	1	
51	S	14:11:31	14:28:51	0:17:20	19	0.6	1.1	Short range 1st returns 8 mi fr N end
50	N	14:31:56	14:48:46	0:16:50	18	0.7	1.2	Short range 1st returns 21, 23 fr S end
49	S	14:52:04	15:09:10	0:17:06	18	0.7	1.1	Short range 1st returns 15, 26 fr S end
48	N	15:12:14	15:29:28	0:17:14	19	0.6	1	
47	S	15:32:46	15:49:56	0:17:10	17	0.7	1	
46	N	15:53:00	16:09:34	0:16:34	16	0.9	1.7	
45	S	16:12:36	16:29:40	0:17:04	17	0.7	1.3	
44	N	16:32:37	16:49:21	0:16:44	17	0.7	1.2	
43	S	16:52:32	17:09:57	0:17:25	16	0.7	1.4	
42	N	17:12:59	17:29:40	0:16:41	18	0.7	1.2	
41	S	17:32:45	17:50:15	0:17:30	19	0.6	1.2	
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Block 1 Lift 1

Woolpert Flight Log

Leica ALS80	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/23/2017	82	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Stanton	N6255Q	551.9	15:00:00	19:00:00	WOOLPERT PIN
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
LaRocque	ALS 8170	555.2	18:26:00	22:26:00	KFWA

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KFWA
130/08	10	Bkn 110	90%	5	-6	30.42	CLR below 110	Arriving	KFWA

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain	X	Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	3	B	

Air Speed	AGL	MSL	Waveform Used				Waveform Mode	Pre-Trigger Dist.
150 Kts	7,800 Ft	8510 Ft	Yes		No	X	@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
40	N	19:28:43	19:46:02	0:17:19	17	0.7	1.2	Clear
39	S	19:48:59	20:06:28	0:17:29	15	0.7	1.5	
38	N	20:09:25	20:26:17	0:16:52	14	0.8	1.9	
37	S	20:29:11	20:47:05	0:17:54	16	0.7	1.3	
36	N	20:50:17	21:05:58	0:15:41	17	0.6	1.2	
35	S	21:08:59	21:25:37	0:16:38	17	0.6	1.3	
34	N	21:28:35	21:44:45	0:16:10	17	0.6	1.2	
33	S	21:47:41	22:02:15	0:14:34	19	0.6	1.1	Clouds 1 mi from S end
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Block 1 Lift 2

* No clouds/obstructions observed below aircraft

Woolpert Flight Log

Leica ALS80	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/24/2020	84	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Stanton	N6255Q	555.2	10:18:00	14:18:00	WOOLPERT PIN
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
LaRocque	ALS 8170	560.4	15:37:00	19:37:00	KFWA

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KFWA
210/16	10	Bkn 140	50%	14	8	30.07	Mod Haze	Arriving	KFWA

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain	X	Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	3	B	

Air Speed	AGL	MSL	Waveform Used				Waveform Mode	Pre-Trigger Dist.
150 Kts	7,800 Ft	8510 Ft	Yes		No	X	@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
32	N	14:51:38	15:05:40	0:14:02	20	0.6	1	Clear
31	S	15:08:27	15:23:01	0:14:34	19	0.6	1	
30	N	15:26:05	15:40:30	0:14:25	17	0.7	1.1	
29	S	15:43:22	15:58:14	0:14:52	18	0.6	1	
28	N	16:01:02	16:15:31	0:14:29	16	0.7	1.3	
27	S	16:18:30	16:33:16	0:14:46	17	0.6	1.2	
26	N	16:36:12	16:50:36	0:14:24	17	0.7	1.2	
25	S	16:53:15	17:08:20	0:15:05	16	0.7	1.4	
24	N	17:11:09	17:25:26	0:14:17	17	0.7	1.1	
23	S	17:28:32	17:43:46	0:15:14	18	0.7	1.1	
22	N	17:46:42	18:01:00	0:14:18	19	0.7	1.1	Small cloud 6 mi from S end
21	S	18:03:49	18:19:08	0:15:19	18	0.7	1.1	Small clouds 3 - 5 mi from S end
123	E	18:33:23	18:48:09	0:14:46	20	0.6	1.1	
124	E	18:52:51	19:07:53	0:15:02	20	0.6	1.1	
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Block 1

Woolpert

Leica ALS80	DD/MM/YEAR	Day of Year	Project #	Phase #	Project Name
	3/29/2017	88	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Galambos	N6255Q	560.4	3:05:00	19:05:00	WOOLPERT PIN
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**		**PID**
LaRocque	ALS 8170	562.9	5:01:00	21:01:00	KFWA

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KFWA
080 19 g 24	10	few 150		12	3	30.22		Arriving	KFWA

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain	255	Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	3	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
150	Kts	7800	Ft	8510	Ft	Yes		No	X	@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	18:36:09
↕ Times entered are Zulu / GMT ↕								Verify S-Turns Before Mission	Yes X No
								takeoff 1845z	
74	S	19:05:08	19:21:19	0:16:11	21	0.6	1.1		
73	N	19:24:08	19:40:07	0:15:59	21	0.6	1.1		
72	S	19:42:50	19:58:47	0:15:57	21	0.6	1.1		
71	N	20:01:36	20:17:21	0:15:45	21	0.6	1.1		
70	S	20:20:13	20:36:42	0:16:29	21	0.6	1.1		
69	N	20:39:13	21:01:25	0:22:12	17	0.7	1.2		

↑ Times entered are Zulu / GMT ↑			Total Time On Line	Verify S-Turns After Mission	Yes	X	No	
Additional Comments:								Drive #
Block 2								156

Woolpert

Leica ALS80	DD/MM/YEAR	Day of Year	Project #	Phase #	Project Name
	4/1/2017	91	77391	2	IND 2017 QL2 LiDAR

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Galambos	N6255Q	563.6	12:38:00	16:38:00	WOOLPERT PIN
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**		**PID**
Swain	ALS 8170	569.0	4:35:00	20:35:00	KDAY

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KDAY
350 10	10			5	2	30.17		Arriving	KRCR

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain	255	Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	3	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
150	Kts	7800	Ft	8510	Ft	Yes		No	X	@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	15:34:10
↕ Times entered are Zulu / GMT ↕								Verify S-Turns Before Mission	Yes X No
								Takeoff:1545z/ OVER CORS 162044	
12	N	16:38:32	16:52:50	0:14:18	17	0.7	1.1	Block 1/CORS = INWB	
11	S	16:54:38	17:08:52	0:14:14	17	0.7	1.1	Block 1	
10	N	17:11:21	17:25:57	0:14:36	17	0.7	1.1	Block 1	
9	S	17:28:02	17:42:14	0:14:12	19	0.6	1.1	Block 1	
8	N	17:44:53	17:59:20	0:14:27	19	0.6	1.1	Block 1	
7	S	18:01:09	18:15:13	0:14:04	19	0.6	1.1	Block 1	
6	N	18:17:01	18:31:12	0:14:11	19	0.6	1.1	Block 1	
5	S	18:33:03	18:47:17	0:14:14	19	0.6	1.1	Block 1	
4	N	18:53:56	19:02:40	0:08:44	19	0.6	1.1	Block 1	
3	S	19:04:46	19:13:21	0:08:35	19	0.7	1.3	Block 1	
2	N	19:15:16	19:23:21	0:08:05	19	0.7	1.3	Block 1	
1	S	19:25:42	19:26:40	0:00:58	19	0.7	1.3	Block 1 - Manual Stop	
								TM1B Error/ALS Warning SOW is	
								not being updated	
								Reebooted 8170 s turns 4 green	
								Over CORS INWB 19:52:03	
1	S	20:26:33	20:35:08	0:08:35	19	0.7	1.2	Reflight	
								Over CORS INWB 20:53:06	
								622/123 gb	
↑ Times entered are Zulu / GMT ↑				Total Time On Line				Verify S-Turns After Mission	Yes X No

Additional Comments:

Drive #

Block 1

156

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/1/2017	91	77391		in

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
SMITH	N475RC	862.2	12:03:00	16:03:00	
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
RADER	ALS 8194	868.5	6:21:00	22:21:00	

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	day
350/9	10			4	2	3017		Arriving	day

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	x	B	

Air Speed	AGL	MSL	Waveform Used	Waveform Mode	Pre-Trigger Dist.
150 Kts	7800 Ft	8346 Ft	Yes [ ] No [ ]	@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
↕ Times entered are Zulu / GMT ↕								Verify S-Turns Before Mission Yes X No
20	n	16:55:00	17:09:00	0:14:00	18	0.6	1.1	cors inab clds wp 11,10
19	s	17:11:00	17:25:00	0:14:00	19	0.6	1.1	clds wp 12
18	n	17:27:00	17:41:00	0:14:00	19	0.6	1.1	
17	s	17:43:00	17:57:00	0:14:00	21	0.6	1.1	
16	n	17:59:00	18:13:00	0:14:00	21	0.6	1.1	
15	s	18:15:00	18:29:00	0:14:00	20	0.6	1.2	
14	n	18:31:00	18:45:00	0:14:00	21	0.6	1.1	
19	s	18:48:00	18:49:00	0:01:00	21	0.6	1.1	reflt wp12
20	n	18:51:00	18:52:00	0:01:00	21	0.6	1.1	reflt wp11,10
13	s	18:57:00	19:11:00	0:14:00	20	0.6	1.1	
33	n	19:17:00	19:18:00	0:01:00	18	0.6	1.5	reflt wp68-65
84	n	19:32:00	19:33:00	0:01:00	17	0.6	1.7	reflt wp 13-10
50	s	19:51:00	20:03:00	0:12:00	18	0.6	1.3	in blk 2 clds wp 19,29-31,37
49	n	20:05:00	20:17:00	0:12:00	19	0.6	1.2	clds wp 43.42
48	s	20:19:00	20:30:00	0:11:00	19	0.6	1.2	
51	n	20:32:00	20:44:00	0:12:00	19	0.6	1.1	clds wp 35
52	s	20:46:00	20:57:00	0:11:00	19	0.6	1.1	
53	n	21:00:00	21:10:00	0:10:00	20	0.6	1.2	
54	s	21:12:00	21:21:00	0:09:00	20	0.6	1.1	
55	n	21:23:00	21:33:00	0:10:00	20	0.6	1.1	
56	s	21:35:00	21:45:00	0:10:00	19	0.6	1.4	
↑ Times entered are Zulu / GMT ↑				Page		1		Verify S-Turns After Mission Yes X No

Additional Comments: Drive #

Blocks 1, 2

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/2/2017	92	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
SMITH	N475RC	868.5	9:19:00	13:19:00	
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
RADER	ALS 8194	876.0	4:54:00	20:54:00	

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud		
130/5	10			5	3	3024		Departing	day
								Arriving	day

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	x	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
150	Kts	7800	Ft	8346	Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	
↕ Times entered are Zulu / GMT ↕								Verify S-Turns Before Mission	Yes x No
68	n	13:59:00	14:14:00	0:15:00	19	0.6	1.2	cors inab	
67	s	14:16:00	14:31:00	0:15:00	21	0.6	1		
66	n	14:33:00	14:48:00	0:15:00	19	0.6	1		
65	s	14:52:00	15:05:00	0:13:00	17	0.6	1.1		
64	n	15:07:00	15:19:00	0:12:00	17	0.6	1.2		
63	s	15:23:00	15:33:00	0:10:00	17	0.6	1.3		
62	n	15:35:00	15:44:00	0:09:00	18	0.6	1.2		
61	s	15:46:00	15:56:00	0:10:00	18	0.6	1.2		
60	n	15:58:00	16:08:00	0:10:00	18	0.6	1.2	lt precip n end	
59	s	16:10:00	16:20:00	0:10:00	17	0.6	1.4		
58	n	16:22:00	16:31:00	0:09:00	16	0.6	1.4		
57	s	16:33:00	16:43:00	0:10:00	19	0.6	1.1		
49	n	16:48:00	16:51:00	0:03:00	18	0.6	1.1	reflt wp 43,42	
50	s	16:57:00	17:00:00	0:03:00	19	0.6	1.1	reflt wp 19,30,31	
51	n	17:03:00	17:04:00	0:01:00	18	0.6	1.2	reflt wp 35	
47	n	17:12:00	17:23:00	0:11:00	20	0.6	1		
46	s	17:26:00	17:37:00	0:11:00	19	0.6	1.1		
45	n	17:39:00	17:51:00	0:12:00	20	0.6	1.1		
44	s	17:53:00	18:04:00	0:11:00	19	0.6	1.1		
43	n	18:06:00	18:18:00	0:12:00	19	0.6	1.1		
42	s	18:20:00	18:33:00	0:13:00	18	0.6	1.2		
41	n	18:35:00	18:47:00	0:12:00	19	0.6	1.1		
9	s	18:57:00	19:09:00	0:12:00	17	0.6	1.3		
8	n	19:11:00	19:16:00	0:05:00	16	0.6	1.6		
7	s	19:18:00	19:24:00	0:06:00	16	0.6	1.6		
6	n	19:26:00	19:31:00	0:05:00	15	0.6	1.7		
5	s	19:33:00	19:39:00	0:06:00	15	0.6	1.6		
4	n	19:41:00	19:47:00	0:06:00	18	0.6	1.2		
3	s	19:50:00	19:55:00	0:05:00	17	0.6	1.3		
2	n	19:57:00	20:02:00	0:05:00	18	0.6	1.2		
1	s	20:04:00	20:08:00	0:04:00	18	0.6	1.2		
↑ Times entered are Zulu / GMT ↑				Page		1		Verify S-Turns After Mission	Yes x No

Additional Comments:

Drive #

Block 2

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/2/2017	92	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
SMITH	N475RC	868.5	9:19:00	13:19:00	
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
RADER	ALS 8194	876.0	4:54:00	20:54:00	

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	day
130/5	10			5	3	3024		Arriving	day

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.
150	Kts	7800	Ft	8346	Ft	Yes		No		@	NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission Yes No
34	**s**	**20:23:00**	**20:25:00**	**0:02:00**	**18**	**0.6**	**1.2**	**blk3 reflt wp 33-37**
↑ Times entered are Zulu / GMT ↑				**Page**		**2**		Verify S-Turns After Mission Yes No

Additional Comments:

Block 3

Drive #

Woolpert

Leica ALS80	DD/MM/YEAR	Day of Year	Project #	Phase #	Project Name
	4/2/2017	92	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Galambos	N6255Q	569.8	10:12:00	14:12:00	WOOLPERT PIN
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**		**PID**
Swain	ALS 8170	575.5	2:40:00	18:40:00	KDAY

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud		
130 6	9	250 bkn		5	3	30.24		Departing	KDAY
								Arriving	KOKK

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain	255	Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	3	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
150	Kts	7800	Ft	8510	Ft	Yes		No	X	@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	12:58:26
↕ Times entered are Zulu / GMT ↕								Verify S-Turns Before Mission	Yes X No
								Flight "A"/ TAKEOFF: 1317Z	
40	N	14:12:49	14:25:35	0:12:46	17	0.7	1.1	Over CORS:INPR 13:49:40	
39	S	14:27:33	14:40:15	0:12:42	17	0.7	1.1	OC60 malufunction, controlling	
38	N	14:43:12	14:47:50	0:04:38	17	0.7	1.1	ALS with Pilot Display	
37	S	15:01:16	15:15:57	0:14:41	19	0.6	1.1		
36	N	15:18:08	15:32:54	0:14:46	19	0.6	1.1	INPR Cors: N40 49 09.97	
35	S	15:35:01	15:49:37	0:14:36	19	0.6	1.1	W 086 07 38.49	
34	N	15:51:49	16:06:26	0:14:37	19	0.6	1.1		
33	S	16:08:55	16:23:30	0:14:35	19	0.6	1.1		
32	N	16:25:33	16:40:09	0:14:36	19	0.6	1.1		
31	S	16:42:26	16:57:01	0:14:35	19	0.7	1.3		
30	N	16:59:20	17:14:03	0:14:43	19	0.7	1.3		
29	S	17:16:07	17:30:54	0:14:47	19	0.7	1.3		
28	N	17:33:25	17:47:51	0:14:26	19	0.7	1.3		
27	S	17:50:11	18:05:00	0:14:49	19	0.7	1.3		
26	N	18:07:29	18:22:00	0:14:31	19	0.7	1.3		
25	S	18:24:51	18:39:42	0:14:51	19	0.7	1.3		
								Over CORS:INPR 18:48:28	
↑ Times entered are Zulu / GMT ↑				Total Time On Line				Verify S-Turns After Mission	Yes X No

Additional Comments:

Drive #

Block 2

134

Woolpert

Leica ALS80	DD/MM/YEAR	Day of Year	Project #	Phase #	Project Name
	4/2/2017	92	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Galambos	N6255Q	575.5	4:01:00	20:01:00	WOOLPERT PIN
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**		**PID**
Swain	ALS 8170	578.4	5:39:00	21:39:00	KDAY

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KOKK
130 10	10	Clear		15	6	30.1		Arriving	KDAY

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain	255	Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	3	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
150	Kts	7800	Ft	8510	Ft	Yes		No	X	@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	19:34:43
↕ Times entered are Zulu / GMT ↕								Verify S-Turns Before Mission	Yes X No
								Flight "B" Takeoff 1937z	
24	**N**	**20:01:48**	**20:16:30**	**0:14:42**	**17**	**0.7**	**1.1**	**CORS INPR N40 49 09.97**	
23	**S**	**20:18:13**	**20:32:58**	**0:14:45**	**17**	**0.7**	**1.1**	**W 086 07 38.49**	
22	**N**	**20:35:00**	**20:49:32**	**0:14:32**	**17**	**0.7**	**1.1**	**Over CORS: 19:46:50**	
21	**S**	**20:51:36**	**21:06:20**	**0:14:44**	**19**	**0.6**	**1.1**		
20	**N**	**21:08:04**	**21:22:37**	**0:14:33**	**19**	**0.6**	**1.1**		
19	**S**	**21:24:37**	**21:39:31**	**0:14:54**	**19**	**0.6**	**1.1**		
								Over CORS: 21:47;48	

↑ Times entered are Zulu / GMT ↑			Total Time On Line	Verify S-Turns After Mission	Yes X No

Additional Comments:

Drive #

Block 2

134

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/8/2017	98	77391		in blk 4

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
SMITH	N475RC	876.0	9:46:00	13:46:00	
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
GEBHART	ALS 8194	882.7	4:23:00	20:23:00	

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud		
310/6	10			4	-4	3014		Departing	day
								Arriving	day

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	x	B	

Air Speed	AGL	MSL	Waveform Used				Waveform Mode	Pre-Trigger Dist.
150 Kts	7800 Ft	8327 Ft	Yes		No		@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
↕ Times entered are Zulu / GMT ↕								Verify S-Turns Before Mission Yes x No
115	s	14:17:00	14:28:00	0:11:00	19	0.6	1	cors inlb
114	n	14:30:00	14:41:00	0:11:00	19	0.6	1	
113	s	14:44:00	14:54:00	0:10:00	18	0.6	1.4	
112	n	14:57:00	15:08:00	0:11:00	18	0.6	1.3	
111	s	15:10:00	15:21:00	0:11:00	19	0.6	1.1	
110	n	15:23:00	15:34:00	0:11:00	18	0.6	1.2	
109	s	15:37:00	15:47:00	0:10:00	18	0.6	1.2	
108	n	15:50:00	16:01:00	0:11:00	16	0.6	1.4	
107	s	16:04:00	16:15:00	0:11:00	18	0.6	1.1	
106	n	16:18:00	16:29:00	0:11:00	17	0.6	1.2	
105	s	16:32:00	16:43:00	0:11:00	18	0.6	1.1	
104	n	16:46:00	16:56:00	0:10:00	19	0.6	1	
103	s	16:59:00	17:10:00	0:11:00	18	0.6	1.1	
102	n	17:13:00	17:23:00	0:10:00	19	0.6	1.1	
101	s	17:27:00	17:36:00	0:09:00	19	0.6	1.1	
100	n	17:40:00	17:50:00	0:10:00	21	0.6	1.1	
99	s	17:53:00	18:03:00	0:10:00	20	0.6	1.2	
98	n	18:07:00	18:17:00	0:10:00	20	0.6	1.1	
97	s	18:20:00	18:30:00	0:10:00	20	0.6	1.2	
96	n	18:33:00	18:44:00	0:11:00	19	0.6	1.3	
95	s	18:47:00	18:57:00	0:10:00	19	0.6	1.2	
94	n	19:00:00	19:10:00	0:10:00	17	0.6	1.6	
93	s	19:13:00	19:23:00	0:10:00	18	0.6	1.4	
92	n	19:27:00	19:37:00	0:10:00	19	0.6	1.2	
91	s	19:40:00	19:50:00	0:10:00	20	0.6	1.1	
↑ Times entered are Zulu / GMT ↑				Page		1		Verify S-Turns After Mission Yes x No

Additional Comments: Drive #

Block 4

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/9/2017	99	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Other	N475RC	882.7	9:41:00	13:41:00	
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
GEBHART	ALS 8194	888.1	3:15:00	19:15:00	

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud		
220/8	10			13	-2	3005		Departing	day
								Arriving	day

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	x	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode	Pre-Trigger Dist.	
150	Kts	7800	Ft	8327	Ft	Yes		No		@ NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments				
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:				
↕ Times entered are Zulu / GMT ↕								Verify S-Turns Before Mission	Yes	x	No	
90	s	14:13:00	14:25:00	0:12:00	19	0.6	1	cors inlb				
89	n	14:27:00	14:38:00	0:11:00	19	0.6	1.1					
88	s	14:42:00	14:55:00	0:13:00	18	0.6	1.1					
87	n	14:57:00	15:14:00	0:17:00	17	0.6	1.3					
86	s	15:18:00	15:38:00	0:20:00	19	0.6	1.1					
85	n	15:41:00	15:59:00	0:18:00	17	0.6	1.1					
84	s	16:01:00	16:23:00	0:22:00	19	0.6	1.1					
83	n	16:26:00	16:45:00	0:19:00	19	0.6	1.1					
82	s	16:48:00	17:10:00	0:22:00	19	0.6	1					
81	n	17:13:00	17:31:00	0:18:00	20	0.6	1.1					
80	s	17:35:00	17:57:00	0:22:00	19	0.6	1.2					
79	n	18:00:00	18:19:00	0:19:00	20	0.6	1.1					
78	s	18:23:00	18:45:00	0:22:00	19	0.6	1.1					
↑ Times entered are Zulu / GMT ↑				Page		1		Verify S-Turns After Mission	Yes	x	No	

Additional Comments:

Drive #

Block 4

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/9/2017	99	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Starbuck	N6255Q	587.3	9:53:00	13:53:00	DAY
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
Alaska Bob	8170	591.4	2:15	18:15	DAY

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	PLD
180/14	10	1,200		15	-1	2999		Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
				Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi		B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
	Kts		Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
↕ Times entered are Zulu / GMT ↕								Verify S-Turns Before Mission Yes No
10	N	15:01:00	15:13:45	0:12:45	18	0.7	1.2	
11	S	15:18:57	15:33:47	0:14:50	18	0.6	1.1	
12	N	15:49:40	16:02:02	0:12:22	17	0.7	1.3	
13	S	16:08:39	16:22:57	0:14:18	17	0.7	1.2	
14	N	16:28:52	16:41:14	0:12:22	18	0.7	1.2	
15	S	16:46:20	17:00:14	0:13:54	19	0.6	1.1	
16	N	17:16:20	17:31:37	0:15:17	19	0.6	1.2	
17	S	17:34:25	17:39:25	0:05:00	21	0.6	1.2	Clouds broke off from line
↑ Times entered are Zulu / GMT ↑				Page		1		Verify S-Turns After Mission Yes Y No

Additional Comments: Drive #

This was a reflight mission for IND BLOCK 2

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/9/2017	99	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Starbuck	N655Q	591.4	2:50:00	18:50:00	DAY
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
Alaska Bob	8170	595.9	7:33	20:33	DAY

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
200/15	10			24	10	2985		Arriving	PLD

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
				Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi		B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
	Kts		Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	
↕ Times entered are Zulu / GMT ↕								Verify S-Turns Before Mission	Yes / No
75	S	19:39:08	20:02:07	0:22:59	21	0.6	1.1		
74	N	20:09:01	20:30:27	0:21:26	21	0.6	1.1		
73	S	20:36:55	20:59:10	0:22:15	20	0.6	1.2		
72	N	21:07:02	21:28:07	0:21:05	17	0.7	1.4		
71	S	21:33:03	21:54:15	0:21:12	20	0.7	1.1		
70	N	22:00:36	22:20:48	0:20:12	18	0.8	1.2		
69	S	22:24:47	22:45:46	0:20:59	17	0.8	1.3		
68	N	22:50:52	23:12:03	0:21:11	17	0.7	1.2		

↑ Times entered are Zulu / GMT ↑		Page	1	Verify S-Turns After Mission	Yes / No

Additional Comments: Drive #

Block 4

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/12/2017	102	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N7268P				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 314				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
135	Kts	6,057	Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
132		21:34:53	21:50:39	0:15:46				
133		21:54:44	22:10:26	0:15:42				
134		22:14:19	22:30:32	0:16:13				
135		22:34:44	22:50:11	0:15:27				
136		22:53:59	23:09:32	0:15:33				
137		23:13:36	23:29:11	0:15:35				
138		23:32:50	23:48:21	0:15:31				
145		23:56:53	0:04:52	0:07:59				

		↑ Times entered are Zulu / GMT ↑		Page	1	Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Mission ID 10698 - Area 1

Woolpert

Leica ALS80	DD/MM/YEAR	Day of Year	Project #	Phase #	Project Name
	4/12/2017	102	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Galambos	N404CP	5980.8	10:13:00	14:13:00	CORS
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**		**PID**
Rader	8191		1:37:00	17:37:00	INSB

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KDAY
300 9	10	Clear		9	6	30.35		Arriving	KDAY

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain	255	Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	3	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
150	Kts	7800	Ft	8510	Ft	Yes		No	X	@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	13:27:22
↕ Times entered are Zulu / GMT ↕								Verify S-Turns Before Mission	Yes X No
								TAKEOFF: 1431Z	
								INSB N39 52 01 W 084 56 27	
								Over INSB 13:56:29	
77	S	14:13:34	14:32:00	0:18:26	16	0.7	1.3	BLOCK 4	
76	N	14:34:54	14:53:46	0:18:52	17	0.8	1.2	BLOCK 4	
147	W	15:18:06	15:34:24	0:16:18	17	0.8	1.2	BLOCK 2	
18	N	15:45:28	16:00:21	0:14:53	16	0.8	1.2	BLOCK 2 - Cross-flight	
17	S	16:02:37	16:16;44	#VALUE!	18	0.7	1	BLOCK 2	
35	S	16:31:48	16:51:44	0:19:56	20	0.6	1.1	BLOCK 4	
34	N	16:53:50	17:14:52	0:21:02	20	0.6	1.1	BLOCK 4	
33	S	17:17:28	17:37:21	0:19:53	21	0.6	1.1	BLOCK 4	
								Over INSB @ 18:04:19	
								Approx 70 GB of Data	

↑ Times entered are Zulu / GMT ↑			Total Time On Line	Verify S-Turns After Mission	Yes	X	No	
Additional Comments:								Drive #
Blocks 2, 4								133

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/12/2017	102	77391	2	IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
SMITH	N475RC	889.4	9:11:00	13:11:00	
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
GEBHART	ALS 8194	896.8	4:33:00	20:33:00	

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	day
	10							Arriving	day

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
40	36	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	x	B	

Air Speed	AGL	MSL	Waveform Used				Waveform Mode	Pre-Trigger Dist.
150 Kts	7800 Ft	8327 Ft	Yes		No		@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission Yes x No
50	s	13:54:00	14:14:00	0:20:00	18	0.6	1	cors inlb clds wp89-91
49	n	14:17:00	14:37:00	0:20:00	16	0.6	1.2	clds wp 87,86
48	s	14:40:00	14:59:00	0:19:00	16	0.6	1.3	
47	n	15:02:00	15:22:00	0:20:00	18	0.6	1.1	
46	s	15:26:00	15:46:00	0:20:00	17	0.6	1.2	
45	n	15:49:00	16:10:00	0:21:00	16	0.6	1.4	
44	s	16:14:00	16:33:00	0:19:00	18	0.6	1.1	
43	n	16:36:00	16:57:00	0:21:00	18	0.6	1.1	
42	s	17:00:00	17:21:00	0:21:00	19	0.6	1.2	
41	n	17:24:00	17:46:00	0:22:00	19	0.6	1.2	
40	s	17:50:00	18:11:00	0:21:00	19	0.6	1.1	
39	n	18:14:00	18:36:00	0:22:00	17	0.6	1.2	
38	s	18:39:00	19:00:00	0:21:00	16	0.6	1.5	
37	n	19:03:00	19:24:00	0:21:00	18	0.6	1.2	
36	s	19:28:00	19:48:00	0:20:00	18	0.6	1.2	
117	e	20:04:00	20:19:00	0:15:00	19	0.6	1.2	
↑ Times entered are Zulu / GMT ↑			Page		1			Verify S-Turns After Mission Yes x No

Additional Comments: Drive #

Block 4

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/12/2017	102	77391	2	Indiana Statewide

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Denham	N6255Q	596.3	9:05:00	13:05:00	NGS
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
Other	ALS-8170	605.9	7:53:00	23:53:00	INSB

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KDAY
								Arriving	KDAY

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
40	35.5	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi		B	

Air Speed	AGL	MSL	Waveform Used				Waveform Mode	Pre-Trigger Dist.
150 Kts	7800 Ft	8330 Ft	Yes		No		@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	PDOP	Kts	Alt.	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	n/a	GPS Began Logging At: CORS
		↕ Times entered are Zulu / GMT ↕							Verify S-Turns Before Mission Yes X No
									Take Off: 9:20
67	S	13:58:00	14:19:00	0:21:00	19	1	157	8248	
66	N	14:25:00	14:48:00	0:23:00	17	1.3	138	8303	
65	S	14:51:00	15:13:00	0:22:00	17	1.3	154	8275	
64	N	15:17:00	15:40:00	0:23:00	17	1.2	140	8337	
63	S	15:44:00	16:05:00	0:21:00	16	1.4	160	8255	
62	N	16:10:00	16:33:00	0:23:00	18	1.1	146	8288	
61	S	16:37:00	16:58:00	0:21:00	18	1.1	161	8267	
60	N	17:03:00	17:28:00	0:25:00	19	1.2	130	8286	
59	S	17:35:00	17:53:00	0:18:00	20	1.2	156	8270	
58	N	19:59:00	20:20:00	0:21:00	18	1.2	132	8268	
57	S	20:23:00	20:42:00	0:19:00	21	1	150	8271	
56	N	20:48:00	21:09:00	0:21:00	18	1.3	139	8324	
55	S	21:12:00	21:30:00	0:18:00	18	1.2	156	8296	
54	N	21:34:00	21:55:00	0:21:00	17	1.2	141	8283	
53	S	21:59:00	22:17:00	0:18:00	16	1.2	154	8269	
52	N	22:22:00	22:43:00	0:21:00	17	1.2	141	8302	
51	S	22:46:00	23:05:00	0:19:00	17	1.2	157	8292	
↑ Times entered are Zulu / GMT ↑			Page		1				Verify S-Turns After Mission Yes X No

Additional Comments:

Drive #

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/12/2017	103	77391	2	2017 Indiana Statewide

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Denham	N475RC	896.8	9:32:00	13:32:00	NGS
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
Other	ALS-8194	900.8	1:46:00	17:46:00	INLB

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KDAY
110 / 11	10	15000	SCT	11		30.37		Arriving	KDAY

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
40	35.5	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi		B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
150	Kts	7800	Ft	8330	Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	PDOP	Kts	Alt.	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	n/a	GPS Began Logging At:	CORS
		↕ Times entered are Zulu / GMT ↕							Verify S-Turns Before Mission	Yes X No
									Take Off: 9:40	
1	S	14:36:00	14:44:00	0:08:00	16	1.4	151	8346		
2	N	14:47:00	14:55:00	0:08:00	17	1.3	156	8330		
3	S	14:58:00	15:06:00	0:08:00	18	1.1	148	8329		
4	N	15:09:00	15:17:00	0:08:00	17	1.2	152	8358		
5	S	15:20:00	15:28:00	0:08:00	17	1.2	151	8362		
6	N	15:31:00	15:38:00	0:07:00	16	1.4	142	8340		
7	S	15:41:00	15:48:00	0:07:00	16	1.4	148	8322		
8	N	15:51:00	15:58:00	0:07:00	16	1.4	153	8324		
9	S	16:01:00	16:09:00	0:08:00	16	1.2	148	8300		
10	N	16:13:00	16:27:00	0:14:00	17	1.2	155	8345		
11	S	16:30:00	16:44:00	0:14:00	18	1.1	142	8319		
12	N	16:48:00	17:02:00	0:14:00	19	1.1	145	8309		

↑ Times entered are Zulu / GMT ↑		Page	1	Verify S-Turns After Mission	Yes	X	No	

Additional Comments: Drive #

BLOCK 4

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/13/2017	103	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N7268P				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 314				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
135	Kts	6,057	Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
149		13:41:29	13:57:06	0:15:37				
150		14:01:21	14:16:18	0:14:57				
151		14:20:43	14:36:41	0:15:58				
152		14:40:51	14:55:51	0:15:00				
153		15:00:05	15:15:54	0:15:49				
154		15:20:25	15:35:21	0:14:56				
155		15:40:04	15:55:48	0:15:44				
156		15:59:59	16:15:01	0:15:02				
157		16:19:38	16:35:03	0:15:25				
158		16:39:55	16:55:16	0:15:21				
159		17:00:07	17:16:09	0:16:02				
160		17:21:05	17:37:04	0:15:59				
161		17:42:08	17:55:07	0:12:59				
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments:

Drive #

Mission ID 10706 - Area 1

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/13/2017	103	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N7268P				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 314				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
135	Kts	6,057	Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
162		21:19:02	21:33:41	0:14:39				
163		21:39:04	21:54:14	0:15:10				
164		21:58:12	22:13:23	0:15:11				
167		22:19:35	22:23:53	0:04:18				
172		22:32:32	22:48:07	0:15:35				
173		22:51:55	23:06:51	0:14:56				
174		23:11:26	23:22:10	0:10:44				
174		23:30:40	23:37:17	0:06:37				
175		23:47:42	0:02:25	0:14:43				
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Mission ID 10706 - Area 1

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/14/2017	104	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N7268P				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 314				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed	AGL	MSL	Waveform Used				Waveform Mode	Pre-Trigger Dist.
135 Kts	6,057 Ft	Ft	Yes		No		@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
185		13:00:09	13:14:06	0:13:57				
186		13:16:40	13:31:28	0:14:48				
194		13:36:37	13:51:44	0:15:07				
193		13:54:15	14:10:02	0:15:47				
192		14:12:29	14:27:49	0:15:20				
191		14:30:14	14:45:15	0:15:01				
190		14:47:40	15:02:24	0:14:44				
189		15:04:51	15:20:20	0:15:29				
188		15:23:14	15:38:05	0:14:51				
187		15:40:30	15:55:04	0:14:34				
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Mission ID 10709 - Area 3 North

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/14/2017	104	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N7268P				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 314				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
135	Kts	6,057	Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
68		18:48:17	18:53:02	0:04:45				
67		18:56:37	19:01:51	0:05:14				
98		19:13:14	19:19:50	0:06:36				
99		19:22:09	19:29:10	0:07:01				
100		19:32:44	19:36:39	0:03:55				
101		19:39:07	19:43:25	0:04:18				
110		19:49:07	19:54:10	0:05:03				
111		19:56:31	20:01:36	0:05:05				
271		20:08:11	20:15:01	0:06:50				
266		20:20:15	20:23:57	0:03:42				
265		20:28:18	20:34:24	0:06:06				
264		20:36:29	20:45:10	0:08:41				
263		20:47:11	20:56:33	0:09:22				
262		20:58:59	21:08:17	0:09:18				
261		21:10:25	21:20:53	0:10:28				
260		21:22:54	21:32:54	0:10:00				
259		21:35:00	21:46:23	0:11:23				
258		21:48:47	21:58:47	0:10:00				
257		22:00:53	22:12:40	0:11:47				
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments:

Drive #

Mission ID 10709 - Area 3 North

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/15/2017	105	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N7268P				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 314				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
135	Kts	6,057	Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments				
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:				
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission	Yes	X	No	
94		14:41:07	14:50:25	0:09:18								
93		14:53:16	14:59:51	0:06:35								
256		15:12:17	15:22:17	0:10:00								
255		15:24:12	15:38:25	0:14:13								
254		15:41:02	15:51:17	0:10:15								
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission	Yes	X	No	

Additional Comments: Drive #

Mission ID 10714 - Area 2

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/15/2017	105	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N7268P				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 314				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
135	Kts	6,057	Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission	Yes X No
253		20:24:27	20:35:11	0:10:44					
252		20:37:27	20:50:43	0:13:16					
251		20:53:45	21:04:38	0:10:53					
250		21:06:33	21:19:17	0:12:44					
249		21:21:43	21:32:12	0:10:29					
254		21:35:03	21:38:05	0:03:02					
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission	Yes X No

Additional Comments:

Drive #

Mission ID 10714 - Area 2

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	12/21/2017	355	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Meyer	N475RC	1134.9	9:46:00	14:46:00	CORS
Pilot	**Sensor Type**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
Ray Larocque	ALS80 8194	1138.7	1:52	18:52	

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	DAY
080/5	10	Sct 090	10%	-2	-5	30.11	N/A	Arriving	DAY

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
40	35.5	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi		B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode	Pre-Trigger Dist.	
150	Kts	7800	Ft	8330	Ft	Yes		No		@ NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments		
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:		
↕ Times entered are Zulu / GMT ↕								Verify S-Turns Before Mission	Yes	No
50	N	15:39:15	15:41:35	0:02:20	20		1.1	Waypoint 91 to 82		
49	S	15:45:06	15:49:43	0:04:37	17		1.2	Waypoint 76 to 91		
32	N	15:56:59	16:18:24	0:21:25	18		1.2			
31	S	16:25:39	16:41:34	0:15:55	19		1.2			
30	N	16:44:26	16:58:59	0:14:33	20		1.1	Offline to left		
29	S	17:02:50	17:18:38	0:15:48	21		1.1			
28	N	17:21:38	17:36:00	0:14:22	21		1.1			
27	S	17:39:43	17:55:36	0:15:53	20		1.1			
26	N	17:58:39	18:12:55	0:14:16	21		1.1			
↑ Times entered are Zulu / GMT ↑				Page		1		Verify S-Turns After Mission	Yes	No

Additional Comments:

Drive #

Block 4

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/3/2018	62	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Kat	475RC	1210.5	16:30:00	21:30:00	
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
Dave	ALS 8130	1214	20:15	1:15	

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
4010								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
40	35.5	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi		B	

Air Speed	AGL	MSL	Waveform Used	Waveform Mode	Pre-Trigger Dist.
150 Kts	7800 Ft	8330 Ft	Yes ☐ No ☐	@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
25	185	22:18:00	22:32:00	0:14:00	20		1.1	
24	004	22:34:00	22:49:00	0:15:00	20		1.3	
23	185	22:51:00	23:05:00	0:14:00	20		1.2	
22	004	23:08:00	23:22:00	0:14:00	20		1.2	
21	184	23:24:00	23:38:00	0:14:00	20		1.1	
20	004	23:41:00	23:55:00	0:14:00	16		1.5	
19	184	23:57:00	0:11:00	0:14:00	18		1.2	
116	094	0:22:00	0:35:00	0:13:00	12		1.2	
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Block 4 Flight 1

Woolpert

Leica LIDAR	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/4/2018	63	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
Kat	475RC	1217.0	16:20:00	21:20:00	
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
Dave	ALS 8130	1220	19:25	0:25	

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	KDAY
090/07	10	SKC	0	7	M05			Arriving	KDAY

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
40	35.5	346	100	Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi		B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
150	Kts	7800	Ft	8330	Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission	Yes X No
18	004	22:08:00	22:22:00	0:14:00	21		1.1		
17	184	22:24:00	22:37:00	0:13:00	20		1.1		
16	004	22:39:00	22:53:00	0:14:00	19		1.3		
15	184	22:55:00	23:09:00	0:14:00	19		1.2		
14	004	23:11:00	23:25:00	0:14:00	19		1.1		
13	184	23:27:00	23:41:00	0:14:00	18		1.3		
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission	Yes X No

Additional Comments: Drive #

Block 4 Flight 2

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/11/2018	70	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N72695				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 5060382				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed	AGL	MSL	Waveform Used				Waveform Mode	Pre-Trigger Dist.
135 Kts	6,057 Ft	Ft	Yes		No		@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
321		14:12:11	14:16:02	0:03:51				
320		14:19:27	14:24:59	0:05:32				
275		14:30:20	14:34:33	0:04:13				
319		14:41:08	14:42:25	0:01:17				
319		14:48:07	15:01:06	0:12:59				
318		15:10:05	15:27:42	0:17:37				
317		15:31:57	15:50:33	0:18:36				
316		15:53:44	16:11:41	0:17:57				
274		16:16:56	16:24:00	0:07:04				
315		19:17:11	19:29:43	0:12:32				
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Mission ID 11801 - Area 3 Remaining

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/12/2018	71	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N72695				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 5060382				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed	AGL	MSL	Waveform Used				Waveform Mode	Pre-Trigger Dist.
135 Kts	6,057 Ft	Ft	Yes		No		@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
315		11:46:12	12:07:14	0:21:02				
315		12:13:41	12:16:26	0:02:45				
314		12:19:17	12:37:40	0:18:23				
313		12:42:17	13:04:48	0:22:31				
312		13:08:07	13:25:52	0:17:45				
311		13:29:46	13:52:43	0:22:57				
310		13:57:06	14:14:47	0:17:41				
309		14:19:32	14:41:58	0:22:26				
308		14:44:32	15:03:00	0:18:28				
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Mission ID 11806 - Area 3 Remaining

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/14/2018	73	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N72695				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 5060382				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
135	Kts	6,057	Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments				
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:				
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission	Yes	X	No	
279		20:03:24	20:19:48	0:16:24								
280		20:23:31	20:46:23	0:22:52								
281		20:49:58	21:07:32	0:17:34								
282		21:11:44	21:34:04	0:22:20								
278		21:41:01	21:47:52	0:06:51								
283		21:55:56	22:13:26	0:17:30								
273		22:21:35	22:27:02	0:05:27								
284		22:32:04	22:54:58	0:22:54								
285		22:57:47	23:16:33	0:18:46								
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission	Yes	X	No	

Additional Comments: Drive #

Mission ID 11819 - Area 3 Remaining

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/15/2018	74	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N72695				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 5060382				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
135	Kts	6,057	Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
286		14:13:32	14:33:04	0:19:32				
287		14:37:50	15:06:36	0:28:46				
288		15:10:23	15:31:07	0:20:44				
289		15:36:40	16:01:59	0:25:19				

	↑ Times entered are Zulu / GMT ↑	Page	1	Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Mission ID 11822 - Area 3 Remaining

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	3/15/2018	74	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N72695				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 5060382				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
135	Kts	6,057	Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission	Yes X No
380		18:03:42	18:08:01	0:04:19					
375		18:13:35	18:16:26	0:02:51					
378		18:21:19	18:26:23	0:05:04					
376		18:29:14	18:33:16	0:04:02					
378		18:36:19	18:40:07	0:03:48					
377		18:43:55	18:47:41	0:03:46					
381		18:50:59	18:55:23	0:04:24					
289		19:27:34	19:32:27	0:04:53					
290		19:43:35	20:04:07	0:20:32					
291		20:10:00	20:38:02	0:28:02					
292		20:42:19	21:03:55	0:21:36					
293		21:08:38	21:35:53	0:27:15					
276		21:46:20	22:05:25	0:19:05					
294		22:16:40	22:37:55	0:21:15					
272		22:44:12	22:53:45	0:09:33					
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission	Yes X No

Additional Comments: Drive #

Mission ID 11822 - Area 3 Remaining

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/12/2018	102	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N27EH				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 5060406				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed	AGL	MSL	Waveform Used				Waveform Mode	Pre-Trigger Dist.
135 Kts	6,057 Ft	Ft	Yes		No		@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
307		14:04:17	14:22:39	0:18:22				
306		14:27:34	14:45:35	0:18:01				
305		14:50:10	15:09:29	0:19:19				
277		15:16:15	15:24:01	0:07:46				
304		15:29:21	15:47:16	0:17:55				
303		15:52:14	16:11:08	0:18:54				
302		16:15:04	16:33:32	0:18:28				
301		18:23:00	18:24:35	0:01:35				
301		18:30:29	18:52:11	0:21:42				
300		19:05:01	19:09:11	0:04:10				
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Mission ID 11934 - Area 3 Remaining

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/13/2018	103	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N27EH				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 5060406				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed	AGL	MSL	Waveform Used				Waveform Mode	Pre-Trigger Dist.
135 Kts	6,057 Ft	Ft	Yes		No		@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
302		13:33:26	13:38:57	0:05:31				
301		13:51:23	14:10:56	0:19:33				
300		14:17:05	14:36:45	0:19:40				
299		14:43:16	15:04:46	0:21:30				
298		15:09:26	15:28:22	0:18:56				
297		15:32:55	15:53:26	0:20:31				
296		15:56:48	15:57:43	0:00:55				
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Mission ID 11941 - Area 3 Remaining

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/21/2018	111	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N72695				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 5060382				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed	AGL	MSL	Waveform Used				Waveform Mode	Pre-Trigger Dist.
135 Kts	6,057 Ft	Ft	Yes		No		@ NS	Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission: Yes X No
296		0:08:44	0:11:01	0:02:17				
296		0:17:30	0:37:16	0:19:46				
295		0:41:07	1:01:27	0:20:20				

		↑ Times entered are Zulu / GMT ↑	Page	1	Verify S-Turns After Mission: Yes X No

Additional Comments: Drive #

Mission ID 11965 - Reflight 1

Lidar Flight Log

	MM/DD/YEAR	Day of Year	Project #	Phase #	Project Name
	4/21/2018	111	77391		IN Indiana Statewide LiDAR 2017 B17

Operator	Aircraft	HOBBS Start	Local Start Time	ZULU Start Time	Base
	N72695				
Pilot	**Sensor Type/Number**	**HOBBS END**	**Local End Time**	**Zulu End Time**	**PID**
	Galaxy 5060382				

Wind Dir/Speed	Visibility	Ceiling	Cloud Cover %	Temp	Dew Point	Pressure	Haze/Fire/Cloud	Departing	
								Arriving	

Scan Angle (FOV)	Scan Frequency (Hz)	Pulse Rate (kHz)	Laser Power %	Fixed Gain		Mode		Threshold Values	
45	49.01			Gain - Course/Up		Single		A	
				Gain - Fine/Down		Multi	X	B	

Air Speed		AGL		MSL		Waveform Used				Waveform Mode		Pre-Trigger Dist.	
135	Kts	6,057	Ft		Ft	Yes		No		@	NS		Ft

Line #	Dir.	Line Start Time	Line End Time	Time On Line	SV's	HDOP	PDOP	Line Notes/Comments	
Test	n/a			n/a	n/a	n/a	n/a	GPS Began Logging At:	
		↕ Times entered are Zulu / GMT ↕						Verify S-Turns Before Mission	Yes X No
393		15:05:21	15:10:55	0:05:34					
395		15:15:33	15:17:21	0:01:48					
394		15:21:01	15:23:28	0:02:27					
392		15:26:55	15:28:48	0:01:53					
391		15:33:14	15:35:22	0:02:08					
390		15:39:34	15:41:38	0:02:04					
389		15:44:15	15:45:56	0:01:41					
384		15:50:00	15:51:39	0:01:39					
383		15:55:34	15:57:21	0:01:47					
382		16:01:40	16:03:16	0:01:36					
388		16:05:56	16:07:56	0:02:00					
385		16:14:36	16:16:33	0:01:57					
386		16:21:11	16:23:02	0:01:51					
387		16:28:01	16:29:52	0:01:51					
355		16:37:03	16:39:33	0:02:30					
354		16:43:35	16:45:55	0:02:20					
353		16:49:45	16:51:27	0:01:42					
		↑ Times entered are Zulu / GMT ↑		Page		1		Verify S-Turns After Mission	Yes X No

Additional Comments: Drive #

Mission ID 11971 - Reflight 12