TARANAKI REGIONAL COUNCIL

PGF-LIDAR TARANAKI REGION AND STRATFORD DISTRICT

VOLUME: PRJ38923_01

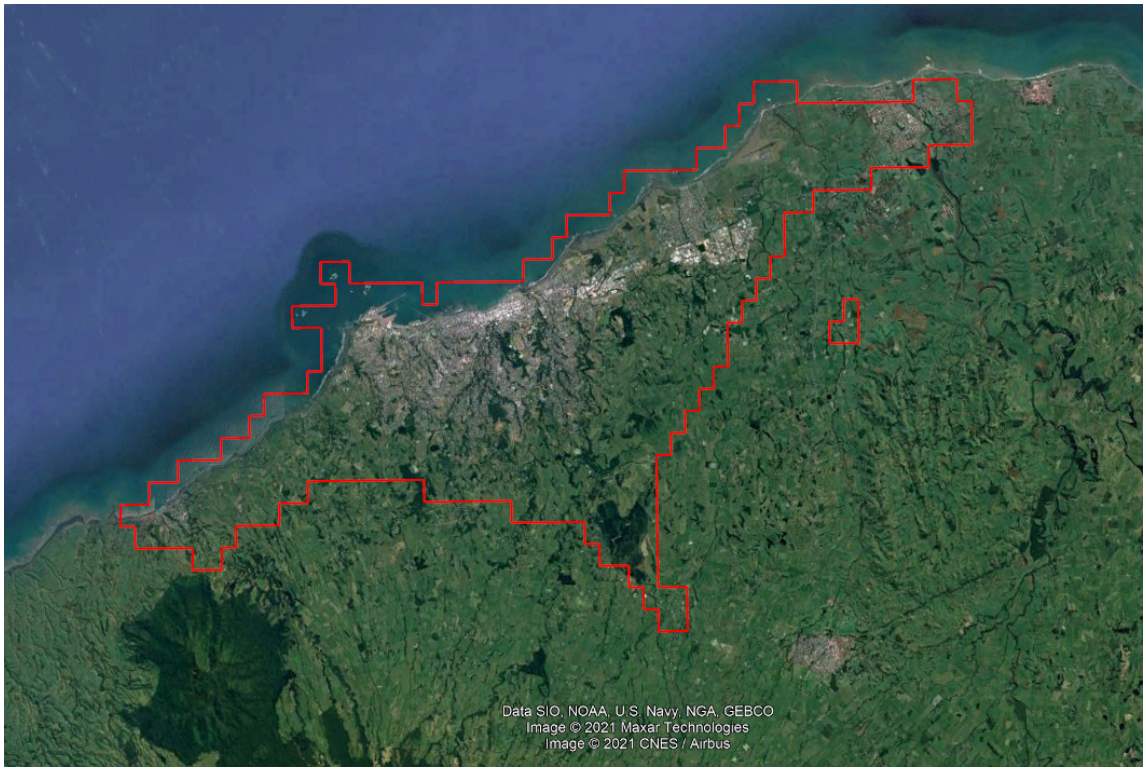
PROJECT SUMMARY

This project is for provision of Airborne LiDAR survey over 8,182 km^2 of the Taranaki Region and Stratford District.

This volume contains approximately 165 km^2 of data in the vicinity of New Plymouth. Captured on the 3rd April, 1st and 2nd May 2021.

The survey was planned to achieve ≤ 20cm vertical accuracy (95% CI), ≤ 100cm horizontal accuracy (95% CI) with an emitted pulse density of 8ppsm, and ground classification to ICSM level 2.

This volume includes resubmitted data, supplied 17 March 2022.



Background image from Google Earth

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NAPIER 4110
Phone +64 296 030 382 | www.aamgroup.com

DATA SUMMARY

This volume includes the following data in NZTM2000 projection and NZVD2016 vertical datum:

- Classified Point Cloud data in LAS v1.4 format
- DEM Grids, 1m cell size in GeoTIFF format
- DSM Grids, 1m cell size in GeoTIFF format
- Hydro-flattening files in ESRI Shapefile format
- Flight lines in ESRI Shapefile format
- Tile layout, 1:1000 NZTopo50 in Shapefile format
- Extent file in ESRI Shapefile format
- File listing in text file format
- Metadata file: This document in PDF format

This data has been supplied in accordance with the specifications agreed with Taranaki Regional Council and the *LINZ PGF Version: New Zealand National Aerial LiDAR Base Specification – January 2020*. Users requiring other formats and projections please contact AAM NZ Ltd.

CONTENTS

1. DATA INFORMATION

Data supply: AWS
Number of files: 2405 data files, 1 file list, 1 metadata report
Data formatted on: 16.03.2022
Metadata Document: This file

Previous Deliveries	Date	Title	Contents
PRJ38923_01	02.09.2021	PGF-LIDAR Taranaki Region and Stratford District	New Plymouth area
PRJ38923_02	30.09.2021	PGF-LIDAR Taranaki Region and Stratford District	North East area
PRJ38923_03	12.11.2021	PGF-LIDAR Taranaki Region and Stratford District	Western area
PRJ38923_04	31.01.2022	PGF-LIDAR Taranaki Region and Stratford District	South East Area

File Details of this Delivery	Contents
Folder: 01_Classified_Point_Cloud, e.g. CL2_BH28_2021_1000_3248	Classified Point Cloud tiles
Folder: 02_DEM, e.g. DEM_BH28_2021_1000_3248	1m DEM tiles
Folder: 03_DSM, e.g. DSM_BH28_2021_1000_3248	1m DSM tiles
Folder: 04_Ancillary, e.g. PRJ38923_New_Plymouth_Extent_NZTM	Extents, Tile Layout, Breaklines, Trajectories, Hydro-clip bdy
Readme_PRJ38923_01_r1.pdf	Metadata Report
PRJ38923_01_File_List.txt	Listing of product files delivered in this volume

2. METADATA

Source Data	Source	Description	Ref No	Date
LiDAR	AAM	Optech Galaxy+ 473	FL014878	03.04.21
		Optech Galaxy+ 473	FL015038	01.05.21
		Optech Galaxy+ 473	FL015048	02.05.21
Trajectory	AAM	RTX™	FL015368	24.06.21
Field Survey	WSP NZ Ltd	RTK	5-N8435	23.04.21 – 02.08.21

LiDAR Characteristics	Description
Format	LAS 1.4
Emitted Density	8 ppm2
Tile size	480m x 720m (NZTopo50 1:1000 tiles)
ICSM Classification	Level 2. Ground surface improvement

Number	Point Class	Description	ICSM	CI %
1	Default	Unclassified	1	95
2	Ground	Bare ground	2	98
3	Low vegetation	< 2 m	1	95
4	Medium vegetation	2-8 m	1	95
5	High vegetation	> 8 m	1	95
6	Buildings, structures	Buildings, houses, silos etc.	1	95
7	Low Noise	Spurious low point returns (unusable)	1	95
9	Water	Any point in water	2	98
18	High Noise	Spurious high point returns (unusable)	1	95

Reference Systems	Horizontal	Vertical
Datum	NZGD2000	NZVD2016
Projection	NZTM2000	N/A
Geoid Model	N/A	NZGeoid2016

Accuracy Specification	Measured Point	Derived Point	Basis of Estimation
Field Survey	5 cm		Survey methodology used
LiDAR (Horizontal)	< 100 cm		Project design
LiDAR (Vertical)	< 20 cm		Project design

Project specifications and technical processes were designed to achieve data accuracies as above.

Notes On Expected Accuracy

- Values shown represent 95% confidence level (2 sigma), in centimetres.
- "Derived points" are those interpolated from a terrain model.
- "Measured points" are those observed directly.
- Accuracy estimates for terrain modelling by LiDAR refer to the terrain definition on clear ground.
- 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 – LiDAR Data

- Vertical Accuracy Validation - Ground data in this volume has been compared to 373 test points obtained by field survey and assumed to be error-free. The test points were distributed in 8 sites across the mapping area and located on clear ground. Comparison of the test points with elevations interpolated from measured data resulted in:

  Mean difference: 0.001 m
  St. Deviation: 0.028 m
  Standard Error (RMS): 0.028 m
  Standard Error (95% CI): 0.055 m (RMS x 1.96), within project specification

  This mean elevation difference has been removed from the data supplied in this volume
- Horizontal Accuracy – the LiDAR point cloud was compared to survey data and found to fit well in position. Expected accuracy is well within the specified range.
- Data classification has been manually checked and edited against available imagery.

3. CONDITIONS OF SUPPLY

The data in this volume has been commissioned by **TARANAKI REGIONAL COUNCIL**.

The data in this volume is provided by AAM Pty Limited (AAM) to **TARANAKI REGIONAL COUNCIL** under the Terms of Engagement described in **Contract for Services TRC Contract Number 2123**. Which transfers Copyright and IP rights in the Deliverables from AAM to **TARANAKI REGIONAL COUNCIL** upon payment of all amounts and subject to the conditions below. AAM retains sole rights to the Raw Data.

1. This file (Readme_PRJ38923_01_r1.pdf) is always stored with the unaltered data contained in this volume.

It is understood that the **TARANAKI REGIONAL COUNCIL** intends to include this data in the LINZ National Elevation Programme, to be released under Creative Commons Attribution 4.0 International. Creative Commons Attribution 4.0 International

This data is provided in accordance with the specifications agreed with Taranaki Regional Council. Any problems associated with the information in the data files contained in this volume should be reported to AAM NZ Limited.

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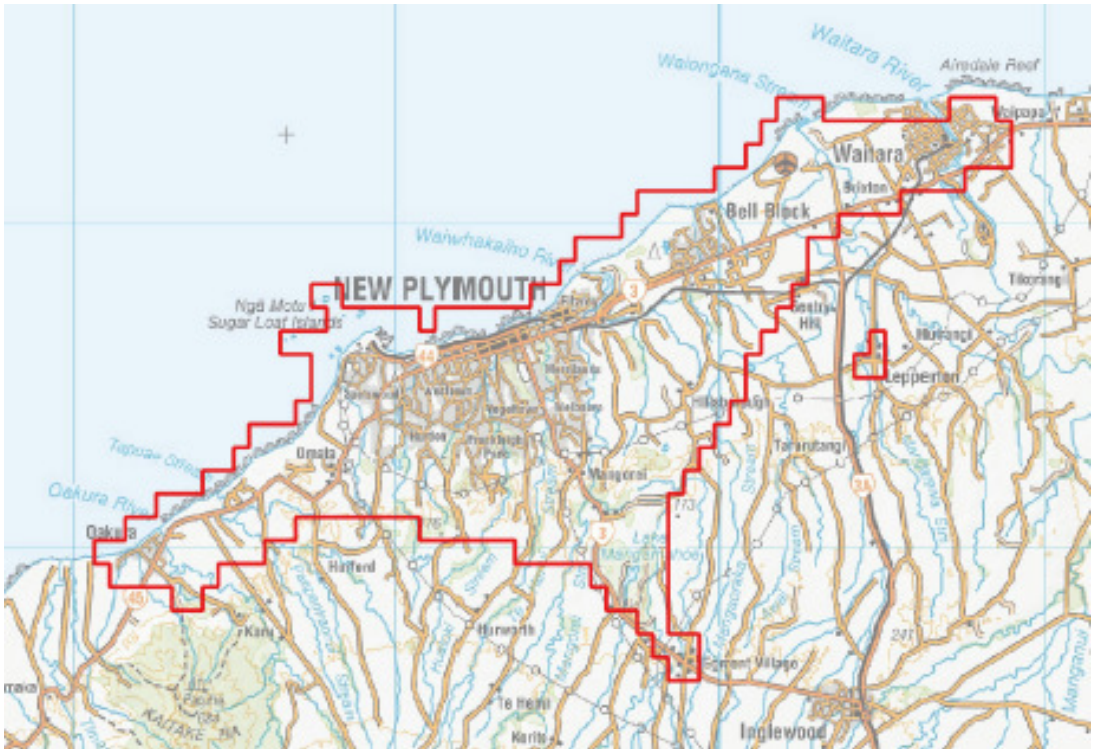
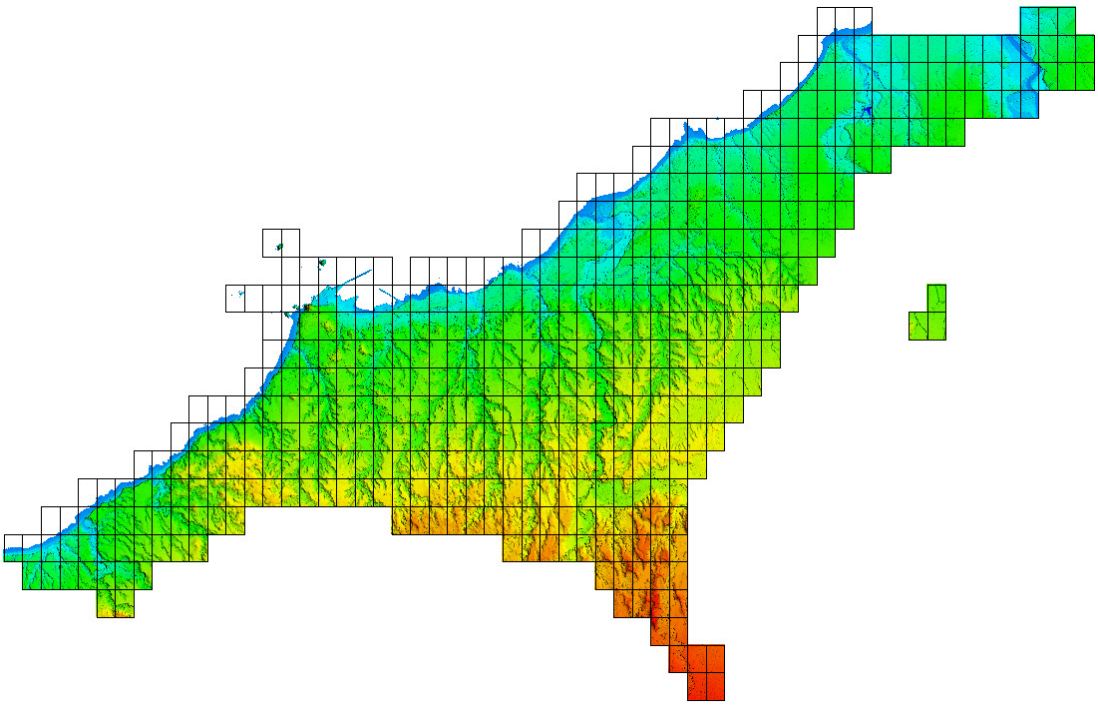
4. VALIDATION

Project Extent



Colour Elevation Image



TARANAKI REGIONAL COUNCIL

PGF-LIDAR TARANAKI REGION AND STRATFORD DISTRICT

VOLUME: PRJ38923_02

PROJECT SUMMARY

This project is for provision of Airborne LiDAR survey over 8,182 km^2 of the Taranaki Region and Stratford District.

This volume contains approximately 1,792 km^2 of data in the North East of the Taranaki Region and Stratford District. Captured between the 22nd May and 1st July 2021.

The survey was planned to achieve ≤ 20cm vertical accuracy (95% CI), ≤ 100cm horizontal accuracy (95% CI) with an emitted pulse density of 8ppsm, and ground classification to ICSM level 2.

Background image LINZ NZ Topo250 Maps

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DATA SUMMARY

This volume includes the following data in NZTM2000 projection and NZVD2016 vertical datum:

- Classified Point Cloud data in LAS v1.4 format
- DEM Grids, 1m cell size in GeoTIFF format
- DSM Grids, 1m cell size in GeoTIFF format
- Hydro-flattening files in ESRI Shapefile format
- Flight lines in ESRI Shapefile format
- Tile layout, 1:1000 NZTopo50 in Shapefile format
- Extent file in ESRI Shapefile format
- File listing in text file format
- Metadata file: This document in PDF format

This data has been supplied in accordance with the specifications agreed with Taranaki Regional Council and the *LINZ PGF Version: New Zealand National Aerial LiDAR Base Specification – January 2020*. Users requiring other formats and projections please contact AAM NZ Ltd.

CONTENTS

1. DATA INFORMATION

Data supply: HDD / AAM AWS S3 (Links via e-mail)
Number of files: 25,940 data files, 1 file list, 1 metadata report
Data formatted on: 30.09.2021
Metadata Document: This file

Previous Deliveries	Date	Title	Contents
PRJ38923_01	02.09.2021	PGF-LIDAR Taranaki Region and Stratford District	New Plymouth area

File Details of this Delivery	Contents
Folder: 01_Classified_Point_Cloud, e.g. CL2_BG31_2021_1000_2422	Classified Point Cloud tiles
Folder: 02_DEM, e.g. DEM_BG31_2021_1000_2422	1m DEM tiles
Folder: 03_DSM, e.g. DSM_BG31_2021_1000_2422	1m DSM tiles
Folder: 04_Ancillary, e.g. PRJ38923_North_East_Extent_NZTM	Extents, Tile Layout, Breaklines, Trajectories, Hydro-clip bdy
Readme_PRJ38923_02.pdf	Metadata Report
PRJ38923_02_File_List.txt	Listing of product files delivered in this volume

2. METADATA

Source Data	Source	Description	Ref No	Date
LiDAR	AAM	Optech Galaxy+ 473	FL015185	22.05.21
		Optech Galaxy+ 473	FL015189	22.05.21
		Optech Galaxy+ 473	FL015207	26.05.21
		Optech Galaxy+ 473	FL015212	27.05.21
		Optech Galaxy+ 473	FL015404	01.07.21
		Optech Galaxy+ 473	FL015401	01.07.21
Trajectory	AAM	RTX™	As above	As above
Field Survey	WSP NZ Ltd	RTK	5-N8435	23.04.21 – 02.08.21

LiDAR Characteristics	Description
Format	LAS 1.4
Emitted Density	4 ppm2
Tile size	480m x 720m (NZTopo50 1:1000 tiles)
ICSM Classification	Level 2. Ground surface improvement

Number	Point Class	Description	ICSM	CI %
1	Default	Unclassified	1	95
2	Ground	Bare ground	2	98
3	Low vegetation	< 2 m	1	95
4	Medium vegetation	2-8 m	1	95
5	High vegetation	> 8 m	1	95
6	Buildings, structures	Buildings, houses, silos etc.	1	95
7	Low Noise	Spurious low point returns (unusable)	1	95
9	Water	Any point in water	2	98
18	High Noise	Spurious high point returns (unusable)	1	95

Reference Systems	Horizontal	Vertical
Datum	NZGD2000	NZVD2016
Projection	NZTM2000	N/A
Geoid Model	N/A	NZGeoid2016

Accuracy Specification	Measured Point	Derived Point	Basis of Estimation
Field Survey	5 cm		Survey methodology used
LiDAR (Horizontal)	< 100 cm		Project design
LiDAR (Vertical)	< 20 cm		Project design

Project specifications and technical processes were designed to achieve data accuracies as above.

Notes On Expected Accuracy

- Values shown represent 95% confidence level (2 sigma), in centimetres.
- “Derived points” are those interpolated from a terrain model.
- “Measured points” are those observed directly.
- Accuracy estimates for terrain modelling by LiDAR refer to the terrain definition on clear ground.
- 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 – LiDAR Data

- Vertical Accuracy Validation - Ground data in this volume has been compared to ~375 test points obtained by field survey and assumed to be error-free. The test points were distributed in 10 sites across the mapping area and located on clear ground. Comparison of the test points with elevations interpolated from measured data resulted in:

Mean difference:	0.000 m
St. Deviation:	0.035 m
Standard Error (RMS):	0.035 m
Standard Error (95% CI):	0.068 m (RMS x 1.96), within project specification

  This mean elevation difference has been removed from the data supplied in this volume

- Horizontal Accuracy – the LiDAR point cloud was compared to survey data and found to fit well in position. Expected accuracy is well within the specified range.
- Data classification has been manually checked and edited against available imagery.

3. CONDITIONS OF SUPPLY

The data in this volume has been commissioned by **TARANAKI REGIONAL COUNCIL**.

The data in this volume is provided by AAM Pty Limited (AAM) to **TARANAKI REGIONAL COUNCIL** under the Terms of Engagement described in **Contract for Services TRC Contract Number 2123**. Which transfers copyright and IP rights in the Deliverables from AAM to **TARANAKI REGIONAL COUNCIL** upon payment amounts and subject to the conditions below. AAM retains all rights to the Raw Data.

1. This file (Readme_PRJ38923_02.pdf) is always stored with the unaltered data contained in this volume.

This data is provided in accordance with the specifications agreed with Taranaki Regional Council. Any problems associated with the information in the data files contained in this volume should be reported to AAM NZ Limited.

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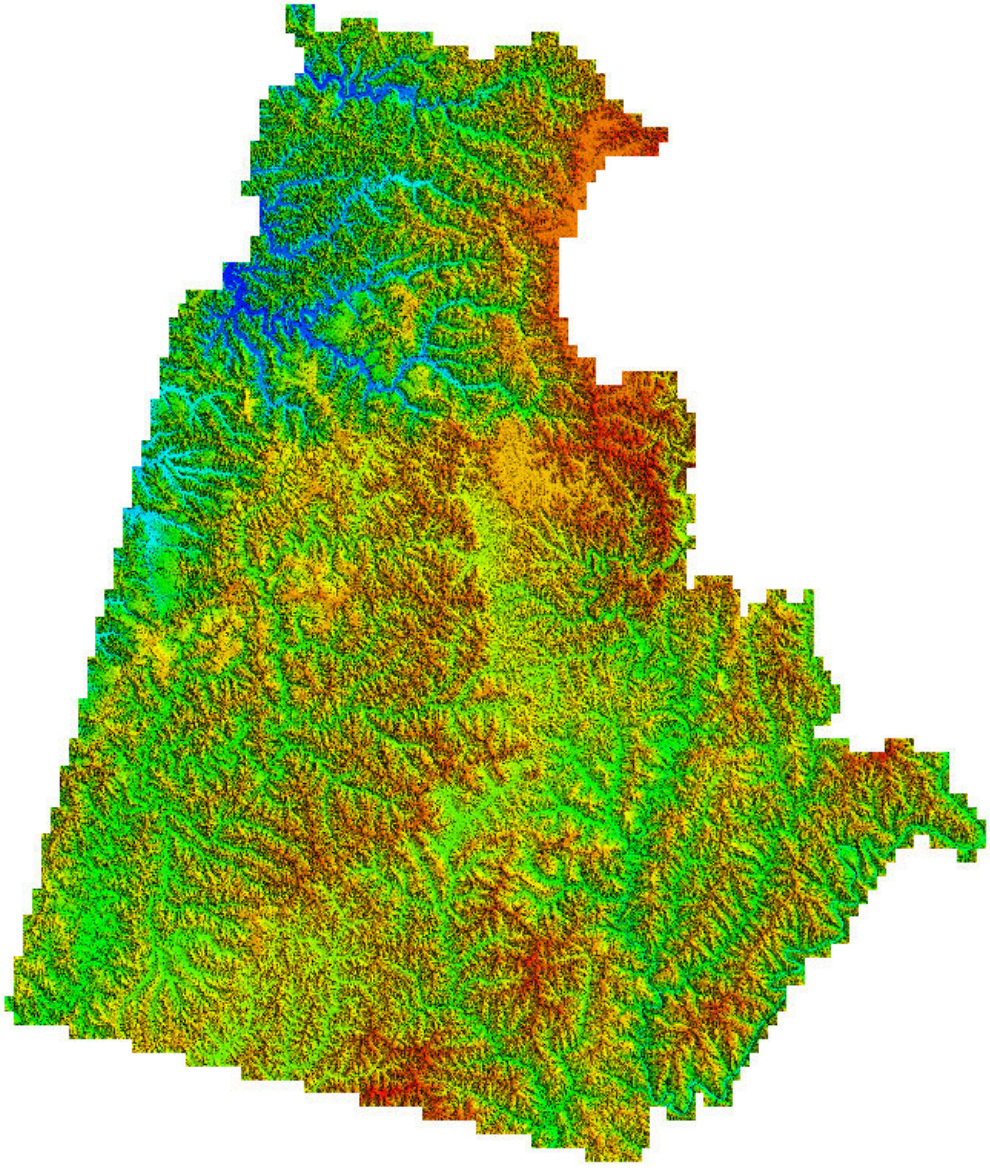
4. VALIDATION

Project Extent in grey with Volume Extent in red

Colour Elevation Image for this Volume



TARANAKI REGIONAL COUNCIL

PGF-LIDAR TARANAKI REGION AND STRATFORD DISTRICT

VOLUME: PRJ38923_03

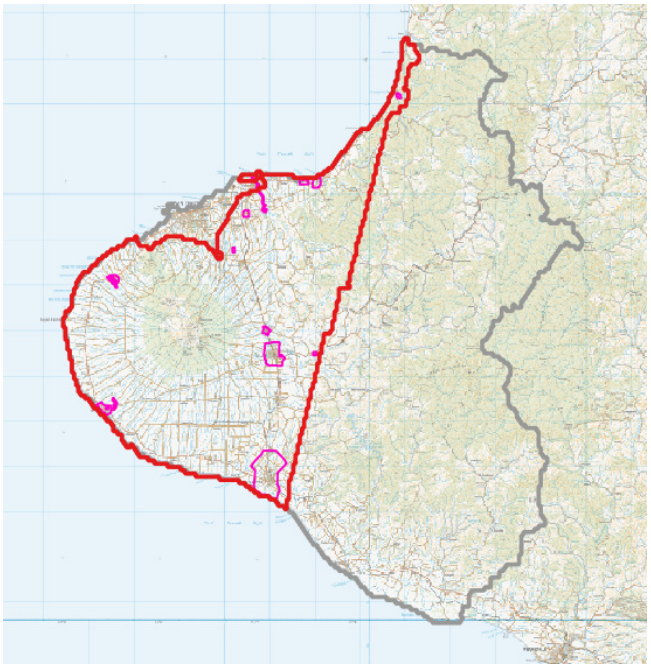
PROJECT SUMMARY

This project is for provision of Airborne LiDAR survey over 8,182 km^2 of the Taranaki Region and Stratford District.

This volume contains approximately 1,792 km^2 of data in the West of the Taranaki Region and Stratford District. Captured between the 3rd April March and 26th May 2021.

The survey was planned to achieve ≤ 20cm vertical accuracy (95% CI), ≤ 100cm horizontal accuracy (95% CI) with an emitted pulse density of 4ppsm and 8ppsm over selected areas shown in pink below. Ground classification to ICSM level 2.

This volume includes resubmitted data, supplied 30 September 2022.



Background image LINZ NZ Topo250 Maps

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DATA SUMMARY

This volume includes the following data in NZTM2000 projection and NZVD2016 vertical datum:

- Classified Point Cloud data in LAS v1.4 format
- DEM Grids, 1m cell size in GeoTIFF format
- DSM Grids, 1m cell size in GeoTIFF format
- Hydro-flattening files in ESRI Shapefile format
- Flight lines in ESRI Shapefile format
- Tile layout, 1:1000 NZTopo50 in Shapefile format
- Extent file in ESRI Shapefile format
- File listing in text file format
- Metadata file: This document in PDF format

This data has been supplied in accordance with the specifications agreed with Taranaki Regional Council and the *LINZ PGF Version: New Zealand National Aerial LiDAR Base Specification – January 2020*. Users requiring other formats and projections please contact AAM NZ Ltd.

CONTENTS

1. DATA INFORMATION

Data supply: HDD
Number of files: 39,236 data files (Part 1), 1 file list, 1 metadata report
Data formatted on: 12.11.2021 / revised 30.09.2022
Metadata Document: This file

Previous Deliveries	Date	Title	Contents
PRJ38923_01	02.09.2021	PGF-LIDAR Taranaki Region and Stratford District	New Plymouth area
PRJ38923_02	30.09.2021	PGF-LIDAR Taranaki Region and Stratford District	North East area

File Details of this Delivery	Contents
Folder: 01_Classified_Point_Cloud, e.g. CL2_BG31_2021_1000_2422	Classified Point Cloud tiles
Folder: 02_DEM, e.g. DEM_BG31_2021_1000_2422	1m DEM tiles
Folder: 03_DSM, e.g. DSM_BG31_2021_1000_2422	1m DSM tiles
Folder: 04_Ancillary, e.g. PRJ38923_North_East_Extent_NZTM	Extents, Tile Layout, Breaklines, Trajectories, Hydro-clip bdy
Readme_PRJ38923_03.pdf	Metadata Report
PRJ38923_03_part1_File_List.txt	Listing of product files delivered in this volume

2. METADATA

Source Data	Source	Description	Ref No	Date
LiDAR	AAM	Optech Galaxy+ 473	FL014869	03.04.21
		Optech Galaxy+ 473	FL014878	03.04.21
		Optech Galaxy+ 473	FL014993	28.04.21
		Optech Galaxy+ 473	FL014994	28.04.21
		Optech Galaxy+ 473	FL015001	29.04.21
		Optech Galaxy+ 473	FL015038	01.05.21
		Optech Galaxy+ 473	FL015039	01.05.21
		Optech Galaxy+ 473	FL015044	02.05.21
		Optech Galaxy+ 473	FL015048	02.05.21
		Optech Galaxy+ 473	FL015053	03.05.21
		Optech Galaxy+ 473	FL015083	07.05.21
		Optech Galaxy+ 473	FL015087	08.05.21
		Optech Galaxy+ 473	FL015185	22.05.21
		Optech Galaxy+ 473	FL015202	26.05.21
Trajectory	AAM	RTX™	As above	As above
Field Survey	WSP NZ Ltd	RTK	5-N8435	23.04.21 – 02.08.21

LiDAR Characteristics	Description
Format	LAS 1.4
Emitted Density	4 ppm^2 and 8ppm^2 (selected Urban and Flood protection areas)
Tile size	480m x 720m (NZTopo50 1:1000 tiles)
ICSM Classification	Level 2. Ground surface improvement

Number	Point Class	Description	ICSM	CI %
1	Default	Unclassified	1	95
2	Ground	Bare ground	2	98
3	Low vegetation	< 2 m	1	95
4	Medium vegetation	2-8 m	1	95
5	High vegetation	> 8 m	1	95
6	Buildings, structures	Buildings, houses, silos etc.	1	95
7	Low Noise	Spurious low point returns (unusable)	1	95
9	Water	Any point in water	2	98
18	High Noise	Spurious high point returns (unusable)	1	95

Reference Systems	Horizontal	Vertical
Datum	NZGD2000	NZVD2016
Projection	NZTM2000	N/A
Geoid Model	N/A	NZGeoid2016

Accuracy Specification	Measured Point	Derived Point	Basis of Estimation
Field Survey	5 cm		Survey methodology used
LiDAR (Horizontal)	< 100 cm		Project design
LiDAR (Vertical)	< 20 cm		Project design

Project specifications and technical processes were designed to achieve data accuracies as above.

Notes On Expected Accuracy

- Values shown represent 95% confidence level (2 sigma), in centimetres.
- “Derived points” are those interpolated from a terrain model.
- “Measured points” are those observed directly.
- Accuracy estimates for terrain modelling by LiDAR refer to the terrain definition on clear ground.
- 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 – LiDAR Data

- Vertical Accuracy Validation - Ground data in this volume has been compared to ~2100 test points obtained by field survey and assumed to be error-free. The test points were distributed in 51 sites across the mapping area and located on clear ground. Comparison of the test points with elevations interpolated from measured data resulted in:

  Mean difference: -0.002 m
  St. Deviation: 0.032 m
  Standard Error (RMS): 0.032 m
  Standard Error (95% CI): 0.064 m (RMS x 1.96), within project specification

  The mean elevation difference has been removed from the data supplied in this volume

- Horizontal Accuracy – the LiDAR point cloud was compared to survey data and found to fit well in position. Expected accuracy is well within the specified range.
- Data classification has been manually checked and edited against available imagery.

3. CONDITIONS OF SUPPLY

The data in this volume has been commissioned by **TARANAKI REGIONAL COUNCIL**.

The data in this volume is provided by AAM Pty Limited (AAM) to **TARANAKI REGIONAL COUNCIL** under the Terms of Engagement described in **Contract for Services TRC Contract Number 2123**. Which transfers copyright and IP rights in the Deliverables from AAM to **TARANAKI REGIONAL COUNCIL** upon payment amounts and subject to the conditions below. AAM retains all rights to the Raw Data.

1. This file (Readme_PRJ38923_03.pdf) is always stored with the unaltered data contained in this volume.

This data is provided in accordance with the specifications agreed with Taranaki Regional Council. Any problems associated with the information in the data files contained in this volume should be reported to AAM NZ Limited.

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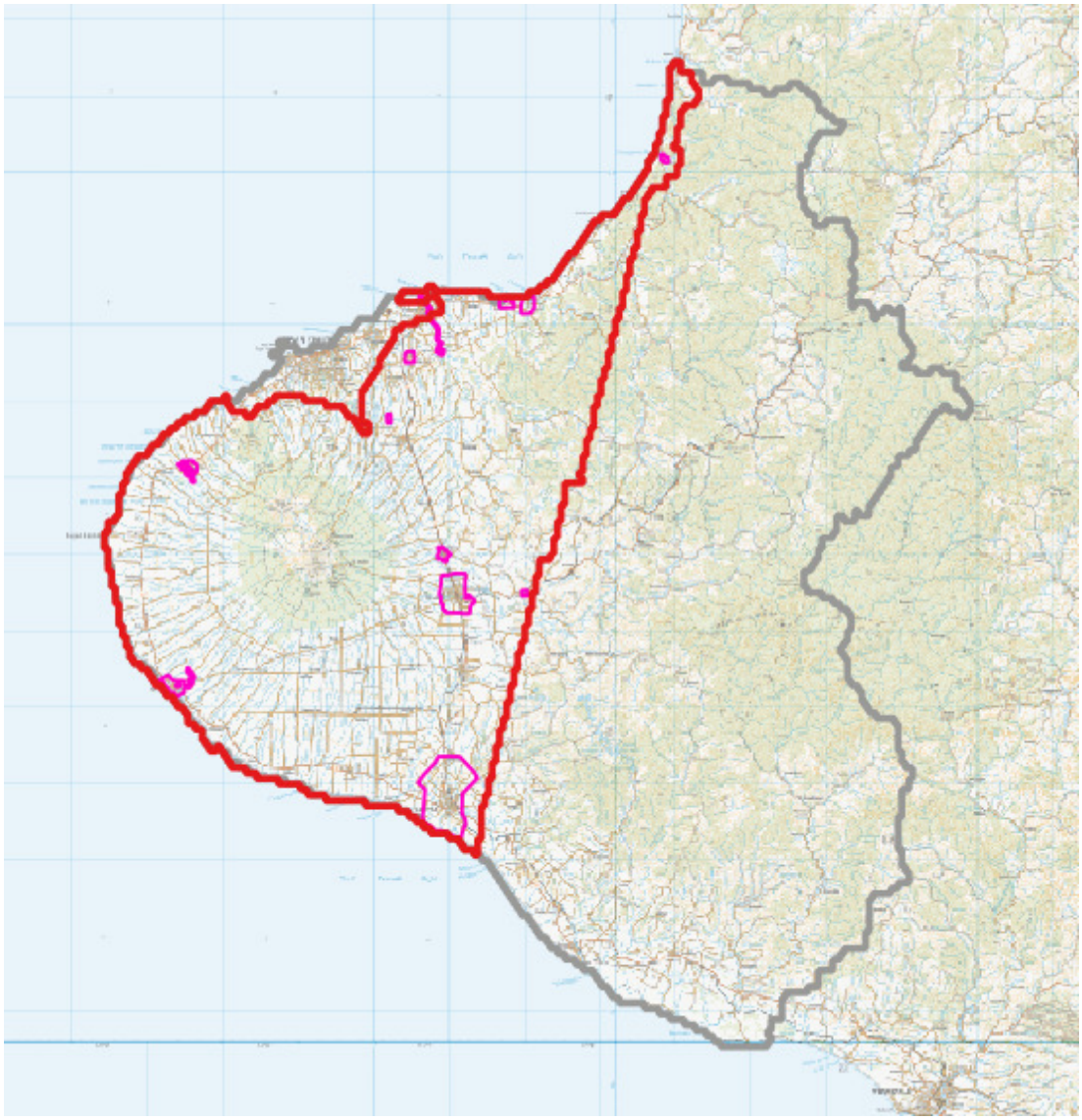
4. VALIDATION

Project Extent in grey with Volume Extent in red.
Areas shown in pink – are the Urban areas and Flood Protection areas captured at 8ppm^2.



Urban areas included in this volume: Hawera, Stratford, Okato, King Rd, Lepperton, Onaero, Urenui, Tongaporutu, Opunake, Toko, Midhurst
Flood Protection areas included in this volume: Okato, Waitara, Opunake.

(New Plymouth, Oakura and Waiwhakaiho – were included in Volume: PRJ38923_01)

TARANAKI REGIONAL COUNCIL

PGF-LIDAR TARANAKI REGION AND STRATFORD DISTRICT

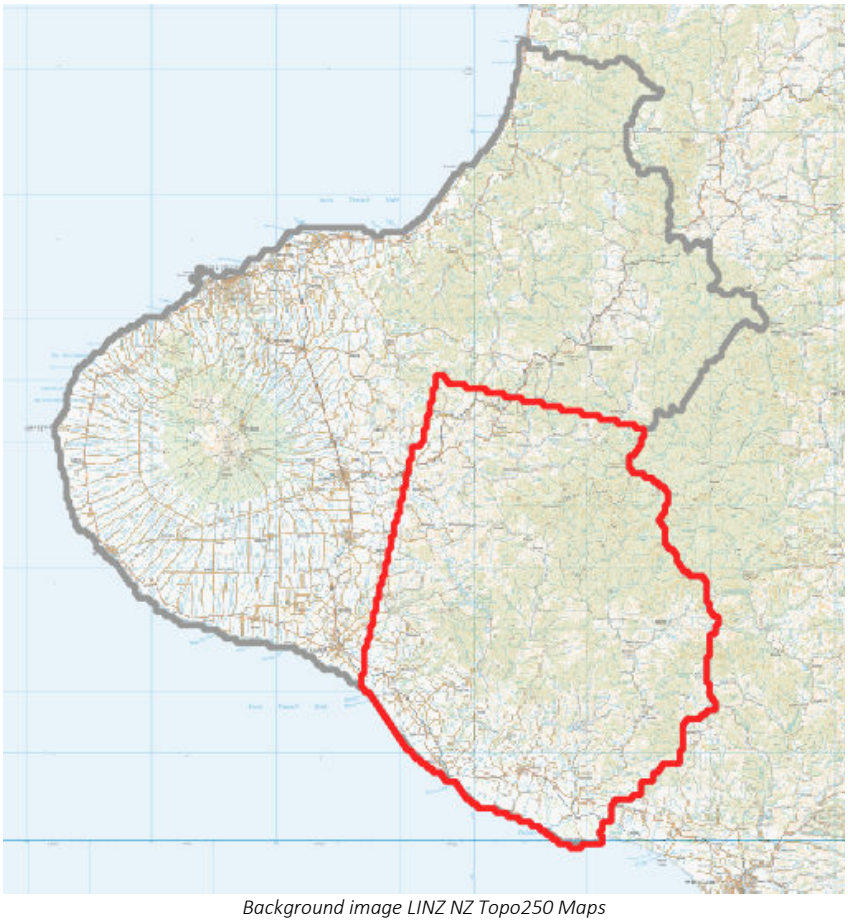
VOLUME: PRJ38923_04

PROJECT SUMMARY

This project is for provision of Airborne LiDAR survey over 8,182 km^2 of the Taranaki Region and Stratford District.

This volume contains approximately 2,992 km^2 of data in the South-East of the Taranaki Region and Stratford District. Captured between the 28th of April and 16th of October 2021.

The survey was planned to achieve ≤ 20cm vertical accuracy (95% CI), ≤ 100cm horizontal accuracy (95% CI) with an emitted pulse density of 4ppsm. Ground classification to ICSM level 2.



Background image LINZ NZ Topo250 Maps

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DATA SUMMARY

This volume includes the following data in NZTM2000 projection and NZVD2016 vertical datum:

- Classified Point Cloud data in LAS v1.4 format
- DEM Grids, 1m cell size in GeoTIFF format
- DSM Grids, 1m cell size in GeoTIFF format
- Hydro-flattening files in ESRI Shapefile format
- Flight lines in ESRI Shapefile format
- Tile layout, 1:1000 NZTopo50 in Shapefile format
- Extent file in ESRI Shapefile format
- File listing in text file format
- Metadata file: This document in PDF format

This data has been supplied in accordance with the specifications agreed with Taranaki Regional Council and the *LINZ PGF Version: New Zealand National Aerial LiDAR Base Specification – January 2020*. Users requiring other formats and projections please contact AAM NZ Ltd.

CONTENTS

1. DATA INFORMATION

Data supply: HDD
Number of files: 43,287 data files, 1 file list, 1 metadata report
Data formatted on: 31.01.2022
Metadata Document: This file

Previous Deliveries	Date	Title	Contents
PRJ38923_01	02.09.2021	PGF-LIDAR Taranaki Region and Stratford District	New Plymouth area
PRJ38923_02	30.09.2021	PGF-LIDAR Taranaki Region and Stratford District	North East area
PRJ38923_03	12.11.2021	PGF-LIDAR Taranaki Region and Stratford District	Western area

File Details of this Delivery	Contents
Folder: 01_Classified_Point_Cloud, e.g. CL2_BG31_2021_1000_2422	Classified Point Cloud tiles
Folder: 02_DEM, e.g. DEM_BG31_2021_1000_2422	1m DEM tiles
Folder: 03_DSM, e.g. DSM_BG31_2021_1000_2422	1m DSM tiles
Folder: 04_Ancillary, e.g. PRJ38923_North_East_Extent_NZTM	Extents, Tile Layout, Breaklines, Trajectories, Hydro-clip bdy
Readme_PRJ38923_04.pdf	Metadata Report
PRJ38923_04_File_List.txt	Listing of product files delivered in this volume

2. METADATA

Source Data	Source	Description	Ref No	Date
LiDAR	AAM	Optech Galaxy+ 473	FL014993	28.04.21
		Optech Galaxy+ 473	FL015039	01.05.21
		Optech Galaxy+ 473	FL015048	02.05.21
		Optech Galaxy+ 473	FL015056	03.05.21
		Optech Galaxy+ 473	FL015087	08.05.21
		Optech Galaxy+ 473	FL015185	22.05.21
		Optech Galaxy+ 473	FL015189	22.05.21
		Optech Galaxy+ 473	FL015207	26.05.21
		Optech Galaxy+ 473	FL015212	27.05.21
		Optech Galaxy+ 473	FL015228	31.05.21
		Optech Galaxy+ 473	FL015276	09.06.21
		Optech Galaxy+ 473	FL015401	01.07.21
		Optech Galaxy+ 473	FL015404	01.07.21
		Optech Galaxy+ 473	FL015429	04.07.21
		Optech Galaxy+ 473	FL015925	14.10.21
		Optech Galaxy+ 473	FL015927	14.10.21
		Optech Galaxy+ 473	FL015936	16.10.21
		Optech Galaxy+ 473	FL015937	16.10.21
Trajectory	AAM	RTX™	As above	As above
Field Survey	WSP NZ Ltd	RTK	5-N8435	23.04.21 – 02.08.21

LiDAR Characteristics	Description
Format	LAS 1.4
Emitted Density	4 ppm^2
Tile size	480m x 720m (NZTopo50 1:1000 tiles)
ICSM Classification	Level 2. Ground surface improvement

Number	Point Class	Description	ICSM	CI %
1	Default	Unclassified	1	95
2	Ground	Bare ground	2	98
3	Low vegetation	< 2 m	1	95
4	Medium vegetation	2-8 m	1	95
5	High vegetation	> 8 m	1	95
6	Buildings, structures	Buildings, houses, silos etc.	1	95
7	Low Noise	Spurious low point returns (unusable)	1	95
9	Water	Any point in water	2	98
18	High Noise	Spurious high point returns (unusable)	1	95

Reference Systems	Horizontal	Vertical
Datum	NZGD2000	NZVD2016
Projection	NZTM2000	N/A
Geoid Model	N/A	NZGeoid2016

Accuracy Specification	Measured Point	Derived Point	Basis of Estimation
Field Survey	5 cm		Survey methodology used
LiDAR (Horizontal)	< 100 cm		Project design
LiDAR (Vertical)	< 20 cm		Project design

Project specifications and technical processes were designed to achieve data accuracies as above.

Notes On Expected Accuracy

- Values shown represent 95% confidence level (2 sigma), in centimetres.
- “Derived points” are those interpolated from a terrain model.
- “Measured points” are those observed directly.
- Accuracy estimates for terrain modelling by LiDAR refer to the terrain definition on clear ground.
- 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 – LiDAR Data

- Vertical Accuracy Validation - Ground data in this volume has been compared to ~700 test points obtained by field survey and assumed to be error-free. The test points were distributed in 19 sites across the mapping area and located on clear ground. Comparison of the test points with elevations interpolated from measured data resulted in:

  Mean difference: 0.003 m
  St. Deviation: 0.039 m
  Standard Error (RMS): 0.039 m
  Standard Error (95% CI): 0.078 m (RMS x 1.96), within project specification

  The mean elevation difference has been removed from the data supplied in this volume

- Horizontal Accuracy – the LiDAR point cloud was compared to survey data and found to fit well in position. Expected accuracy is well within the specified range.
- Data classification has been manually checked and edited against available imagery.

3. CONDITIONS OF SUPPLY

The data in this volume has been commissioned by **TARANAKI REGIONAL COUNCIL**.

The data in this volume is provided by AAM Pty Limited (AAM) to **TARANAKI REGIONAL COUNCIL** under the Terms of Engagement described in **Contract for Services TRC Contract Number 2123**. Which transfers copyright and IP rights in the Deliverables from AAM to **TARANAKI REGIONAL COUNCIL** upon payment amounts and subject to the conditions below. AAM retains all rights to the Raw Data.

1. This file (Readme_PRJ38923_03.pdf) is always stored with the unaltered data contained in this volume.

This data is provided in accordance with the specifications agreed with Taranaki Regional Council. Any problems associated with the information in the data files contained in this volume should be reported to AAM NZ Limited.

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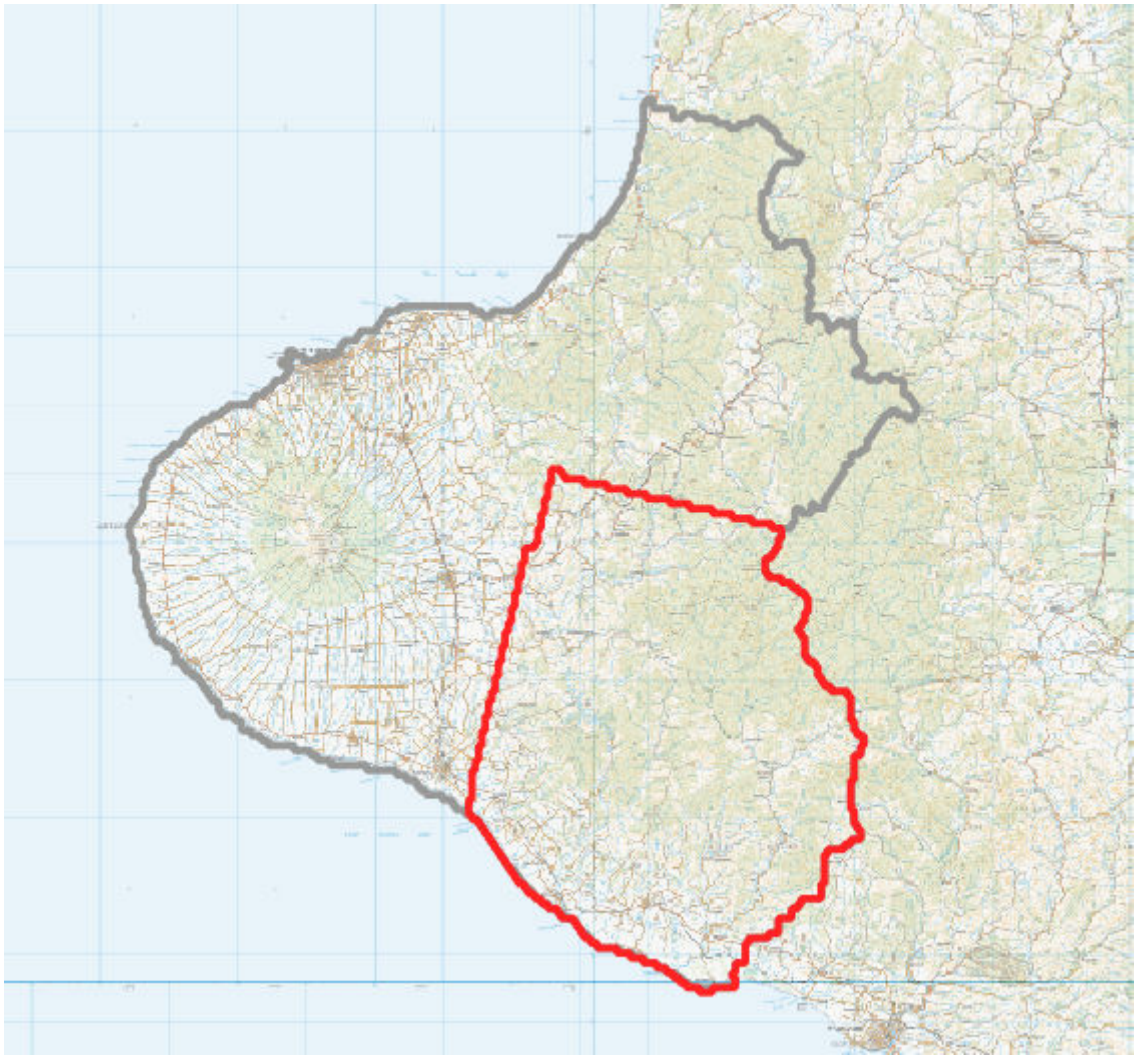
4. VALIDATION

Project Extent in grey with Volume Extent in red.



Coloured Elevation Image