GNS SCIENCE

ALPINE FAULT LIDAR 2015

VOLUME 25252A01NOK

Summary

Project

AAM was engaged by GNS Science to undertake a LiDAR survey on the West Coast of New Zealand - sites located between Hokitika River and Maruia River. The data was collected 22-25 September 2015, and is to be used for the study of the Alpine Fault.

Data

LiDAR data and other products supplied in this volume are as follows:

1. Classified point cloud as LAS 1.2
2. Orthoimagery RGB 15cm gsd, GeoTIFF tiles
3. Ancillary Files:
   - Trajectories as ESRI Shapefile
   - Tile Index Metadata as ESRI Shapefile
   - Project Extent as ESRI Shapefile

The vertical accuracy for this dataset is 0.15m RMS, and the horizontal accuracy is 0.5m RMS. This dataset is supplied in NZTM, vertical datum is NZVD2009.

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1. PROJECT REPORT

Safety: No safety Incidents were reported during the project

Acquisition: AAM was engaged by GNS Science to undertake a LiDAR survey and acquisition was flown on 22, 24 & 25 September 2015.

Ground Support: GPS base station support was sourced from GeoNet CORS. The ground check points acquired by Sounds Surveying allowed an assessment of the accuracy of the ALS data. Surveyed ellipsoidal heights were converted to NZVD09 orthometric heights using LINZ NZGeoid09. No local adjustment to benchmarks applied.

Data Processing: Reduction of the ALS data proceeded without any significant problems. Laser strikes were classified into ground and non-ground points using a single algorithm across the project area. Manual checking and editing of the data classification further improved the quality of the terrain model.

Data Presentation: The data provided on this volume has been supplied in accordance with a specification agreed with the primary client. Subsequent users experiencing difficulties in handling the data should please contact AAM to arrange a more appropriate data presentation.

Further Issues: There are no further issues to report.

Project Contacts:

Client	
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Company	
GNS Science	
AAM Account Manager	
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AAM Project Manager	
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AAM-MKS LiDAR Production Management	aam-mks-lidar-production-management@aamgroup.com

2. DATA INSTALLATION

Data formats	:	ESRI Shapefile, LAS 1.2
Number & type of media	:	Refer to File_Listing_25252A01NOK.txt
Information files on media	:	Readme_25252A01NOK.pdf File_Listing_25252A01NOK.txt
Data formatted on	:	18.11.2015
Disk volume	:	25252A01NOK

README FILE

This document (Readme_25252A01NOK.pdf) is provided as an Acrobat file in this volume. To open the file, double click on the PDF file to activate Acrobat Reader Software.

Adobe Acrobat Reader may be downloaded from:
http://www.adobe.com/products/acrobat/readstep2.html

LOADING NOTES

Data may be copied using a file copy utility such as Windows Explorer or similar.

FILE SIZES AND NAMES

Discrete point Data sets are provided in 500m by 500m tiles to the following filenaming convention:

eg. AF2015_PRODUCTID_NZTopo50_XXXXX_YYYYY.abc

PRODUCTID:
C = Classified Point Cloud
O = Orthophoto

LAS format is a binary format and cannot be listed. LAS file point classifications levels are formatted to comply with ASPRS Standard LiDAR Point Classes.

1 Default
2 Ground

See: File_Listing_25252A01NOK.txt

3. METADATA

SOURCE DATA

Item	Source	Description	Ref No	Date
Laser System	AAM	Riegl Q1560	25252A	22-25.09.2015
Pulse Rate Frequency	AAM	390-400 kHz	25252A	22-25.09.2015
Base Stn Coords	GeoNET	CORS	25252A	22-25.09.2015
Field Survey Data	Sounds Surveying	RTK GPS	25252A	5-6.10.2015

LASER DATA CHARACTERISTICS

Characteristic	Description
Device Name:	Riegl Q1560
Half Scan Angle:	30 degrees
Laser Pulse Rate:	390-400 kHz
Laser Pulse Mode:	Single Pulse
Laser Return Types:	1st, 2nd, 3rd and last
Laser Footprint Size:	0.24 - 0.36m
File Format:	ESRI Shapefile, LAS 1.2
Horizontal Datum:	NZGD2000
Vertical Datum:	NZVD2009
Map Projection:	NZTM
Vertical Accuracy Specification:	±0.15m Standard Error (68% confidence level or 1 sigma)
Horizontal Accuracy Specification:	±0.50m Standard Error (68% confidence level or 1 sigma)

REFERENCE SYSTEMS

	Horizontal	Vertical
Datum	NZGD2000	NZVD2009
Projection	NZTM	N/A
Geoid Model	N/A	NZGeoid09
Primary Reference Station	HOKI LKTA	HOKI LKTA

5. ACCURACY

PROJECT DESIGN ACCURACY

Project specifications and technical processes were designed to achieve data accuracies as follows:

	Measured Point	Basis of Estimation
Vertical data Horizontal data	0.15 m < 0.26 m	Project Design System specifications ($^{1}/_{5500}$ flying height)
Test points	0.05m	Survey methodology used

Notes on Expected Accuracy

- Values shown represent standard error (68% confidence level or 1 sigma), in meters.
- "Measured points" are those observed directly.
- Accuracy estimates for terrain modeling refer to the terrain definition on clear ground. Ground definition in vegetated terrain may contain localized areas with systematic errors or outliers which fall outside this accuracy estimate.
- Laser strikes have been classified into "ground" and "non-ground", based upon algorithms tailored for major terrain/vegetation combinations existing in the project area. The definition of the ground may be less accurate in isolated pockets of dissimilar terrain/vegetation combinations.

LIMITATIONS OF DATA

- The definition of the ground under trees may be less accurate.

DATA VALIDATION

- Ground data in this volume has been compared to 422 test points obtained by field survey and assumed to be error-free. Comparison was made between the field test point elevations and the measured data, and the mean difference has been removed from the data. Final accuracy estimation for this data set are as follows:

Ref Point Site	No. of Points	Mean Difference (m)	Std Deviation (m)	RMS (m)
Alp04	79	-0.000	0.017	0.017
Alp05-Hp01	135	-0.001	0.044	0.045
Alp03	87	-0.003	0.013	0.013
Alp01-02	121	-0.005	0.043	0.043

- Horizontal accuracy of the data set was visually checked against surveyed data, and deemed to be within expected levels.
- Data classification has been manually checked and edited against any available imagery.

USE OF DATA

- Intended use : Geological Study
- Intended scale of use : 1:500

6. CONDITIONS OF SUPPLY

The data in this volume has been commissioned by **GNS SCIENCE**.

The data in this volume is provided by AAM NZ Limited (AAM) to **GNS SCIENCE** under **AAM Terms of Engagement**, which provides **GNS SCIENCE** with a full and unrestricted license in perpetuity to use all reports, mapping and other delivered data (Project IP), in accord with documented provisions, and subject to the following conditions:

1. This file (Readme_25252A01NOK.pdf) is always stored with the unaltered data contained in this volume.

2. The data is not used for purposes beyond that explicitly agreed in the description of the Services provided by AAM.

Any breach of these conditions will result in the immediate termination of the license issued by AAM, and **GNS SCIENCE** will indemnify AAM from all resulting liabilities.

Any problems associated with the information in the data files contained in this volume should be reported to AAM NZ Limited. A complete list of project related contacts is listed on page 2 under the Project Report heading.

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7. VALIDATION PLOTS

Project area coloured by elevation