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Ministry of Energy, Mines & Petroleum Resources
Mining & Minerals Division
BC Geological Survey

Michael Anthony Pond
2017.12.12 07:14:41 -
08'00'
Mount Milligan Mine

Assessment Report
Title Page and Summary

TYPE OF REPORT [type of survey(s)]: Lidar Survey and Orthographic Base Mapping **TOTAL COST:** CAD$42,797.00

AUTHOR(S): Michael Pond **SIGNATURE(S):**

PROFESSIONAL GEOSCIENTIST — PROVINCE OF BRITISH COLUMBIA — M. A. POND

NOTICE OF WORK PERMIT NUMBER(S)/DATE(S): **YEAR OF WORK:** 2016

STATEMENT OF WORK - CASH PAYMENTS EVENT NUMBER(S)/DATE(S): statement of work - event # 5669817

PROPERTY NAME: Mount Milligan Minesite - Mine #1300188

CLAIM NAME(S) (on which the work was done): 595163, 595146, 512884, 512891, 512909, 512913, 512931, 512930, 512924, 512927, 521164, 512925, 521178, 521177, 521180, 521181, 521165, 512921, 512919, 512888, 512888, 512907

COMMODITIES SOUGHT: Gold, Copper, Silver

MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN: 093N/ 194

MINING DIVISION: Omineca **NTS/BCGS:** 093K, 093O, 093J, 093K UTM Zone 10

LATITUDE: 55 ° 07 ' 19 " **LONGITUDE:** 124 ° 01 ' 46 " **(at centre of work)**

OWNER(S):
1) Thompson Creek Metals Company Inc. 2)

MAILING ADDRESS:
177 Victoria Street, Suite 100
Prince George, BC V2L 5R8

OPERATOR(S) [who paid for the work]:
1) Thompson Creek Metals Company Inc. 2)

MAILING ADDRESS:
177 Victoria Street, Suite 100
Prince George, BC V2L 5R8

PROPERTY GEOLOGY KEYWORDS (lithology, age, stratigraphy, structure, alteration, mineralization, size and attitude):
Commodities: Gold, Copper Significant Minerals: Pyrite, Magnetite, Chalcopyrite, Sphalerite, Bornite
Alteration: K-Feldspar, Biotite, Actinolite, Epidote, Calcite, Chlorite, Albite, Pyrite Alteration Type: Potassic, Propylitic,
Classification: Porphyry, Hydrothermal, Epigenetic Type: L03: Alkalic Porphyry Cu-Au Carbonate
Shape: Regular Modifier: Fractured Dimension: 1300x950x244 metres

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS:

Next Page

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (IN METRIC UNITS)	ON WHICH CLAIMS	PROJECT COSTS APPORTIONED (incl. support)
GEOLOGICAL (scale, area)			
Ground, mapping			
Photo interpretation			
GEOPHYSICAL (line-kilometres)			
Ground			
Magnetic			
Electromagnetic			
Induced Polarization			
Radiometric			
Seismic			
Other			
Airborne			
GEOCHEMICAL (number of samples analysed for...)			
Soil			
Silt			
Rock			
Other			
DRILLING (total metres; number of holes, size)			
Core			
Non-core			
RELATED TECHNICAL			
Sampling/assaying			
Petrographic			
Mineralographic			
Metallurgic			
PROSPECTING (scale, area)			
PREPARATORY / PHYSICAL			
Line/grid (kilometres)			
Topographic/Photogrammetric (scale, area)	1m contours - 110 sq. km.		CAD$42,797.00
Legal surveys (scale, area)			
Road, local access (kilometres)/trail			
Trench (metres)			
Underground dev. (metres)			
Other			
		TOTAL COST:	CAD$42,797.00

Assessment Report

Mount Milligan Mine
2016-17 Exploration Lidar Topographic Survey & Orthophotograph Base Mapping

Omineca Mining Division

N.T.S. 93N , 93O, 93J, 93K
Latitude 55^0 07' 19" N
Longitude 124^0 01' 46" W

Owner/Operator:

Thompson Creek Metals Company Inc.
Mount Milligan Mine
177 Victoria Street
Prince George, B.C. V2L 5R8

Prepared for

Ministry of Energy, Mines, & Petroleum Resources
Mining & Minerals Division

by

Michael Pond, P. Geo.
Thompson Creek Metals Company Inc – Mount Milligan Mine.

December 12, 2017

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Appendices

Maps

1.0 Summary

The Mount Milligan alkali gold-copper porphyry deposit is located 155 kilometres northwest of Prince George in central British Columbia. The property consists of 109 claims and 1 mineral lease covering approximately 51,079 hectares. Thompson Creek Metals Company Inc. (TCM), owns 100% of the operation and all mineral titles. The Mount Milligan Mine consists of one open pit and one Tailings storage facility. Mine life is 22 years with a total proven and probable reserve of 496.2 million tonnes grading 0.4 g/t gold and 0.187% copper as of December 31, 2016, (5.8 million ounces contained gold and 2,049 million pounds contained copper). The mine is currently operating at a rate of approximately 50,694 tonnes per day.

LiDAR and photo acquisition was completed in a single flight on November 6, 2016. Both datasets were collected simultaneously, and equipment was co-mounted in the same aircraft. Weather conditions were clear over the project area of interest (AOI), with few clouds at 8000ft in the surrounding areas. Collection occurred late in the afternoon during low light conditions which resulted in usable imagery only partially covering the AOI. Re-collection of the imagery occurred on May 29, 2017 under much better conditions.

The Lidar point cloud captured a point density of greater than 12-13 points per square metre with an accuracy of +/- 15cm vertically and +/-20cm horizontally. The final topographic map was compiled at 1 metre accuracy.

2.0 Introduction

2.1 Terms of Reference

On September 12, 2016 TCM contacted Eagle Mapping Ltd. of Coquitlam, BC to submit a proposal to fly a Lidar and photography survey of the Mount Milligan Mine site and surrounding area. Eagle Mapping had previously worked with TCM in 2013 to fly Lidar surveys at both TCM's Milligan and Endako mine operations.

LiDAR and photo acquisition was completed in a single flight on November 6, 2016. Both datasets were collected simultaneously, and equipment was co-mounted in the same aircraft. Weather conditions were clear over the project area of interest (AOI), with few clouds at 8000ft in the surrounding areas. Collection occurred late in the afternoon during low light conditions which resulted in usable imagery only partially covering the AOI. Re-collection of the imagery occurred on May 29, 2017 under much better conditions.

Sixteen flight lines comprising 193 line kilometers covered the 110 square kilometres of active mine operations and surrounding exploration areas. Details of the survey and the resulting processing and analysis are fully described in the report submitted from Eagle Mapping which is wholly included in this report as Appendix 6.

Deliverables for the projects included digital files for the Lidar point cloud, contour elevation lines, and site orthophotograph.

The work was conducted under work approval for Mines Act Permits M-236 and MX-13-182, (recently amended July 31, 2017).

2.2 Property Description and Location

The Property is 100% owned by Thompson Creek (Owner Number 283374), a division of Centerra Gold Inc. Located within the Omineca Mining Division in north-central British Columbia, approximately 155 km northwest of Prince George. Access is from Fort St James 86 km to the south, or from Mackenzie 95 km to the east (Figure 1). The claim group consists of 109 mineral claims and 1 mining lease covering a total area of 51,078 ha, the details of which are summarized in Appendix 2 and shown in Figures 2, 3, and 4. The boundaries of these claims are defined by map locations (longitude/latitude or UTM) rather than ground position. Positioned over four National Topographic System (NTS) maps, which include 93O04, 93N01, 93K16 and 93J13, the Property is centred at approximately 124°01'46" west longitude and 55°07'19" north latitude, or 434,349 mE, 6,108,845 mN (NAD 83 Zone 10).

The Mount Milligan Mine consists of one open pit and one Tailings storage facility. Mine life is 22 years with a total proven and probable reserve of 496.2 million tonnes grading 0.4 g/t gold and 0.187% copper as of December 31, 2016, (5.8 million ounces contained gold and 2,049 million pounds contained copper). The mine is currently operating at a rate of approximately 50,694 tonnes per day.

2.3 Accessibility, Climate, Local Resources, Infrastructure and Physiography

The Mt. Milligan Property can be accessed from the south via Fort St James on the Germansen North Road followed by the Rainbow-Milligan Forest Service Road (FSR), or from the east via Mackenzie on the Community Connector FSR and switching to the Rainbow-Milligan FSR. The roads are in good condition and well maintained owing to active logging and mining in the area that utilises both routes. In addition, the Community Connector FSR serves as a haul road for the Mt. Milligan mine site. Both routes are used for daily and weekly crew changes.

The climate in the area is classified as Interior Plateau that is characterized by short warm summers and longer moderately cold winters. Climate data derived from a monitoring station at Mackenzie airport indicate that temperatures range from an average low of -12.9°C in January to an average high of 22.2°C in July.

Regionally, the Property lies near the northern boundary of the Nechako Plateau and the southern limits of the Swannell Range of the Omineca Mountains of the Canadian Cordilleran Interior System. A chain of peaks aligned in an approximate north-south direction dominates the western part of the Property, which includes the field area for this report and the Mt. Milligan mine site. Mt. Milligan is the highest of these peaks, rising to an elevation of 1,508 m, and is rounded and symmetrical in shape. The Mt. Milligan deposit occurs to the south of Mt. Milligan at an elevation of approximately 1,100 m. The eastern part of the Property is dominated by gentle relief but includes a central region of elevated topography trending northwest and rising to approximately 1,350 m. Several isolated rounded hills also occur in the area rising to a similar elevation. A region of lower topography separates the western and eastern areas of the Property. Several elongated northwest-trending lakes occur in the eastern part of the Property and are interpreted to reflect the regional structural grain.

The Mt. Milligan area was last glaciated 10,000–20,000 years ago with regional ice flow direction to the northeast. This event coated the landscape with a blanket of glacial till and altered pre-glacial drainage patterns. Drumlins, flutings, eskers and melt-water channels of various dimensions are noticeable features of the region. Locally, glacial features show that ice was funnelled through east–west oriented valleys north and south of the Mt. Milligan deposit before flowing northeast. In the field area south of the Nation River, ice flow direction was re-oriented towards the east. The field area is generally well drained with flow towards the Nation River except for glacial depressions that have formed into bogs.

Vegetation in the region consists of pine and spruce with lesser amounts of alder. Beetle-killed timber is present throughout the field area and represents a hazard during fieldwork, especially during strong winds. In addition, numerous recent and active logging cut blocks occur throughout the field area, many of which have been recently replanted.

Labour and services are readily available from Fort St James, Mackenzie, Vanderhoof and Prince George with access provided by the aforementioned forest service roads from the south and east. The Mt. Milligan mine site occurs approximately 4.5 km to the southeast of the field area providing well-serviced camp accommodation, emergency response capabilities and specialized trade expertise. Electrical power is accessed directly from the BC Hydro Kennedy Substation south of Mackenzie or from the main

high voltage transmission lines that run from the Kennedy Substation to the Mt. Milligan mine site.

2.4 Property History

Limited exploration activity was first recorded in 1937. In 1984, prospector Richard Haslinger (Haslinger) and BP Resources Canada Limited (BP Resources) located claims on the site. In 1986, Lincoln Resources Inc. (Lincoln) optioned the claims and in 1987 completed a diamond drilling program that led to the discovery of significant copper-gold mineralization. In the late 1980s, Lincoln reorganized, amalgamated with Continental Gold Corp. (Continental Gold) and continued ongoing drilling in a joint-venture with BP Resources.

In 1991, Placer Dome Inc. (Placer Dome) acquired the Project from the joint-venture partners, resumed exploration drilling and completed a pre-feasibility study for the development of a 60,000 t/d open pit mine and flotation process plant.

Barrick Gold Corporation (Barrick) purchased Placer Dome in 2006 and sold its Canadian assets to Goldcorp Inc. (Goldcorp), who then in turn sold the Project to Atlas Cromwell Ltd. (Atlas Cromwell). Atlas Cromwell changed its name to Terrane Metals Corp. (Terrane) and initiated a comprehensive work program.

In October 2010, Thompson Creek Metals Company Inc. (TCM) acquired the Mount Milligan development project through its acquisition of Terrane and subsequently constructed the Mount Milligan Mine, which commenced commercial production in February 2014.

In October 2016, TCM was acquired by a subsidiary of Centerra (the Acquisition) and, in connection with that acquisition, Terrane and certain other subsidiary entities of TCM were amalgamated into TCM. The Mount Milligan Mine is now owned indirectly by Centerra.

Figure 1 Property Location Map

Figure 2 Mount Milligan Mine – Regional Land Tenure

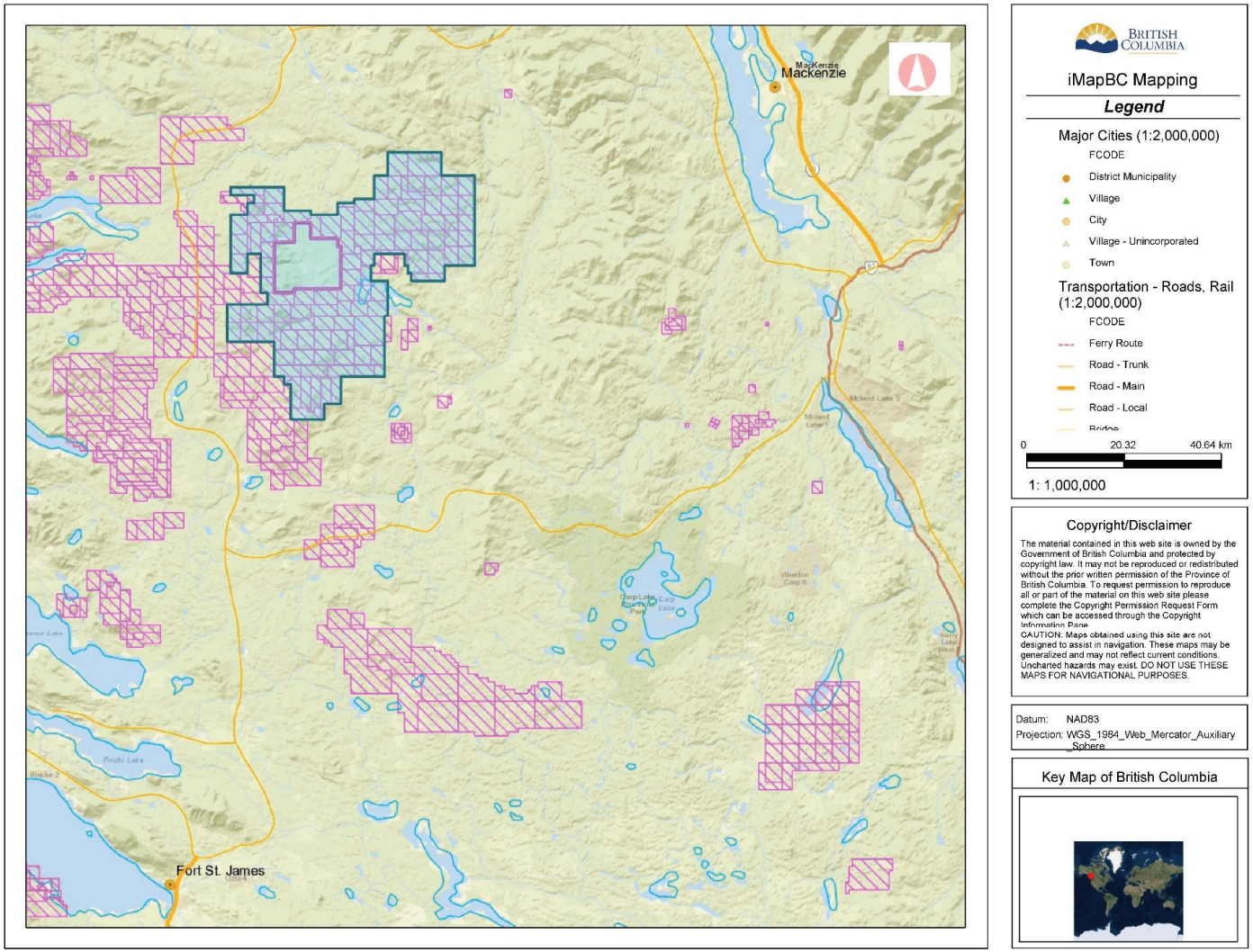


Figure 3 Mount Milligan Mine – Detail Land Tenure

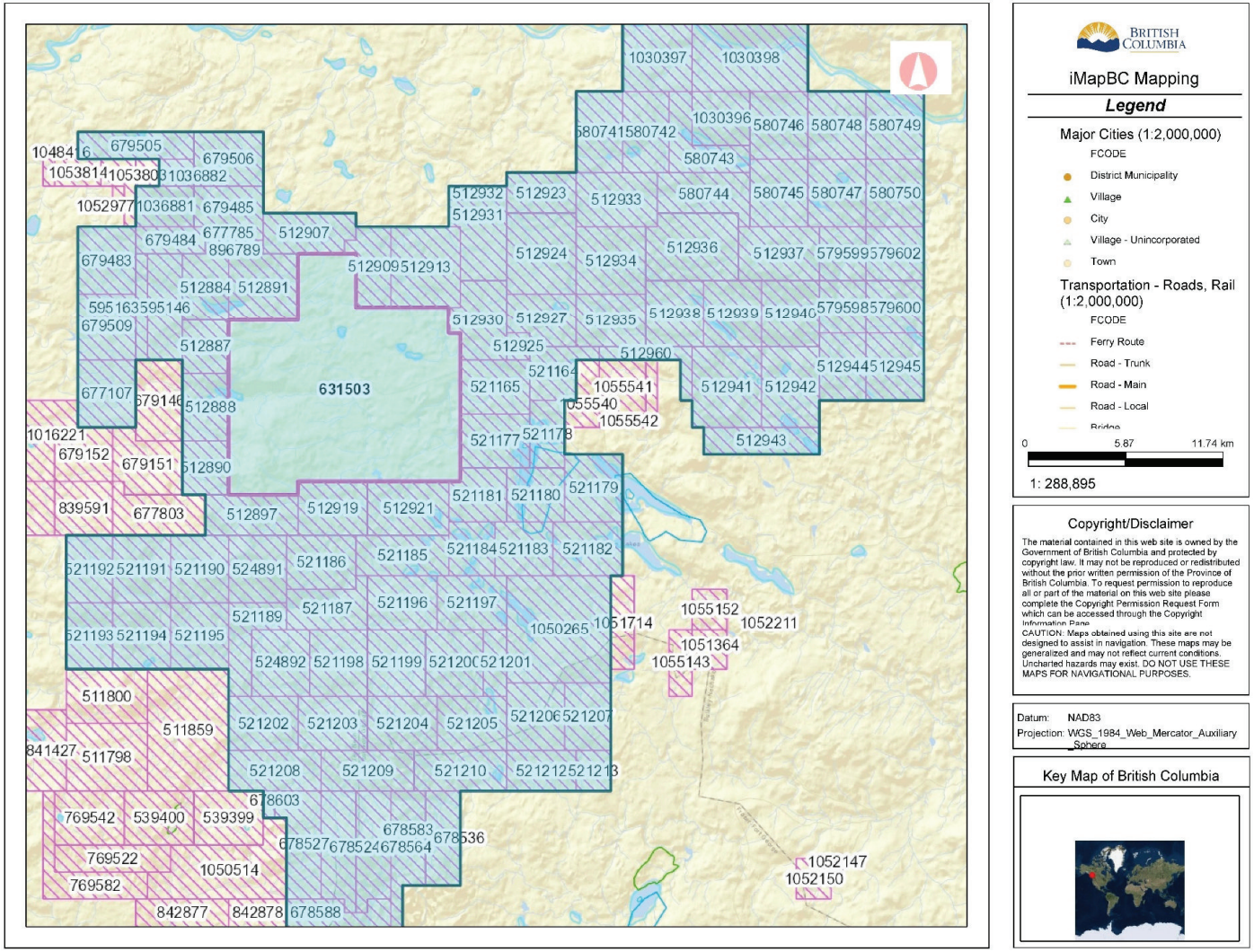
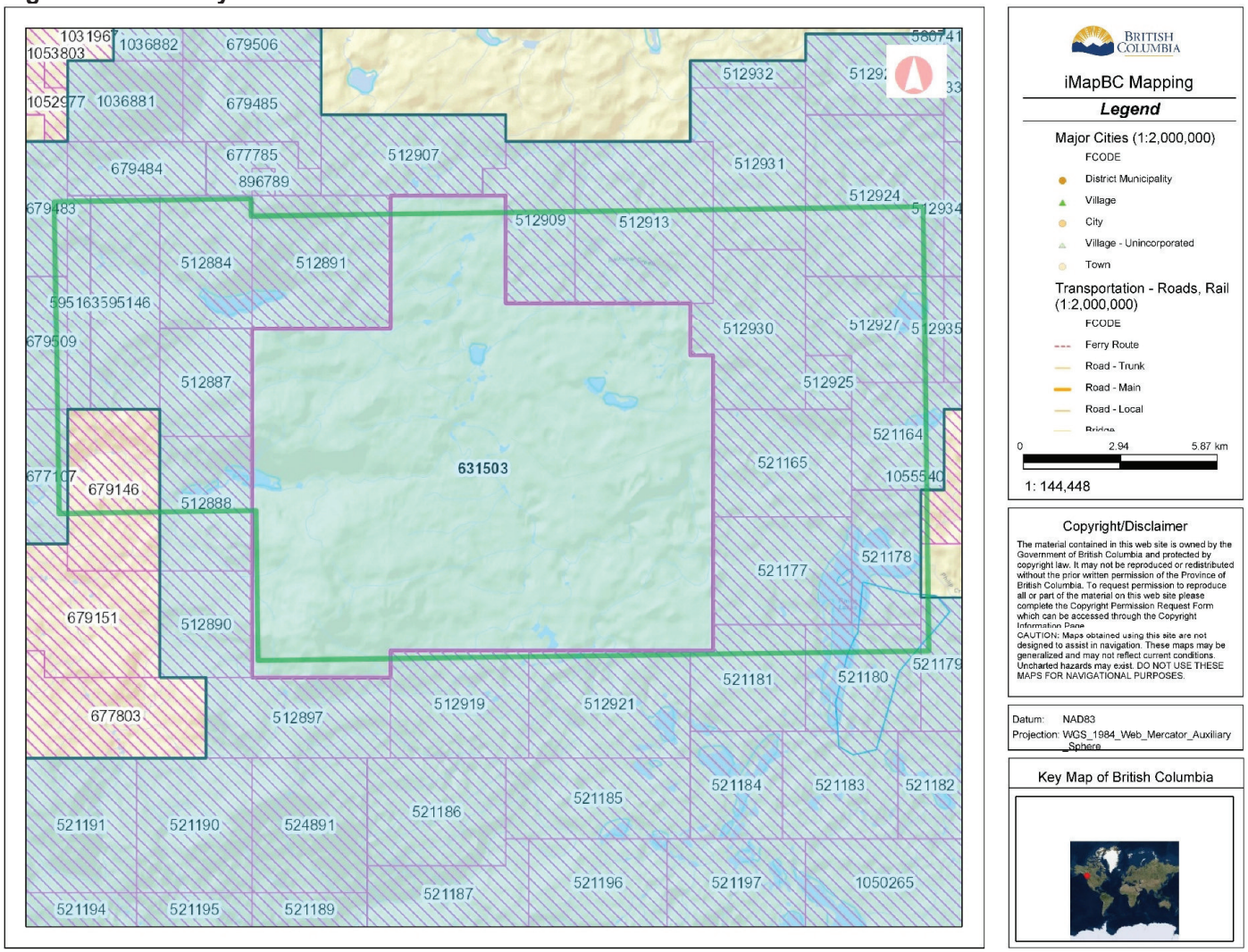


Figure 4 Survey Assessment Tenures



3.0 Lidar Survey

3.1 Contract

In October 2016 Mount Milligan requested a proposal from Eagle Mapping Ltd. Of Port Coquitlam, BC , to submit a survey and cost schedule to collect aerial LiDAR and photography over the Mount Milligan property. The area of interest for the project covered 110 sq. km.

LiDAR and photo acquisition was completed in a single flight on November 6, 2016. Both datasets were collected simultaneously, and equipment was co-mounted in the same aircraft. Weather conditions were clear over the project area of interest (AOI), with few clouds at 8000ft in the surrounding areas. Collection occurred late in the afternoon during low light conditions which resulted in usable imagery only partially covering the AOI. Re-collection of the imagery occurred on May 29, 2017 under much better conditions.

3.2 Survey Parameters

The Lidar was flown using a Piper Navajo aircraft and Riegl Q1560 dual channel Lidar scanner. The photography was taken using a Trimble IQ-180MP Digital Camera.

All data was processed in the Eagle Mapping Port Coquitlam office using Applanix PosPAC v7.1 software. The imagery was also processed in the Port Coquitlam office using Trimble OrthoVista software.

For both Photo and Lidar acquisition, there were an operator and a pilot in the plane. At the processing stage there were 4 persons processing the Lidar, and 1 processing the Orthophoto.

The Lidar point cloud captured a point density of greater than 12-13 points per square metre with an accuracy of +/- 15cm vertically and +/-20cm horizontally The topography map was compiled to 1 meter accuracy.

Table 1 and Figure 5 show the 6 ground control points that were used to complete the surveys. Points were placed on the ground by mine engineering crews prior to the survey flight. Locations were surveyed using mine Trimble GPS equipment. Large white markers made of ‘Tyvek’ sheeting identified the surveyed points from the air. The markers were a ‘cross’ 3.5 x 3.5 meters, made of the 0.5 meters Tyvek sheets.

Table 1 2016 Flight ground Control Points

Ground Monument	UTM Zone 10 NAD83 UTM_N	UTM_E	Elev.
Pt_1A	6,113,932.350	441,986.220	1,007.500
Pt_2A	6,106,279.510	440,779.830	1,024.600
Pt_3A	6,109,149.546	436,464.122	1,053.577
Pt_4A	6,110,688.803	434,495.906	1,104.166
Pt_5A	6,108,816.000	432,259.000	1,053.000
Pt_6A	6,103,159.021	434,424.506	1,214.994

Figure 5 Survey Flight Ground Control Points

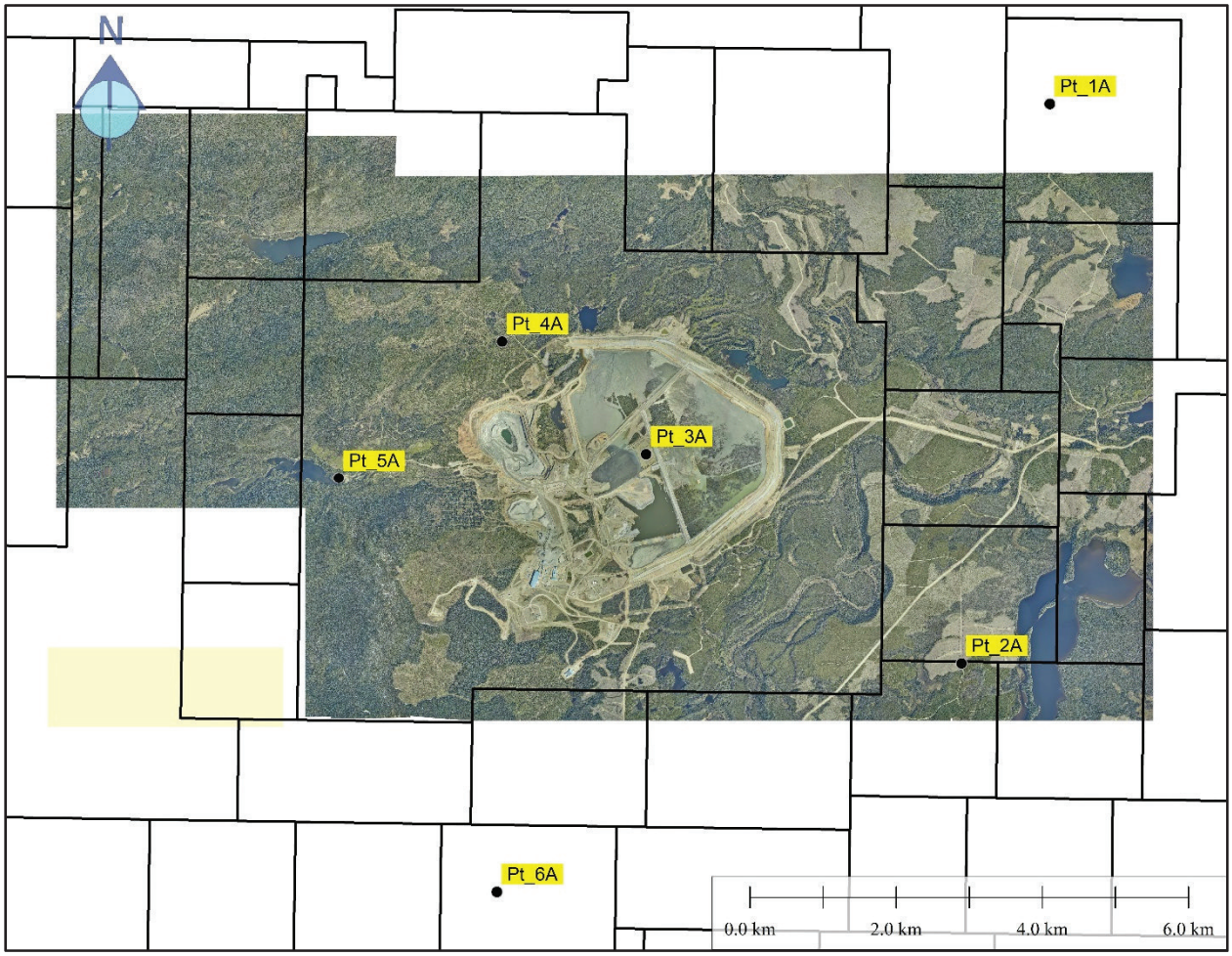
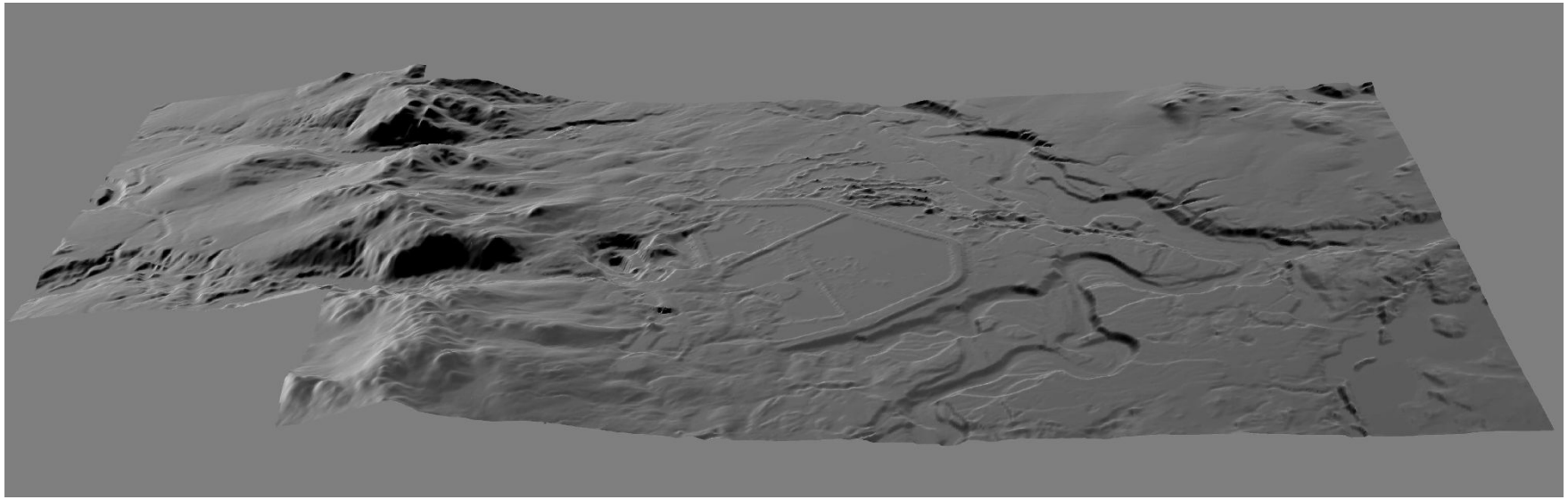


Figure 6 Topography Shaded Relief (1.5 vertical exaggeration)



4.0 Survey Results

Initial Lidar and image deliverables were received by November 23, 2016. Re-flown imagery was received June 15, 2017. Lidar survey data was immediately used by the Engineering group to improve water monitoring and planning within the Tailings Storage Facility. Full scale prints of the orthophotograph were made and distributed to most departments in the mine to assist with planning.

The updated topography has been used to update mine plans and adjust mineral reserves and resources, as well as to plan new exploration drill programs.

4.1 Orthophotograph

Map 1 shows the large scale Mount Milligan Mine orthophotograph, (November 6, 2016). Only a part of the Area of Interest was able to be used due to low light conditions.

Map 2 shows the re collection of imagery on May 29, 2017 resulting in a much finer detail product.

4.2 Lidar Topography

Map 3 shows the 1:40,000 scale , 1 metre contour topography of the Mount Milligan Mine site with 5 meter index contours plotted. (note, the Mount Milligan Mine standard bench height is 15 meters.)

5.0 Conclusions

1. The orthophotography flown May 29, 2017 has provided up to date imagery to support exploration and production support at the Mount Milligan Mine.

2. Detailed Lidar topography has provided required engineering control to assist with exploration programs in 2017 and program planning for 2018. Control for this 2016 survey conforms to previous survey control. No significant adjustments were required.

Respectfully submitted,

Michael Pond, P.Geo.
Regional Exploration Geologist
Thompson Creek Metals Company Inc. – Mount Milligan Mine
December 12, 2017

Appendix 1

Statement of Author's Qualifications

I, Michael Pond, P.Geo. do hereby certify that:

1. I am currently employed as Regional Exploration Geologist by:

   Thompson Creek Metals Company Inc.
   Mount Milligan Mine
   177 Victoria Street, Suite 100
   Prince George, BC V2L 5R8

2. I graduated from the University of British Columbia with a Bachelors of Science, Geology in 1982

3. I graduated from the British Columbia Institute of Technology with a Diploma of Technology, CAD/CAM in 1986.

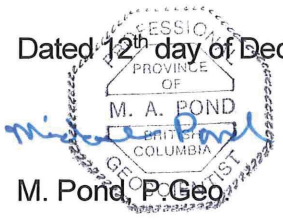
4. I am a Registered Professional Geologist with the Association of Professional Engineers and Geoscientists of BC.
   Registration # 18735

5. I have worked as a Geologist for a total of 30 years since my graduation from university.

6. I am responsible for all sections of this report except Appendix 6. (Eagle Mapping Technical Report)

7. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes this Assessment Report misleading.

Dated 12th day of December, 2017.



M. Pond, P.Geo.

Appendix 2

Tenure Information

All 110 TCM – Mount Milligan Titles in Good Standing to March 14, 2018 and beyond.

Only 3 Mineral Titles for the Map Sheet 093K listing are located on the Mount Milligan property (highlighted in Yellow).

Appendix 4

Computer Software List

1. Project locations were accurately sited using a Trimble GPS system. Data input and output functions used “Trimble Geomatics Office”, version 1.60.

2. Many plotting and drafting functions were done with the Autodesk – “Autocad 2013” program.

3. General report and documentation has been done using the “Microsoft Office Professional Plus 2013 Suite”. (Word, Excel, Outlook)

4. Document PDF file creation and edits have been done using Nuance “PDF Converter Professional 6.0”.

5. PDF document review and collaboration have also used the Adobe Systems Inc, “Adobe Reader” DC (18.009.20050).

6. Simple text data file edits and review used the Helios Software Solutions – “TextPad” program, version 5.4.2.

7. Map GIS and coordinate translations were done with “MapInfo Discover” Bundle 2017.

8. Regional and detailed locations and imagery were plotted from “Google Earth”, version 6.2.2.6613.

9. Screen Captures completed with Techsmith SnagIt version 9.1.3.

10. Aircraft GNSS Trajectory Processing with Applanix PostPAC v7.1 software.

11. Lidar Processing with Reigl RiProcess software.

12. Ortho imagery with Trimble OrthoVista software.

13. Additional GIS Mapping with Blue Marble - Global Mapper version 16.1.3 software.

Appendix 5

Program Expenditures

Eagle Mapping	
Mob / DeMob:	$3,081.57
Lidar Acquisition:	$18,854.36
Lidar Processing:	$8,352.68
Photo Acquisition:	$7,176.82
Photo Processing:	$3,081.57
TCM Project Management Michael Pond	
3 days @ $750/d	$2,250.00
Total	$42,797.00

Appendix 6

Eagle Mapping Technical Report

Eagle Mapping Ltd. : Project File , EML #16-071

LiDAR & Orthophoto Data Report

MOUNT MILLIGAN

Data collected and prepared for:

Thompson Creek Metals

#100 177 Victoria St

Prince George, BC V2L5R8

Eagle Mapping Ltd.

#201 2071 Kingsway Ave

Port Coquitlam, BC V3C6N2

1.877.942.5551

EML Project # 16-071

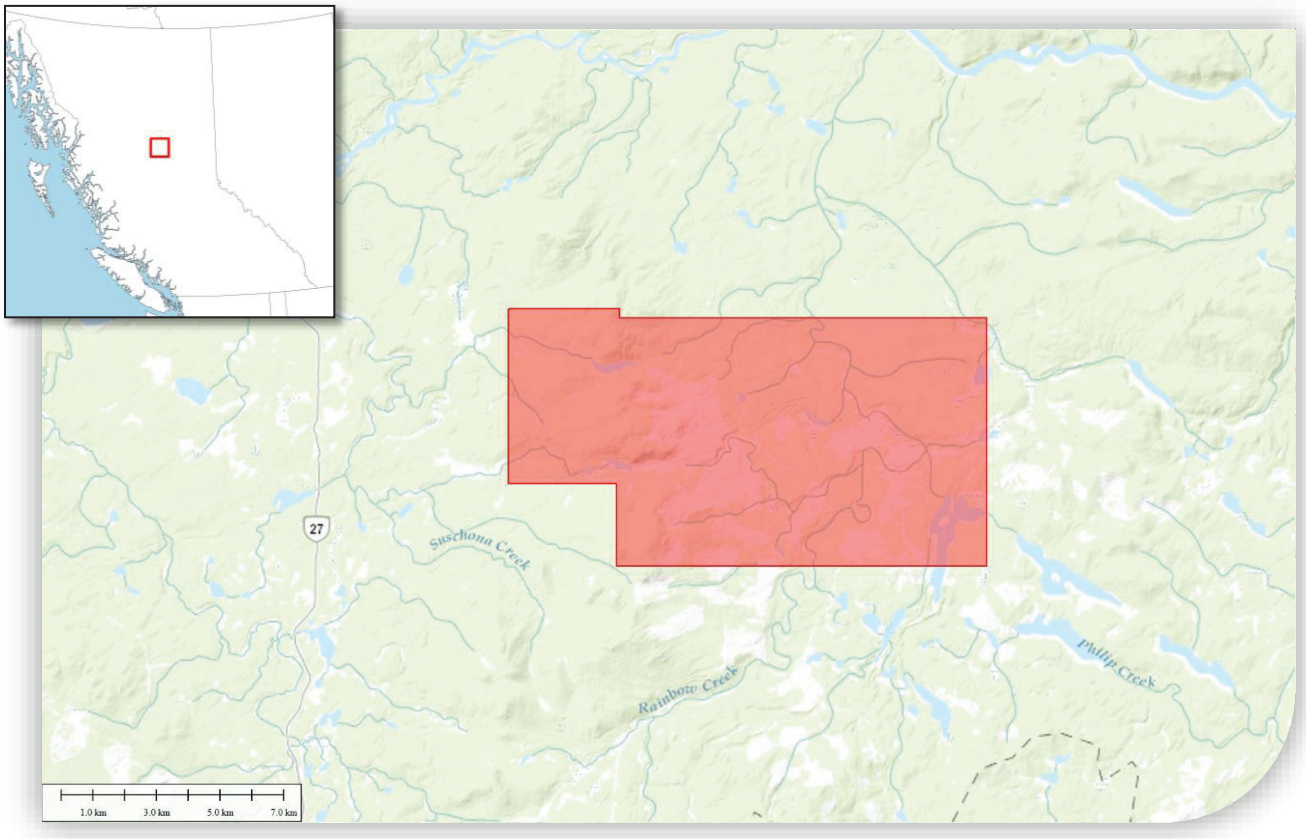
Report Contents

June 19, 2017

1. Project Overview

1.1 Area of Interest

Eagle Mapping Ltd. collected aerial LiDAR and photography of the Mount Milligan mine located 50 km east of Mackenzie, BC. The Area of Interest (AOI) for this project covers approximately 110 sq. km. A significant buffer was collected surrounding the project AOI in order to guarantee accuracy and density within the boundary.



1.2 Collection Conditions

LiDAR and photo acquisition was completed in a single flight on November 6, 2016. Both datasets were collected simultaneously, and equipment was co-mounted in the same aircraft. Weather conditions were clear over the project AOI with few clouds at 8000ft in the surrounding areas. Collection occurred late in the afternoon during low light conditions which resulted in usable imagery only partially covering the AOI. Re-collection of the imagery occurred on May 29, 2017 under much better conditions.

1.3 File Formats, Units, and Projection

Project deliverables include the following:

Digital Elevation Contours – 1m intervals

- ESRI Shapefile and AutoCAD dwg file formats
- Delivered as one file per project tile

Classified LiDAR point cloud

- LAS v1.2 file format
- Delivered as one file per project tile

LiDAR Model Key Points

- ASCII .xyz file format
- Delivered as one file per project tile

Digital orthophoto – 20cm resolution

- GeoTiff format with accompanying world files

LiDAR Data Report

- Overview of project specifications, methodology and accuracies achieved
- PDF format

Map Projection Information	
Projection	UTM zone 10N
Horizontal Datum	NAD83 (CSRS)
Vertical Datum	CGVD28
Geoid	HTv2.0
Units	Meters
EPSG Code	3157

LAS Point Classes	
Class 1	Unclassified
Class 2	Ground

2. Acquisition & Calibration

2.1 Airborne LiDAR Collection

A Riegl Q1560 dual-channel LiDAR system was used for acquisition of the LiDAR data. This system was installed in a Piper Navajo aircraft operated by Peregrine Aerial Surveys out of Abbotsford, BC. In total, 16 flight were required to cover the AOI. Nominal flying height was 1350m above ground level (AGL) and flying speed was approximately 140kts. The scan field of view for the Riegl Q1560 is 29° either side of nadir, for a total scan field of view of 58°. The scan rate used for this project was 800 kHz. However, due to the nature of the 4-sided rotating mirror in Riegl scanners only 2/3 of pulses are recorded (533 kHz useable). This yields an average pulse density of 2 pulses per channel per swath (4 pulses per dual-channel flight line). Note, each pulse may result in one or more returned points as the pulse filters through vegetation, etc.

LiDAR Acquisition Specifications	
Flight Altitude	1350m AGL
Flying Speed	140kts nominal
Scan Rate	800khz (533khz usable)
Scan Field of View	58°
Line Spacing	600m
Minimum Overlap	60%

Photo Acquisition Specifications	
Flight Altitude	1350m AGL
Flying Speed	140kts nominal
Photo Resolution	20cm
Line Spacing	600m
Forward Overlap	60%
Side Overlap	60%

2.2 Aerial Photography Collection

Aerial photography was collected simultaneously with the LiDAR data, using a Trimble IQ-180 80MP digital camera co-mounted with the Q1560 LiDAR system. Imagery collection occurred late in the afternoon during low light level conditions which resulted in usable imagery only partially covering the AOI.

2.3 Aircraft GNSS Trajectory Processing

GNSS post-processing determines the position and attitude of the aircraft at 200Hz along the entire flight path. This data is logged on the Q1560 via an Applanix POS AV510. Post-processing requires data from the onboard GNSS and Inertial Measurement Unit (IMU) as well as data from one or more static GNSS base station(s) with known coordinates.

Processing is done with Applanix PosPAC v7.1 software. Here the aircraft GNSS / IMU data is referenced to the base station data to provide adjusted positions for the aircraft in latitude, longitude, and height, roll, pitch, and yaw / heading. The final trajectory is then smoothed, and exported in .pos format for use in RiProcess for LiDAR processing. The resulting flight path is commonly referred to as a Smoothed Best Estimate of Trajectory (SBET).

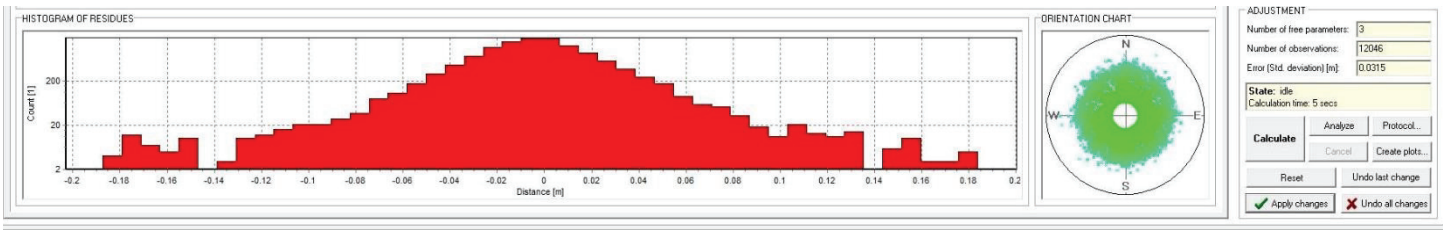
Mission planning ensures the project is flown during a period of good satellite visibility, resulting here in a minimum PDOP of 1.1 and maximum of 1.5. Statistical accuracy (RMS) of the SBET trajectory is <3.1cm.

Trimble RTX real-time correction service was used for differential processing of the GPS trajectory. This service is able to converge to within several cm of accuracy, and is very helpful when surveying remote projects with limited base station coverage.

Trajectory Processing Results	
Min. # satellites	12
Max. # satellites	18
Minimum PDOP	1.1
Maximum PDOP	1.5
RMSE	3.1 cm

2.4 LiDAR Calibration

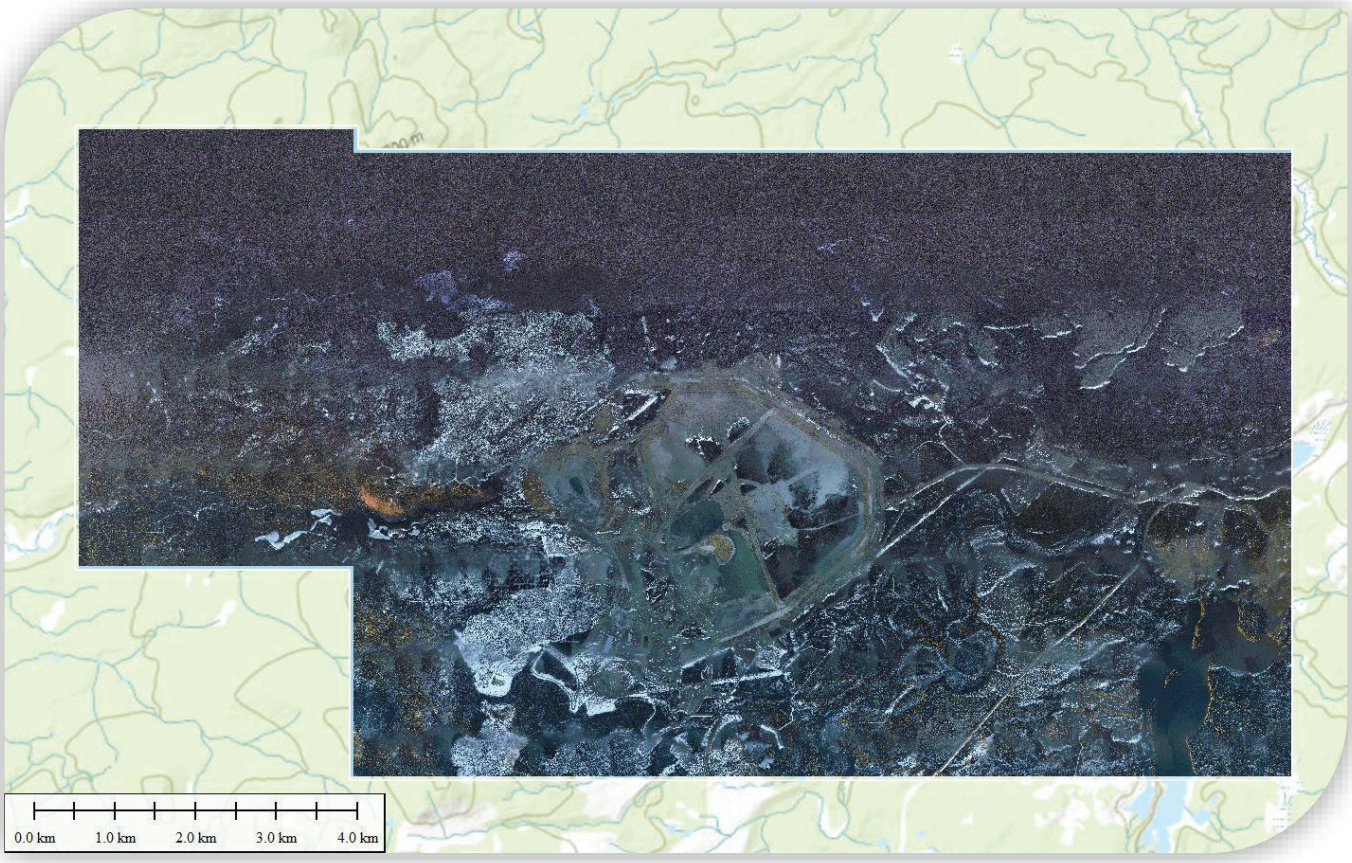
LiDAR data was calibrated using Riegl RiProcess software. A quality check was performed using matching tie planes which are calculated automatically and analyzed via a least-squares adjustment. Manual cross section checks were also performed to verify the automatic results. Internal accuracy of the LiDAR data was calculated at ±3cm. Once deemed properly calibrated, the LAS data is exported along with individual 'trajectories' for each scan line. All data is projected into UTM and adjusted to the proper geoid (HTv2.0) at this time.



2.5 Photo Processing

Imagery is first colour-balanced to adjust for lighting differences between lines. It is then exported as geotiffs for use in the orthorectification process. Ortho processing is performed with Trimble OrthoVista software. With this software, images are aligned geographically (mosaicked) using their time stamp and the position from the SBET which corresponds to this time. The software also references the attitude information from this time stamp in order to 'project' the image on the correct ground location depending on where the aircraft was pointing at that moment.

The overall mosaic of all images is then inspected for busts or other discrepancies and image seam lines are adjusted to have the least visual impact. Control points are measured and checked for accuracy. Finally, once approved, the mosaic is cut into tiles and exported in the appropriate deliverable format.



Low lighting levels during imagery collection resulted in usable imagery only partially covering the AOI. As requested by the client all possible detail was extracted from the raw imagery and delivered.

Imagery was re-flown on May 29, 2017 under optimal weather and lighting conditions. This was then processed and the final orthophoto was delivered on June 13, 2017.

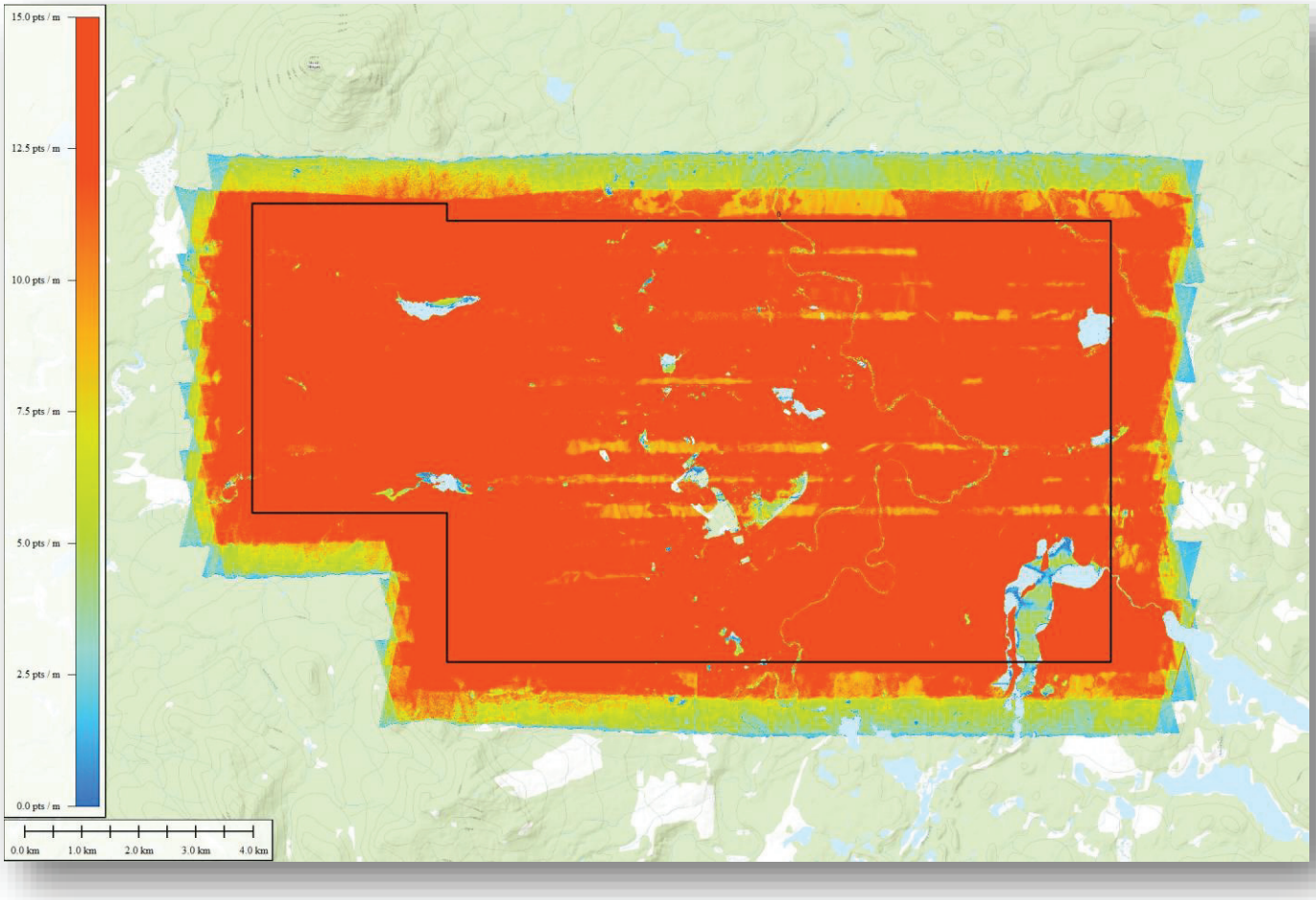
3. Ground Control Measurement

Ground control was provided by the client to be used for LiDAR verification. In total six control points were delivered, five of which were located throughout the project AOI.

4. Results and Conclusions

4.1 Point Density and Coverage

The delivered LiDAR data is positioned with an average density of 12-13 points / sq. meter for all returns, and 8-9 points / sq. meter counting only first-returns. Density is much greater for all returns vs first-returns due to the full waveform analysis performed by the Q1560 laser. By analyzing the full LiDAR waveform, the Q1560 is able to extract many additional points in vegetation, or other terrain where the laser pulse is 'filtered' through many objects in close proximity to each other.



4.2 Accuracy

LiDAR Accuracy

Accuracy of the LiDAR data was determined via comparison to ground control provided by the client. Eagle Mapping technicians concluded that three of the five control points were located in areas which had changed since the survey and therefore were not used for quality control purposes. LiDAR data was measured to fit the remaining control points very well– within <1cm and so no adjustment was required.

Number	Easting	Northing	Known Z	Laser Z	Dz	COMMENTS
1	441986.220	6113932.350	1007.500	1008.000	+0.500	rounded decimals
2	440779.830	6106279.510	1024.600	1022.880	-1.720	antenna height?
3	436464.120	6109149.546	1053.577	1053.580	+0.003	
4	434495.900	6110688.803	1104.166	1104.160	-0.006	
5	432259.000	6108816.000	1053.000	1079.090	+26.090	ellipsodial?
6	434424.500	6103159.021	1214.994	outside	*	

Average dz	+4.973
Minimum dz	-1.720
Maximum dz	+26.090
Average magnitude	5.664
Root mean square	11.695
Std deviation	11.835

5. Cost of Project

The total cost of the project which includes LiDAR and Imagery flown in 2016, and a reflight and Orthophoto of 2017 Imagery was $40,547.00 plus GST.

Appendix A LiDAR Flight Log

Field Crew Names			Project Location		Eagle Mapping Project #			Daily Field Acquisition Log			
Pilot	Chris Dixon		Mackenzie, BC		16-071						
Operator	Alex Corr		LiDAR System Make/Model		GNSS System Make / Model						
Ground Crew			Riegl Q1560		Applanix POS AV 510						
Flight Date (UTC)	Time Offset from UTC		Lever Arm Offsets (m)								
11/6/2016	-8				x	y	z	Meteorological Conditions			
Airport Location		Ident	GPS to IMU		-0.262	-0.042	-1.082		Elev. (ft)	Temp (•C)	Pressure (inHg)
Abbotsford, BC		CYXX	Scanner to IMU		0.018	-0.010	0.407	Airport	2264	10	29.76
GNSS Logging Times	Start	3:10 PM	Aircraft Registration		C-FFSL			At Altitude	8405	-9	
	Stop	5:15 PM	Aircraft Type		Piper Navajo			Sky Cond.		FEW080	

Line	Altitude (ft)	Start	Stop	Total Time	Comments	Avg. Ground Speed
17	8402	3:21 PM	3:22 PM	00:00:30	CH1 Current too high-REDO reduced power 25%	-
17	8402	3:26 PM	3:28 PM	00:02:08		135kts
16	8412	3:30 PM	3:34 PM	00:03:08		138kts
15	8405	3:37 PM	3:40 PM	00:03:15		135kts
14	8405	3:42 PM	3:45 PM	00:03:12		140kts
13	8350	3:48 PM	3:51 PM	00:03:13		135kts
12	8287	3:54 PM	3:58 PM	00:03:47	CLOUD EAST END OF LINE	140kts
11	8169	4:01 PM	4:05 PM	00:04:05	CLOUD EAST END OF LINE	132kts
10	8228	4:08 PM	4:11 PM	00:03:50		140kts
9	8218	4:15 PM	4:19 PM	00:03:59		138kts
8	8215	4:21 PM	4:22 PM	00:00:53		-
8	8215	4:25 PM	4:29 PM	00:03:42		140kts
7	8182	4:32 PM	4:36 PM	00:04:07		134kts
6	8110	4:38 PM	4:42 PM	00:03:52		145kts
5	8123	4:45 PM	4:49 PM	00:03:56		136kts
4	8127	4:51 PM	4:55 PM	00:03:47		140kts
3	8136	4:58 PM	5:02 PM	00:04:03		136kts
2	8143	5:05 PM	5:09 PM	00:03:51		142kts
1				0	NOT NEEDED	-

N

Mount Milligan Mine

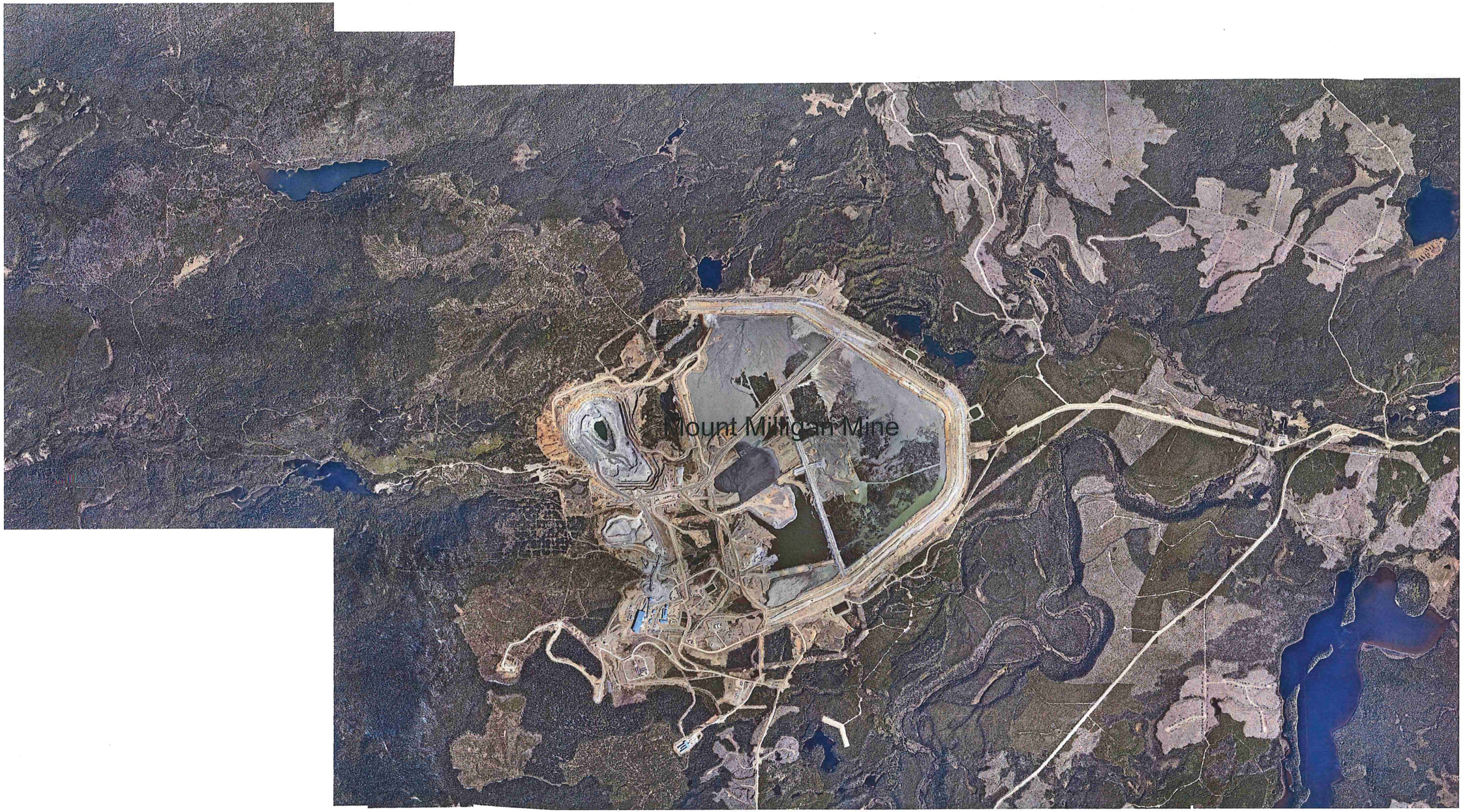
0 0.5 1 2 3 4

Kilometers

Thompson Creek Metals Company Inc.

Map 1 - Mount Milligan Mine
Orthophotograph - November 6. 2016

Scale: 1:40,000 5 meter contours



N

0 0.5 1 2 3 4 Kilometers

Thompson Creek Metals Company Inc.

Map 2 - Mount Milligan Mine
Orthophotograph - May 29, 2017

Scale: 1:40,000

Mount Milligan Mine

0 0.5 1 2 3 4

Kilometers

Thompson Creek Metals Company Inc.

Map 3 - Mount Milligan Mine
Topography Detail

Scale: 1:40,000 5 meter contours