BC Geological Survey
Assessment Report
33152b

2011 EXPLORATION REPORT

for the

TITAN PROPERTY

Volume II - Appendices

Atlin Mining Division, Northwestern B.C.
Latitude 59°28'12" N, Longitude 134°18'42"W
Trim Map sheet 104M049

Prepared for
Blue Gold Mining Inc.

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Vancouver BC, V6E 2E9

by

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January 18, 2012

Appendix I - Statement of Qualifications

Aaron A. Higgs, B. Sc.

I, Aaron Ashwell Higgs, B.Sc. do hereby certify that:

I am currently employed as a Geologist by TerraLogic Exploration Inc., with business location of Suite 200, 44-12th Ave S., Cranbrook, BC, V1C 2R7 (Telephone: 778-520-2000, email: aah@terralogicexploration.com

I graduated with a Bachelor of Science in Geology from the University of British Columbia in the year 2005.

I have worked as a Geologist in Western Canada for 7 years.

I am responsible for the preparation of this Technical Report entitled "2011 Exploration Report for the Titan Property", prepared for Blue Gold Mining Inc.

Dated at Cranbrook, British Columbia, Canada this 18th day of January, 2012.

Respectfully submitted

Aaron A. Higgs, B.Sc. (Geol)

Januray 18th, 2012

Appendix II – Statement of Expenditures

2011 Titan Expenditures					
Geochemical and Geophysical					**Totals**
Personnel (Name) / Position	**Field Days (list actual days)**	**Days**	**Rate**	**Subtotal**	
Jarrod Brown, P. Geo / Chief Geologist	**September 14th - September 22nd**	**9.0**	**$675.00**	$6,075.00	
Brad Robison / Geotech	**September 14th - September 22nd**	**7.0**	**$525.00**	$3,675.00	
Nathan Taylor / Geotech	**September 14th - September 22nd**	**7.0**	**$395.00**	$2,765.00	
				$12,515.00	**$12,515.00**
Office Studies	**List Personnel**				
Project Management	Jarrod Brown, P.Geo	6.15	$675.00	$4,151.25	
Project Management	Jim Ryley	0.10	$675.00	$67.50	
Database compilation	Brad Robison	9.45	$525.00	$4,961.25	
Computer modelling	Glen Hendrickson	0.12	$525.00	$63.00	
Project preperation	Andreas Unterberger	1.25	$330.00	$412.50	
Project preperation	Nathan Taylor	4.00	$395.00	$1,580.00	
Project Preparation and Report preparation	Jarrod Brown, P.Geo	8.65	$675.00	$5,838.75	
Report preparation	Nathan Taylor	5.47	$360.00	$1,969.20	
Report preparation	Mike McCuaig	2.00	$525.00	$1,050.00	
				$20,093.45	**$20,093.45**
Contractors and Subcontractors					
Geological	All-Terrane Mineral Exploration Services			$777.20	
				$777.20	**$777.20**
Airborne Exploration Surveys	**Line Kilometres / Enter total invoiced amount**				
Electromagnetics				$117,177.60	
				$117,177.60	**$117,177.60**
Ground Geophysical Surveys	**Survey Type**				
Petrophysics	Sample measurements for geologic modeling			$400.00	
				$400.00	**$400.00**
Geochemical Surveying	**Number of Samples**	**No.**	**Rate**	**Subtotal**	
Stream sediment	6		$21.29	$127.74	
Soil	*392*		$19.71	$7,728.27	
Rock	*61*		$20.21	$1,232.89	
				$9,088.90	**$9,088.90**
Transportation		**No.**	**Rate**	**Subtotal**	
Airfare				$3,247.67	
Truck rental				$905.85	
Fuel				$154.02	
Helicopter (hours)	9.03 hours			$9,710.83	
Fuel (litres/hour)	114 litres per hour			$1,544.70	
Other	Baggage charges			$52.20	
				$15,615.27	**$15,615.27**
Accommodation & Food	**Rates per day**				
Hotel				$2,644.65	
Camp				$1,013.81	
Meals	day rate or actual costs-specify			$1,060.30	
				$4,718.76	**$4,718.76**
Geological and Geochemical					
Map Plotting				$0.00	
Geological Supplies				$53.11	
Sampling Consumables	sample bags, tags, flagging, etc…			$285.74	
				$338.85	**$338.85**
Equipment Rentals			Per Week		
Field Gear (Specify)	Field pack with gear, GPS, palm, compass, cruiser vest, hand lense, geotool, chisel, hip chain.	4.99	$175.00	$873.25	
Sat Phone		1.71	$75.00	$128.25	
Hand Held Radios		6.84	$40.00	$273.60	
Computer with Printer		3.42	$55.00	$188.10	
Digital Camera		1.71	$30.00	$51.30	
Survival Kit		1.71	$30.00	$51.30	
Truck with insurance		0.9	$700.00	$595.00	
Kilometerage		340.0	$0.30	$102.00	
				$2,262.80	**$2,262.80**
Freight	**Purpose**				
Greyhound Courier	Sample Shipping			$171.26	
				$171.26	**$171.26**
TerraLogic Exploration Handling and Adminstration Fees on 3rd party purchases				$22,243.18	
				$22,243.18	**$22,243.18**
TOTAL Expenditures					**$205,402.27**

Appendix III – Geochemical Protocol

3.1 – Sampling Techniques
3.2 - Analytical Techniques
3.3 - Software

3.1 Geochemistry - Field sampling techniques

All 2011 samples were collected by TerraLogic Exploration Inc employees and sub-contractors. The sampling process is standardized and continually monitored for quality assurance and quality control. 3 types of samples were collected in the field, these include: rock, silt and soil samples. All samples are described in a digital form on a Palm Pilot in the field at the time of collection and also have a GPS location recorded at the site. Sample data was also recorded in field books and locations plotted on field maps as a backup to the digital forms. Upon return to town each day the digital forms are uploaded to a relational database where quality control is conducted to assure all pertinent attribute information has been recorded and the spatial coordinates of each sample is correct.

Rock Samples

Rock samples were collected where mineralization was noted. Transported rock materials were sampled as Float, Talus or Subcrop rock sample types, depending on the perceived distance the rock had traveled from its source. Rocks were collected from outcrops as fist sized Grab samples, or as Chip samples. A Chip sample is a series of continuous and representative samples taken over a set direction and length. In each case rock samples are recorded on the digital forms with a spatial location and a variety of attributes which include: map unit, major rock type, minor rock type, colour fresh, colour weathered, texture, grain size, mineralization major and mineralization minor. All samples were shipped in plastic rice bags with locking plastic straps with unique identification numbers to prevent tampering during the chain of custody.

Soil Samples

Samplers conducted soil sampling traverses over both grids and contour lines. Soil grids were laid out using compass bearings and hip chains. Sample spacing on grids was 25 meter with line spacing that was kept at one hundred metres. Contour soil sample lines were continued on terrain where the grid was not as effective. Soil samples were collected from pits dug with geo-tools to an average depth of 10-20 cm. Where possible the soil sample was collected from the B-Horizon of the soil profile. Attribute data collected for each soil sample included: sample size, quality, depth, slope of sample site, soil horizon, colour and other notes. Sample size is rated from 1-5 with one being much too small sample size and 5 being the perfect sample size, filling roughly ¾ of the sample bag. Quality of the sample rated from 1-5 with 1 being very poor quality and 5 being excellent quality. Factors that include: sample size, soil development and quality (the lack of organics), and depth of sample all contribute to the overall quality attribute.

Silt Samples

Samplers and geologists collected silt samples at any stream they crossed while on a soil line. Attribute data collected for each silt sample included: sample size, quality, depth, water velocity and tributary order. Samples size is rated on a scale of 1-5 with 1 being a very small sample and 5 being the perfect sample amount, filling roughly ¾ of the sample bag. Factors that include: sample size and silt quality (lack or pebbles or mud) contribute to the overall quality attribute.

Sample Handling and Shipping Procedure

At the end of each field day all samples were taken back to the field house in Atlin; here soil and silt samples were arranged in order and hung to dry. Rock samples were also lined up in order of sampler and number. Samples with damaged bags or unclear labels were re-bagged and placed back into order. At the end of the program, a shipment was prepared. This would require one person going through each sample ensuring that all samples were in order and that any missing samples were accounted for with an empty bag marked with the sample number and “LS” for lost sample. The other person would record each sample number to be shipped. Once recorded, the samples were placed in rice bags labeled with the shipment number and addresses. Each shipping bag was kept under 25 kg. The list of samples was compared to the database and any discrepancies investigated. Once the list of samples to be shipped matched the database’s records, the bags were sealed with a zip tie security seal. The bags were shipped by Greyhound Courier from Whitehorse to the Eco-Tech Labs in Kamloops.

Sample Preparation, Analysis and Security

All samples were collected by TerraLogic Exploration Inc. employees or sub contractors. Soil and silt samples were collected using standard kraft sample bags and were dried prior to shipping. Samples were placed in double rice bags and sealed with cable ties and shipped directly to the analytical laboratory using Greyhound Canada Transportation Corp's bus freight service. Analytical work was contracted to Acme Labs 852 East Hastings St. Vancouver, B.C. Acme Labs is registered for ISO 9001:2008.

The samples from the 2011 program were analyzed using ICP-MS (Mass Spectrometer) and ICP-ES (Emission Spectrometer) methods. The rock samples were analyzed using the packages Group 1DX and Group 7AR, while the soil and silt samples were analyzed using the packages Group 1DX and Group 3B.

3.2 Analytical Procedures

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METHOD SPECIFICATIONS
GENERAL SAMPLE PREPARATION METHODS

Receiving: Samples arrive via courier, post or by client drop-off; shipment inspected for completeness.

Sorting and Inspection: Samples sorted and inspected for quality of use (quantity and condition). Pulp samples inspected for homogeneity and fineness.

SOILS

SS80, S230, SSXX Drying and Sieving: Wet or damp soil samples are dried at 60°C (Air dried or 40°C if specified by the client). Soil and sediment sieved to -80 mesh (SS80) or -230 mesh (S230), unless client specifies otherwise (SSXX). Sieves cleaned by brush and compressed air between samples.

SP100, SCP100 Pulverizing: Soils are pulverized to -100 mesh ASTM with an option of using a mild-steel pulverizer (SP100) or a ceramic pulverizer (SCP100), per 100g.

ROCKS AND DRILL CORE

R200-250, R200-500, R200-1000: Rock and Drill Core crushed to 80% passing 10 mesh (2 mm), homogenized, riffle split (250g, 500g, or 1000g subsample) and pulverized to 85% passing 200 mesh (75 microns). Crusher and pulverizer are cleaned by brush and compressed air between routine samples. Granite/Quartz wash scours equipment after high-grade samples, between changes in rock colour and at end of each file. Granite/Quartz is crushed and pulverized as first sample in sequence and carried through to analysis.

P200, PSCB: Samples requiring pulverizing only are dried at 60°C and pulverized to 85% passing 200 mesh (75 microns), using a mild-steel pulverizer (P200), per 250g or a ceramic pulverizer (PSCB), per 100g.

M150, M200s: Rock and Drill Core are crushed, pulverized and sieved, save +150 and -150 mesh fractions (M150) or +200 and -200 mesh fractions (M200) for metallic Au or Cu analysis. Typically 500g samples are sieved.

HPUL: Rock and Drill Core are pulverized by using a mortar and pestle.

VEGETATION

PM1: Plant material is dried then milled to 1mm

VA475: Up to 0.1 kg of wet vegetation is ashed by heating to 475°C.

WWSH: Plant samples are washed with Type-1 water then dried at 60°C prior to analysis, per 100g.

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METHOD SPECIFICATIONS
GROUP 1D AND 1F – GEOCHEMICAL AQUA REGIA DIGESTION

Package Codes: 1D01 to 1D03, 1DX1 to 1DX3, 1F01 to 1F07
Sample Digestion: HNO3-HCl acid digestion
Instrumentation Method: ICP-ES (1D), ICP-MS (1DX, 1F)
Applicability: Sediment, Soil, Non-mineralized Rock and Drill Core

Method Description:

Prepared sample is digested with a modified Aqua Regia solution of equal parts concentrated HCl, HNO3 and DI H2O for one hour in a heating block of hot water bath. Sample is made up to volume with dilute HCl. Sample splits of 0.5g, 15g or 30g can be analyzed.

Element	Group 1D Detection	Group 1DX Detection	Group 1F Detection	Upper Limit
Ag	0.3 ppm	0.1 ppm	2 ppb	100 ppm
Al*	0.01%	0.01%	0.01%	10%
As	2 ppm	0.5 ppm	0.1 ppm	10000 ppm
Au	2 ppm	0.5 ppb	0.2 ppb	100 ppm
B*^	20 ppm	20 ppm	20 ppm	2000 ppm
Ba*	1 ppm	1 ppm	0.5 ppm	10000 ppm
Bi	3 ppm	0.1 ppm	0.02 ppm	2000 ppm
Ca*	0.01%	0.01%	0.01%	40%
Cd	0.5 ppm	0.1 ppm	0.01 ppm	2000 ppm
Co	1 ppm	0.1 ppm	0.1 ppm	2000 ppm
Cr*	1 ppm	1 ppm	0.5 ppm	10000 ppm
Cu	1 ppm	0.1 ppm	0.01 ppm	10000 ppm
Fe*	0.01%	0.01%	0.01%	40%
Ga*	-	1 ppm	0.1 ppm	1000 ppm
Hg	1 ppm	0.01 ppm	5 ppb	50 ppm
K*	0.01%	0.01%	0.01%	10%
La*	1 ppm	1 ppm	0.5 ppm	10000 ppm
Mg*	0.01%	0.01%	0.01%	30%
Mn*	2 ppm	1 ppm	1 ppm	10000 ppm
Mo	1 ppm	0.1 ppm	0.01 ppm	2000 ppm
Na*	0.01%	0.001%	0.001%	5%
Ni	1 ppm	0.1 ppm	0.1 ppm	10000 ppm
P*	0.001%	0.001%	0.001%	5%
Pb	3 ppm	0.1 ppm	0.01 ppm	10000 ppm
S	0.05%	0.05%	0.02%	10%

Element	Group 1D Detection	Group 1DX Detection	Group 1F Detection	Upper Limit
Sb	3 ppm	0.1 ppm	0.02 ppm	2000 ppm
Sc	-	0.1 ppm	0.1 ppm	100 ppm
Se	-	0.5 ppm	0.1 ppm	100 ppm
Sr*	1 ppm	1 ppm	0.5 ppm	10000 ppm
Te	-	0.2 ppm	0.02 ppm	1000 ppm
Th*	2 ppm	0.1 ppm	0.1 ppm	2000 ppm
Ti*	0.01%	0.001%	0.001%	5%
Tl	5 ppm	0.1 ppm	0.02 ppm	1000 ppm
U*	8 ppm	0.1 ppm	0.05 ppm	2000 ppm
V*	1 ppm	2 ppm	2 ppm	10000 ppm
W*	2 ppm	0.1 ppm	0.05 ppm	100 ppm
Zn	1 ppm	1 ppm	0.1 ppm	10000 ppm
Be*	-	-	0.1 ppm	1000 ppm
Ce*	-	-	0.1 ppm	2000 ppm
Cs*	-	-	0.02 ppm	2000 ppm
Ge*	-	-	0.1 ppm	100 ppm
Hf*	-	-	0.02 ppm	1000 ppm
In	-	-	0.02 ppm	1000 ppm
Li*	-	-	0.1 ppm	2000 ppm
Nb*	-	-	0.02 ppm	2000 ppm
Rb*	-	-	0.1 ppm	2000 ppm
Re	-	-	1 ppb	1000 ppb
Sn*	-	-	0.1 ppm	100 ppm
Ta*	-	-	0.05 ppm	2000 ppm
Y*	-	-	0.01 ppm	2000 ppm
Zr*	-	-	0.1 ppm	2000 ppm
Pt*	-	-	2 ppb	100 ppm
Pd*	-	-	10 ppb	100 ppm
Pb_{204}	-	-	0.01 ppm	10000 ppm
Pb_{206}	-	-	0.01 ppm	10000 ppm
Pb_{207}	-	-	0.01 ppm	10000 ppm
Pb_{208}	-	-	0.01 ppm	10000 ppm

* Solubility of some elements will be limited by mineral species present.
^Detection limit = 1 ppm for 15g / 30g analysis.

Limitations:

Au solubility can be limited by refractory and graphitic samples.

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METHOD SPECIFICATIONS
GROUP 3B AND G6 – PRECIOUS METALS BY FIRE ASSAY FUSION

Package Codes: 3B01 to 3B04, G601 to G614
Sample Digestion: Lead-collection fire assay fusion
Instrumentation Method: ICP-ES (3B, G6), ICP-MS (3B-MS), AA (3B, G6), Gravimetric (G6)
Applicability: Rock, Drill Core

Method Description:

Prepared sample is custom-blended with fire-assay fluxes, PbO litharge and a Ag inquart. Firing the charge at 1050 ^{o}C liberates Ag ± Au ± PGEs that report to the molten Pb-metal phase. After cooling the Pb button is recovered, placed in a cupel and fired at 950 ^{o}C to render a Ag ± Au ± PGEs dore bead. The bead is digested for ICP analysis or weighed and parted in ACS grade HNO_3 to dissolve Ag leaving a Au sponge. Au is weighed for Gravimetric determination; ACS grade HCl is added dissolving the Au ± PGE sponge for Instrument determination.

Element	3B Detection	3B Upper Limit	3B-MS Detection	3B-MS Upper Limit
Au	2 ppb	10000 ppb	1 ppb	10000 ppb
Pt	3 ppb	10000 ppb	0.1 ppb	10000 ppb
Pd	2 ppb	10000 ppb	0.5 ppb	10000 ppb

Element	G6 (Inst) Detection	G6 (Inst) Upper Limit	G6 (Grav) Detection	G6 (Grav) Upper Limit
Ag	--	--	50 g/t	1 ton
Au	0.005 g/t	10 g/t	0.17 g/t	1 ton
Pt	0.01 g/t	100 g/t	--	--
Pd	0.01 g/t	100 g/t	--	--

Note:
*Sulphide-rich samples require a 15g or smaller sample for proper fusion.

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METHOD SPECIFICATIONS
GROUP 7AR AND 7AX – ASSAY AQUA REGIA DIGESTION

Package Codes: 7AR1, 7AR2, 7AX, 7AR.1
Sample Digestion: HNO3-HCl acid digestion
Instrumentation Method: ICP-ES (7AR,7AX), ICP-MS (7AX)
Applicability: Rock and Drill Core

Method Description:

Prepared sample is digested with a modified Aqua Regia solution of equal parts concentrated HCl, HNO3 and DI H2O for one hour in a hot water bath. Sample is made up to volume with dilute HCl in class A volumetric flasks. Sample splits of 1g, 0.4 or 0.1g can be analyzed. Very high-grade samples are reweighed at lower weight to accommodate analysis up to 100% upper limit.

Element	Group 7AR Detection	Group 7AX Detection
Ag	2 g/t	0.5 ppm
Al*	0.01%	0.01%
As	0.01%	5 ppm
Ba*	-	5 ppm
Bi*	0.01%	0.5 ppm
Ca*	0.01%	0.01%
Cd	0.001%	0.5 ppm
Co*	0.001%	0.5 ppm
Cr*	0.001%	0.5 ppm
Cu	0.001%	0.5 ppm
Fe*	0.01%	0.01%
Ga*	-	5 ppm
Hg	0.001%	0.05 ppm
K*	0.01%	0.01%
La	-	0.5 ppm
Mg*	0.01%	0.01%
Mn*	0.01%	5 ppm
Mo	0.001%	0.5 ppm
Na*	0.01%	0.01%
Ni*	0.001%	0.5 ppm
P	0.001%	0.001%
Pb	0.01%	0.5 ppm
S*	0.05%	0.05%
Sb	0.001%	0.5 ppm

Element	Group 7AR Detection	Group 7AX Detection
Sc*	-	0.5 ppm
Se	-	2 ppm
Sr*	0.001%	5 ppm
Th*	-	0.5 ppm
Ti*	-	0.001%
Tl	-	0.5 ppm
U*	-	0.5 ppm
V*	-	10 ppm
W*	0.001%	0.5 ppm
Zn*	0.01%	5 ppm

Limitations:

*This digestion is only partial for some Cr and Ba minerals and some oxides of Al, Fe, Hf, Mn, Nb, S, Sn, Ta, Ti, W and Zr if refractory minerals are present.

QUALITY CONTROL: DEFINITIONS AND GUIDELINES FOR INTERPRETATION

Acme Analytical Laboratories core product is analytical data. Therefore Acme has invested heavily into proprietary software and professional staff to ensure we produce the highest quality data. Acme uses a detailed and comprehensive quality system to minimize errors and maximize the reliability of our analytical results. This system applies a tiered approach to the application of quality systems in our laboratories. These tiers are layered in the following manner;

1. ISO 9001 and 17025 documentation, training and standard operating procedures. This forms the framework of the application of each specific method in the laboratory.
2. The use of instrument calibration standards. These solutions are analyzed before any other solutions to establish the factors required to convert raw instrument data into concentration values.
3. QC validation solutions. These solutions are analyzed with client samples to validate each run and to confirm that each analytical run has been performed correctly. These are typically inserted immediately before and immediately after client sample solutions.
4. Reference materials, replicates and blanks. These samples are inserted into randomly assigned positions within each rack as generated by our proprietary LIMS system so that they are analyzed with the client solutions. Their purpose is to provide a final verification of the entire sample handling process. These samples are made up of the following categories:
    - Sample preparation blank;
    - Sample preparation replicate;
    - Analytical blank;
    - Analytical replicate;
    - Certified Reference Material (CRM);
    - Internal Reference Material (IRM).
5. Data review and validation. This is the final layer that is made up of sophisticated proprietary software and professional personnel reviewing the data. The following steps are applied;
    a. Software validation. Proprietary software is used to review the data for specific problems and to perform a series of rational checks upon the data. Data values are flagged and given specific colors, red for fail and amber for warning. Operators must take action on failures and log their actions.
    b. Rack level validation is performed by the instrument operator that analyzed the samples. At Acme, this person is a Chemist or other person with substantial and equivalent experience. This can only occur when the data has passed the software validation. The operator reviews the rack QC and validates the rack of samples if all QC samples pass.
    c. Method level validation. This validation is performed by the senior department Chemist. This review examines all racks analyzed by a specific method. Its purpose is to identify any trends or unusual results that are not apparent when only looking at a single rack of data.
    d. Final Job validation. This is performed by a Certified Assayer or equivalent senior person. This person has access to all the data from multiple analytical methods to check and compare. This is the person that ultimately signs the final certificate.

This document provides a detailed description of Acme's application of Reference materials, Replicates and Blanks.

The Use of Analytical Blanks and Preparation Blanks

Acme uses two types of blanks in the sample analysis stream for drill and rock samples. The first is a preparation blank that is collected from the cleaning sand or rock used between each and every job to clean the crushing and pulverizing equipment prior to starting another client's samples. It also separates different jobs from the same client that may have been separated due to large differences in composition or grade. This blank appears as the first sample in each job, with results reported in the QC section of the certificate under the heading Prep Wash. The analytical results from this blank are used to monitor contamination during the preparation process. The second blank is an analytical blank which is inserted during analysis to monitor reagent contamination and is reported in the QC section of the certificate as BLK.

If the Client chooses to insert blank material, they must be previously certified by a minimum of 4 ISO 9001 accredited laboratories. The nominal maximum value for acceptance will be up to 1% of the preceding sample up to a maximum of 15ppb (preceding sample of 1,500ppb). For preceding samples above this range, additional cleaning rock must be run through equipment prior to these samples and repeat analysis will be at the cost of the client. In some cases, higher rates of contamination can occur. This is typically due to mineral types that contain higher levels of water of hydration (clay minerals). Our operators are trained to recognize this and use cleaning sand between such samples. Since this additional cleaning step carries an added cost, we do our best to contact the client to confirm these actions.

The Use of Replicates

Acme uses analytical and preparation replicates on drill samples to track reproducibility of the analytical and preparation processes. Data for both types of replicates is provided with each certificate at no charge. Replicate precision varies with concentration from 100% or greater error at or near the detection limit for the method, down to the method precision at concentrations greater than 10 times the detection limit.

If clients choose to submit blind replicates please note that replicates on drill samples may not meet the same reproducibility criteria as CRM's/IRM's because the drill samples may not be as homogeneous as an aggressively prepared and mixed standard.

The presence of native gold can also cause serious reproducibility problems. Where the presence of coarse gold is suspected, the parties should discuss more appropriate analytical and preparation techniques that can mitigate these problems.

The Use of Certified Standard Reference Materials (CRM's)

Acme uses CRM's whenever possible to track analytical accuracy and precision for each method. If a CRM is not available or of such high cost that they are not practical, Acme uses internal reference materials (IRM's) that are either synthetically made or certified by performing round robin analyses by several laboratories. If an IRM is used, Acme routinely validates their concentrations using CRM's when they are available.

For concentrations above 10 times the detection limit expected geochemical exploration sample precision is 15% for methods such as 1D and 1E. Ore grade expected precision is 7% at levels greater than 10 times the detection limit for methods such as 7AR and 7TD. Exact precision is method, element and standard quality dependent, so acceptance criteria for individual standard and method combinations are determined on a minimum of 30 replicates measured during the course of routine analyses at a single laboratory. It should be noted that the

expected precision for gold in methods such as Group 3 and Group 6 are difficult to predict due to the heterogeneous distribution of gold in many materials.

Client Field Replicates

Field replicate precision is a measure of the sampling process and natural variability within the sample media; they are not suited for determining analytical precision.

Client's Use of Blind or Hidden Internal Standards

Acme encourages and strongly recommends the use of blind client standards and we recognize that their use is an important component of project data evaluation and acceptance. It is Acme's policy to reanalyze any sample batch that contains a failed customer standard, free of charge, under the following conditions;

- The client supplies Acme with the certification documentation for the standard or proof of certification parameters such as, but not limited to; method of analysis, number of participating laboratories, range of data in the round robin.
- Standards must come from an accredited manufacturer such as CANMET, CDN Labs, Ore Research, Rocklabs or WCM. Certification criteria/method of analysis should be considered before determining if a standard is applicable to a method.
- The analytical result falls outside 3 standard deviations of a population of no less than 30 values determined using a single analytical method (good laboratory practice indicates that 1 value between 2 and 3 SD's is acceptable, while 2 consecutive values will call for reanalysis. In the above description, Acme refers to the standard deviation of values determined over the course of these minimum 30 routine analytical measurements at a single lab, and not the value quoted in the certification sheet for the standard. This definition includes error associated with both the analytical technique, as well as error in the certified value, and is therefore a robust measure of a CRMs performance under a particular set of analytical conditions. In addition, individual standard values that fall outside 3 standard deviations but still lie within the certified error of the material will not be considered to have failed QC validation and costs for requested repeat analyses will be borne by client.
- The failed standard is brought to our attention within 90 days of the initial reporting of the analytical results.

If the reanalysis of a batch or rack is requested by the client due to a Standard failure and the only analytical result that changes significantly is the result for the Standard, the client will be charged for the reanalysis of the rack or batch as this indicates heterogeneity of the Standard itself. In addition, if both samples AND standards are unchanged upon reanalysis, the client will bear the cost of said reanalysis.

Some additional considerations should be noted;

- Variability of a standard material is additive to the analytical method error. Therefore, a poorly prepared standard will increase the total standard deviation realized.
- Selection of an appropriate standard that is both mineralogically and compositionally similar to the samples it is to be analyzed with is of critical importance.
    - If the standard has a different matrix then it would not be unusual if the only sample failing the performance criteria is the standard itself.
    - If the standard has a concentration that is not in a useful concentration range, then unexpected results can occur. For instance, if the concentration of the standard is too high, the laboratory may consistently reanalyze this standard under the assumption that the result is highly anomalous and therefore requires another check. This will waste money and time.

Determination of Method Confidence Limits to be Used for Pass/Fail Criteria

When referring to the Standard Certificate, neither the 95% confidence interval nor the standard deviation quoted in the certificate should be used to calculate control limits or to fail a batch of samples. The 95% confidence interval (normally appearing on the front page of a certificate) is a measure of the certainty of the accuracy of the recommended value. It does not relate to the expected precision during routine use. In addition, it does not account for variations controlled by the limitations imposed by a particular digestion method.

The control limits used to determine the passing or failing of batch data should be calculated from the data that is generated by the laboratory itself (see section "Client use of Blind or Hidden Internal Standards" above for details). Each laboratory provides Standards analyzed with each batch, for this purpose.

Whenever possible, the client should discuss their quality program with the laboratory prior to the start of the project. In this way, any difference in interpretation may be discussed and agreed to in advance.

3.3 Software

The following is a list of software used in the field and writing of this report:

- Arc GIS 9.3
- Microsoft Office
- Pendragon Forms
- Open Office.org
- Adobe X

Appendix IV – Sample Locations and Descriptions

4.1 – Rock Samples
4.2 - Silt and Soil Samples

Appendix 4.1 - Rock Samples

Sample Number	Date	Sample Type	UTM East	UTM North	Chip Length (m)	Chip Azimuth (°)	Rock Type Major	Rock Type Minor	Colour Fresh	Colour Weathered	Grainsize	Texture	Mineralization	Mineralization Style	Alteration	Alteration Degree	Description
BRTIR001	15-Sep-11	outcrop	537627	6594345			quartz diorite	Vein		brown		sheared	galena	semimassive	SILICA	5	yl brn silicified min vein (=AHTIR002)
BRTIR002	15-Sep-11	outcrop	537627	6594345			quartz diorite	Vein		brown		sheared	galena	semimassive	SILICA	5	creamy qtz-eye aplite (=AHTIR003)
BRTIR003	15-Sep-11	outcrop	537627	6594345			quartz diorite	Vein		brown		sheared	galena	semimassive	SILICA	5	brn weathered ser-alt qtz diorite host at Buchans showing
BRTIR004	21-Sep-11	outcrop	540361	6593139	1	180	metasiltite	Vein	bl-grey		fine						Crosscut Mal+Azur stn w CPY+Py+Gal w 30% qtz gaunge hosted in metasiltite
BRTIR005	21-Sep-11	outcrop	540361	6593139	1	180	metasiltite	Vein	bl-grey		fine						Crosscut Mal+Azur stn w CPY+Py+Gal w 30% qtz gaunge hosted in metasiltite
BRTIR006	21-Sep-11	outcrop	540361	6593139	1	180	metasiltite	Vein	bl-grey		fine						Crosscut Mal+Azur stn w CPY+Py+Gal w 30% qtz gaunge hosted in metasiltite
BRTIR007	21-Sep-11	outcrop	540361	6593139	1	180	metasiltite	Vein	bl-grey		fine						Crosscut Mal+Azur stn w CPY+Py+Gal w 30% qtz gaunge hosted in metasiltite
BRTIR008	18-Nov-11	GRAB	540269	6593522	0											0	High grade grab sample from Moose showing shaft
CDTIR001	19-Sep-11	GRAB	534734	6592778			diorite	vein									15cm qtz vein with epd-chl alt on 190/70
CDTIR002	19-Sep-11	GRAB	534726	6592816			diorite	vein									15cm qtz vein with epd-chl alt on 190/38; 60% vein material
CDTIR003	19-Sep-11	GRAB	534707	6592863			diorite	vein									vein material in samp from array of 10 per25m 3-8 cm qtz vns w epd, hem alt, minor py
CDTIR004	19-Sep-11	GRAB	534707	6592863			diorite	vein									similar to samp 3 with 1% dissem py+cpy; 50% vein material in samp
CDTIR005	19-Sep-11	GRAB	534536	6593250			gneiss	vein									5cm qtz vein (small samp) is at 230/90
CDTIR006	19-Sep-11	GRAB	534536	6593196			gneiss										rsty gneiss w conformable bands of cpy-po
CDTIR007	19-Sep-11	GRAB	534575	6593150			gneiss	vein									wht-grey fn graind qtz vein (5cm) w cs dis gal (curvilinear) + chloritized gniess wallrock
JBTIR050	16-Sep-11	outcrop	536716	6591963			Quartzite		light grey								dirty qtzite with 5% biotite forming crude gniessocity; wk spotty Fe-alt
JBTIR051	16-Sep-11	subcrop	536759	6591987			amphibole gneiss	marble	med-dk grey		fine-med						med grey (salt and pepper) well banded amph gneiss in contact with next
JBTIR052	16-Sep-11	subcrop	536759	6591987			amphibole gneiss	marble	med-dk grey		fine-med						dark grey massive amphibolite gneiss
JBTIR053	16-Sep-11	subcrop	536867	6592081			amphibole gneiss										calcareous amphibolite gneiss; comprises 40% of this unit
JBTIR054	16-Sep-11	subcrop	536887	6592093			quartzofeldspathic gneiss		light grey	tan							pristine non fractured low alt, quartzofeldspathic gneiss
JBTIR055	16-Sep-11	subcrop	536887	6592093			quartzofeldspathic gneiss		light grey	tan							mod Fe-altered and fract qtz-feld gneiss more typical of subtle gossans above Fee Glacier
JBTIR056	16-Sep-11	outcrop	536995	6592055			quartzofeldspathic gneiss		light grey	tan							rusty angular massive granite subcrop/float w 2-5% ds pyrite
JBTIR057	16-Sep-11	outcrop	536995	6592055			quartzofeldspathic gneiss		light grey	tan							rusty angular massive granite subcrop/float w 2-5% ds pyrite
JBTIR058	16-Sep-11	subcrop	537093	6592032			muscovite gneiss		light grey	tan							muscovite gneiss w minor penetrative Fe-stain and rare qtz boudins
JBTIR059	16-Sep-11	subcrop	537166	6592038			aplite		white	white	very fine	massive					qtz-eye granite/rhyolite (aplite) w 5% feromag minerals

Sample Number	Date	Sample Type	UTM East	UTM North	Chip Length (m)	Chip Azimuth (°)	Rock Type Major	Rock Type Minor	Colour Fresh	Colour Weathered	Grainsize	Texture	Mineralization	Mineralization Style	Alteration	Alteration Degree	Description
JBTIR060	16-Sep-11	outcrop	537255	6592065			Granite		light grey		medium						granite dyke/sill? W chl-ser altered Feld>>qtz>>bt and rusty with 1% ds pyrite
JBTIR061	16-Sep-11	outcrop	537255	6592065			Granite		light grey		medium						granite dyke/sill? With low to mod chl-ser altered Feld>>qtz>>bt
JBTIR062	16-Sep-11	subcrop	537252	6591979			aplite	marble									composite grab of gossanous silic amphibole-rich mafic uni assoc with marble. Wk positive zinc-zap result
JBTIR063	16-Sep-11	subcrop	537086	6591913			marble										gossanous marble subcrop with mt or po
JBTIR064	16-Sep-11	outcrop	537274	6591773			aplite										qtz-eye aplite with trace bt; variably rusty
JBTIR065	17-Sep-11	FLOAT	536514	6591042			amphibole gneiss										med gry, blky silicfd pyritic diorite
JBTIR066	17-Sep-11	cobbles	536514	6591042			amphibole gneiss										med gry, blky silicfd pyritic diorite
JBTIR067	17-Sep-11	FLOAT	536559	6591117			quartzofeldspathic gneiss	amphibole gneiss									rusty diorite boulders
JBTIR068	17-Sep-11	outcrop	537341	6591791			muscovite quartzofelspathic am										gossanous musc-qtz-feld-amph gneiss w rar py-qtz stringers and mn-cb rich vugs
JBTIR069	17-Sep-11	outcrop	537440	6591742			marble	aplite									low-alt-min marble sample
JBTIR070	17-Sep-11	outcrop	537415	6591718			vein	marble									qtz vein (rusty) at top of marble unit; assoc with granite structure
JBTIR071	17-Sep-11	outcrop	537335	6591198			gabbro	amphibolite									magnetic gabbro/aphibolite; low alt or min
JBTIR072	18-Sep-11	outcrop	534709	6592829	1	5	diorite	vein	greenish grey			fractured			epd	4	footwall diorite to 64K ppb Au aplite is fractured with abundant epd-chl-qtz FF
JBTIR073	18-Sep-11	outcrop	534709	6592829	1	5	diorite	vein	greenish grey			fractured			epd	4	hangingwall diorite to 64K ppb Au aplite is fractured with abundant epd-chl-qtz FF
JBTIR074	18-Sep-11	outcrop	534344	6592979			diorite		salt and pepper						epd	4	10cm zone of massive epd+trc qtz,py hosted in cs diorite
JBTIR075	18-Sep-11	outcrop	534344	6592979			diorite		salt and pepper						epd	4	low angle 15cm pnnk-gry qtz monzonite dyke cut by JBTIR074
JBTIR076	18-Sep-11	outcrop	534327	6593021			diorite								chl	3	chl-si altered diorite with blasts of epd + Po+Py
JBTIR077	18-Sep-11	outcrop	534319	6593024			diorite								chl	3	chl-si altered diorite with blasts of epd + Po+Py
JBTIR078	18-Sep-11	outcrop	534319	6593024			diorite								chl	3	chl-si altered diorite with blasts of epd + Po+Py
JBTIR079	18-Sep-11	outcrop	534404	6593008			diorite								chl	4	epd-qtz-gossan 10cm FF vein (=Hook structure?)
JBTIR080	18-Sep-11	outcrop	534709	6592829			diorite	vein	greenish grey			fractured			epd	4	diorite with moderate penetrative and frac-filled epd-magnetite alteration; host to high grade Au aplite
JBTIR081	19-Sep-11	outcrop	535350	6592245			quartofeldspathic gneiss	gabbro dyke									50cm rusty white fresh, qtz vein w trc Po
JBTIR082	19-Sep-11	outcrop	535136	6592502			biotite quartofeldspathic gnei			gossanous							qtz sill in rusty bt-qtz-feld gneiss
JBTIR083	19-Sep-11	outcrop	535129	6592566			biotite quartofeldspathic gnei			granite sills							hornfeldsed bt-qtzofeld gneiss typical of large gossanous area

Sample Number	Date	Sample Type	UTM East	UTM North	Chip Length (m)	Chip Azimuth (°)	Rock Type Major	Rock Type Minor	Colour Fresh	Colour Weathered	Grainsize	Texture	Mineralization	Mineralization Style	Alteration	Alteration Degree	Description
JBTIR084	19-Sep-11	outcrop	535120	6592674			biotite quartofeldspathic gnei			granite sills							gossanous 2-50cm qtz sills in bt-qtz-feld geniess gossan host
JBTIR085	19-Sep-11	outcrop	534965	6592270			diorite								epd-chl	1	trac FF epd-chl alt in foliated diorite; typical of mass of low alt diorite in region
JBTIR086	19-Sep-11	outcrop	534803	6592200			diorite		green-grey		coarse				epd-chl	2	10cm qtz-py veinlets w drusy qtz and semimassive seams of py
JBTIR087	21-Sep-11	outcrop	540415	6593041			metasiltite	Vein	bl-grey		fine						20cm qtz vein SILL hosted in metasiltite
JBTIR088	21-Sep-11	dump	540332	6593187			vein										qtz vein material from WM-B dump w cs 5x10cm massiv sulph clots of gal>sphal>>cpy
JBTIR089	21-Sep-11	dump	540332	6593187			vein										qtz vein material from WM-B dump w 20cm+ seam of massive fn grnd py
JBTIR090	21-Sep-11	dump	540332	6593187			vein										qtz vein material from WM-B dump w wht,grey,blk,red green mottled colours + gal+cpy+mod mal+az stn. Good znc zap reaction
JBTIR091	21-Sep-11	outcrop	540314	6593166			chlorite schist	aplite									30cm crosscut qtz vein in place w 5% dissem galena+cpy and mod malachite stn.
JBTIR092	21-Sep-11	shaft	540269	6593521			chlorite schist										malachite stnd grey fine grnd qtz vein ore w trc dissem py+cpy; see assay BRTIR008
JBTIR093	21-Sep-11	shaft	540274	6593481			chlorite schist	aplite									conform py-qtz-gal+mal vein in east shaft at contact w MV and aplite
JBTIR094	21-Sep-11	dump	540327	6594048			unknown	Vein									qtz vein from dump of WM-North showing with 5% dissem cpy, 3% ds gal + mal stn

Appendix 4.2 - Soil Samples

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL009 00+00	9/16/2011	GPS	536731	6591933	8N	brown	light brown	10 - 20	15	3		
TIL009 00+25E	9/16/2011	MAP	536755	6591939	8N	brown	light brown	10 - 20	15	3	Rocky	
TIL009 00+50E	9/16/2011	MAP	536780	6591945	8N	brown	light brown	10 - 20	15	3		
TIL009 00+75E	9/16/2011	MAP	536804	6591951	8N	brown	light brown	10 - 20	15	4		
TIL009 01+00E	9/16/2011	MAP	536828	6591957	8N	brown	light brown	10 - 20	15	4		
TIL009 01+25E	9/16/2011	MAP	536853	6591963	8N	brown	light brown	10 - 20	15	4		
TIL009 01+50E	9/16/2011	MAP	536877	6591968	8N	brown	light brown	10 - 20	15	3		
TIL009 01+75E	9/16/2011	MAP	536901	6591974	8N	brown	light brown	10 - 20	15	3	Rocky	
TIL009 02+00E	9/16/2011	MAP	536926	6591980	8N	brown	light brown	10 - 20	15	3		
TIL009 02+25E	9/16/2011	MAP	536950	6591986	8N	brown	light brown	10 - 20	15	4		
TIL009 02+50E	9/16/2011	MAP	536975	6591992	8N	brown	light brown	10 - 20	15	3		
TIL009 02+75E	9/16/2011	MAP	536999	6591998	8N	brown	light brown	10 - 20	15	3		
TIL009 03+00E	9/16/2011	MAP	537023	6592004	8N	brown	light brown	10 - 20	15	3		
TIL009 03+25E	9/16/2011	MAP	537048	6592010	8N	brown	light brown	10 - 20	15	3		
TIL009 03+50E	9/16/2011	MAP	537072	6592016	8N	brown	light brown	10 - 20	15	4		
TIL009 03+75E	9/16/2011	MAP	537096	6592022	8N	brown	light brown	10 - 20	15	2	Rocky	
TIL009 04+00E	9/16/2011	MAP	537121	6592027	8N	brown	light brown	10 - 20	15	4		
TIL009 04+25E	9/16/2011	MAP	537145	6592033	8N	brown	light brown	10 - 20	15	4		

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL009 04+50E	9/16/2011	MAP	537169	6592039	8N	brown	light brown	10 - 20	15	3		
TIL009 04+75E	9/16/2011	MAP	537194	6592045	8N	brown	light brown	10 - 20	15	3		
TIL009 05+00E	9/16/2011	GPS	537218	6592051	8N	brown	light brown	10 - 20	15	2	Rocky	
TIL010 00+00	9/16/2011	GPS	536755	6591844	8N	Brown		10-20	5	3	ROCKY	
TIL010 00+25E	9/16/2011	MAP	536779	6591850	8N	Brown		10-20	10	3	ROCKY	
TIL010 00+50E	9/16/2011	MAP	536803	6591857	8N	Brown		10-20	5	3	ROCKY	
TIL010 00+75E	9/16/2011	MAP	536827	6591863	8N	Brown		10-20	10	3	ROCKY	
TIL010 01+00E	9/16/2011	MAP	536851	6591869	8N	Brown		10-20	15	3	ROCKY	
TIL010 01+25E	9/16/2011	MAP	536875	6591876	8N	Brown		10-20	10	3	ROCKY	
TIL010 01+50E	9/16/2011	MAP	536899	6591882	8N	Brown		10-20	10	3	ROCKY	
TIL010 01+75E	9/16/2011	MAP	536923	6591888	8N	Brown		10-20	10	3	ROCKY	
TIL010 02+00E	9/16/2011	MAP	536947	6591895	8N	Brown		10-20	5	3	ROCKY	
TIL010 02+25E	9/16/2011	MAP	536971	6591901	8N	Brown		10-20	10	3	ROCKY	
TIL010 02+50E	9/16/2011	MAP	536996	6591908	8N	Brown		10-20	10	3	ROCKY	
TIL010 02+75E	9/16/2011	MAP	537020	6591914	8N	Brown		10-20	10	3	ROCKY	
TIL010 03+00E	9/16/2011	MAP	537044	6591920	8N	Brown		10-20	10	3	ROCKY	
TIL010 03+25E	9/16/2011	MAP	537068	6591927	8N	Brown		10-20	10	3	ROCKY	
TIL010 03+50E	9/16/2011	MAP	537092	6591933	8N	Brown		10-20	10	3	ROCKY	

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL010 03+75E	9/16/2011	MAP	537116	6591939	8N	Brown		10-20	10	3	ROCKY	
TIL010 04+00E	9/16/2011	MAP	537140	6591946	8N	Brown		10-20	10	3	ROCKY	
TIL010 04+25E	9/16/2011	MAP	537164	6591952	8N	Brown		10-20	10	3	ROCKY	
TIL010 04+50E	9/16/2011	MAP	537188	6591958	8N	Brown		10-20	10	3	ROCKY	
TIL010 04+75E	9/16/2011	MAP	537212	6591965	8N	Brown		10-20	10	3	ROCKY	
TIL010 05+00E	9/16/2011	GPS	537236	6591971	8N	Brown		10-20	20	3	ROCKY	
TIL011 00+00	9/16/2011	GPS	536784	6591743	8N	brown	light brown	10 - 20	15	3		
TIL011 00+25E	9/16/2011	MAP	536808	6591751	8N	brown	light brown	10 - 20	15	4		
TIL011 00+50E	9/16/2011	MAP	536831	6591759	8N	brown	light brown	10 - 20	15	4		
TIL011 00+75E	9/16/2011	MAP	536855	6591767	8N	brown	light brown	10 - 20	15	4		
TIL011 01+00E	9/16/2011	MAP	536879	6591774	8N	brown	light brown	10 - 20	15	4		
TIL011 01+25E	9/16/2011	MAP	536903	6591782	8N	brown	light brown	10 - 20	15	2		
TIL011 01+50E	9/16/2011	MAP	536926	6591790	8N	brown	light brown	10 - 20	15	2	ORGANIC	
TIL011 01+75E	9/16/2011	MAP	536950	6591798	8N	brown	light brown	10 - 20	15	4		
TIL011 02+00E	9/16/2011	MAP	536974	6591806	8N	brown	light brown	10 - 20	15	3		
TIL011 02+25E	9/16/2011	MAP	536997	6591814	8N	brown	light brown	10 - 20	15	3		
TIL011 02+50E	9/16/2011	MAP	537021	6591822	8N	brown	light brown	10 - 20	15	3	ORGANIC	
TIL011 02+75E	9/16/2011	MAP	537045	6591829	8N	brown	light brown	10 - 20	15	4		

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL011 03+00E	9/16/2011	MAP	537068	6591837	8N	brown	light brown	10 - 20	15	3		
TIL011 03+25E	9/16/2011	MAP	537092	6591845	8N	brown	light brown	10 - 20	15	4		
TIL011 03+50E	9/16/2011	MAP	537116	6591853	8N	brown	light brown	10 - 20	15	4		
TIL011 03+75E	9/16/2011	MAP	537140	6591861	8N	brown	light brown	10 - 20	15	5		
TIL011 04+00E	9/16/2011	MAP	537163	6591869	8N	brown	light brown	10 - 20	15	4		
TIL011 04+25E	9/16/2011	MAP	537187	6591876	8N	brown	light brown	10 - 20	15	3		
TIL011 04+50E	9/16/2011	MAP	537211	6591884	8N	brown	light brown	10 - 20	15	4		
TIL011 04+75E	9/16/2011	MAP	537234	6591892	8N	brown	light brown	10 - 20	15	4		
TIL011 05+00E	9/16/2011	GPS	537258	6591900	8N	brown	light brown	10 - 20	15	4	Rocky	
TIL012 00+00	9/16/2011	GPS	536805	6591651	8N	Brown		10-20	20	3	ROCKY	
TIL012 00+25E	9/16/2011	MAP	536829	6591658	8N	Brown		10-20	10	3	ROCKY	
TIL012 00+50E	9/16/2011	MAP	536853	6591666	8N	Brown		10-20	15	3	ROCKY	
TIL012 00+75E	9/16/2011	MAP	536876	6591673	8N	Brown		10-20	20	3	ROCKY	
TIL012 01+00E	9/16/2011	MAP	536900	6591680	8N	Brown		10-20	20	3	ROCKY	
TIL012 01+25E	9/16/2011	MAP	536924	6591687	8N	Brown		10-20	20	3	ROCKY	
TIL012 01+50E	9/16/2011	MAP	536948	6591695	8N	Brown		10-20	20	4	ROCKY	
TIL012 01+75E	9/16/2011	MAP	536971	6591702	8N	Brown		10-20	25	4	ROCKY	
TIL012 02+00E	9/16/2011	MAP	536995	6591709	8N	Brown		10-20	20	2	ROCKY	

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL012 02+25E	9/16/2011	MAP	537019	6591716	8N	Brown		10-20	20	4	ROCKY	
TIL012 02+50E	9/16/2011	MAP	537043	6591724	8N	Brown		10-20	20	3	ROCKY	
TIL012 02+75E	9/16/2011	MAP	537066	6591731	8N	Brown		10-20	20	3	ROCKY	
TIL012 03+00E	9/16/2011	MAP	537090	6591738	8N	Brown		10-20	20	3	ROCKY	
TIL012 03+25E	9/16/2011	MAP	537114	6591745	8N	Brown		10-20	20	3	ROCKY	
TIL012 03+50E	9/16/2011	MAP	537138	6591753	8N	Brown		10-20	20	3	ROCKY	
TIL012 03+75E	9/16/2011	MAP	537161	6591760	8N	Brown		10-20	20	3	ROCKY	
TIL012 04+00E	9/16/2011	MAP	537185	6591767	8N	Brown		10-20	20	3	ROCKY	
TIL012 04+25E	9/16/2011	MAP	537209	6591774	8N	Brown		10-20	20	4	ROCKY	
TIL012 04+50E	9/16/2011	MAP	537233	6591782	8N	Brown		10-20	20	3	ROCKY	
TIL012 04+75E	9/16/2011	MAP	537256	6591789	8N	Brown		10-20	20	2	ROCKY	
TIL012 05+00E	9/16/2011	GPS	537280	6591796	8N	Brown		10-20	20	3	ROCKY	
TIL013 00+00	9/16/2011	GPS	536830	6591557	8N	Brown		10-20	20	3	ROCKY	
TIL013 00+25E	9/16/2011	MAP	536853	6591564	8N	Brown		10-20	20	4	ROCKY	
TIL013 00+50E	9/16/2011	MAP	536876	6591572	8N	Brown		10-20	20	4	ROCKY	
TIL013 00+75E	9/16/2011	MAP	536899	6591579	8N	Brown		10-20	20	4	ROCKY	
TIL013 01+00E	9/16/2011	MAP	536923	6591587	8N	Brown		10-20	20	4	ROCKY	
TIL013 01+25E	9/16/2011	MAP	536946	6591594	8N	Brown		10-20	20	2	ROCKY	

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL013 01+50E	9/16/2011	MAP	536969	6591601	8N	Brown		10-20	20	1	ROCKY	
TIL013 01+75E	9/16/2011	MAP	536992	6591609	8N	Brown		10-20	20	3	ROCKY	
TIL013 02+00E	9/16/2011	MAP	537015	6591616	8N	Brown		10-20	20	3	ROCKY	
TIL013 02+25E	9/16/2011	MAP	537038	6591624	8N	Brown		10-20	20	4	ROCKY	
TIL013 02+50E	9/16/2011	MAP	537062	6591631	8N	Brown		10-20	20	4	ROCKY	
TIL013 02+75E	9/16/2011	MAP	537085	6591638	8N	Brown		10-20	20	4	ROCKY	
TIL013 03+00E	9/16/2011	MAP	537108	6591646	8N	Brown		10-20	20	4	ROCKY	
TIL013 03+25E	9/16/2011	MAP	537131	6591653	8N	brown	light brown	10 - 20	25	4		
TIL013 03+50E	9/16/2011	MAP	537154	6591661	8N	brown	grey	10 - 20	25	2	Rocky	
TIL013 03+75E	9/16/2011	MAP	537177	6591668	8N	brown	grey	10 - 20	25	3		
TIL013 04+00E	9/16/2011	MAP	537200	6591675	8N	brown	grey	10 - 20	15	3	Rocky	
TIL013 04+25E	9/16/2011	MAP	537224	6591683	8N	brown	grey	40 - 50	15	4		
TIL013 04+50E	9/16/2011	MAP	537247	6591690	8N	brown	grey	40 - 50	25	3		
TIL013 04+75E	9/16/2011	MAP	537270	6591698	8N	brown	grey	40 - 50	15	3	Rocky	
TIL013 05+00E	9/16/2011	GPS	537293	6591705	8N	brown	grey	40 - 50	25	3	Rocky	
TIL014 00+00	9/17/2011	GPS	536849	6591460	8N	brown	light brown	10 - 20	15	4		
TIL014 00+25E	9/17/2011	MAP	536873	6591467	8N	brown	light brown	10 - 20	15	4		
TIL014 00+50E	9/17/2011	MAP	536897	6591475	8N	brown	light brown	10 - 20	15	4		

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL014 00+75E	9/17/2011	MAP	536920	6591482	8N	brown	light brown	10 - 20	15	3		
TIL014 01+00E	9/17/2011	MAP	536944	6591490	8N	brown	light brown	10 - 20	15	3		
TIL014 01+25E	9/17/2011	MAP	536968	6591497	8N	brown	light brown	10 - 20	35	4		
TIL014 01+50E	9/17/2011	MAP	536992	6591504	8N	brown	light brown	10 - 20	25	4		
TIL014 01+75E	9/17/2011	MAP	537016	6591512	8N	brown	light brown	10 - 20	25	3		
TIL014 02+00E	9/17/2011	MAP	537039	6591519	8N	brown	light brown	10 - 20	15	2		
TIL014 02+25E	9/17/2011	MAP	537063	6591527	8N	brown	light brown	10 - 20	15	3		
TIL014 02+50E	9/17/2011	MAP	537087	6591534	8N	brown	light brown	10 - 20	25	3		
TIL014 02+75E	9/17/2011	MAP	537111	6591541	8N	brown	light brown	10 - 20	25	3	Rocky	
TIL014 03+00E	9/17/2011	MAP	537135	6591549	8N	brown	light brown	10 - 20	15	2	Rocky	organic
TIL014 03+25E	9/17/2011	MAP	537158	6591556	8N	brown	light brown	20 - 30	25	2	Rocky	
TIL014 03+50E	9/17/2011	MAP	537182	6591564	8N	brown	light brown	20 - 30	15	2	Rocky	
TIL014 03+75E	9/17/2011	MAP	537206	6591571	8N	brown	light brown	20 - 30	15	2	Rocky	
TIL014 04+00E	9/17/2011	MAP	537230	6591578	8N						Snow	
TIL014 04+25E	9/17/2011	MAP	537254	6591586	8N						Snow	
TIL014 04+50E	9/17/2011	MAP	537277	6591593	8N	brown		20 - 30	25	3		
TIL014 04+75E	9/17/2011	MAP	537301	6591601	8N						Snow	
TIL014 05+00E	9/17/2011	GPS	537325	6591608	8N	brown		20 - 30	15	3	Rocky	

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL015 00+00	9/17/2011	GPS	536854	6591360	8N	Brown		10-20	20	3	ROCKY	
TIL015 00+25E	9/17/2011	MAP	536878	6591367	8N	Brown		10-20	20	3	ROCKY	
TIL015 00+50E	9/17/2011	MAP	536902	6591374	8N	Brown		10-20	20	3	ROCKY	
TIL015 00+75E	9/17/2011	MAP	536926	6591380	8N	Brown		10-20	20	3	ROCKY	
TIL015 01+00E	9/17/2011	MAP	536951	6591387	8N	Brown		10-20	20	3	ROCKY	
TIL015 01+25E	9/17/2011	MAP	536975	6591394	8N	Brown		10-20	30	4	ROCKY	
TIL015 01+50E	9/17/2011	MAP	536999	6591401	8N	Brown		10-20	30	3	ROCKY	
TIL015 01+75E	9/17/2011	MAP	537023	6591408	8N	Brown		10-20	30	3	ROCKY	
TIL015 02+00E	9/17/2011	NO SAMPLE	537047	6591414	8N	Brown						
TIL015 02+25E	9/17/2011	NO SAMPLE	537071	6591421	8N	Brown						
TIL015 02+50E	9/17/2011	MAP	537096	6591428	8N	Brown		10-20	30	3	ROCKY	
TIL015 02+75E	9/17/2011	MAP	537120	6591435	8N	Brown		10-20	30	3	ROCKY	
TIL015 03+00E	9/17/2011	MAP	537144	6591442	8N	Brown		10-20	25	3	ROCKY	
TIL015 03+25E	9/17/2011	MAP	537168	6591448	8N	Brown	Black	10-20	15	3	ROCKY	
TIL015 03+50E	9/17/2011	MAP	537192	6591455	8N	Brown	Black	10-20	30	1	ROCKY	Organics
TIL015 03+75E	9/17/2011	MAP	537216	6591462	8N	Brown		30-40	30	3	ROCKY	Organics
TIL015 04+00E	9/17/2011	MAP	537240	6591469	8N	Brown		30-40	30	3	ROCKY	
TIL015 04+25E	9/17/2011	MAP	537265	6591476	8N	Brown		30-40	30	4	ROCKY	

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL015 04+50E	9/17/2011	MAP	537289	6591482	8N	Brown		30-40	30	3	ROCKY	Organics
TIL015 04+75E	9/17/2011	MAP	537313	6591489	8N	Brown		30-40	30	3	ROCKY	
TIL015 05+00E	9/17/2011	GPS	537337	6591496	8N	Brown		30-40	30	3	ROCKY	
TIL016 00+00	9/17/2011	GPS	536873	6591263	8N	brown	light brown	10 - 20	15	3		
TIL016 00+25E	9/17/2011	MAP	536897	6591270	8N	brown	light brown	10 - 20	15	3		
TIL016 00+50E	9/17/2011	MAP	536921	6591277	8N	brown	light brown	10 - 20	15	3		
TIL016 00+75E	9/17/2011	MAP	536945	6591284	8N	brown	light brown	10 - 20	15	4		
TIL016 01+00E	9/17/2011	MAP	536969	6591291	8N	brown	light brown	10 - 20	15	3		
TIL016 01+25E	9/17/2011	MAP	536993	6591298	8N	brown	light brown	10 - 20	25	4		
TIL016 01+50E	9/17/2011	MAP	537017	6591305	8N	brown	light brown	10 - 20	25	3		
TIL016 01+75E	9/17/2011	MAP	537041	6591312	8N	brown	light brown	10 - 20	15	4		
TIL016 02+00E	9/17/2011	MAP	537065	6591319	8N	brown	light brown	10 - 20	35	4		
TIL016 02+25E	9/17/2011	MAP	537089	6591326	8N	brown	light brown	10 - 20	25	4		
TIL016 02+50E	9/17/2011	MAP	537114	6591333	8N	brown	light brown	10 - 20	25	4		
TIL016 02+75E	9/17/2011	MAP	537138	6591339	8N	brown	light brown	10 - 20	35	4		
TIL016 03+00E	9/17/2011	MAP	537162	6591346	8N	brown	light brown	10 - 20	15	3		
TIL016 03+25E	9/17/2011	MAP	537186	6591353	8N	brown	light brown	10 - 20	15	3	Rocky	
TIL016 03+50E	9/17/2011	MAP	537210	6591360	8N	brown	light brown	10 - 20	25	3		

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL016 03+75E	9/17/2011	MAP	537234	6591367	8N	brown	dark brown	10 - 20	25	3	Rocky	
TIL016 04+00E	9/17/2011	MAP	537258	6591374	8N	brown	dark brown	30 - 40	25	3		
TIL016 04+25E	9/17/2011	MAP	537282	6591381	8N	brown	light brown	10 - 20	25	3	Rocky	
TIL016 04+50E	9/17/2011	MAP	537306	6591388	8N	brown	light brown	20 -30	25	4		
TIL016 04+75E	9/17/2011	MAP	537330	6591395	8N	brown	light brown	20 -30	15	3		
TIL016 05+00E	9/17/2011	GPS	537354	6591402	8N	brown	dark brown	20 - 30	25	4		
TIL017 00+00	9/17/2011	GPS	536905	6591155	8N	Brown		10-20	30	3	ROCKY	
TIL017 00+25E	9/17/2011	MAP	536929	6591161	8N	Brown		10-20	30	3	ROCKY	
TIL017 00+50E	9/17/2011	MAP	536953	6591167	8N	Brown		10-20	30	3	ROCKY	
TIL017 00+75E	9/17/2011	MAP	536977	6591173	8N	Brown		10-20	30	3	ROCKY	
TIL017 01+00E	9/17/2011	MAP	537001	6591178	8N	Brown		10-20	30	3	ROCKY	
TIL017 01+25E	9/17/2011	MAP	537025	6591184	8N	Brown		10-20	30	3	ROCKY	
TIL017 01+50E	9/17/2011	MAP	537049	6591190	8N	Brown		10-20	30	3	ROCKY	
TIL017 01+75E	9/17/2011	MAP	537073	6591196	8N	Brown	RUSTY	10-20	30	3	ROCKY	
TIL017 02+00E	9/17/2011	MAP	537097	6591202	8N	Brown		10-20	30	3	ROCKY	
TIL017 02+25E	9/17/2011	MAP	537121	6591208	8N	Brown		10-20	30	3	ROCKY	
TIL017 02+50E	9/17/2011	MAP	537145	6591214	8N	Brown		10-20	30	3	ROCKY	
TIL017 02+75E	9/17/2011	MAP	537168	6591219	8N	Brown		10-20	30	3	ROCKY	

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL017 03+00E	9/17/2011	MAP	537192	6591225	8N	Brown		10-20	30	3	ROCKY	
TIL017 03+25E	9/17/2011	MAP	537216	6591231	8N	Brown		10-20	30	3	ROCKY	
TIL017 03+50E	9/17/2011	MAP	537240	6591237	8N	Brown		10-20	30	3	ROCKY	
TIL017 03+75E	9/17/2011	MAP	537264	6591243	8N	Brown		30-40	30	3	ROCKY	
TIL017 04+00E	9/17/2011	MAP	537288	6591249	8N	Brown		30-40	30	3	ROCKY	
TIL017 04+25E	9/17/2011	MAP	537312	6591254	8N	Brown		30-40	30	3	ROCKY	
TIL017 04+50E	9/17/2011	MAP	537336	6591260	8N	Brown		30-40	30	3	ROCKY	
TIL017 04+75E	9/17/2011	MAP	537360	6591266	8N	Brown		30-40	30	3	ROCKY	
TIL017 05+00E	9/17/2011	GPS	537384	6591272	8N	Brown		30-40	30	3	ROCKY	
TIL018 00+00	9/17/2011	GPS	536921	6591054	8N	Brown		10-20	30	3	ROCKY	
TIL018 00+25E	9/17/2011	MAP	536945	6591060	8N	Brown		10-20	30	3	ROCKY	
TIL018 00+50E	9/17/2011	MAP	536969	6591067	8N	Brown		10-20	30	2	ROCKY	
TIL018 00+75E	9/17/2011	MAP	536992	6591073	8N	Brown		10-20	30	3	ROCKY	
TIL018 01+00E	9/17/2011	MAP	537016	6591079	8N	Brown		10-20	30	4	ROCKY	
TIL018 01+25E	9/17/2011	MAP	537040	6591086	8N	Brown		10-20	30	2	ROCKY	
TIL018 01+50E	9/17/2011	MAP	537064	6591092	8N	Brown		10-20	30	1	ROCKY	
TIL018 01+75E	9/17/2011	MAP	537088	6591098	8N	Brown		10-20	30	2	ROCKY	
TIL018 02+00E	9/17/2011	MAP	537111	6591105	8N	Brown		10-20	30	3	ROCKY	

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL018 02+25E	9/17/2011	NO SAMPLE	537135	6591111	8N							
TIL018 02+50E	9/17/2011	MAP	537159	6591118	8N	Brown		10-20	30	2	ROCKY	
TIL018 02+75E	9/17/2011	MAP	537183	6591124	8N	Brown		10-20	30	3	ROCKY	
TIL018 03+00E	9/17/2011	MAP	537207	6591130	8N	Brown		10-20	30	2	ROCKY	
TIL018 03+25E	9/17/2011	MAP	537230	6591137	8N	brown	light brown	10 - 20	25	4		
TIL018 03+50E	9/17/2011	MAP	537254	6591143	8N	brown	light brown	10 - 20	25	3		
TIL018 03+75E	9/17/2011	MAP	537278	6591149	8N	brown	dark brown	20 - 30	25	3	Rocky	
TIL018 04+00E	9/17/2011	MAP	537302	6591156	8N	brown	light brown	20 - 30	15	4		
TIL018 04+25E	9/17/2011	MAP	537326	6591162	8N	brown	light brown	20 - 30	15	2	Rocky	
TIL018 04+50E	9/17/2011	MAP	537349	6591168	8N	brown	dark brown	20 - 30	25	2	Rocky	
TIL018 04+75E	9/17/2011	MAP	537373	6591175	8N	brown	light brown	20 - 30	25	3		
TIL018 05+00E	9/17/2011	GPS	537397	6591181	8N	brown	dark brown	30 - 40	15	3	Rocky	
TIL019 00+00	9/18/2011	GPS	534420	6593253	8N	brown	grey	10 - 20	25	3		
TIL019 00+25E	9/18/2011	MAP	534441	6593266	8N	brown	grey	10 - 20	35	2	Ash	
TIL019 00+25W	9/18/2011	MAP	534398	6593239	8N	grey		10 - 20	35	1	Ash	
TIL019 00+50E	9/18/2011	MAP	534462	6593279	8N	brown	grey	10 - 20	25	4		
TIL019 00+50W	9/18/2011	MAP	534377	6593226	8N	brown	brown	10 - 20	25	4		
TIL019 00+75E	9/18/2011	MAP	534483	6593292	8N	brown		10 - 20	25	3		

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL019 00+75W	9/18/2011	MAP	534355	6593212	8N	grey	brown	10 - 20	25	2	Organic	
TIL019 01+00E	9/18/2011	MAP	534505	6593305	8N	brown		10 - 20	25	2		
TIL019 01+00W	9/18/2011	MAP	534333	6593198	8N	brown	brown	10 - 20	25	4		
TIL019 01+25E	9/18/2011	NO SAMPLE	534526	6593317	8N							
TIL019 01+25W	9/18/2011	MAP	534312	6593185	8N	brown	brown	10 - 20	25	3		
TIL019 01+50E	9/18/2011	NO SAMPLE	534547	6593330	8N							
TIL019 01+50W	9/18/2011	GPS	534290	6593171	8N	brown	brown	10 - 20	15	4		
TIL019 01+75E	9/18/2011	MAP	534568	6593343	8N	brown	grey	10 - 20	35	2	Ash	
TIL019 02+00E	9/18/2011	GPS	534589	6593356	8N	brown	grey	10 - 20	35	2	Ash	
TIL020 00+00	9/18/2011	GPS	534473	6593171	8N	Brown		10-20	20	3	ROCKY	
TIL020 00+25E	9/18/2011	MAP	534495	6593186	8N	Brown		10-20	20	2	ROCKY	
TIL020 00+25W	9/18/2011	MAP	534466	6593159	8N	Brown		10-20	30	4	ROCKY	
TIL020 00+50E	9/18/2011	MAP	534517	6593200	8N	Brown		10-20	10	2	ROCKY	
TIL020 00+50W	9/18/2011	MAP	534459	6593147	8N	Brown		10-20	30	2	ROCKY	
TIL020 00+75E	9/18/2011	MAP	534538	6593215	8N	Brown		10-20	10	3	ROCKY	
TIL020 00+75W	9/18/2011	MAP	534452	6593135	8N	Brown		10-20	30	3	ROCKY	
TIL020 01+00E	9/18/2011	MAP	534560	6593230	8N	Brown		10-20	10	3	ROCKY	
TIL020 01+00W	9/18/2011	MAP	534445	6593122	8N	Brown		10-20	30	2	ROCKY	

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL020 01+25E	9/18/2011	NO SAMPLE	534582	6593244	8N							
TIL020 01+25W	9/18/2011	MAP	534438	6593110	8N	Brown		10-20	30	3	ROCKY	
TIL020 01+50E	9/18/2011	MAP	534604	6593259	8N	Brown		10-20	30	3	ROCKY	
TIL020 01+50W	9/18/2011	GPS	534431	6593098	8N	Brown		10-20	30	3	ROCKY	
TIL020 01+75E	9/18/2011	NO SAMPLE	534625	6593273	8N							
TIL020 02+00E	9/18/2011	GPS	534647	6593288	8N	Brown		10-20	30	3	ROCKY	
TIL021 00+00	9/18/2011	GPS	534527	6593083	8N	brown	light brown	30 - 40	15	3		
TIL021 00+25E	9/18/2011	MAP	534547	6593098	8N	brown	Rusty	30 - 40	15	3		
TIL021 00+25W	9/18/2011	MAP	534506	6593069	8N	brown	dark brown	20 - 30	15	3		
TIL021 00+50E	9/18/2011	MAP	534566	6593113	8N	brown	Rusty	30 - 40	25	3		
TIL021 00+50W	9/18/2011	MAP	534485	6593056	8N	brown	dark brown	20 - 30	15	3		
TIL021 00+75E	9/18/2011	MAP	534586	6593127	8N	brown	Rusty	30 - 40	25	3		
TIL021 00+75W	9/18/2011	MAP	534464	6593042	8N	brown	dark brown	20 - 30	15	4		
TIL021 01+00E	9/18/2011	NO SAMPLE	534606	6593142	8N						Cliff	
TIL021 01+00W	9/18/2011	MAP	534443	6593028	8N	brown	dark brown	20 - 30	15	3		
TIL021 01+25E	9/18/2011	MAP	534625	6593157	8N	brown	Rusty	30 - 40	15	3		
TIL021 01+25W	9/18/2011	MAP	534422	6593014	8N	brown	dark brown	20 - 30	25	2		
TIL021 01+50E	9/18/2011	MAP	534645	6593172	8N	brown	Rusty	20 - 30	35	3		

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL021 01+50W	9/18/2011	MAP	534402	6593001	8N	brown	dark brown	20 - 30	25	3		
TIL021 01+75E	9/18/2011	MAP	534664	6593186	8N	brown	dark brown	20 - 30	35	4		
TIL021 01+75W	9/18/2011	NO SAMPLE	534381	6592987	8N							
TIL021 02+00E	9/18/2011	GPS	534684	6593201	8N	brown	dark brown	20 - 30	35	2		
TIL021 02+00W	9/18/2011	MAP	534360	6592973	8N	brown	dark brown	20 - 30	15	3		
TIL021 02+25W	9/18/2011	MAP	534339	6592959	8N	brown	Rusty	20 - 30	15	4		
TIL021 02+50W	9/18/2011	MAP	534318	6592946	8N	brown	Rusty	20 - 30	25	3		
TIL021 02+75W	9/18/2011	MAP	534297	6592932	8N	brown	Rusty	20 - 30	25	3		
TIL021 03+00W	9/18/2011	GPS	534276	6592918	8N	brown	Rusty	20 - 30	15	3		
TIL022 00+00	9/18/2011	GPS	534588	6593010	8N	Brown		10-20	20	3	ROCKY	
TIL022 00+25E	9/18/2011	MAP	534611	6593023	8N	Brown		10-20	20	3	ROCKY	
TIL022 00+25W	9/18/2011	MAP	534566	6592998	8N	Brown		10-20	20	3	ROCKY	
TIL022 00+50E	9/18/2011	MAP	534635	6593037	8N	Brown		10-20	10	2	ROCKY	
TIL022 00+50W	9/18/2011	MAP	534545	6592986	8N	Brown		10-20	20	3	ROCKY	
TIL022 00+75E	9/18/2011	MAP	534658	6593050	8N	Brown		10-20	20	3	ROCKY	
TIL022 00+75W	9/18/2011	MAP	534523	6592974	8N	Brown		10-20	30	3	ROCKY	
TIL022 01+00E	9/18/2011	NO SAMPLE	534682	6593063	8N						ROCKY	
TIL022 01+00W	9/18/2011	MAP	534501	6592962	8N	Brown		10-20	10	3	ROCKY	

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL022 01+25E	9/18/2011	NO SAMPLE	534705	6593076	8N						ROCKY	
TIL022 01+25W	9/18/2011	MAP	534479	6592950	8N	Brown		10-20	10	3	ROCKY	
TIL022 01+50E	9/18/2011	MAP	534728	6593090	8N	Brown		10-20	20	2	ROCKY	
TIL022 01+50W	9/18/2011	MAP	534458	6592939	8N	Brown		10-20	30	3	ROCKY	
TIL022 01+75E	9/18/2011	MAP	534752	6593103	8N	Brown		10-20	20	2	ROCKY	
TIL022 01+75W	9/18/2011	NO SAMPLE	534436	6592927	8N						ROCKY	
TIL022 02+00E	9/18/2011	GPS	534775	6593116	8N	Brown		10-20	20	3	ROCKY	
TIL022 02+00W	9/18/2011	NO SAMPLE	534414	6592915	8N						ROCKY	
TIL022 02+25W	9/18/2011	MAP	534392	6592903	8N	Brown		10-20	10	2	ROCKY	
TIL022 02+50W	9/18/2011	MAP	534371	6592891	8N	Brown		10-20	10	2	ROCKY	
TIL022 02+75W	9/18/2011	GPS	534349	6592879	8N	Brown		10-20	10	2	ROCKY	
TIL023 00+00	9/18/2011	GPS	534640	6592906	8N	brown	light brown	10 - 20	15	4		
TIL023 00+25E	9/18/2011	MAP	534660	6592921	8N	brown	light brown	10 - 20	25	4		
TIL023 00+25W	9/18/2011	MAP	534617	6592896	8N	brown	light brown	10 - 20	35	4		
TIL023 00+50E	9/18/2011	MAP	534680	6592936	8N	brown	light brown	10 - 20	25	2	Rocky	
TIL023 00+50W	9/18/2011	MAP	534593	6592887	8N	brown	light brown	10 - 20	25	2		
TIL023 00+75E	9/18/2011	MAP	534700	6592951	8N	brown	dark brown	10 - 20	25	2	Organic	
TIL023 00+75W	9/18/2011	MAP	534570	6592877	8N	brown	dark brown	10 - 20	25	3		

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL023 01+00E	9/18/2011	MAP	534720	6592966	8N	brown	dark brown	10 - 20	25	2	Organic	
TIL023 01+00W	9/18/2011	MAP	534547	6592868	8N	brown	dark brown	10 - 20	25	3		
TIL023 01+25E	9/18/2011	MAP	534740	6592981	8N	brown	dark brown	10 - 20	25	2		
TIL023 01+25W	9/18/2011	MAP	534523	6592858	8N	brown	dark brown	10 - 20	25	4		
TIL023 01+50E	9/18/2011	MAP	534760	6592995	8N	brown	dark brown	10 - 20	25	4	Organic	
TIL023 01+50W	9/18/2011	MAP	534500	6592848	8N	brown	dark brown	10 - 20	25	3		
TIL023 01+75E	9/18/2011	MAP	534780	6593010	8N	brown	dark brown	10 - 20	25	2		
TIL023 01+75W	9/18/2011	MAP	534476	6592839	8N	brown	dark brown	10 - 20	25	3		
TIL023 02+00E	9/18/2011	MAP	534800	6593025	8N	brown	light brown	10 - 20	25	2		
TIL023 02+00W	9/18/2011	GPS	534453	6592829	8N	brown	light brown	10 - 20	25	3		
TIL023 02+25E	9/18/2011	MAP	534820	6593040	8N	brown	light brown	10 - 20	25	3		
TIL023 02+50E	9/18/2011	GPS	534840	6593055	8N	brown	light brown	10 - 20	35	3		
TIL024 00+00	9/18/2011	GPS	534705	6592819	8N	Brown		10-20	20	3	ROCKY	
TIL024 00+25E	9/18/2011	MAP	534684	6592807	8N	Brown		20-30	20	3	ROCKY	
TIL024 00+25W	9/18/2011	MAP	534724	6592834	8N	Brown		20-30	30	1	ROCKY	
TIL024 00+50E	9/18/2011	MAP	534663	6592795	8N	Brown		10-20	30	3	ROCKY	
TIL024 00+50W	9/18/2011	MAP	534743	6592849	8N	Brown		10-20	30	3	ROCKY	
TIL024 00+75E	9/18/2011	MAP	534642	6592783	8N	Brown		10-20	30	3	ROCKY	

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL024 00+75W	9/18/2011	MAP	534761	6592864	8N	Brown		10-20	30	3	ROCKY	
TIL024 01+00E	9/18/2011	NO SAMPLE	534620	6592770	8N	Brown		10-20	30	2	ROCKY	
TIL024 01+00W	9/18/2011	MAP	534780	6592880	8N						ROCKY	
TIL024 01+25E	9/18/2011	MAP	534599	6592758	8N	Brown		10-20	30	2	ROCKY	
TIL024 01+25W	9/18/2011	MAP	534799	6592895	8N	Brown		10-20	30	3	ROCKY	
TIL024 01+50E	9/18/2011	GPS	534578	6592746	8N	Brown		10-20	30	4	ROCKY	
TIL024 01+50W	9/18/2011	MAP	534818	6592910	8N	Brown		10-20	30	4	ROCKY	
TIL024 01+75E	9/1/2011	MAP	534556	6592733	8N							
TIL024 01+75W	9/18/2011	NO SAMPLE	534836	6592925	8N	Brown		10-20	30	2	ROCKY	
TIL024 02+00E	9/1/2011	MAP	534536	6592718	8N							
TIL024 02+00W	9/18/2011	NO SAMPLE	534855	6592940	8N	Brown		10-20	30	2	ROCKY	
TIL025 00+00	9/19/2011	GPS	534760	6592740	8N	Brown		10-20	20	1		
TIL025 00+25E	9/19/2011	MAP	534780	6592756	8N	brown	dark brown	10 - 20	25	3		
TIL025 00+25W	9/19/2011	MAP	534738	6592729	8N	Brown		10-20	20	2		
TIL025 00+50E	9/19/2011	MAP	534799	6592772	8N	brown	dark brown	10 - 20	25	2		
TIL025 00+50W	9/19/2011	MAP	534716	6592718	8N	Brown		10-20	20	3		
TIL025 00+75E	9/19/2011	MAP	534819	6592788	8N	brown	dark brown	10 - 20	25	3		
TIL025 00+75W	9/19/2011	NO SAMPLE	534694	6592707	8N							

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL025 01+00E	9/19/2011	MAP	534838	6592804	8N	brown	dark brown	10 - 20	25	2		
TIL025 01+00W	9/19/2011	MAP	534672	6592695	8N	Brown	RUSTY	20-30	10	3		
TIL025 01+25E	9/19/2011	MAP	534858	6592821	8N	brown		20 - 30	25	3		
TIL025 01+25W	9/19/2011	MAP	534650	6592684	8N	Brown	RUSTY	20-30	10	3		
TIL025 01+50E	9/19/2011	MAP	534877	6592837	8N	brown	dark brown	20 - 30	25	3		
TIL025 01+50W	9/19/2011	GPS	534628	6592673	8N	Brown	RUSTY	20-30	10	3		
TIL025 01+75E	9/19/2011	MAP	534897	6592853	8N	brown		Oct-20	25	3	Organic	
TIL025 02+00E	9/19/2011	MAP	534916	6592869	8N	brown		20 - 30	25	3		
TIL025 02+25E	9/19/2011	GPS	534936	6592885	8N	brown	dark brown	20 - 30	25	3		
TIL026 00+00	9/19/2011	GPS	534807	6592667	8N	Brown		10-20	20	3	ROCKY	
TIL026 00+25E	9/19/2011	MAP	534829	6592678	8N	Brown		10-20	10	3	ROCKY	
TIL026 00+25W	9/19/2011	MAP	534786	6592653	8N	Brown		20	20	3	ROCKY	
TIL026 00+50E	9/19/2011	MAP	534851	6592689	8N	Brown		10-20	30	3	ROCKY	
TIL026 00+50W	9/19/2011	MAP	534766	6592640	8N	Brown		10-20	20	3	ROCKY	
TIL026 00+75E	9/19/2011	NO SAMPLE	534873	6592700	8N	Brown		10-20	30		ROCKY	
TIL026 00+75W	9/19/2011	MAP	534745	6592626	8N	Brown		10-20	20	3	ROCKY	
TIL026 01+00E	9/19/2011	MAP	534894	6592711	8N	Brown		10-20	30	3	ROCKY	
TIL026 01+00W	9/19/2011	NO SAMPLE	534724	6592612	8N							

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL026 01+25E	9/19/2011	MAP	534916	6592722	8N	Brown		10-20	30	4	ROCKY	
TIL026 01+25W	9/19/2011	MAP	534703	6592598	8N	Brown		10-20	10	3	ROCKY	
TIL026 01+50E	9/19/2011	MAP	534938	6592733	8N	Brown		10-20	20	4	ROCKY	
TIL026 01+50W	9/19/2011	MAP	534683	6592585	8N	Brown		10-20	10	3	ROCKY	
TIL026 01+75E	9/19/2011	GPS	534960	6592744	8N	Brown		10-20	20	3	ROCKY	
TIL026 01+75W	9/19/2011	MAP	534662	6592571	8N	Brown		10-20	10	3	ROCKY	
TIL026 02+00W	9/19/2011	GPS	534641	6592557	8N	Brown		10-20	10	3	ROCKY	
TIL027 00+00	9/19/2011	GPS	534859	6592576	8N	brown	grey	20 - 30	15	3		
TIL027 00+25E	9/19/2011	MAP	534881	6592586	8N	brown		10 - 20	15	3		
TIL027 00+25W	9/19/2011	NO SAMPLE	534837	6592563	8N	brown	dark brown	10 - 20	15	4		
TIL027 00+50E	9/19/2011	MAP	534903	6592597	8N	brown	dark brown	10 - 20	15	3		
TIL027 00+50W	9/19/2011	NO SAMPLE	534815	6592550	8N	brown		10 - 20	15	4		
TIL027 00+75E	9/19/2011	MAP	534925	6592607	8N	brown		20 - 30	25	3		
TIL027 00+75W	9/19/2011	NO SAMPLE	534793	6592537	8N	brown		10 - 20	15	4		
TIL027 01+00E	9/19/2011	MAP	534947	6592618	8N	brown	dark brown	20 - 30	15	4	5 meters past	
TIL027 01+00W	9/19/2011	NO SAMPLE	534771	6592523	8N	brown		10 - 20	15	2		
TIL027 01+25E	9/19/2011	MAP	534969	6592628	8N	brown	dark brown	20 - 30	15	3		
TIL027 01+25W	9/19/2011	NO SAMPLE	534749	6592510	8N	brown		10 - 20	15	3		

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL027 01+50E	9/19/2011	MAP	534991	6592639	8N	brown	dark brown	20 - 30	15	3		
TIL027 01+50W	9/19/2011	NO SAMPLE	534727	6592497	8N							
TIL027 01+75E	9/19/2011	GPS	535013	6592649	8N	brown		10 - 20	15	4		
TIL027 01+75W	9/19/2011	GPS	534705	6592484	8N	brown	grey	10 - 20	15	3		
TIL028 00+00	9/19/2011	GPS	534912	6592485	8N	Brown		10-20	20	1	ROCKY	
TIL028 00+25E	9/19/2011	MAP	534933	6592497	8N	Brown		10-20	20	3	ROCKY	
TIL028 00+25W	9/19/2011	MAP	534890	6592472	8N	Brown		10-20	20	3	ROCKY	
TIL028 00+50E	9/19/2011	MAP	534954	6592509	8N	Brown		10-20	20	3	ROCKY	
TIL028 00+50W	9/19/2011	MAP	534868	6592458	8N	Brown		10-20	20	3	ROCKY	
TIL028 00+75E	9/19/2011	MAP	534975	6592521	8N	Brown		10-20	20	3	ROCKY	
TIL028 00+75W	9/19/2011	MAP	534846	6592445	8N	Brown		40-50	20	3	ROCKY	
TIL028 01+00E	9/19/2011	MAP	534995	6592534	8N	Brown		20-30	20	2	ROCKY	
TIL028 01+00W	9/19/2011	MAP	534825	6592431	8N	Brown		20-30	10	3	ROCKY	
TIL028 01+25E	9/19/2011	MAP	535016	6592546	8N	Brown		20-30	10	3	ROCKY	
TIL028 01+25W	9/19/2011	MAP	534803	6592418	8N	Brown		20-30	10	4	ROCKY	
TIL028 01+50E	9/19/2011	MAP	535037	6592558	8N	Brown		20-30	10	4	ROCKY	
TIL028 01+50W	9/19/2011	MAP	534781	6592404	8N	Brown		20-30	10	3	ROCKY	
TIL028 01+75E	9/19/2011	GPS	535058	6592570	8N	Brown		20-30	10	3	ROCKY	

Sample Number	Date	Location Method	UTM East	UTM North	UTM Zone	Colour 1	Colour 2	Slope	Depth	Quality	Note 1	Note 2
TIL028 01+75W	9/19/2011	GPS	534759	6592391	8N	Brown		20-30	20	3	ROCKY	
TIL029 00+00	9/19/2011	GPS	534960	6592398	8N	brown	Rusty	10 - 20	25	2	rocky	
TIL029 00+25E	9/19/2011	MAP	534982	6592412	8N	brown	Rusty	10 - 20	25	4		
TIL029 00+25W	9/19/2011	MAP	534939	6592386	8N	brown	grey	20 - 30	15	2	rocky	
TIL029 00+50E	9/19/2011	MAP	535004	6592425	8N	brown	Rusty	10 - 20	25	4		
TIL029 00+50W	9/19/2011	MAP	534917	6592374	8N	brown	grey	20 - 30	15	4		
TIL029 00+75E	9/19/2011	MAP	535027	6592439	8N	brown	Rusty	20 - 30	25	4		
TIL029 00+75W	9/19/2011	MAP	534896	6592362	8N	grey		10 - 20	15	2	sand	
TIL029 01+00E	9/19/2011	MAP	535049	6592453	8N	brown	Rusty	20 - 30	25	3		
TIL029 01+00W	9/19/2011	MAP	534874	6592350	8N	brown		10 - 20	15	1	rocky	
TIL029 01+25E	9/19/2011	MAP	535071	6592466	8N	brown	Rusty	20 - 30	25	3		
TIL029 01+25W	9/19/2011	NO SAMPLE	534853	6592338	8N			10 - 20				
TIL029 01+50E	9/19/2011	GPS	535093	6592480	8N	brown	Rusty	20 - 30	25	3		
TIL029 01+50W	9/19/2011	GPS	534831	6592326	8N	brown	grey	10 - 20	15	2	rocky	

Appendix V – Analytical Certificates

5.1 – Rock Samples
5.2 - Silt and Soil Samples

5.1 – Rock Samples

Acme Analytical Laboratories (Vancouver) Ltd.
1020 Cordova St. East Vancouver BC V6A 4A3 Canada

www.acmelab.com

Client: **TerraLogic Exploration Inc.**
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Submitted By: Jarrod Brown
Receiving Lab: Canada-Vancouver
Received: October 12, 2011
Report Date: November 17, 2011
Page: 1 of 3

CERTIFICATE OF ANALYSIS VAN11005475.1

CLIENT JOB INFORMATION

Project: Titan
Shipment ID: Ti11-002
P.O. Number
Number of Samples: 48

SAMPLE DISPOSAL

RTRN-PLP Return
DISP-RJT Dispose of Reject After 90 days

Acme does not accept responsibility for samples left at the laboratory after 90 days without prior written instructions for sample storage or return.

SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

Method Code	Number of Samples	Code Description	Test Wgt (g)	Report Status	Lab
R200-500	40	Crush, split and pulverize 500 g rock to 200 mesh			VAN
P200	2	Pulverize to 85% - 200 mesh			VAN
1DX3	44	1:1:1 Aqua Regia digestion ICP-MS analysis	30	Completed	VAN
7AR	9	1:1:1 Aqua Regia Digestion ICP-ES Finish	0.4	Completed	VAN

ADDITIONAL COMMENTS

Invoice To: TerraLogic Exploration Inc.
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7
Canada

CC: Chris Gallagher

BRITISH COLUMBIA CERTIFIED ASSAYER
CLARENCE LEONG
GENERAL MANAGER

This report supersedes all previous preliminary and final reports with this file number dated prior to the date on this certificate. Signature indicates final approval; preliminary reports are unsigned and should be used for reference only.
All results are considered the confidential property of the client. Acme assumes the liabilities for actual cost of analysis only. Results apply to samples as submitted.
"*" asterisk indicates that an analytical result could not be provided due to unusually high levels of interference from other elements.

Acme Analytical Laboratories (Vancouver) Ltd.
1020 Cordova St. East Vancouver BC V6A 4A3 Canada
Phone (604) 253-3158 Fax (604) 253-1716
www.acmelab.com

Client: **TerraLogic Exploration Inc.**
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: November 17, 2011

CERTIFICATE OF ANALYSIS VAN11005475.1

Method		WGHT	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30
Analyte		Wgt	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
Unit		kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
MDL		0.01	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
JBTIR056	Rock	0.85	1.0	19.8	7.9	1	<0.1	1.0	2.1	48	0.82	0.9	1.2	<0.1	13	<0.1	0.2	<0.1	<2	0.07	<0.001
JBTIR059	Rock	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.
JBTIR062	Rock	1.60	0.7	62.3	2.1	36	<0.1	62.0	20.6	176	3.44	<0.5	1.9	0.5	33	<0.1	<0.1	0.3	29	1.36	0.090
JBTIR063	Rock	0.98	7.1	78.4	3.8	28	<0.1	40.1	18.0	400	3.16	<0.5	3.8	10.5	152	<0.1	<0.1	3.1	49	2.81	0.063
JBTIR065	Rock	1.14	2.0	121.1	4.1	26	0.4	21.5	16.8	362	4.02	3.0	2.6	1.1	24	<0.1	0.2	1.8	57	0.72	0.025
JBTIR067	Rock	1.28	1.0	54.3	2.8	34	0.2	1.7	5.4	443	2.58	0.7	1.5	2.8	10	<0.1	<0.1	1.3	27	0.31	0.049
JBTIR068	Rock	1.19	0.2	41.1	20.4	99	0.4	27.4	18.3	705	2.14	4.7	1.1	9.5	12	1.5	0.1	1.6	32	0.42	0.043
JBTIR070	Rock	1.01	0.4	48.3	4.2	12	<0.1	24.7	14.5	308	2.84	2.6	1.9	9.4	68	<0.1	0.4	0.7	25	0.95	0.026
JBTIR072	Rock	1.86	0.7	157.3	17.9	82	0.6	3.5	6.0	823	2.65	3.4	266.6	1.0	87	0.6	<0.1	0.4	56	1.45	0.127
JBTIR073	Rock	1.59	0.3	33.9	23.8	159	0.3	3.1	8.0	593	2.73	2.4	41.2	0.7	131	1.5	0.1	0.1	60	1.31	0.139
JBTIR074	Rock	1.07	0.4	15.1	8.9	29	<0.1	2.5	7.2	177	1.64	0.6	1.7	0.8	205	0.1	0.1	<0.1	36	1.00	0.094
JBTIR075	Rock	1.08	0.2	1.6	3.3	12	<0.1	1.5	1.6	147	0.83	<0.5	1.0	<0.1	30	<0.1	<0.1	<0.1	12	0.26	0.014
JBTIR076	Rock	1.68	1.8	7.5	2.9	36	0.2	5.5	17.9	337	3.63	1.1	3.4	2.4	52	<0.1	<0.1	0.4	58	0.38	0.084
JBTIR077	Rock	2.10	15.3	49.9	4.2	37	1.0	7.9	38.4	340	9.01	0.6	25.4	2.1	53	<0.1	<0.1	2.0	40	0.43	0.058
BRTIR001S	Rock Pulp	0.06	1029	4187	215.7	163	57.6	57.3	35.6	398	4.62	45.6	6000	1.2	230	<0.1	161.1	4.1	15	1.14	0.042
BRTIR002S	Rock Pulp	0.03	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.
BRTIR003S	Rock Pulp	0.04	305.6	5947	113.3	191	19.3	13.6	31.8	410	7.40	37.4	847.9	0.9	138	0.7	28.0	4.5	229	1.49	0.167
BRTIR001B	Rock Chip	0.24	0.2	2.8	3.1	44	<0.1	2.0	3.5	565	2.10	<0.5	2.1	5.5	107	<0.1	<0.1	<0.1	37	0.64	0.074
BRTIR002B	Rock Chip	0.32	0.2	3.3	3.0	42	<0.1	2.1	3.6	549	2.09	<0.5	1.8	5.4	91	<0.1	<0.1	<0.1	37	0.64	0.070
CDTIR001	Rock	1.72	0.9	8.4	3.3	69	<0.1	3.8	7.6	573	2.59	0.8	0.8	0.6	89	<0.1	<0.1	0.1	60	1.18	0.119
CDTIR002	Rock	1.15	0.1	3.1	2.4	58	<0.1	3.2	5.9	594	2.14	<0.5	2.5	0.4	111	<0.1	<0.1	<0.1	36	1.60	0.086
CDTIR003	Rock	1.38	0.1	2.6	2.7	21	<0.1	1.6	2.7	221	1.32	<0.5	0.6	0.2	68	<0.1	<0.1	<0.1	25	0.46	0.034
CDTIR004	Rock	0.79	1.7	4.3	4.2	49	0.1	2.7	5.3	597	2.12	0.6	<0.5	0.5	93	<0.1	<0.1	2.8	47	0.89	0.083
CDTIR005	Rock	0.11	0.3	0.9	1.5	2	<0.1	1.0	0.4	88	0.67	<0.5	0.6	<0.1	23	<0.1	<0.1	<0.1	<2	0.11	<0.001
CDTIR006	Rock	2.00	5.4	1375	2.1	43	1.1	80.5	108.2	286	8.03	<0.5	21.9	0.8	65	0.5	<0.1	0.1	145	1.52	0.149
CDTIR007	Rock	1.05	25.3	84.2	230.4	10	0.9	12.3	1.1	129	0.71	<0.5	1.4	<0.1	2	<0.1	2.2	>2000	5	0.14	0.001
BRTIR004	Rock	1.40	1.2	2672	7298	7730	20.0	11.1	11.2	1163	3.96	4.2	66.9	1.3	16	83.7	0.3	84.2	52	0.66	0.036
BRTIR005	Rock	1.52	2.0	211.8	186.2	584	0.6	27.6	20.0	781	3.73	6.9	5.9	1.6	17	4.2	0.1	14.0	87	1.19	0.028
BRTIR006	Rock	1.40	2.0	185.5	80.1	456	0.2	28.5	16.5	831	3.91	4.1	1.6	2.0	20	3.6	0.2	1.2	68	1.32	0.032
BRTIR007	Rock	1.81	1.0	186.3	57.0	278	0.3	31.0	23.7	701	4.04	7.7	1.7	1.5	26	2.0	0.3	2.5	65	1.63	0.026

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Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: November 17, 2011

CERTIFICATE OF ANALYSIS VAN11005475.1

	Method	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	7AR	7AR	7AR
	Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se	Te	Pb	Zn	Ag
	Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	%	%	gm/t
	MDL	1	1	0.01	1	0.001	1	0.01	0.001	0.01	0.1	0.01	0.1	0.1	0.05	1	0.5	0.2	0.01	0.01	2
JBTIR056	Rock	<1	1	<0.01	62	<0.001	<1	0.28	0.062	0.07	<0.1	<0.01	<0.1	<0.1	0.12	<1	0.7	<0.2			
JBTIR059	Rock	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.			
JBTIR062	Rock	2	51	0.71	13	0.204	1	1.05	0.111	0.07	0.3	<0.01	1.6	<0.1	0.74	4	0.6	<0.2			
JBTIR063	Rock	26	38	0.94	21	0.137	1	1.98	0.162	0.40	0.6	<0.01	3.2	0.2	1.05	5	0.9	0.8			
JBTIR065	Rock	2	69	0.62	13	0.156	<1	1.18	0.098	0.06	17.0	<0.01	3.0	<0.1	1.83	4	<0.5	0.2			
JBTIR067	Rock	7	4	0.58	65	0.131	<1	1.00	0.080	0.26	10.5	<0.01	5.7	0.4	0.58	5	0.5	<0.2			
JBTIR068	Rock	33	43	0.48	47	0.141	<1	0.99	0.037	0.20	<0.1	<0.01	3.0	0.2	0.06	5	<0.5	0.6			
JBTIR070	Rock	20	26	0.40	13	0.109	<1	1.12	0.069	0.10	0.5	<0.01	3.0	0.1	0.73	4	<0.5	0.3			
JBTIR072	Rock	3	7	0.86	127	0.109	<1	2.28	0.174	0.20	22.3	0.02	3.1	<0.1	0.58	7	<0.5	0.3			
JBTIR073	Rock	5	5	0.82	67	0.147	<1	1.70	0.111	0.12	2.4	0.07	2.8	<0.1	0.16	7	<0.5	0.4			
JBTIR074	Rock	5	10	0.07	58	0.113	<1	0.69	0.090	0.04	0.2	<0.01	1.0	<0.1	0.11	3	<0.5	<0.2			
JBTIR075	Rock	<1	6	0.19	91	0.044	<1	0.45	0.072	0.15	0.2	<0.01	0.6	<0.1	<0.05	2	<0.5	<0.2			
JBTIR076	Rock	8	22	0.60	95	0.157	<1	1.05	0.120	0.43	0.2	<0.01	4.2	0.1	0.91	5	0.6	0.2			
JBTIR077	Rock	5	14	0.55	24	0.117	<1	1.10	0.116	0.34	0.5	<0.01	3.2	0.1	6.12	5	2.8	0.7			
BRTIR001S	Rock Pulp	9	32	0.16	90	0.015	1	0.48	0.042	0.16	0.5	15.04	0.5	0.1	3.36	3	10.8	34.2	0.02	0.02	61
BRTIR002S	Rock Pulp	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.			
BRTIR003S	Rock Pulp	8	8	1.03	339	0.186	7	1.71	0.199	0.21	2.5	0.96	4.9	<0.1	0.59	9	5.1	2.4	0.04	0.02	21
BRTIR001B	Rock Chip	15	5	0.47	131	0.137	<1	1.07	0.126	0.48	<0.1	<0.01	2.1	0.3	<0.05	5	<0.5	<0.2			
BRTIR002B	Rock Chip	15	5	0.48	133	0.132	<1	1.03	0.118	0.46	<0.1	<0.01	2.0	0.3	<0.05	5	<0.5	<0.2			
CDTIR001	Rock	4	8	0.85	86	0.144	<1	1.56	0.112	0.12	0.6	<0.01	2.5	<0.1	0.06	7	<0.5	<0.2			
CDTIR002	Rock	3	7	0.77	560	0.084	<1	1.18	0.041	0.11	0.1	<0.01	1.6	<0.1	<0.05	5	<0.5	<0.2			
CDTIR003	Rock	1	4	0.33	171	0.083	<1	0.79	0.079	0.22	0.2	<0.01	1.1	<0.1	<0.05	3	<0.5	<0.2			
CDTIR004	Rock	3	7	0.71	150	0.139	1	1.31	0.095	0.30	0.6	<0.01	1.5	0.1	0.21	6	<0.5	0.8			
CDTIR005	Rock	<1	3	0.03	112	0.004	<1	0.31	0.097	0.14	0.3	<0.01	<0.1	<0.1	<0.05	<1	<0.5	<0.2			
CDTIR006	Rock	6	23	0.29	15	0.130	<1	0.97	0.057	0.05	0.6	0.03	4.2	<0.1	6.08	3	16.8	0.9			
CDTIR007	Rock	<1	13	0.20	7	0.002	<1	0.17	0.003	0.02	0.7	<0.01	<0.1	<0.1	0.10	<1	9.9	11.4			
BRTIR004	Rock	3	20	1.04	17	0.170	<1	1.77	0.065	0.21	0.6	<0.01	7.7	0.3	1.30	7	7.4	12.9	0.69	0.85	20
BRTIR005	Rock	3	48	1.06	12	0.139	<1	1.89	0.102	0.10	0.4	<0.01	8.0	<0.1	0.29	5	0.6	0.8			
BRTIR006	Rock	4	38	1.07	15	0.168	<1	1.80	0.118	0.10	0.4	<0.01	7.6	<0.1	0.38	5	0.6	<0.2			
BRTIR007	Rock	4	45	0.88	15	0.127	<1	1.85	0.145	0.10	0.3	<0.01	8.0	<0.1	0.27	4	0.9	0.2			

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Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: November 17, 2011

CERTIFICATE OF ANALYSIS VAN11005475.1

Method		WGHT	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30
Analyte		Wgt	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
Unit		kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
MDL		0.01	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
BRTIR008	Rock	1.62	1.3	2469	8711	3826	19.7	3.7	1.4	184	1.49	<0.5	126.6	1.3	3	36.5	0.8	26.6	4	0.05	0.014
BRTIR009	Rock	1.80	0.5	60.5	9.8	66	<0.1	9.5	18.9	691	3.88	1.4	<0.5	1.8	56	<0.1	0.2	1.2	128	1.43	0.071
BRTIR010	Rock	0.85	5.0	9.4	23.9	92	0.2	4.1	18.6	2383	4.96	1.8	93.5	1.3	176	1.0	0.1	0.7	17	6.83	0.078
JBTIR078	Rock	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.
JBTIR079	Rock	1.55	28.8	64.1	3.5	32	0.6	1.7	4.4	3664	5.41	0.7	3.9	0.6	55	0.2	0.2	2.0	63	4.01	0.071
JBTIR081	Rock	1.37	1.0	43.9	68.5	872	0.3	12.9	11.0	117	1.05	2.6	522.9	0.3	9	21.8	0.7	0.3	4	0.20	0.004
JBTIR082	Rock	1.35	4.7	91.2	3.9	9	0.4	30.7	13.2	117	1.94	4.4	12.0	1.6	19	0.2	1.7	2.1	56	0.33	0.016
JBTIR074	Rock	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.
JBTIR086	Rock	0.87	243.6	59.5	116.3	255	9.9	2.5	10.0	664	3.97	<0.5	16.5	0.3	46	2.6	<0.1	66.1	44	0.44	0.077
JBTIR087	Rock	1.18	9.4	37.4	12.4	100	<0.1	4.0	4.3	178	2.66	6.3	2.5	0.2	3	0.9	1.1	1.0	21	0.23	0.004
JBTIR088	Rock	2.40	1.3	447.2	>10000	7657	15.0	4.6	6.8	1158	2.25	<0.5	37.6	1.0	19	89.6	4.3	3.5	31	2.13	0.014
JBTIR089	Rock	1.65	1.9	546.5	691.8	1316	9.9	16.9	99.0	117	22.63	80.8	21.3	<0.1	<1	30.3	0.3	38.6	11	0.05	0.001
JBTIR090	Rock	1.43	0.9	9267	>10000	>10000	86.4	4.0	7.7	5441	1.93	<0.5	93.1	0.2	64	172.0	<0.1	101.9	11	11.61	0.004
JBTIR091	Rock	1.61	1.9	1320	7997	341	34.7	1.6	1.5	2270	1.27	<0.5	5.9	0.1	34	5.5	<0.1	61.7	13	5.52	0.003
JBTIR093	Rock	1.69	6.1	63.4	>10000	>10000	66.0	12.5	2.1	74	5.90	<0.5	303.7	<0.1	3	205.6	<0.1	91.1	<2	<0.01	<0.001
JBTIR094	Rock	1.29	0.9	4989	1120	1339	14.0	1.7	0.9	87	1.46	6.7	254.7	0.2	<1	15.7	6.9	0.8	3	0.02	0.009
JBTIR060	Rock	1.36	1.1	29.9	65.3	24	0.1	2.9	1.6	123	1.12	1.4	<0.5	0.2	12	<0.1	<0.1	0.1	11	0.32	0.002
JBTIR084	Rock	1.81	4.7	58.9	113.5	71	0.3	27.3	10.0	289	2.12	0.8	48.7	3.3	74	0.5	<0.1	0.9	54	1.19	0.015

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Project: Titan
Report Date: November 17, 2011

CERTIFICATE OF ANALYSIS VAN11005475.1

	Method	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	7AR	7AR	7AR
	Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se	Te	Pb	Zn	Ag
	Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	%	%	gm/t
	MDL	1	1	0.01	1	0.001	1	0.01	0.001	0.01	0.1	0.01	0.1	0.1	0.05	1	0.5	0.2	0.01	0.01	2
BRTIR008	Rock	<1	6	0.03	16	0.005	<1	0.16	0.002	0.10	0.2	0.02	0.2	<0.1	0.74	<1	11.4	10.0	0.80	0.34	19
BRTIR009	Rock	6	18	2.09	178	0.264	1	2.57	0.119	0.68	0.4	<0.01	6.2	<0.1	0.29	8	<0.5	<0.2			
BRTIR010	Rock	7	3	0.86	108	0.004	<1	1.04	0.027	0.30	0.1	<0.01	1.4	<0.1	0.71	3	<0.5	<0.2			
JBTIR078	Rock	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.			
JBTIR079	Rock	3	5	0.32	26	0.098	<1	1.46	0.041	0.05	>100	0.04	1.5	<0.1	<0.05	7	<0.5	0.5			
JBTIR081	Rock	<1	11	0.06	13	0.009	1	0.17	0.012	0.02	2.6	0.01	0.6	<0.1	0.16	<1	<0.5	<0.2			
JBTIR082	Rock	3	66	0.13	16	0.039	1	0.49	0.042	0.07	2.2	0.02	1.6	<0.1	0.26	2	1.5	0.4			
JBTIR074	Rock	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.			
JBTIR086	Rock	2	7	0.54	50	0.097	<1	0.97	0.072	0.18	98.6	<0.01	2.1	0.1	1.66	5	<0.5	4.3			
JBTIR087	Rock	<1	9	0.09	5	0.025	<1	0.20	0.025	0.03	0.8	<0.01	1.0	<0.1	0.69	1	1.0	0.4			
JBTIR088	Rock	2	15	0.63	6	0.061	<1	0.69	0.010	0.11	0.5	<0.01	4.2	0.2	1.84	3	4.7	26.5	1.51	0.82	15
JBTIR089	Rock	<1	2	0.06	4	0.002	<1	0.07	0.001	0.01	10.3	0.04	0.4	<0.1	>10	<1	13.9	9.9			
JBTIR090	Rock	2	3	0.17	3	0.013	<1	0.24	0.001	0.05	0.3	0.02	6.0	0.7	1.73	2	18.1	35.9	2.48	1.64	82
JBTIR091	Rock	3	8	0.16	2	0.014	<1	0.48	<0.001	0.03	0.5	0.01	2.7	0.3	0.41	2	12.1	8.3	0.78	0.04	36
JBTIR093	Rock	<1	11	<0.01	5	<0.001	<1	0.01	0.001	0.01	0.2	0.10	<0.1	<0.1	7.45	<1	37.9	17.5	4.92	2.13	66
JBTIR094	Rock	<1	7	0.01	6	0.013	<1	0.08	0.002	0.07	0.5	0.02	0.4	0.1	0.93	<1	3.5	5.6	0.09	0.13	27
JBTIR060	Rock	2	5	0.20	34	0.039	<1	0.65	0.062	0.08	<0.1	<0.01	1.0	<0.1	0.07	3	<0.5	<0.2			
JBTIR084	Rock	6	42	0.48	58	0.181	<1	2.03	0.143	0.30	0.8	<0.01	5.7	0.1	0.26	8	<0.5	0.3			

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Project: Titan
Report Date: November 17, 2011

QUALITY CONTROL REPORT VAN11005475.1

	Method	WGHT	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30
	Analyte	Wgt	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
	Unit	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
	MDL	0.01	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
Pulp Duplicates																					
JBTIR075	Rock	1.08	0.2	1.6	3.3	12	<0.1	1.5	1.6	147	0.83	<0.5	1.0	<0.1	30	<0.1	<0.1	<0.1	12	0.26	0.014
REP JBTIR075	QC		<0.1	1.7	3.5	12	<0.1	1.8	1.8	151	0.85	<0.5	0.6	<0.1	32	<0.1	<0.1	<0.1	12	0.26	0.015
BRTIR005	Rock	1.52	2.0	211.8	186.2	584	0.6	27.6	20.0	781	3.73	6.9	5.9	1.6	17	4.2	0.1	14.0	87	1.19	0.028
REP BRTIR005	QC		2.2	219.6	204.4	623	0.6	31.1	21.9	852	4.02	7.4	5.6	1.9	19	4.2	0.2	14.5	94	1.31	0.032
JBTIR088	Rock	2.40	1.3	447.2	>10000	7657	15.0	4.6	6.8	1158	2.25	<0.5	37.6	1.0	19	89.6	4.3	3.5	31	2.13	0.014
REP JBTIR088	QC		1.2	453.7	>10000	7647	15.4	4.9	7.6	1160	2.38	<0.5	37.5	1.0	19	90.6	4.0	3.6	31	2.12	0.014
JBTIR094	Rock	1.29	0.9	4989	1120	1339	14.0	1.7	0.9	87	1.46	6.7	254.7	0.2	<1	15.7	6.9	0.8	3	0.02	0.009
REP JBTIR094	QC																				
Core Reject Duplicates																					
CDTIR001	Rock	1.72	0.9	8.4	3.3	69	<0.1	3.8	7.6	573	2.59	0.8	0.8	0.6	89	<0.1	<0.1	0.1	60	1.18	0.119
DUP CDTIR001	QC		0.8	8.4	3.6	68	<0.1	2.8	8.1	599	2.66	<0.5	1.5	0.6	94	<0.1	<0.1	0.1	62	1.23	0.124
Reference Materials																					
STD DS8	Standard		14.1	115.3	154.4	358	1.9	37.5	7.6	604	2.47	24.5	118.5	7.5	71	3.3	4.9	7.5	43	0.74	0.084
STD DS8	Standard		12.9	101.6	114.2	288	1.7	36.4	6.9	620	2.36	22.3	101.5	6.5	65	2.1	5.5	6.5	39	0.68	0.071
STD GC-7	Standard																				
STD GC-7	Standard																				
STD GC-7	Standard																				
STD GC-7	Standard																				
STD DS8 Expected			13.44	110	123	312	1.69	38.1	7.5	615	2.46	26	107	6.89	67.7	2.38	5.7	6.67	41.1	0.7	0.08
STD GC-7 Expected																					
BLK	Blank		<0.1	5.5	9.0	8	<0.1	<0.1	<0.1	<1	0.02	<0.5	<0.5	<0.1	<1	<0.1	<0.1	<0.1	<2	<0.01	<0.001
BLK	Blank		<0.1	1.3	<0.1	<1	<0.1	<0.1	<0.1	<1	<0.01	<0.5	1.5	<0.1	<1	<0.1	<0.1	<0.1	<2	<0.01	<0.001
BLK	Blank																				
BLK	Blank																				
Prep Wash																					
G1	Prep Blank	<0.01	<0.1	2.3	3.0	45	<0.1	2.3	4.0	653	2.24	<0.5	1.3	5.8	71	<0.1	<0.1	<0.1	41	0.54	0.077
G1	Prep Blank	<0.01	0.2	3.7	3.5	49	<0.1	2.6	4.2	643	2.31	<0.5	1.2	6.5	67	<0.1	<0.1	0.1	41	0.56	0.078

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Client: **TerraLogic Exploration Inc.**
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: November 17, 2011

QUALITY CONTROL REPORT VAN11005475.1

	Method	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	1DX30	7AR	7AR	7AR
	Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se	Te	Pb	Zn	Ag
	Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	%	%	gm/t
	MDL	1	1	0.01	1	0.001	1	0.01	0.001	0.01	0.1	0.01	0.1	0.1	0.05	1	0.5	0.2	0.01	0.01	2
Pulp Duplicates																					
JBTIR075	Rock	<1	6	0.19	91	0.044	<1	0.45	0.072	0.15	0.2	<0.01	0.6	<0.1	<0.05	2	<0.5	<0.2			
REP JBTIR075	QC	<1	6	0.19	93	0.044	1	0.47	0.074	0.15	0.2	<0.01	0.5	<0.1	<0.05	2	<0.5	<0.2			
BRTIR005	Rock	3	48	1.06	12	0.139	<1	1.89	0.102	0.10	0.4	<0.01	8.0	<0.1	0.29	5	0.6	0.8			
REP BRTIR005	QC	3	52	1.15	13	0.159	<1	2.04	0.109	0.11	0.4	<0.01	8.8	<0.1	0.32	5	<0.5	0.8			
JBTIR088	Rock	2	15	0.63	6	0.061	<1	0.69	0.010	0.11	0.5	<0.01	4.2	0.2	1.84	3	4.7	26.5	1.51	0.82	15
REP JBTIR088	QC	2	14	0.63	5	0.061	<1	0.69	0.010	0.10	0.6	<0.01	4.3	0.2	2.01	3	4.6	27.2			
JBTIR094	Rock	<1	7	0.01	6	0.013	<1	0.08	0.002	0.07	0.5	0.02	0.4	0.1	0.93	<1	3.5	5.6	0.09	0.13	27
REP JBTIR094	QC																		0.09	0.13	13
Core Reject Duplicates																					
CDTIR001	Rock	4	8	0.85	86	0.144	<1	1.56	0.112	0.12	0.6	<0.01	2.5	<0.1	0.06	7	<0.5	<0.2			
DUP CDTIR001	QC	4	8	0.88	92	0.161	<1	1.63	0.125	0.13	0.7	<0.01	2.5	<0.1	0.06	7	<0.5	<0.2			
Reference Materials																					
STD DS8	Standard	16	116	0.61	274	0.125	2	0.97	0.096	0.43	3.1	0.19	2.4	5.4	0.17	5	4.8	5.3			
STD DS8	Standard	15	111	0.57	243	0.108	2	0.88	0.087	0.40	2.0	0.18	1.9	4.8	0.16	4	4.5	4.8			
STD GC-7	Standard																		>10	22.30	>300
STD GC-7	Standard																		>10	22.57	>300
STD GC-7	Standard																		>10	22.17	>300
STD GC-7	Standard																		>10	21.97	>300
STD DS8 Expected		14.6	115	0.6045	279	0.113	2.6	0.93	0.0883	0.41	3	0.192	2.3	5.4	0.1679	4.7	5.23	5			
STD GC-7 Expected																			10.44	22.06	619
BLK	Blank	<1	<1	<0.01	<1	<0.001	<1	<0.01	<0.001	<0.01	<0.1	<0.01	<0.1	<0.1	<0.05	<1	<0.5	<0.2			
BLK	Blank	<1	<1	<0.01	<1	<0.001	<1	<0.01	<0.001	<0.01	<0.1	<0.01	<0.1	<0.1	<0.05	<1	<0.5	<0.2			
BLK	Blank																		<0.01	<0.01	<2
BLK	Blank																		<0.01	<0.01	<2
Prep Wash																					
G1	Prep Blank	15	5	0.51	148	0.124	2	0.95	0.093	0.48	<0.1	<0.01	1.8	0.3	<0.05	5	<0.5	<0.2			
G1	Prep Blank	15	7	0.54	163	0.134	<1	1.01	0.095	0.51	0.2	<0.01	2.0	0.4	<0.05	5	<0.5	<0.2			

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5.2 – Silt and Soil Samples

Acme Analytical Laboratories (Vancouver) Ltd.
1020 Cordova St. East Vancouver BC V6A 4A3 Canada

www.acmelab.com

Client: **TerraLogic Exploration Inc.**
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Submitted By: Chris Gallagher
Receiving Lab: Canada-Vancouver
Received: October 06, 2011
Report Date: October 28, 2011
Page: 1 of 8

CERTIFICATE OF ANALYSIS VAN11005319.1

CLIENT JOB INFORMATION

Project: Titan
Shipment ID: Ti11-001
P.O. Number
Number of Samples: 207

SAMPLE DISPOSAL

RTRN-PLP Return
DISP-RJT-SOIL Immediate Disposal of Soil Reject

Acme does not accept responsibility for samples left at the laboratory after 90 days without prior written instructions for sample storage or return.

SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

Method Code	Number of Samples	Code Description	Test Wgt (g)	Report Status	Lab
Dry at 60C	204	Dry at 60C			VAN
SS80	204	Dry at 60C sieve 100g to -80 mesh			VAN
3B	204	Fire assay fusion Au by ICP-ES	30	Completed	VAN
1DX	204	1:1:1 Aqua Regia digestion ICP-MS analysis	0.5	Completed	VAN

ADDITIONAL COMMENTS

Invoice To: TerraLogic Exploration Inc.
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7
Canada

CC: Jesse Campbell
Jarrod Brown

BRITISH COLUMBIA CERTIFIED ASSAYER
CLARENCE LEONG
GENERAL MANAGER

This report supersedes all previous preliminary and final reports with this file number dated prior to the date on this certificate. Signature indicates final approval; preliminary reports are unsigned and should be used for reference only.
All results are considered the confidential property of the client. Acme assumes the liabilities for actual cost of analysis only. Results apply to samples as submitted.
"*" asterisk indicates that an analytical result could not be provided due to unusually high levels of interference from other elements.

Acme Analytical Laboratories (Vancouver) Ltd.
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Phone (604) 253-3158 Fax (604) 253-1716
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Client: **TerraLogic Exploration Inc.**
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: October 28, 2011

CERTIFICATE OF ANALYSIS VAN11005319.1

		Method	3B	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Analyte	Au	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
		Unit	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
		MDL	2	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
TIL009 00+00	Soil		3	2.6	70.9	20.5	104	0.2	49.7	20.2	529	4.18	10.4	3.6	6.9	112	0.7	0.5	1.9	84	0.67	0.216
TIL009 00+25E	Soil		3	2.0	60.4	21.4	81	0.1	61.7	14.4	359	3.24	11.6	1.7	5.0	77	0.8	0.8	2.6	63	0.72	0.278
TIL009 00+50E	Soil		4	1.4	49.5	13.3	70	<0.1	149.4	23.5	463	2.40	8.0	4.2	4.2	47	0.5	1.0	2.0	43	0.75	0.244
TIL009 00+75E	Soil		4	1.6	59.7	16.8	75	0.1	111.2	23.9	519	2.97	9.8	1.8	6.0	41	0.4	0.6	1.7	51	0.62	0.184
TIL009 01+00E	Soil		<2	1.6	51.0	22.0	74	0.2	86.8	17.9	478	2.83	16.5	1.3	6.6	36	0.4	0.7	3.0	49	0.55	0.179
TIL009 01+25E	Soil		2	1.8	38.1	15.1	64	<0.1	39.6	13.0	451	2.66	18.2	1.3	7.6	32	0.3	1.0	2.7	49	0.44	0.120
TIL009 01+50E	Soil		2	1.9	76.8	348.2	161	1.2	53.5	26.9	1320	4.10	1032	<0.5	9.9	38	1.9	24.9	14.1	70	0.39	0.074
TIL009 01+75E	Soil		<2	1.7	49.7	25.2	92	0.2	44.3	19.4	762	3.57	140.0	0.6	9.9	42	0.5	2.1	1.4	57	0.38	0.084
TIL009 02+00E	Soil		<2	1.7	51.3	19.4	81	0.1	36.5	15.9	484	3.16	33.8	1.2	8.6	50	0.4	0.5	1.4	45	0.29	0.078
TIL009 02+25E	Soil		2	1.6	72.1	65.5	111	0.3	42.8	22.2	763	3.88	41.8	1.3	12.3	86	0.7	0.7	2.1	56	0.31	0.065
TIL009 02+50E	Soil		3	2.0	73.5	30.0	108	0.2	49.3	25.9	781	4.16	30.9	0.8	13.4	80	0.5	0.4	1.6	67	0.40	0.085
TIL009 02+75E	Soil		2	1.4	105.1	35.5	165	0.3	86.8	51.5	1607	5.01	48.3	0.9	12.2	87	1.1	0.4	1.8	70	0.37	0.073
TIL009 03+00E	Soil		<2	1.9	46.8	17.7	97	0.1	49.8	23.3	886	4.17	13.3	1.1	8.7	71	0.3	0.2	1.0	76	0.56	0.093
TIL009 03+25E	Soil		4	2.3	40.5	17.8	72	0.1	30.1	12.5	541	3.11	9.6	<0.5	7.3	48	0.5	0.3	1.4	59	0.44	0.099
TIL009 03+50E	Soil		<2	2.0	47.4	18.0	70	0.2	37.8	15.4	559	3.34	9.9	1.6	8.5	50	0.3	0.4	1.4	53	0.47	0.103
TIL009 03+75E	Soil		<2	2.6	43.5	14.9	69	0.1	34.0	13.3	495	2.99	13.0	1.3	7.4	33	0.3	0.7	1.2	50	0.38	0.093
TIL009 04+00E	Soil		13	2.2	55.7	10.3	75	<0.1	43.5	21.1	930	3.90	6.5	4.4	7.8	69	0.2	0.4	1.2	60	0.76	0.126
TIL009 04+25E	Soil		<2	2.4	51.7	12.1	79	<0.1	38.9	17.3	650	3.66	8.9	1.7	9.0	36	0.2	0.7	1.0	68	0.39	0.096
TIL009 04+50E	Soil		<2	2.5	43.1	51.5	127	<0.1	31.3	15.1	768	3.35	12.1	1.9	10.2	28	0.9	1.1	1.4	63	0.29	0.085
TIL009 04+75E	Soil		<2	1.7	46.7	19.1	152	0.1	44.3	20.7	1160	4.11	36.4	2.5	9.9	37	1.1	1.4	1.0	66	0.24	0.063
TIL009 05+00E	Soil		<2	2.6	42.8	15.6	76	<0.1	34.4	14.5	562	3.04	9.5	1.4	6.1	25	0.2	0.6	1.1	57	0.22	0.070
TIL010 00+00	Soil		<2	3.2	66.2	38.2	110	0.3	64.1	31.9	906	4.65	28.9	1.7	10.5	74	0.5	0.5	2.5	130	0.81	0.114
TIL010 00+25E	Soil		<2	1.7	50.1	46.2	84	0.2	67.2	15.3	485	2.78	19.2	1.6	7.1	39	0.8	0.5	2.8	55	0.57	0.159
TIL010 00+50E	Soil		<2	2.0	48.3	29.4	80	0.2	53.4	16.3	531	3.00	17.7	<0.5	8.6	44	0.7	0.7	2.3	60	0.56	0.138
TIL010 00+75E	Soil		<2	2.2	36.4	17.2	54	<0.1	35.1	11.0	381	2.26	37.1	1.3	6.9	31	0.4	1.0	1.4	41	0.33	0.100
TIL010 01+00E	Soil		<2	1.3	66.3	22.1	87	0.1	59.6	22.0	727	4.04	47.6	0.7	10.5	83	0.3	0.6	2.4	72	0.40	0.072
TIL010 01+25E	Soil		<2	1.8	49.5	21.3	67	0.1	41.6	13.1	505	3.20	34.5	1.4	8.2	29	0.2	0.6	1.9	58	0.23	0.079
TIL010 01+50E	Soil		<2	1.5	52.4	13.5	71	<0.1	39.7	16.4	584	3.66	11.1	1.2	8.3	52	0.2	0.2	1.0	79	0.40	0.082
TIL010 01+75E	Soil		<2	2.2	60.1	82.8	85	0.4	39.0	14.6	591	3.41	13.2	<0.5	7.0	46	0.4	0.3	4.0	62	0.32	0.074
TIL010 02+00E	Soil		<2	2.2	66.3	71.9	90	0.5	40.6	15.3	675	3.44	14.1	<0.5	7.0	49	0.6	0.4	3.8	55	0.37	0.080

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Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: October 28, 2011

CERTIFICATE OF ANALYSIS VAN11005319.1

		Method	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Tl	S	Sc	Se	Ga	Te
		Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
		MDL	1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.05	0.1	0.5	1	0.2
TIL009 00+00	Soil		20	56	1.21	321	0.197	<20	2.44	0.024	0.74	0.9	<0.01	0.7	0.08	5.8	0.9	9	0.3
TIL009 00+25E	Soil		18	51	0.90	204	0.108	<20	1.67	0.026	0.28	1.6	<0.01	0.3	0.16	2.9	0.9	6	0.4
TIL009 00+50E	Soil		17	85	1.31	119	0.082	<20	1.43	0.015	0.09	2.0	<0.01	0.3	<0.05	2.4	<0.5	5	0.5
TIL009 00+75E	Soil		22	82	1.17	147	0.093	<20	1.79	0.015	0.23	1.4	<0.01	0.4	<0.05	3.8	<0.5	6	<0.2
TIL009 01+00E	Soil		21	71	1.02	133	0.091	<20	1.63	0.015	0.19	1.4	<0.01	0.3	<0.05	3.4	0.8	6	0.2
TIL009 01+25E	Soil		22	45	0.82	115	0.099	<20	1.62	0.015	0.17	1.6	<0.01	0.3	<0.05	3.4	<0.5	6	0.2
TIL009 01+50E	Soil		28	57	1.10	155	0.082	<20	2.08	0.012	0.31	1.2	0.04	0.6	<0.05	6.4	0.6	7	1.6
TIL009 01+75E	Soil		32	67	1.06	120	0.114	<20	2.06	0.013	0.30	0.6	0.02	0.4	<0.05	4.9	0.7	7	0.2
TIL009 02+00E	Soil		23	46	0.70	97	0.096	<20	1.66	0.014	0.20	0.4	<0.01	0.3	0.06	3.9	0.7	6	<0.2
TIL009 02+25E	Soil		35	54	0.99	122	0.115	<20	2.42	0.015	0.33	0.2	0.01	0.5	0.08	5.1	0.7	8	0.3
TIL009 02+50E	Soil		34	66	1.24	133	0.157	<20	2.65	0.022	0.46	0.2	<0.01	0.6	0.12	5.9	<0.5	9	<0.2
TIL009 02+75E	Soil		32	80	1.40	148	0.112	<20	2.83	0.016	0.36	0.2	<0.01	0.7	0.08	6.4	<0.5	10	0.3
TIL009 03+00E	Soil		21	100	1.60	175	0.155	<20	3.42	0.020	0.59	0.3	<0.01	0.9	<0.05	6.4	<0.5	10	<0.2
TIL009 03+25E	Soil		19	50	0.98	142	0.121	<20	2.14	0.021	0.27	0.8	<0.01	0.3	<0.05	4.6	<0.5	7	<0.2
TIL009 03+50E	Soil		23	53	0.94	106	0.105	<20	2.00	0.019	0.19	0.8	<0.01	0.2	<0.05	4.3	0.5	6	<0.2
TIL009 03+75E	Soil		20	50	0.87	113	0.104	<20	1.84	0.014	0.17	1.0	0.02	0.2	<0.05	4.3	<0.5	6	<0.2
TIL009 04+00E	Soil		19	52	1.34	93	0.095	<20	2.12	0.046	0.19	0.9	<0.01	0.2	<0.05	4.2	<0.5	7	<0.2
TIL009 04+25E	Soil		23	65	1.25	127	0.130	<20	2.43	0.014	0.27	0.8	0.01	0.3	<0.05	5.2	<0.5	8	<0.2
TIL009 04+50E	Soil		25	51	1.00	143	0.123	<20	2.29	0.013	0.19	0.8	0.02	0.3	<0.05	5.2	<0.5	7	<0.2
TIL009 04+75E	Soil		30	70	1.22	215	0.098	<20	2.72	0.015	0.34	0.3	0.02	0.4	<0.05	7.2	0.7	8	<0.2
TIL009 05+00E	Soil		19	55	0.97	108	0.104	<20	2.39	0.013	0.14	0.7	0.04	0.2	<0.05	4.1	0.6	7	<0.2
TIL010 00+00	Soil		19	99	2.11	171	0.143	<20	3.88	0.047	0.81	1.1	<0.01	1.1	<0.05	9.2	<0.5	13	0.5
TIL010 00+25E	Soil		21	58	0.94	127	0.100	<20	1.68	0.020	0.18	2.2	<0.01	0.3	<0.05	3.7	<0.5	6	0.2
TIL010 00+50E	Soil		22	61	1.02	124	0.119	<20	1.88	0.022	0.23	1.9	0.01	0.3	<0.05	4.4	<0.5	6	<0.2
TIL010 00+75E	Soil		16	37	0.65	80	0.085	<20	1.33	0.016	0.17	1.7	<0.01	0.2	<0.05	3.1	<0.5	4	<0.2
TIL010 01+00E	Soil		26	109	1.45	150	0.140	<20	2.82	0.016	0.46	0.4	<0.01	0.8	0.06	6.1	0.7	9	0.4
TIL010 01+25E	Soil		24	55	0.98	129	0.131	<20	2.41	0.015	0.20	0.9	0.01	0.3	<0.05	4.6	<0.5	7	<0.2
TIL010 01+50E	Soil		24	75	1.43	169	0.195	<20	2.75	0.022	0.57	0.3	<0.01	0.7	<0.05	6.0	0.7	9	<0.2
TIL010 01+75E	Soil		21	59	1.05	126	0.138	<20	2.49	0.020	0.21	0.7	<0.01	0.4	0.05	4.6	0.6	7	0.3
TIL010 02+00E	Soil		22	50	0.90	120	0.109	<20	2.49	0.022	0.15	1.0	0.02	0.3	<0.05	4.5	0.6	7	0.5

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Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: October 28, 2011

CERTIFICATE OF ANALYSIS VAN11005319.1

		Method	3B	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Analyte	Au	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
		Unit	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
		MDL	2	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
TIL010 02+25E	Soil		<2	2.2	49.6	23.8	61	0.2	34.7	14.1	533	2.83	11.4	1.6	7.2	88	0.4	0.3	1.6	44	0.56	0.085
TIL010 02+50E	Soil		<2	0.6	45.8	9.9	90	<0.1	49.0	25.7	818	5.24	8.1	<0.5	5.9	41	0.1	<0.1	0.6	103	0.71	0.161
TIL010 02+75E	Soil		<2	2.0	46.0	13.3	69	0.1	38.7	19.0	655	3.57	8.8	1.9	8.3	50	0.3	0.5	3.8	54	0.52	0.102
TIL010 03+00E	Soil		<2	1.8	57.2	12.8	71	0.1	43.2	20.2	824	3.72	8.3	1.5	8.2	62	0.3	0.3	1.6	57	0.56	0.112
TIL010 03+25E	Soil		<2	1.7	66.5	44.0	95	0.1	49.6	22.7	904	4.07	9.5	1.3	7.3	63	0.4	0.3	1.5	62	0.56	0.099
TIL010 03+50E	Soil		5	3.1	64.8	16.2	67	0.1	44.9	22.4	878	3.79	8.1	1.7	8.6	68	0.2	0.4	2.3	50	0.68	0.138
TIL010 03+75E	Soil		3	0.9	95.9	19.0	151	0.1	81.1	34.6	1738	5.02	4.8	6.6	5.9	124	0.7	0.2	0.6	66	1.15	0.123
TIL010 04+00E	Soil		2	2.2	51.8	14.6	79	0.1	42.8	17.9	697	3.53	27.2	2.3	9.5	35	0.4	1.4	1.1	62	0.39	0.096
TIL010 04+25E	Soil		<2	1.9	91.4	8.3	81	0.1	71.4	32.0	1250	5.26	3.7	<0.5	7.8	93	0.1	<0.1	0.7	85	1.05	0.104
TIL010 04+50E	Soil		4	2.4	72.6	13.0	75	0.2	53.7	22.8	1046	4.19	4.7	1.6	7.0	117	0.2	0.2	1.2	65	0.93	0.120
TIL010 04+75E	Soil		8	2.5	61.5	13.1	77	0.2	47.5	19.2	875	3.67	5.2	2.8	6.8	132	0.6	0.3	0.8	53	1.67	0.126
TIL010 05+00E	Soil		6	1.4	77.1	25.0	91	0.2	56.1	23.5	1083	3.85	5.0	22.0	5.6	168	0.8	0.2	0.8	52	0.86	0.111
TIL011 00+00	Soil		<2	2.2	74.6	36.5	100	0.1	54.2	18.8	512	3.64	26.1	2.7	9.5	37	0.7	1.0	1.9	69	0.41	0.114
TIL011 00+25E	Soil		<2	2.0	52.6	24.4	82	0.2	42.7	14.9	524	3.34	37.9	<0.5	9.8	34	0.6	0.6	1.8	64	0.39	0.099
TIL011 00+50E	Soil		<2	2.2	48.3	23.9	81	0.2	38.3	12.7	482	3.00	66.2	<0.5	8.8	28	0.5	0.9	2.5	59	0.34	0.088
TIL011 00+75E	Soil		<2	1.9	55.9	21.2	80	0.2	44.6	15.0	498	3.22	22.4	10.8	7.8	44	0.4	0.4	1.7	61	0.39	0.097
TIL011 01+00E	Soil		2	1.9	63.8	45.3	88	0.4	44.9	16.6	571	3.38	20.9	2.3	7.7	100	0.8	0.5	2.7	56	0.58	0.086
TIL011 01+25E	Soil		<2	2.3	53.1	31.6	80	0.2	38.3	13.5	491	2.87	21.4	0.8	5.0	29	0.5	0.5	2.1	49	0.26	0.080
TIL011 01+50E	Soil		<2	3.3	71.4	76.2	93	1.0	49.5	22.5	1077	3.59	26.0	1.9	2.4	60	0.8	0.8	4.8	67	0.70	0.169
TIL011 01+75E	Soil		<2	2.0	39.1	33.4	67	0.2	28.8	13.1	411	2.91	9.7	<0.5	6.9	26	0.2	0.3	2.4	54	0.27	0.075
TIL011 02+00E	Soil		<2	2.0	29.3	15.2	61	<0.1	24.1	9.8	314	2.35	6.5	<0.5	6.5	24	0.2	0.3	1.8	44	0.36	0.096
TIL011 02+25E	Soil		4	2.2	29.2	12.6	53	<0.1	27.7	10.8	370	2.57	6.6	2.5	6.5	21	0.2	0.3	1.1	49	0.32	0.091
TIL011 02+50E	Soil		<2	3.3	57.5	30.6	96	0.3	54.3	25.4	1119	4.42	14.8	0.5	5.0	44	0.3	0.4	2.1	91	0.53	0.110
TIL011 02+75E	Soil		<2	2.4	36.7	12.1	68	<0.1	32.8	15.5	461	3.17	8.3	<0.5	6.5	21	<0.1	0.2	1.4	61	0.22	0.065
TIL011 03+00E	Soil		<2	2.6	36.2	15.0	66	<0.1	30.3	13.8	433	2.76	10.7	1.1	5.2	23	0.2	0.6	1.8	54	0.25	0.072
TIL011 03+25E	Soil		<2	3.0	48.2	34.4	93	0.3	36.6	17.6	614	3.11	14.2	0.5	6.9	36	0.4	0.4	3.4	56	0.35	0.076
TIL011 03+50E	Soil		<2	2.7	42.4	20.1	82	0.2	34.8	14.8	511	2.89	8.4	<0.5	7.7	41	0.3	0.2	2.1	55	0.42	0.097
TIL011 03+75E	Soil		<2	2.3	43.1	13.0	67	<0.1	32.7	14.4	474	2.98	8.1	0.8	7.8	32	0.2	0.3	1.6	59	0.35	0.102
TIL011 04+00E	Soil		<2	2.8	39.4	11.6	66	<0.1	32.0	14.2	445	3.09	8.3	0.7	8.2	28	0.2	0.2	1.3	58	0.31	0.087
TIL011 04+25E	Soil		<2	2.8	33.1	11.2	64	<0.1	31.3	14.1	446	3.04	7.0	<0.5	7.0	28	0.2	0.4	1.1	59	0.30	0.095

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Project: Titan
Report Date: October 28, 2011

CERTIFICATE OF ANALYSIS VAN11005319.1

	Method	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
	Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Tl	S	Sc	Se	Ga	Te
	Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	MDL	1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.05	0.1	0.5	1	0.2
TIL010 02+25E	Soil	20	40	0.65	116	0.094	<20	1.98	0.046	0.15	1.0	<0.01	0.2	<0.05	3.8	<0.5	6	0.2
TIL010 02+50E	Soil	19	98	2.03	365	0.279	<20	3.82	0.016	1.23	0.3	0.01	1.0	<0.05	9.4	0.6	13	<0.2
TIL010 02+75E	Soil	22	50	0.93	142	0.144	<20	2.09	0.020	0.32	0.8	0.01	0.3	<0.05	5.2	<0.5	7	0.2
TIL010 03+00E	Soil	21	54	1.14	124	0.126	<20	2.24	0.031	0.24	0.7	<0.01	0.2	<0.05	5.3	<0.5	7	<0.2
TIL010 03+25E	Soil	21	56	1.24	120	0.118	<20	2.28	0.037	0.20	2.6	<0.01	0.2	<0.05	5.8	<0.5	7	<0.2
TIL010 03+50E	Soil	23	42	0.83	109	0.093	<20	1.77	0.036	0.13	1.2	<0.01	0.1	<0.05	5.1	0.6	6	0.2
TIL010 03+75E	Soil	15	98	2.18	89	0.106	<20	3.16	0.117	0.31	0.5	0.02	0.4	<0.05	3.6	<0.5	7	<0.2
TIL010 04+00E	Soil	26	66	1.04	103	0.108	<20	2.04	0.011	0.22	0.7	0.02	0.3	<0.05	4.8	0.5	7	<0.2
TIL010 04+25E	Soil	25	79	2.09	87	0.113	<20	3.15	0.097	0.21	0.9	<0.01	0.3	<0.05	4.9	<0.5	8	<0.2
TIL010 04+50E	Soil	19	55	1.16	81	0.088	<20	2.53	0.086	0.14	0.8	0.01	0.2	<0.05	4.4	<0.5	7	<0.2
TIL010 04+75E	Soil	18	44	0.91	87	0.072	<20	2.07	0.085	0.10	1.1	<0.01	0.1	<0.05	3.4	<0.5	6	0.2
TIL010 05+00E	Soil	17	47	1.15	106	0.064	<20	2.54	0.114	0.08	0.7	<0.01	0.2	<0.05	3.6	<0.5	7	0.3
TIL011 00+00	Soil	25	67	1.15	122	0.137	<20	2.15	0.013	0.34	0.8	<0.01	0.4	0.05	5.1	<0.5	8	0.4
TIL011 00+25E	Soil	24	58	1.12	119	0.136	<20	2.08	0.014	0.34	0.8	<0.01	0.3	<0.05	4.9	<0.5	7	<0.2
TIL011 00+50E	Soil	21	50	1.02	106	0.122	<20	1.94	0.012	0.29	1.2	<0.01	0.3	<0.05	4.1	<0.5	6	0.3
TIL011 00+75E	Soil	23	77	1.14	115	0.139	<20	2.17	0.013	0.30	1.0	<0.01	0.4	0.05	4.5	<0.5	7	0.2
TIL011 01+00E	Soil	23	57	0.87	112	0.119	<20	2.29	0.047	0.15	1.1	0.01	0.3	<0.05	4.6	<0.5	7	0.3
TIL011 01+25E	Soil	18	51	0.80	106	0.102	<20	2.01	0.011	0.22	1.8	0.03	0.3	<0.05	3.5	<0.5	6	<0.2
TIL011 01+50E	Soil	41	65	0.93	250	0.116	<20	3.35	0.011	0.25	2.8	0.08	0.5	0.18	4.4	0.6	9	0.3
TIL011 01+75E	Soil	20	49	0.84	116	0.133	<20	2.00	0.010	0.31	1.0	0.01	0.3	<0.05	3.9	<0.5	7	<0.2
TIL011 02+00E	Soil	20	37	0.65	83	0.095	<20	1.39	0.009	0.16	1.2	<0.01	0.2	<0.05	2.9	<0.5	5	<0.2
TIL011 02+25E	Soil	23	45	0.74	91	0.103	<20	1.65	0.010	0.15	1.0	0.01	0.1	<0.05	3.2	<0.5	5	<0.2
TIL011 02+50E	Soil	38	84	1.32	263	0.158	<20	3.98	0.010	0.31	1.6	0.05	0.3	0.10	5.9	<0.5	12	<0.2
TIL011 02+75E	Soil	23	57	1.00	127	0.155	<20	2.34	0.007	0.25	1.1	0.01	0.3	<0.05	4.2	<0.5	7	<0.2
TIL011 03+00E	Soil	20	44	0.88	102	0.115	<20	2.02	0.009	0.14	1.4	0.02	0.2	<0.05	3.2	<0.5	6	<0.2
TIL011 03+25E	Soil	21	49	0.93	105	0.111	<20	2.21	0.011	0.09	1.4	0.02	0.2	<0.05	3.5	<0.5	7	0.2
TIL011 03+50E	Soil	20	50	1.05	101	0.125	<20	2.34	0.023	0.19	1.5	0.02	0.3	<0.05	3.3	<0.5	7	<0.2
TIL011 03+75E	Soil	24	50	1.00	129	0.125	<20	2.23	0.011	0.21	1.2	<0.01	0.3	<0.05	3.8	<0.5	7	<0.2
TIL011 04+00E	Soil	27	51	0.96	138	0.131	<20	2.25	0.010	0.25	1.1	<0.01	0.3	<0.05	4.0	<0.5	7	<0.2
TIL011 04+25E	Soil	20	53	1.03	132	0.120	<20	2.19	0.009	0.24	1.2	0.01	0.3	<0.05	4.3	<0.5	7	<0.2

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	Method	3B	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
	Analyte	Au	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
	Unit	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
	MDL	2	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
TIL011 04+50E	Soil	4	3.4	43.2	17.2	175	<0.1	42.1	16.8	701	3.51	8.1	<0.5	10.2	35	1.0	0.3	1.5	68	0.38	0.090
TIL011 04+75E	Soil	3	3.1	31.7	11.4	63	<0.1	27.4	12.3	439	2.98	7.0	2.5	6.3	21	0.2	0.3	1.3	57	0.26	0.080
TIL011 05+00E	Soil	<2	3.6	39.5	26.6	124	0.2	34.2	14.7	550	3.18	8.1	0.8	8.5	23	0.8	0.4	1.4	62	0.27	0.091
TIL012 00+00	Soil	<2	2.9	56.6	25.1	82	0.1	32.5	13.6	523	3.19	28.1	0.8	8.2	27	0.6	1.1	4.1	54	0.25	0.079
TIL012 00+25E	Soil	<2	2.2	46.8	17.1	75	0.1	33.9	12.7	457	2.96	22.9	<0.5	7.7	28	0.4	0.5	1.4	58	0.30	0.083
TIL012 00+50E	Soil	<2	2.4	43.3	18.7	74	0.1	30.6	11.3	430	2.76	13.7	5.9	8.8	31	0.5	0.4	1.9	53	0.37	0.094
TIL012 00+75E	Soil	<2	2.0	47.5	35.3	82	0.2	30.8	10.7	397	2.81	14.5	<0.5	7.7	29	0.6	0.4	1.7	51	0.35	0.092
TIL012 01+00E	Soil	<2	2.2	50.1	27.4	71	0.2	35.9	12.2	457	2.82	19.7	<0.5	6.9	39	0.4	0.4	1.8	50	0.37	0.090
TIL012 01+25E	Soil	<2	2.5	48.6	31.3	80	0.2	36.3	11.8	446	2.85	26.8	<0.5	7.2	30	0.5	0.5	2.7	53	0.28	0.078
TIL012 01+50E	Soil	<2	2.7	43.2	23.0	74	0.2	32.9	12.5	483	2.77	22.8	0.6	5.8	26	0.4	0.7	2.3	47	0.27	0.077
TIL012 01+75E	Soil	3	2.7	41.7	25.6	74	0.2	31.5	13.1	475	2.96	16.3	<0.5	7.2	24	0.3	0.3	2.5	56	0.26	0.082
TIL012 02+00E	Soil	3	2.4	38.2	26.6	75	0.2	33.6	13.9	479	3.13	9.1	1.2	7.2	23	0.3	0.4	3.2	62	0.27	0.082
TIL012 02+25E	Soil	<2	3.6	40.1	19.9	70	<0.1	30.9	12.6	460	2.80	9.6	2.2	8.2	23	0.3	0.5	3.6	51	0.23	0.057
TIL012 02+50E	Soil	<2	3.5	39.6	20.0	72	<0.1	30.3	12.5	455	2.79	9.5	2.3	8.2	23	0.4	0.5	2.5	51	0.24	0.059
TIL012 02+75E	Soil	<2	2.5	40.2	16.5	66	0.1	33.7	13.4	435	2.89	8.9	1.5	6.2	22	0.2	0.5	1.6	53	0.26	0.078
TIL012 03+00E	Soil	3	3.1	34.8	14.3	58	<0.1	26.0	11.1	375	2.66	19.7	0.5	4.7	18	0.2	0.7	1.5	48	0.19	0.066
TIL012 03+25E	Soil	<2	3.4	47.5	42.0	86	0.3	31.9	15.2	565	2.88	37.7	0.6	7.7	32	0.5	1.4	3.7	46	0.40	0.080
TIL012 03+50E	Soil	2	2.5	42.1	22.0	73	0.1	29.5	12.9	470	2.92	70.7	1.6	6.3	24	0.4	2.1	3.6	51	0.32	0.095
TIL012 03+75E	Soil	3	2.9	37.8	25.5	74	0.2	25.9	11.3	413	2.68	30.3	0.7	7.3	23	0.5	1.6	2.2	48	0.33	0.093
TIL012 04+00E	Soil	<2	2.7	37.7	20.7	69	0.1	26.4	11.3	380	2.62	28.6	<0.5	6.4	23	0.4	1.6	1.9	47	0.35	0.098
TIL012 04+25E	Soil	<2	3.0	41.3	27.8	72	0.2	26.1	10.9	422	2.67	26.1	1.0	6.1	25	0.5	1.3	2.5	50	0.35	0.107
TIL012 04+50E	Soil	<2	3.4	41.4	20.3	69	<0.1	26.1	11.3	440	2.67	15.4	1.9	7.1	24	0.4	0.8	3.4	53	0.32	0.089
TIL012 04+75E	Soil	8	3.8	42.9	24.1	88	0.1	29.5	13.0	553	2.80	17.8	1.2	5.4	24	0.4	0.7	2.6	55	0.29	0.086
TIL012 05+00E	Soil	2	4.0	39.3	23.7	92	0.2	31.0	13.1	531	2.77	14.7	3.8	4.7	23	0.4	0.7	1.8	55	0.27	0.065
TIL013 00+00	Soil	<2	3.1	48.9	57.7	114	0.3	31.0	12.0	452	2.67	20.0	18.7	7.6	33	1.1	0.8	4.2	48	0.33	0.106
TIL013 00+25E	Soil	<2	2.5	50.6	109.5	166	0.7	30.0	11.9	484	2.59	18.5	1.8	7.2	28	1.7	0.7	5.8	48	0.29	0.086
TIL013 00+50E	Soil	<2	3.2	54.6	56.1	116	0.4	36.2	16.8	643	2.86	14.5	0.9	9.2	51	1.3	0.6	10.9	50	0.40	0.096
TIL013 00+75E	Soil	<2	3.3	49.4	55.9	111	0.4	27.4	11.6	464	2.56	14.3	<0.5	8.7	35	1.3	0.6	5.1	46	0.35	0.089
TIL013 01+00E	Soil	<2	3.1	49.4	34.1	88	0.2	32.1	11.6	438	2.63	13.5	1.0	7.7	36	0.8	0.5	2.7	47	0.34	0.081
TIL013 01+25E	Soil	<2	2.9	43.3	25.2	74	0.2	28.9	11.0	430	2.66	10.6	0.6	6.8	59	0.5	0.5	1.8	45	0.35	0.084

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Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: October 28, 2011

CERTIFICATE OF ANALYSIS VAN11005319.1

		Method	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Tl	S	Sc	Se	Ga	Te
		Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
		MDL	1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.05	0.1	0.5	1	0.2
TIL011 04+50E	Soil		23	84	1.50	186	0.174	<20	2.79	0.011	0.46	1.0	<0.01	0.5	<0.05	5.0	<0.5	9	<0.2
TIL011 04+75E	Soil		21	48	0.87	123	0.135	<20	2.19	0.009	0.23	0.9	0.02	0.2	<0.05	3.8	<0.5	7	<0.2
TIL011 05+00E	Soil		21	54	1.07	141	0.146	<20	2.49	0.008	0.28	1.2	<0.01	0.3	<0.05	4.4	<0.5	8	<0.2
TIL012 00+00	Soil		21	46	0.80	108	0.118	<20	1.94	0.013	0.22	2.0	<0.01	0.3	<0.05	4.4	<0.5	6	0.2
TIL012 00+25E	Soil		19	54	0.98	106	0.114	<20	1.90	0.012	0.27	1.3	<0.01	0.3	<0.05	4.1	<0.5	7	0.2
TIL012 00+50E	Soil		20	47	0.91	107	0.118	<20	1.75	0.013	0.25	1.3	<0.01	0.3	<0.05	3.9	<0.5	6	<0.2
TIL012 00+75E	Soil		19	44	0.82	95	0.101	<20	1.73	0.014	0.19	1.0	0.02	0.2	<0.05	3.7	<0.5	6	0.2
TIL012 01+00E	Soil		17	46	0.84	87	0.095	<20	1.72	0.017	0.17	1.2	<0.01	0.2	<0.05	3.8	<0.5	6	<0.2
TIL012 01+25E	Soil		19	48	0.80	100	0.100	<20	1.86	0.011	0.16	1.3	0.01	0.3	<0.05	3.8	<0.5	6	<0.2
TIL012 01+50E	Soil		17	45	0.74	113	0.104	<20	1.82	0.011	0.22	1.8	0.01	0.3	<0.05	3.2	<0.5	6	<0.2
TIL012 01+75E	Soil		20	49	0.83	114	0.123	<20	2.08	0.010	0.25	1.9	0.02	0.3	<0.05	4.1	<0.5	7	<0.2
TIL012 02+00E	Soil		22	57	0.95	132	0.149	<20	2.25	0.008	0.29	1.7	<0.01	0.3	<0.05	4.3	<0.5	7	<0.2
TIL012 02+25E	Soil		21	51	0.90	128	0.128	<20	2.09	0.008	0.18	2.9	0.03	0.2	<0.05	4.0	<0.5	7	<0.2
TIL012 02+50E	Soil		21	49	0.90	131	0.129	<20	2.09	0.008	0.19	3.1	0.03	0.2	<0.05	4.0	<0.5	7	<0.2
TIL012 02+75E	Soil		20	46	0.98	110	0.127	<20	2.16	0.009	0.20	2.0	0.03	0.2	<0.05	3.5	<0.5	7	<0.2
TIL012 03+00E	Soil		19	42	0.80	97	0.099	<20	1.98	0.008	0.12	1.9	0.04	0.2	<0.05	3.1	<0.5	6	<0.2
TIL012 03+25E	Soil		19	37	0.84	78	0.101	<20	1.58	0.011	0.11	2.0	0.02	0.2	<0.05	3.8	<0.5	5	0.5
TIL012 03+50E	Soil		21	42	0.86	113	0.109	<20	1.84	0.009	0.13	1.7	0.03	0.2	<0.05	4.3	<0.5	6	0.4
TIL012 03+75E	Soil		21	37	0.80	123	0.102	<20	1.67	0.010	0.13	1.9	0.02	0.2	<0.05	3.9	<0.5	5	0.3
TIL012 04+00E	Soil		19	35	0.79	108	0.096	<20	1.62	0.010	0.12	1.9	0.03	0.2	<0.05	3.7	<0.5	5	0.2
TIL012 04+25E	Soil		17	34	0.79	101	0.091	<20	1.67	0.009	0.10	2.1	0.03	0.2	<0.05	3.4	<0.5	5	<0.2
TIL012 04+50E	Soil		20	37	0.79	102	0.102	<20	1.77	0.010	0.11	2.2	0.02	0.2	<0.05	3.5	<0.5	6	<0.2
TIL012 04+75E	Soil		21	40	0.85	145	0.098	<20	2.31	0.012	0.10	2.1	0.03	0.2	<0.05	3.7	<0.5	7	<0.2
TIL012 05+00E	Soil		19	45	0.90	120	0.108	<20	2.26	0.011	0.12	2.1	0.04	0.2	<0.05	3.5	<0.5	7	<0.2
TIL013 00+00	Soil		18	44	0.77	106	0.107	<20	1.68	0.012	0.20	3.3	0.02	0.3	<0.05	3.8	<0.5	5	0.3
TIL013 00+25E	Soil		17	43	0.77	109	0.098	<20	1.68	0.012	0.19	3.6	0.02	0.3	<0.05	3.8	<0.5	5	0.4
TIL013 00+50E	Soil		22	51	0.89	111	0.113	<20	1.75	0.013	0.21	3.1	0.02	0.3	<0.05	4.4	<0.5	6	0.4
TIL013 00+75E	Soil		19	45	0.78	98	0.105	<20	1.55	0.012	0.20	3.8	0.02	0.2	<0.05	3.8	<0.5	5	0.3
TIL013 01+00E	Soil		18	46	0.84	100	0.103	<20	1.63	0.013	0.22	2.4	0.02	0.3	<0.05	4.0	<0.5	5	<0.2
TIL013 01+25E	Soil		18	38	0.73	131	0.111	<20	1.76	0.019	0.20	2.7	0.02	0.2	<0.05	3.9	<0.5	6	<0.2

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Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: October 28, 2011

CERTIFICATE OF ANALYSIS VAN11005319.1

		Method	3B	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Analyte	Au	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
		Unit	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
		MDL	2	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
TIL013 01+50E	Soil		3	3.3	35.9	22.0	62	0.2	23.6	9.8	341	2.31	11.7	3.1	7.7	25	0.5	0.5	2.0	40	0.28	0.091
TIL013 01+75E	Soil		2	3.2	40.5	24.4	73	0.1	29.5	11.7	430	2.79	16.5	<0.5	7.2	27	0.5	0.5	2.5	50	0.31	0.090
TIL013 02+00E	Soil		<2	3.2	43.5	23.7	79	0.2	34.9	15.1	521	3.27	17.5	0.5	6.8	24	0.4	0.5	2.5	60	0.22	0.064
TIL013 02+25E	Soil		<2	2.8	36.3	16.5	66	0.1	30.0	12.8	425	2.93	10.0	<0.5	7.4	26	0.3	0.3	2.2	55	0.30	0.091
TIL013 02+50E	Soil		<2	2.1	60.3	49.7	99	0.3	35.1	16.8	697	3.65	47.2	<0.5	7.0	28	0.6	1.6	4.0	55	0.36	0.105
TIL013 02+75E	Soil		3	3.4	55.2	48.2	91	0.2	33.5	15.6	531	3.22	32.7	0.8	5.8	23	0.4	1.1	4.0	60	0.25	0.075
TIL013 03+00E	Soil		3	2.4	46.3	40.1	83	0.2	29.3	12.8	450	2.86	18.4	0.6	5.1	25	0.4	0.7	3.6	56	0.33	0.088
TIL013 03+25E	Soil		<2	3.5	46.8	22.1	69	0.2	26.9	12.9	522	2.82	32.6	1.5	4.7	21	0.3	1.4	2.7	53	0.25	0.077
TIL013 03+50E	Soil		<2	3.1	47.6	23.4	70	0.2	34.0	13.8	466	2.98	34.6	13.5	4.8	20	0.3	1.7	2.4	55	0.24	0.081
TIL013 03+75E	Soil		3	3.7	43.8	22.7	70	0.2	29.5	13.5	514	2.75	35.1	<0.5	4.4	24	0.4	1.9	3.4	50	0.31	0.101
TIL013 04+00E	Soil		<2	3.6	42.3	16.9	64	0.1	27.6	11.7	418	2.63	30.4	2.6	7.1	28	0.3	1.3	2.6	49	0.39	0.116
TIL013 04+25E	Soil		8	2.8	41.7	16.3	72	0.2	31.5	12.8	462	2.73	20.5	1.5	6.0	34	0.4	0.7	1.7	51	0.50	0.116
TIL013 04+50E	Soil		6	1.8	61.8	16.1	101	0.1	38.1	21.2	885	3.47	46.9	<0.5	5.9	34	0.5	2.1	3.5	70	0.50	0.129
TIL013 04+75E	Soil		3	1.5	86.9	63.0	161	0.2	42.8	27.0	935	4.63	27.0	2.5	6.2	74	1.3	0.8	2.2	117	0.62	0.173
TIL013 05+00E	Soil		3	1.9	57.5	132.3	248	0.2	38.2	22.3	1140	3.61	59.1	<0.5	6.9	52	3.4	2.3	2.7	59	0.53	0.115
TIL014 00+00	Soil		3	3.5	53.6	64.2	138	0.4	31.1	12.8	492	2.62	119.2	0.8	8.9	29	1.3	2.5	6.7	47	0.37	0.126
TIL014 00+25E	Soil		4	3.5	51.8	81.7	149	0.5	32.1	12.8	494	2.63	40.3	2.4	7.6	30	1.5	1.2	7.2	48	0.34	0.102
TIL014 00+50E	Soil		3	3.6	48.0	60.8	113	0.3	29.3	11.4	459	2.36	22.8	<0.5	6.7	27	1.1	1.1	11.5	40	0.28	0.079
TIL014 00+75E	Soil		3	3.7	51.0	65.2	111	0.3	33.2	12.9	541	2.83	21.4	2.4	7.2	30	1.0	0.8	5.6	52	0.24	0.073
TIL014 01+00E	Soil		5	5.4	54.2	88.6	143	0.4	30.9	12.5	547	2.73	16.4	2.3	8.7	30	1.2	0.7	7.6	50	0.26	0.076
TIL014 01+25E	Soil		2	4.1	49.3	51.2	99	0.3	30.8	11.7	507	2.71	15.5	1.1	6.2	25	0.9	0.5	4.4	50	0.20	0.067
TIL014 01+50E	Soil		<2	2.9	52.9	51.6	108	0.2	31.3	12.8	524	2.98	15.9	1.0	8.1	37	1.1	0.4	9.7	52	0.26	0.068
TIL014 01+75E	Soil		3	3.6	44.9	29.3	85	0.1	27.0	10.8	428	2.67	11.5	2.6	9.9	33	0.5	0.3	3.9	47	0.29	0.076
TIL014 02+00E	Soil		4	7.8	48.5	38.9	81	0.3	26.5	11.5	599	2.71	11.8	2.9	6.5	23	0.6	0.4	8.7	49	0.23	0.095
TIL014 02+25E	Soil		<2	2.9	61.0	24.0	97	0.1	40.1	17.9	717	3.74	23.3	0.9	7.0	34	0.4	0.6	2.6	70	0.43	0.102
TIL014 02+50E	Soil		3	3.7	31.5	13.9	49	<0.1	21.2	9.2	292	2.27	12.9	6.7	1.2	25	0.2	0.8	2.8	39	0.20	0.057
TIL014 02+75E	Soil		3	4.6	37.0	16.2	60	0.2	25.3	10.5	402	2.59	14.5	<0.5	2.1	20	0.1	0.7	4.7	48	0.16	0.055
TIL014 03+00E	Soil		3	3.7	39.2	16.1	70	0.1	32.5	12.6	426	2.88	9.6	0.9	4.0	28	0.1	0.5	1.8	54	0.24	0.050
TIL014 03+25E	Soil		<2	4.3	46.6	24.3	75	0.3	32.1	13.4	495	3.03	12.3	1.2	4.3	34	0.3	0.4	3.8	58	0.26	0.049
TIL014 03+50E	Soil		<2	4.4	38.7	18.1	64	0.2	26.6	11.2	479	2.67	10.5	1.2	2.8	33	0.2	0.5	2.2	51	0.25	0.064

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Project: Titan
Report Date: October 28, 2011

CERTIFICATE OF ANALYSIS VAN11005319.1

		Method	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Tl	S	Sc	Se	Ga	Te
		Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
		MDL	1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.05	0.1	0.5	1	0.2
TIL013 01+50E	Soil		16	36	0.64	91	0.101	<20	1.36	0.010	0.20	3.0	0.02	0.2	<0.05	3.2	<0.5	5	0.2
TIL013 01+75E	Soil		20	43	0.78	115	0.113	<20	1.83	0.010	0.20	2.9	0.02	0.2	<0.05	4.1	<0.5	6	<0.2
TIL013 02+00E	Soil		22	55	0.94	155	0.138	<20	2.48	0.009	0.28	2.3	0.02	0.3	<0.05	4.9	<0.5	8	<0.2
TIL013 02+25E	Soil		21	52	0.90	127	0.159	<20	2.04	0.009	0.33	2.5	0.02	0.3	<0.05	4.8	<0.5	7	<0.2
TIL013 02+50E	Soil		19	41	0.96	106	0.136	<20	2.12	0.010	0.22	1.8	0.04	0.3	<0.05	4.9	<0.5	7	0.3
TIL013 02+75E	Soil		20	46	0.88	107	0.111	<20	2.40	0.009	0.12	2.1	0.02	0.2	<0.05	4.4	<0.5	7	0.4
TIL013 03+00E	Soil		18	42	0.84	97	0.111	<20	2.06	0.011	0.13	1.7	0.02	0.2	<0.05	3.9	<0.5	6	0.4
TIL013 03+25E	Soil		20	38	0.81	98	0.096	<20	1.97	0.008	0.11	2.0	0.03	0.2	<0.05	3.8	<0.5	6	0.3
TIL013 03+50E	Soil		15	42	0.87	97	0.107	<20	2.14	0.008	0.15	2.3	0.03	0.2	<0.05	3.6	<0.5	6	0.3
TIL013 03+75E	Soil		16	39	0.81	85	0.091	<20	1.83	0.009	0.14	2.6	0.03	0.2	<0.05	3.4	<0.5	6	0.2
TIL013 04+00E	Soil		17	37	0.80	99	0.099	<20	1.72	0.013	0.15	2.0	0.02	0.2	<0.05	3.7	<0.5	6	<0.2
TIL013 04+25E	Soil		17	43	1.06	103	0.125	<20	1.98	0.030	0.29	2.0	0.02	0.3	<0.05	4.1	<0.5	7	<0.2
TIL013 04+50E	Soil		16	45	1.29	156	0.110	<20	2.18	0.016	0.44	0.9	0.02	0.5	<0.05	6.1	<0.5	7	<0.2
TIL013 04+75E	Soil		19	66	1.68	269	0.169	<20	2.85	0.015	0.75	0.3	0.01	0.9	0.06	7.5	<0.5	11	0.3
TIL013 05+00E	Soil		19	43	1.18	218	0.094	<20	2.12	0.022	0.29	0.9	0.03	0.3	<0.05	4.8	<0.5	7	0.5
TIL014 00+00	Soil		16	45	0.78	111	0.104	<20	1.72	0.013	0.21	7.8	0.02	0.3	<0.05	4.0	<0.5	6	0.4
TIL014 00+25E	Soil		16	44	0.78	101	0.106	<20	1.61	0.012	0.19	5.9	0.02	0.3	<0.05	3.9	<0.5	5	0.5
TIL014 00+50E	Soil		15	39	0.68	95	0.096	<20	1.46	0.010	0.17	6.1	0.01	0.2	<0.05	3.4	<0.5	5	0.3
TIL014 00+75E	Soil		18	46	0.77	115	0.110	<20	2.12	0.009	0.21	5.7	<0.01	0.3	<0.05	3.7	<0.5	7	<0.2
TIL014 01+00E	Soil		18	45	0.77	97	0.105	<20	1.86	0.009	0.23	6.3	<0.01	0.3	<0.05	3.8	<0.5	6	0.4
TIL014 01+25E	Soil		16	47	0.78	100	0.097	<20	2.06	0.009	0.19	3.3	0.01	0.2	<0.05	3.5	<0.5	6	<0.2
TIL014 01+50E	Soil		19	44	0.78	107	0.101	<20	1.95	0.011	0.22	2.4	<0.01	0.3	<0.05	4.0	<0.5	6	0.2
TIL014 01+75E	Soil		18	38	0.74	93	0.095	<20	1.63	0.010	0.24	2.3	<0.01	0.3	<0.05	3.4	<0.5	5	<0.2
TIL014 02+00E	Soil		18	35	0.68	94	0.089	<20	1.98	0.010	0.21	4.6	0.02	0.2	<0.05	3.3	0.6	6	<0.2
TIL014 02+25E	Soil		20	52	1.19	130	0.145	<20	2.56	0.012	0.38	1.9	0.01	0.3	<0.05	5.3	<0.5	9	0.3
TIL014 02+50E	Soil		13	33	0.59	72	0.087	<20	1.51	0.007	0.16	2.9	0.03	0.2	0.06	2.3	<0.5	5	<0.2
TIL014 02+75E	Soil		13	39	0.71	72	0.104	<20	1.87	0.007	0.18	3.0	0.03	0.2	0.05	2.2	<0.5	7	<0.2
TIL014 03+00E	Soil		14	48	1.08	96	0.138	<20	2.36	0.012	0.30	3.3	0.02	0.3	<0.05	3.0	<0.5	8	<0.2
TIL014 03+25E	Soil		15	45	1.05	96	0.136	<20	2.49	0.011	0.25	2.9	0.02	0.3	<0.05	3.3	<0.5	8	<0.2
TIL014 03+50E	Soil		15	38	0.84	95	0.099	<20	2.08	0.011	0.16	2.2	0.03	0.2	<0.05	2.7	0.6	7	<0.2

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Client: **TerraLogic Exploration Inc.**
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: October 28, 2011

CERTIFICATE OF ANALYSIS VAN11005319.1

		Method	3B	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Analyte	Au	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
		Unit	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
		MDL	2	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
TIL014 03+75E	Soil		<2	2.3	82.6	13.3	81	0.1	47.6	24.0	679	3.69	10.6	0.7	4.9	64	0.2	0.2	1.2	103	0.73	0.193
TIL014 04+00E	Soil		I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.
TIL014 04+25E	Soil		I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.
TIL014 04+50E	Soil		<2	1.5	124.7	9.1	114	0.1	75.1	41.1	914	5.77	31.7	1.0	4.8	46	0.2	0.3	1.3	177	0.71	0.220
TIL014 04+75E	Soil		I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.
TIL014 05+00E	Soil		3	2.3	107.9	13.5	110	0.3	60.0	41.9	1069	5.78	78.0	1.7	3.9	84	0.3	0.4	1.3	149	0.59	0.157
TIL015 00+00	Soil		3	5.2	78.5	142.9	420	1.3	41.8	16.5	889	3.19	19.4	1.2	7.2	28	2.9	0.8	12.0	57	0.34	0.106
TIL015 00+25E	Soil		<2	4.7	59.7	40.4	120	0.4	40.2	14.8	611	3.05	14.8	0.9	8.7	27	1.3	0.5	6.3	55	0.32	0.117
TIL015 00+50E	Soil		<2	5.9	62.3	55.7	147	0.5	33.6	14.2	696	2.95	18.5	0.7	7.1	27	1.6	0.8	6.4	53	0.32	0.109
TIL015 00+75E	Soil		<2	2.9	64.8	26.6	94	0.4	46.7	21.9	639	3.73	29.7	<0.5	6.2	82	1.0	0.3	3.6	73	0.43	0.079
TIL015 01+00E	Soil		4	3.6	45.8	57.4	112	0.3	32.7	10.9	426	2.47	36.3	1.3	5.8	30	1.1	0.9	6.6	46	0.31	0.085
TIL015 01+25E	Soil		<2	5.5	51.9	60.0	114	0.3	30.7	12.8	544	2.74	28.4	0.8	6.8	25	0.8	0.7	8.7	50	0.27	0.092
TIL015 01+50E	Soil		<2	4.7	46.0	57.4	102	0.3	29.8	11.4	506	2.79	21.8	1.0	4.9	24	0.8	0.6	4.2	53	0.24	0.081
TIL015 01+75E	Soil		<2	5.4	48.3	51.1	106	0.4	28.7	11.3	544	2.67	14.7	0.6	7.1	30	1.0	0.5	7.7	49	0.30	0.094
TIL015 02+50E	Soil		4	4.4	56.0	27.6	90	0.2	36.9	17.3	693	3.66	25.4	<0.5	5.3	35	0.3	0.5	3.8	66	0.24	0.059
TIL015 02+75E	Soil		<2	4.3	41.7	16.6	65	<0.1	31.8	13.2	416	3.04	13.0	1.0	3.6	25	0.1	0.5	2.4	55	0.19	0.041
TIL015 03+00E	Soil		3	2.8	142.4	8.6	87	0.1	67.0	39.6	872	4.99	18.5	2.6	5.4	109	<0.1	0.4	1.6	213	0.65	0.240
TIL015 03+25E	Soil		<2	4.7	52.2	19.8	71	0.2	35.5	16.5	632	3.26	15.2	0.9	2.8	24	0.2	0.8	2.9	67	0.22	0.065
TIL015 03+50E	Soil		<2	4.0	42.4	15.6	69	0.2	30.5	12.8	494	2.86	10.3	1.1	1.9	28	0.2	0.7	6.0	55	0.29	0.062
TIL015 03+75E	Soil		<2	4.1	47.2	16.6	79	0.1	36.1	14.2	465	2.98	7.0	<0.5	5.0	38	0.2	0.4	2.4	54	0.38	0.054
TIL015 04+00E	Soil		<2	3.3	61.6	17.1	78	0.1	35.7	15.4	595	3.08	8.6	1.9	6.9	121	0.3	0.4	2.3	58	0.46	0.072
TIL015 04+25E	Soil		11	0.6	166.2	15.9	68	0.3	41.8	26.4	1242	3.67	104.7	2.8	7.6	59	0.3	0.9	1.5	51	0.56	0.049
TIL015 04+50E	Soil		4	1.0	130.5	11.3	88	0.1	56.3	51.4	2409	6.13	420.0	1.9	12.5	56	<0.1	5.2	0.6	63	0.46	0.089
TIL015 04+75E	Soil		<2	2.1	138.6	8.7	112	0.2	81.9	41.5	1100	6.22	238.9	0.9	4.8	60	0.1	2.9	0.6	158	0.81	0.250
TIL015 05+00E	Soil		<2	1.7	110.1	16.7	125	0.2	72.1	33.3	1094	4.95	60.6	<0.5	5.7	41	0.4	1.1	1.0	121	0.81	0.212
TIL016 00+00	Soil		<2	4.2	80.4	49.6	119	0.6	35.6	22.7	723	3.86	12.9	0.8	8.7	43	1.4	0.3	6.5	65	0.43	0.194
TIL016 00+25E	Soil		<2	6.9	70.6	104.8	152	1.5	70.1	20.3	931	3.51	15.0	1.4	1.3	32	1.3	0.6	9.3	67	0.25	0.157
TIL016 00+50E	Soil		2	5.7	127.2	73.1	248	0.7	42.3	21.9	651	3.71	19.9	3.9	1.2	36	1.5	0.6	10.1	74	0.37	0.209
TIL016 00+75E	Soil		<2	5.4	77.7	79.4	260	0.8	41.5	19.7	655	3.08	17.4	1.6	6.3	24	2.1	0.9	11.9	51	0.39	0.168
TIL016 01+00E	Soil		4	5.7	74.5	86.4	213	0.5	38.0	15.9	516	3.04	21.6	1.8	6.0	28	2.0	1.0	7.8	52	0.31	0.131

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Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: October 28, 2011

CERTIFICATE OF ANALYSIS VAN11005319.1

		Method	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Tl	S	Sc	Se	Ga	Te
		Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
		MDL	1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.05	0.1	0.5	1	0.2
TIL014 03+75E	Soil		15	80	1.37	167	0.138	<20	2.56	0.025	0.60	0.7	<0.01	0.4	0.07	5.4	<0.5	9	<0.2
TIL014 04+00E	Soil		I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.
TIL014 04+25E	Soil		I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.
TIL014 04+50E	Soil		15	98	2.27	253	0.210	<20	4.59	0.006	1.58	0.4	0.02	1.1	<0.05	9.6	<0.5	17	<0.2
TIL014 04+75E	Soil		I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.
TIL014 05+00E	Soil		9	83	2.02	171	0.170	<20	3.99	0.011	1.34	0.3	0.01	1.6	0.08	11.7	<0.5	15	<0.2
TIL015 00+00	Soil		17	49	0.90	111	0.111	<20	2.12	0.011	0.24	10.0	0.01	0.3	<0.05	4.4	<0.5	7	0.3
TIL015 00+25E	Soil		20	48	0.87	129	0.117	<20	2.06	0.011	0.29	6.3	0.01	0.3	<0.05	4.3	<0.5	6	0.2
TIL015 00+50E	Soil		17	44	0.88	117	0.120	<20	2.11	0.013	0.33	9.9	0.01	0.3	<0.05	3.8	0.6	7	0.3
TIL015 00+75E	Soil		13	112	1.76	149	0.155	<20	3.15	0.014	0.70	1.5	<0.01	0.6	<0.05	5.8	<0.5	10	<0.2
TIL015 01+00E	Soil		15	53	0.78	96	0.097	<20	1.78	0.010	0.19	5.2	<0.01	0.2	<0.05	3.3	<0.5	5	0.2
TIL015 01+25E	Soil		18	43	0.76	110	0.104	<20	1.96	0.011	0.20	7.1	0.02	0.2	<0.05	3.8	0.6	6	0.3
TIL015 01+50E	Soil		17	45	0.76	108	0.100	<20	2.12	0.011	0.17	4.4	<0.01	0.2	<0.05	3.7	<0.5	6	0.3
TIL015 01+75E	Soil		16	40	0.74	113	0.101	<20	1.80	0.012	0.23	4.5	0.01	0.2	<0.05	3.7	0.5	6	<0.2
TIL015 02+50E	Soil		18	53	1.02	133	0.124	<20	2.81	0.010	0.26	2.3	0.02	0.2	<0.05	4.7	<0.5	9	0.4
TIL015 02+75E	Soil		16	41	0.88	94	0.107	<20	2.17	0.008	0.28	1.7	0.02	0.2	<0.05	3.0	<0.5	7	<0.2
TIL015 03+00E	Soil		16	104	1.73	223	0.181	<20	4.24	0.004	1.01	0.7	0.02	0.6	0.07	8.0	<0.5	15	0.3
TIL015 03+25E	Soil		18	48	0.98	104	0.121	<20	2.62	0.010	0.20	2.9	0.04	0.3	0.06	3.7	<0.5	8	0.3
TIL015 03+50E	Soil		12	45	1.07	87	0.125	<20	2.48	0.013	0.26	2.1	0.02	0.2	0.05	2.6	<0.5	8	<0.2
TIL015 03+75E	Soil		14	49	1.37	93	0.162	<20	2.62	0.024	0.52	2.1	<0.01	0.4	<0.05	3.6	<0.5	9	<0.2
TIL015 04+00E	Soil		16	43	1.17	87	0.130	<20	2.41	0.020	0.38	2.1	<0.01	0.3	<0.05	4.8	<0.5	8	<0.2
TIL015 04+25E	Soil		22	27	1.17	86	0.008	<20	1.93	0.009	0.23	0.2	0.04	0.2	<0.05	6.9	<0.5	5	0.3
TIL015 04+50E	Soil		35	26	1.62	104	0.009	<20	2.03	0.002	0.25	0.3	0.06	0.3	<0.05	7.5	<0.5	8	0.2
TIL015 04+75E	Soil		22	87	1.98	754	0.207	<20	3.57	0.008	1.55	0.3	0.04	0.8	0.08	12.1	<0.5	14	<0.2
TIL015 05+00E	Soil		19	79	1.97	291	0.199	<20	3.23	0.039	1.09	0.8	0.03	0.6	<0.05	8.5	<0.5	12	<0.2
TIL016 00+00	Soil		15	46	1.19	228	0.214	<20	2.74	0.011	0.95	6.8	0.01	0.6	0.05	5.9	<0.5	9	0.2
TIL016 00+25E	Soil		18	77	1.14	180	0.109	<20	2.77	0.008	0.24	12.9	0.08	0.4	0.11	3.0	0.7	9	<0.2
TIL016 00+50E	Soil		11	42	0.91	195	0.130	<20	2.50	0.010	0.16	9.4	0.04	0.3	0.07	3.3	0.9	9	0.4
TIL016 00+75E	Soil		15	47	0.90	135	0.136	<20	2.31	0.007	0.31	13.0	0.02	0.4	<0.05	4.9	0.5	7	0.3
TIL016 01+00E	Soil		18	48	0.83	113	0.123	<20	2.21	0.008	0.20	13.4	0.02	0.3	<0.05	4.7	0.7	6	0.4

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		Method	3B	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Analyte	Au	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
		Unit	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
		MDL	2	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
TIL016 01+25E	Soil		<2	5.3	71.6	70.5	196	0.6	37.7	15.9	561	3.05	19.4	2.5	6.8	27	2.0	0.9	14.9	51	0.30	0.141
TIL016 01+50E	Soil		4	2.3	60.6	31.2	91	0.3	44.4	20.8	572	2.92	13.6	2.2	6.2	61	1.0	0.4	2.8	58	0.39	0.064
TIL016 01+75E	Soil		<2	5.0	63.4	91.5	155	0.7	31.2	15.0	580	2.68	49.7	0.8	8.3	37	1.8	1.5	11.4	48	0.31	0.101
TIL016 02+00E	Soil		<2	1.0	69.4	26.7	108	0.3	41.0	21.6	762	3.64	12.3	<0.5	16.7	66	1.6	0.2	3.4	57	0.23	0.055
TIL016 02+25E	Soil		3	5.3	41.7	24.7	72	0.2	19.2	13.1	491	2.64	11.6	<0.5	8.7	27	0.8	0.5	3.8	48	0.30	0.098
TIL016 02+50E	Soil		<2	6.0	56.7	26.6	89	0.2	27.2	16.3	618	3.07	12.2	2.3	9.1	43	0.7	0.5	3.3	56	0.35	0.101
TIL016 02+75E	Soil		<2	1.3	43.5	33.1	46	0.4	30.2	16.7	565	2.97	2.7	1.1	6.2	757	0.3	0.1	2.4	32	13.83	0.113
TIL016 03+00E	Soil		<2	0.6	68.4	6.9	98	<0.1	73.5	32.6	429	4.40	3.5	1.3	6.7	45	0.1	<0.1	0.5	76	0.51	0.202
TIL016 03+25E	Soil		<2	5.8	45.2	13.9	63	<0.1	28.0	13.1	399	2.80	10.8	0.7	3.4	31	0.3	0.6	2.4	52	0.31	0.078
TIL016 03+50E	Soil		6	7.4	55.9	14.9	68	<0.1	29.7	14.6	455	2.89	14.4	0.8	4.5	26	0.3	0.8	2.4	54	0.30	0.073
TIL016 03+75E	Soil		<2	5.0	57.9	15.9	80	<0.1	39.1	19.2	543	3.12	15.7	<0.5	2.9	42	0.3	0.8	2.0	57	0.34	0.061
TIL016 04+00E	Soil		<2	5.5	84.2	13.7	97	0.1	50.3	23.5	671	3.63	23.1	0.7	7.9	47	0.4	0.6	2.4	75	0.47	0.140
TIL016 04+25E	Soil		<2	4.1	79.9	49.7	96	0.2	43.6	22.8	1039	3.54	15.7	1.1	5.3	115	0.6	0.9	3.4	59	0.49	0.094
TIL016 04+50E	Soil		<2	5.8	53.0	21.3	79	0.1	32.5	15.9	504	3.00	17.7	0.6	3.0	40	0.3	0.9	2.8	55	0.27	0.065
TIL016 04+75E	Soil		<2	2.4	118.8	77.0	131	0.6	65.4	46.0	1457	4.72	46.9	1.6	4.8	46	1.2	0.7	4.0	69	1.03	0.153
TIL016 05+00E	Soil		3	1.5	82.4	39.8	108	0.4	47.9	22.1	711	3.85	31.5	1.1	4.5	41	0.5	0.6	1.8	61	0.64	0.176
TIL017 00+00	Soil		<2	7.2	88.3	17.8	112	0.2	32.7	24.1	779	3.44	36.6	0.7	8.6	39	1.2	1.2	7.6	75	0.18	0.073
TIL017 00+25E	Soil		3	6.4	80.0	23.4	125	0.3	45.6	20.5	623	3.67	31.6	<0.5	10.4	38	1.3	0.6	4.9	89	0.17	0.074
TIL017 00+50E	Soil		2	11.9	70.9	32.3	140	0.3	28.3	13.8	713	2.74	24.8	0.8	2.7	27	1.5	1.1	10.1	55	0.18	0.122
TIL017 00+75E	Soil		<2	7.9	77.2	35.0	153	0.3	38.1	13.5	504	3.07	33.6	1.8	4.5	27	1.6	1.5	10.1	57	0.23	0.089
TIL017 01+00E	Soil		<2	9.8	74.7	60.3	154	0.8	43.6	15.4	628	2.65	17.6	0.5	2.5	29	1.3	1.0	10.5	46	0.34	0.157
TIL017 01+25E	Soil		<2	2.1	89.7	8.4	97	0.2	303.4	47.3	374	3.16	5.1	1.0	3.0	65	0.6	0.1	1.7	52	0.83	0.252
TIL017 01+50E	Soil		<2	7.2	74.3	57.6	180	0.8	39.1	20.6	608	3.28	12.0	0.9	6.3	36	1.9	0.5	7.6	58	0.47	0.199
TIL017 01+75E	Soil		<2	7.4	75.5	53.2	158	0.5	43.3	22.5	554	3.27	10.9	0.7	4.7	36	1.7	0.5	10.9	58	0.34	0.158
TIL017 02+00E	Soil		2	4.4	67.4	61.0	156	0.4	40.3	18.9	667	3.06	19.4	<0.5	6.8	28	1.9	0.7	8.0	53	0.21	0.072
TIL017 02+25E	Soil		3	4.2	80.1	68.0	145	0.6	42.2	21.8	705	3.33	32.7	0.8	8.5	33	1.6	0.7	6.0	59	0.22	0.078
TIL017 02+50E	Soil		<2	5.9	94.0	139.7	194	1.5	58.5	23.3	860	3.28	22.0	<0.5	5.9	33	2.0	0.6	10.0	48	0.25	0.101
TIL017 02+75E	Soil		<2	3.2	55.7	20.8	84	0.2	24.5	14.6	577	2.92	12.8	<0.5	13.5	34	0.7	0.4	2.8	50	0.17	0.041
TIL017 03+00E	Soil		<2	6.2	68.3	38.4	107	0.3	34.7	17.6	619	3.15	17.2	0.7	8.2	35	1.0	0.4	6.6	58	0.26	0.090
TIL017 03+25E	Soil		2	3.8	96.3	18.3	132	0.1	76.9	34.2	687	4.49	29.2	<0.5	9.8	113	0.6	0.3	3.7	74	0.38	0.070

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Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: October 28, 2011

CERTIFICATE OF ANALYSIS VAN11005319.1

	Method	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
	Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Tl	S	Sc	Se	Ga	Te
	Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	MDL	1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.05	0.1	0.5	1	0.2
TIL016 01+25E	Soil	18	48	0.83	127	0.131	<20	2.16	0.008	0.22	6.7	0.02	0.3	<0.05	4.9	0.6	6	0.3
TIL016 01+50E	Soil	15	99	1.23	154	0.152	<20	2.85	0.009	0.31	1.6	<0.01	0.4	<0.05	7.4	<0.5	8	0.3
TIL016 01+75E	Soil	16	43	0.73	129	0.128	<20	2.13	0.008	0.19	9.6	0.02	0.3	<0.05	4.8	0.5	6	0.3
TIL016 02+00E	Soil	35	76	1.32	213	0.181	<20	3.47	0.001	0.76	0.2	<0.01	0.8	<0.05	7.4	0.6	10	<0.2
TIL016 02+25E	Soil	16	33	0.63	134	0.111	<20	1.62	0.009	0.19	3.9	0.02	0.2	<0.05	4.2	<0.5	5	<0.2
TIL016 02+50E	Soil	20	45	0.84	175	0.136	<20	2.30	0.011	0.25	2.7	<0.01	0.2	<0.05	6.0	<0.5	7	0.2
TIL016 02+75E	Soil	20	32	0.57	131	0.124	<20	2.62	0.149	0.34	1.9	<0.01	0.2	0.06	4.4	0.7	7	0.2
TIL016 03+00E	Soil	18	84	1.77	280	0.279	<20	3.46	0.009	1.41	0.2	<0.01	0.9	0.05	7.9	<0.5	11	<0.2
TIL016 03+25E	Soil	15	44	0.79	109	0.123	<20	2.00	0.008	0.28	5.7	0.02	0.2	<0.05	3.8	<0.5	6	<0.2
TIL016 03+50E	Soil	17	46	0.84	93	0.133	<20	1.99	0.011	0.18	3.4	0.02	0.2	<0.05	4.4	<0.5	6	0.2
TIL016 03+75E	Soil	17	53	1.22	111	0.134	<20	2.63	0.009	0.19	2.1	0.02	0.2	<0.05	4.1	<0.5	8	<0.2
TIL016 04+00E	Soil	19	80	1.70	210	0.177	<20	3.16	0.014	0.45	3.1	0.01	0.4	<0.05	7.6	<0.5	10	<0.2
TIL016 04+25E	Soil	14	53	1.42	123	0.135	<20	3.19	0.026	0.29	3.7	0.02	0.4	<0.05	6.1	<0.5	9	0.2
TIL016 04+50E	Soil	14	50	1.02	123	0.136	<20	2.41	0.008	0.13	3.9	0.02	0.2	<0.05	3.7	<0.5	8	<0.2
TIL016 04+75E	Soil	16	68	1.97	123	0.184	<20	3.31	0.049	0.41	1.0	0.03	0.4	<0.05	6.3	0.6	11	0.3
TIL016 05+00E	Soil	17	63	1.76	123	0.196	<20	3.12	0.027	0.58	1.1	0.03	0.5	<0.05	5.0	<0.5	10	0.3
TIL017 00+00	Soil	25	59	1.11	183	0.179	<20	3.22	0.006	0.38	3.7	0.01	0.5	<0.05	7.9	<0.5	9	0.2
TIL017 00+25E	Soil	26	89	1.38	184	0.150	<20	3.34	0.007	0.39	2.8	0.01	0.4	0.05	8.7	0.8	10	0.2
TIL017 00+50E	Soil	13	47	0.80	108	0.101	<20	2.35	0.008	0.19	9.7	0.06	0.3	0.07	4.0	0.5	7	<0.2
TIL017 00+75E	Soil	17	57	0.90	118	0.124	<20	2.30	0.009	0.18	13.7	0.03	0.3	<0.05	4.9	0.6	7	0.2
TIL017 01+00E	Soil	14	45	0.75	89	0.100	<20	2.06	0.011	0.15	13.7	0.04	0.2	0.05	3.4	0.7	6	0.2
TIL017 01+25E	Soil	16	207	3.08	221	0.134	<20	2.19	0.003	0.47	2.4	<0.01	0.7	<0.05	2.6	<0.5	7	<0.2
TIL017 01+50E	Soil	16	48	1.05	184	0.169	<20	2.41	0.012	0.45	7.5	0.02	0.4	<0.05	5.3	<0.5	8	0.2
TIL017 01+75E	Soil	16	61	1.06	175	0.160	<20	2.51	0.009	0.50	8.0	0.02	0.4	<0.05	5.6	0.6	8	0.3
TIL017 02+00E	Soil	19	60	0.88	155	0.125	<20	2.63	0.008	0.25	6.3	0.02	0.3	<0.05	5.6	0.5	7	0.3
TIL017 02+25E	Soil	20	77	1.11	168	0.145	<20	3.09	0.009	0.32	3.0	0.01	0.4	<0.05	6.8	0.7	8	0.4
TIL017 02+50E	Soil	18	56	0.91	119	0.125	<20	2.41	0.007	0.20	3.2	0.03	0.3	<0.05	4.7	0.6	7	0.5
TIL017 02+75E	Soil	22	46	0.74	139	0.132	<20	2.46	0.006	0.27	0.6	0.01	0.3	<0.05	6.2	<0.5	7	<0.2
TIL017 03+00E	Soil	19	58	0.98	164	0.138	<20	2.74	0.009	0.29	2.2	0.01	0.3	<0.05	6.4	<0.5	8	0.3
TIL017 03+25E	Soil	29	98	1.85	175	0.212	<20	3.34	0.008	0.72	0.8	0.02	0.9	<0.05	7.5	0.5	10	0.6

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Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: October 28, 2011

CERTIFICATE OF ANALYSIS VAN11005319.1

	Method	3B	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
	Analyte	Au	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
	Unit	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
	MDL	2	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
TIL017 03+50E	Soil	<2	4.5	107.2	20.0	222	0.4	63.5	20.9	552	4.06	33.9	1.0	5.3	86	1.1	0.8	2.3	67	0.16	0.055
TIL017 03+75E	Soil	<2	4.4	70.1	64.0	100	1.1	40.9	18.1	485	3.19	15.1	<0.5	5.2	27	0.7	0.5	5.2	57	0.17	0.059
TIL017 04+00E	Soil	<2	3.0	138.9	13.1	113	0.2	92.9	37.5	817	4.68	25.8	1.1	7.9	122	0.3	0.3	5.6	147	0.44	0.046
TIL017 04+25E	Soil	<2	3.0	124.4	13.9	114	0.2	53.8	31.0	931	5.74	32.8	<0.5	9.8	129	0.3	0.4	25.6	226	0.49	0.051
TIL017 04+50E	Soil	<2	3.6	84.9	15.3	118	0.2	47.5	29.3	963	4.57	29.4	<0.5	7.5	132	0.6	0.5	5.5	140	0.47	0.071
TIL017 04+75E	Soil	<2	4.3	111.6	12.0	125	0.1	67.7	30.7	945	5.59	26.9	<0.5	9.6	92	0.4	0.2	4.6	138	0.45	0.090
TIL017 05+00E	Soil	<2	6.4	71.6	20.4	110	0.3	46.4	16.0	701	3.79	21.9	<0.5	3.8	57	0.7	0.8	7.1	74	0.22	0.088
TIL018 00+00	Soil	5	16.3	125.3	77.1	918	1.0	31.3	17.0	1480	3.44	8.9	<0.5	9.0	29	6.9	0.4	35.2	65	0.33	0.080
TIL018 00+25E	Soil	2	15.2	98.4	65.3	589	0.9	31.7	19.1	1577	3.86	29.7	1.1	9.7	29	6.3	3.2	37.9	59	0.37	0.093
TIL018 00+50E	Soil	<2	6.5	123.1	14.8	242	0.2	141.0	31.2	1177	3.86	55.9	<0.5	4.8	41	3.0	2.9	5.8	62	0.66	0.239
TIL018 00+75E	Soil	<2	10.4	94.1	16.2	138	0.1	50.0	17.0	746	3.16	45.8	<0.5	5.8	25	1.0	2.7	6.8	59	0.28	0.093
TIL018 01+00E	Soil	<2	16.8	98.4	22.6	134	0.2	41.1	17.7	927	3.42	39.4	<0.5	8.4	29	1.1	2.3	8.2	67	0.27	0.096
TIL018 01+25E	Soil	<2	8.2	87.2	23.5	126	0.1	43.4	20.6	834	3.89	34.3	<0.5	11.2	34	1.2	1.2	9.7	88	0.18	0.065
TIL018 01+50E	Soil	<2	10.6	58.4	39.2	104	0.3	29.1	9.3	419	2.57	18.0	<0.5	1.2	22	0.8	1.1	6.4	48	0.17	0.084
TIL018 01+75E	Soil	8	10.8	78.0	46.5	153	0.7	45.0	16.1	741	3.09	19.9	<0.5	7.6	37	2.2	0.8	9.6	57	0.35	0.109
TIL018 02+00E	Soil	<2	4.7	116.3	33.7	150	0.4	106.0	28.7	775	4.64	17.3	<0.5	1.9	59	1.3	0.3	9.6	80	0.47	0.191
TIL018 02+50E	Soil	4	3.9	111.3	90.5	243	0.7	70.5	27.2	1088	4.53	23.1	<0.5	5.0	302	3.0	0.8	4.2	84	0.50	0.151
TIL018 02+75E	Soil	<2	5.1	110.4	43.4	285	0.3	55.8	20.8	789	4.38	18.0	<0.5	2.3	60	2.1	0.4	24.6	78	0.29	0.114
TIL018 03+00E	Soil	<2	4.9	75.9	40.1	127	0.5	43.6	17.9	632	3.39	19.3	<0.5	4.9	32	1.4	0.8	9.3	54	0.29	0.120
TIL018 03+25E	Soil	4	6.9	59.7	38.3	112	0.5	35.1	14.7	573	2.92	17.1	<0.5	10.1	33	1.7	0.7	4.4	49	0.34	0.101
TIL018 03+50E	Soil	<2	7.2	54.9	42.5	102	0.4	29.1	13.4	552	2.85	13.6	<0.5	11.1	26	1.1	0.6	11.8	48	0.25	0.076
TIL018 03+75E	Soil	<2	9.8	65.3	27.5	110	0.3	37.9	18.7	734	3.40	23.8	<0.5	2.8	52	0.7	1.0	3.4	74	0.25	0.091
TIL018 04+00E	Soil	<2	6.2	68.9	14.2	130	0.1	47.7	21.0	718	4.21	22.5	<0.5	5.9	50	0.9	0.6	2.6	92	0.27	0.044
TIL018 04+25E	Soil	<2	3.8	143.1	11.7	148	0.2	105.5	38.7	1414	5.86	93.6	1.5	10.8	197	0.4	1.7	5.4	153	0.40	0.047
TIL018 04+50E	Soil	<2	3.5	80.5	63.2	170	0.2	74.2	27.4	925	4.38	48.2	<0.5	6.7	63	1.0	1.5	3.5	73	0.19	0.064
TIL018 04+75E	Soil	<2	3.2	110.3	29.0	147	0.3	73.0	36.0	1112	5.67	93.7	1.7	13.2	145	0.6	1.4	3.6	119	0.43	0.067
TIL018 05+00E	Soil	3	5.4	115.9	49.3	152	0.8	67.9	36.3	1176	5.65	352.1	2.0	15.5	126	0.8	3.6	5.0	103	0.39	0.084

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	Method	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
	Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Tl	S	Sc	Se	Ga	Te
	Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	MDL	1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.05	0.1	0.5	1	0.2
TIL017 03+50E	Soil	23	82	1.36	128	0.138	<20	3.04	0.006	0.22	0.6	0.03	0.4	0.06	6.2	<0.5	9	0.2
TIL017 03+75E	Soil	21	61	1.03	77	0.128	<20	2.48	0.007	0.15	1.1	0.03	0.2	<0.05	4.6	0.6	7	0.3
TIL017 04+00E	Soil	25	201	3.30	165	0.259	<20	4.92	0.006	0.93	0.3	0.01	1.5	0.05	13.2	0.6	14	0.4
TIL017 04+25E	Soil	26	126	3.00	164	0.267	<20	5.52	0.013	0.57	0.1	0.02	1.0	0.05	12.8	<0.5	16	9.8
TIL017 04+50E	Soil	23	89	2.11	189	0.227	<20	4.05	0.010	0.61	0.4	0.03	0.6	0.06	8.0	0.5	12	1.3
TIL017 04+75E	Soil	21	137	2.51	127	0.231	<20	4.88	0.012	0.49	0.8	0.02	1.0	<0.05	10.9	<0.5	15	1.4
TIL017 05+00E	Soil	19	79	1.47	105	0.119	<20	3.16	0.008	0.18	1.5	0.06	0.5	0.08	4.5	0.5	9	0.7
TIL018 00+00	Soil	18	54	1.07	148	0.153	<20	2.64	0.013	0.32	43.5	0.02	0.5	<0.05	5.8	<0.5	8	0.3
TIL018 00+25E	Soil	21	40	0.79	135	0.113	<20	2.09	0.011	0.23	35.9	0.02	0.4	<0.05	6.2	<0.5	6	0.3
TIL018 00+50E	Soil	18	74	1.54	168	0.153	<20	2.45	0.013	0.28	13.9	0.04	0.4	<0.05	4.5	<0.5	8	<0.2
TIL018 00+75E	Soil	17	53	0.93	122	0.132	<20	2.30	0.011	0.18	13.0	0.02	0.3	<0.05	4.8	<0.5	7	<0.2
TIL018 01+00E	Soil	18	49	1.02	150	0.148	<20	2.71	0.012	0.28	15.3	0.03	0.4	<0.05	5.4	<0.5	8	0.2
TIL018 01+25E	Soil	29	70	1.37	211	0.183	<20	3.43	0.012	0.43	5.0	0.03	0.5	<0.05	7.0	<0.5	10	0.3
TIL018 01+50E	Soil	17	41	0.62	76	0.077	<20	2.04	0.009	0.08	8.6	0.05	0.2	0.07	2.2	0.5	6	<0.2
TIL018 01+75E	Soil	18	53	0.95	168	0.128	<20	2.23	0.011	0.28	10.4	0.02	0.3	<0.05	4.7	<0.5	7	0.2
TIL018 02+00E	Soil	15	93	1.30	251	0.170	<20	2.70	0.016	0.31	3.1	0.04	0.4	0.09	3.6	<0.5	10	0.4
TIL018 02+50E	Soil	21	82	1.62	249	0.184	<20	3.34	0.012	0.65	2.5	0.03	0.7	0.05	6.8	<0.5	10	0.4
TIL018 02+75E	Soil	16	69	1.04	158	0.161	<20	3.03	0.011	0.19	2.6	0.02	0.3	0.10	4.2	<0.5	10	1.3
TIL018 03+00E	Soil	19	48	0.83	117	0.119	<20	2.12	0.010	0.21	3.3	0.02	0.3	<0.05	3.9	<0.5	7	0.3
TIL018 03+25E	Soil	21	43	0.79	130	0.127	<20	1.98	0.012	0.22	3.6	<0.01	0.3	<0.05	4.3	<0.5	6	0.3
TIL018 03+50E	Soil	18	37	0.70	120	0.116	<20	1.97	0.010	0.19	7.8	<0.01	0.2	<0.05	3.7	<0.5	6	0.2
TIL018 03+75E	Soil	22	55	1.11	141	0.138	<20	2.70	0.011	0.21	3.3	0.05	0.4	0.08	4.0	<0.5	8	0.3
TIL018 04+00E	Soil	25	90	1.45	126	0.214	<20	3.40	0.009	0.46	1.6	0.03	0.6	<0.05	6.2	<0.5	10	0.4
TIL018 04+25E	Soil	27	93	2.38	158	0.235	<20	5.14	0.016	0.69	0.4	0.04	1.1	<0.05	10.4	0.5	15	1.5
TIL018 04+50E	Soil	25	80	1.36	121	0.147	<20	3.17	0.005	0.28	0.7	0.03	0.5	0.06	4.8	<0.5	9	1.0
TIL018 04+75E	Soil	34	125	2.35	181	0.215	<20	4.04	0.029	0.77	0.3	0.02	1.0	0.16	10.7	0.6	12	1.1
TIL018 05+00E	Soil	42	109	2.06	226	0.193	<20	3.61	0.033	0.74	0.8	0.03	0.8	0.23	9.0	0.9	11	1.2

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Client: **TerraLogic Exploration Inc.**
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: October 28, 2011

QUALITY CONTROL REPORT VAN11005319.1

	Method	3B	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
	Analyte	Au	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
	Unit	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
	MDL	2	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
Pulp Duplicates																					
TIL009 01+50E	Soil	2	1.9	76.8	348.2	161	1.2	53.5	26.9	1320	4.10	1032	<0.5	9.9	38	1.9	24.9	14.1	70	0.39	0.074
REP TIL009 01+50E	QC	<2																			
TIL010 00+75E	Soil	<2	2.2	36.4	17.2	54	<0.1	35.1	11.0	381	2.26	37.1	1.3	6.9	31	0.4	1.0	1.4	41	0.33	0.100
REP TIL010 00+75E	QC		1.7	35.9	16.2	53	<0.1	34.8	10.7	376	2.30	37.2	<0.5	7.8	31	0.5	1.0	1.5	41	0.33	0.100
TIL011 01+00E	Soil	2	1.9	63.8	45.3	88	0.4	44.9	16.6	571	3.38	20.9	2.3	7.7	100	0.8	0.5	2.7	56	0.58	0.086
REP TIL011 01+00E	QC	<2																			
TIL012 04+00E	Soil	<2	2.7	37.7	20.7	69	0.1	26.4	11.3	380	2.62	28.6	<0.5	6.4	23	0.4	1.6	1.9	47	0.35	0.098
REP TIL012 04+00E	QC	<2																			
TIL012 04+50E	Soil	<2	3.4	41.4	20.3	69	<0.1	26.1	11.3	440	2.67	15.4	1.9	7.1	24	0.4	0.8	3.4	53	0.32	0.089
REP TIL012 04+50E	QC		3.3	40.5	20.5	69	<0.1	26.3	11.8	438	2.67	15.3	0.8	7.2	24	0.3	0.8	2.3	54	0.32	0.094
TIL015 02+75E	Soil	<2	4.3	41.7	16.6	65	<0.1	31.8	13.2	416	3.04	13.0	1.0	3.6	25	0.1	0.5	2.4	55	0.19	0.041
REP TIL015 02+75E	QC	2																			
TIL015 03+50E	Soil	<2	4.0	42.4	15.6	69	0.2	30.5	12.8	494	2.86	10.3	1.1	1.9	28	0.2	0.7	6.0	55	0.29	0.062
REP TIL015 03+50E	QC		4.0	41.5	16.1	66	0.2	29.8	13.0	492	2.86	10.0	0.9	2.0	27	0.2	0.6	2.1	56	0.29	0.062
TIL016 00+50E	Soil	2	5.7	127.2	73.1	248	0.7	42.3	21.9	651	3.71	19.9	3.9	1.2	36	1.5	0.6	10.1	74	0.37	0.209
REP TIL016 00+50E	QC		6.0	125.7	75.5	240	0.7	43.1	22.9	682	3.78	19.1	2.8	1.2	36	1.5	0.6	10.1	77	0.36	0.200
TIL016 03+75E	Soil	<2	5.0	57.9	15.9	80	<0.1	39.1	19.2	543	3.12	15.7	<0.5	2.9	42	0.3	0.8	2.0	57	0.34	0.061
REP TIL016 03+75E	QC	<2																			
TIL018 04+25E	Soil	<2	3.8	143.1	11.7	148	0.2	105.5	38.7	1414	5.86	93.6	1.5	10.8	197	0.4	1.7	5.4	153	0.40	0.047
REP TIL018 04+25E	QC	<2																			
Reference Materials																					
STD DS8	Standard		13.1	104.1	116.4	307	1.8	35.5	7.5	588	2.39	26.1	112.9	6.6	68	2.4	4.6	6.9	39	0.68	0.075
STD DS8	Standard		12.8	106.4	129.0	316	1.7	37.1	7.5	598	2.44	26.2	104.6	7.1	67	2.4	5.4	7.1	41	0.68	0.080
STD DS8	Standard		13.3	113.7	117.7	324	1.8	37.1	7.4	587	2.44	24.4	99.9	7.2	65	2.2	4.1	5.8	41	0.69	0.078
STD DS8	Standard		13.2	111.7	128.3	329	1.8	38.1	7.4	648	2.57	26.6	121.3	7.4	75	2.4	4.5	7.0	43	0.74	0.083
STD DS8	Standard		13.4	120.9	114.1	318	1.6	37.0	8.4	590	2.44	28.4	102.8	6.9	61	2.7	5.0	7.0	41	0.69	0.093
STD DS8	Standard		13.4	119.3	126.5	323	1.9	39.6	8.2	630	2.60	26.5	94.9	6.9	72	2.5	5.1	7.3	44	0.74	0.082
STD OREAS45CA	Standard		0.7	497.0	21.4	61	0.3	240.7	86.4	897	15.13	4.0	45.4	7.1	17	<0.1	<0.1	0.2	196	0.39	0.033

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Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: October 28, 2011

QUALITY CONTROL REPORT VAN11005319.1

	Method	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
	Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Tl	S	Sc	Se	Ga	Te
	Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	MDL	1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.05	0.1	0.5	1	0.2
Pulp Duplicates																		
TIL009 01+50E	Soil	28	57	1.10	155	0.082	<20	2.08	0.012	0.31	1.2	0.04	0.6	<0.05	6.4	0.6	7	1.6
REP TIL009 01+50E	QC																	
TIL010 00+75E	Soil	16	37	0.65	80	0.085	<20	1.33	0.016	0.17	1.7	<0.01	0.2	<0.05	3.1	<0.5	4	<0.2
REP TIL010 00+75E	QC	17	36	0.67	82	0.087	<20	1.35	0.016	0.17	2.0	<0.01	0.2	<0.05	3.2	<0.5	4	<0.2
TIL011 01+00E	Soil	23	57	0.87	112	0.119	<20	2.29	0.047	0.15	1.1	0.01	0.3	<0.05	4.6	<0.5	7	0.3
REP TIL011 01+00E	QC																	
TIL012 04+00E	Soil	19	35	0.79	108	0.096	<20	1.62	0.010	0.12	1.9	0.03	0.2	<0.05	3.7	<0.5	5	0.2
REP TIL012 04+00E	QC																	
TIL012 04+50E	Soil	20	37	0.79	102	0.102	<20	1.77	0.010	0.11	2.2	0.02	0.2	<0.05	3.5	<0.5	6	<0.2
REP TIL012 04+50E	QC	20	37	0.81	95	0.104	<20	1.77	0.011	0.11	2.0	0.02	0.2	<0.05	3.5	0.5	6	<0.2
TIL015 02+75E	Soil	16	41	0.88	94	0.107	<20	2.17	0.008	0.28	1.7	0.02	0.2	<0.05	3.0	<0.5	7	<0.2
REP TIL015 02+75E	QC																	
TIL015 03+50E	Soil	12	45	1.07	87	0.125	<20	2.48	0.013	0.26	2.1	0.02	0.2	0.05	2.6	<0.5	8	<0.2
REP TIL015 03+50E	QC	12	38	1.08	91	0.126	<20	2.51	0.014	0.27	2.3	0.03	0.2	0.05	2.8	<0.5	8	<0.2
TIL016 00+50E	Soil	11	42	0.91	195	0.130	<20	2.50	0.010	0.16	9.4	0.04	0.3	0.07	3.3	0.9	9	0.4
REP TIL016 00+50E	QC	11	42	0.92	201	0.126	<20	2.62	0.011	0.16	9.4	0.03	0.3	0.08	3.2	0.5	8	0.4
TIL016 03+75E	Soil	17	53	1.22	111	0.134	<20	2.63	0.009	0.19	2.1	0.02	0.2	<0.05	4.1	<0.5	8	<0.2
REP TIL016 03+75E	QC																	
TIL018 04+25E	Soil	27	93	2.38	158	0.235	<20	5.14	0.016	0.69	0.4	0.04	1.1	<0.05	10.4	0.5	15	1.5
REP TIL018 04+25E	QC																	
Reference Materials																		
STD DS8	Standard	15	109	0.59	301	0.115	<20	0.90	0.089	0.40	2.5	0.25	5.4	0.16	2.0	5.6	5	4.9
STD DS8	Standard	14	109	0.61	304	0.113	<20	0.88	0.083	0.41	2.8	0.22	5.4	0.16	2.0	5.1	5	5.0
STD DS8	Standard	14	118	0.59	273	0.108	<20	0.91	0.085	0.40	2.3	0.20	5.1	0.16	1.8	4.6	4	4.4
STD DS8	Standard	15	118	0.64	292	0.115	<20	0.97	0.096	0.42	2.9	0.20	5.6	0.17	2.0	5.5	5	5.0
STD DS8	Standard	15	101	0.61	281	0.124	<20	0.95	0.082	0.41	2.6	0.18	5.2	0.16	2.4	5.0	5	4.9
STD DS8	Standard	16	123	0.64	292	0.135	<20	1.00	0.105	0.44	2.5	0.18	5.3	0.17	2.1	4.6	5	5.2
STD OREAS45CA	Standard	17	657	0.15	178	0.131	<20	3.82	0.015	0.08	<0.1	0.04	<0.1	<0.05	35.7	0.9	18	<0.2

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Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: October 28, 2011

QUALITY CONTROL REPORT VAN11005319.1

		3B	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Au	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
		ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
		2	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
STD OREAS45CA	Standard		0.8	506.1	21.8	64	0.3	240.0	89.6	939	16.09	4.2	42.8	7.8	17	0.1	0.1	0.2	200	0.42	0.040
STD OREAS45CA	Standard		0.7	532.1	19.4	66	0.3	267.1	93.7	948	16.09	3.3	36.3	6.5	16	<0.1	<0.1	0.2	214	0.43	0.038
STD OREAS45CA	Standard		0.8	543.7	22.9	68	0.3	265.3	90.0	991	16.73	3.8	43.1	7.7	18	<0.1	<0.1	0.2	217	0.47	0.044
STD OREAS45CA	Standard		0.9	531.8	22.3	66	0.3	271.9	107.6	931	16.46	4.3	45.0	8.0	19	0.1	<0.1	0.1	234	0.43	0.047
STD OREAS45CA	Standard		0.9	554.0	23.6	66	0.3	284.9	95.5	972	14.95	3.5	40.7	7.7	17	0.1	<0.1	0.2	237	0.44	0.038
STD OXC88	Standard	192																			
STD OXC88	Standard	208																			
STD OXC88	Standard	197																			
STD OXC88	Standard	207																			
STD OXC88	Standard	200																			
STD OXC88	Standard	205																			
STD OXH82	Standard	1262																			
STD OXH82	Standard	1302																			
STD OXH82	Standard	1291																			
STD OXH82	Standard	1258																			
STD OXH82	Standard	1322																			
STD OXH82	Standard	1246																			
STD OXC88 Expected		203																			
STD OXH82 Expected		1278																			
STD DS8 Expected			13.44	110	123	312	1.69	38.1	7.5	615	2.46	26	107	6.89	67.7	2.38	4.8	6.67	41.1	0.7	0.08
STD OREAS45CA Expected			1	494	20	60	0.275	240	92	943	15.69	3.8	43	7	15	0.1	0.13	0.19	215	0.4265	0.0385
BLK	Blank		<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<1	<0.01	<0.5	<0.5	<0.1	<1	<0.1	<0.1	<0.1	<2	<0.01	<0.001
BLK	Blank		<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<1	<0.01	<0.5	<0.5	<0.1	<1	<0.1	<0.1	<0.1	<2	<0.01	<0.001
BLK	Blank		<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<1	<0.01	<0.5	<0.5	<0.1	<1	<0.1	<0.1	<0.1	<2	<0.01	<0.001
BLK	Blank		<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<1	<0.01	<0.5	<0.5	<0.1	<1	<0.1	<0.1	<0.1	<2	<0.01	<0.001
BLK	Blank		<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<1	<0.01	<0.5	<0.5	<0.1	<1	<0.1	<0.1	<0.1	<2	<0.01	<0.001
BLK	Blank	<2																			
BLK	Blank	<2																			
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QUALITY CONTROL REPORT VAN11005319.1

		1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Tl	S	Sc	Se	Ga	Te
		ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
		1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.05	0.1	0.5	1	0.2
STD OREAS45CA	Standard	17	643	0.16	173	0.133	<20	3.58	0.009	0.07	<0.1	0.04	<0.1	<0.05	39.7	0.8	19	<0.2
STD OREAS45CA	Standard	15	724	0.14	151	0.127	<20	3.90	0.009	0.08	<0.1	0.02	<0.1	<0.05	35.9	<0.5	19	<0.2
STD OREAS45CA	Standard	17	693	0.17	161	0.148	<20	4.00	0.006	0.10	<0.1	0.04	<0.1	<0.05	41.5	0.7	21	<0.2
STD OREAS45CA	Standard	19	713	0.19	192	0.142	<20	4.04	0.006	0.08	<0.1	0.04	<0.1	<0.05	47.7	0.8	19	<0.2
STD OREAS45CA	Standard	18	673	0.17	173	0.159	<20	4.15	0.007	0.07	<0.1	0.03	<0.1	<0.05	39.6	0.9	20	<0.2
STD OXC88	Standard																	
STD OXC88	Standard																	
STD OXC88	Standard																	
STD OXC88	Standard																	
STD OXC88	Standard																	
STD OXC88	Standard																	
STD OXH82	Standard																	
STD OXH82	Standard																	
STD OXH82	Standard																	
STD OXH82	Standard																	
STD OXH82	Standard																	
STD OXH82	Standard																	
STD OXC88 Expected																		
STD OXH82 Expected																		
STD DS8 Expected		14.6	115	0.6045	279	0.113	2.6	0.93	0.0883	0.41	3	0.192	5.4	0.1679	2.3	5.23	4.7	5
STD OREAS45CA Expected		15.9	709	0.1358	164	0.128		3.592	0.0075	0.0717		0.03	0.07	0.021	39.7	0.5	18.4	
BLK	Blank	<1	<1	<0.01	<1	<0.001	<20	<0.01	<0.001	<0.01	<0.1	<0.01	<0.1	<0.05	<0.1	<0.5	<1	<0.2
BLK	Blank	<1	<1	<0.01	<1	<0.001	<20	<0.01	<0.001	<0.01	<0.1	<0.01	<0.1	<0.05	<0.1	<0.5	<1	<0.2
BLK	Blank	<1	<1	<0.01	<1	<0.001	<20	<0.01	<0.001	<0.01	<0.1	<0.01	<0.1	<0.05	<0.1	<0.5	<1	<0.2
BLK	Blank	<1	<1	<0.01	<1	<0.001	<20	<0.01	<0.001	<0.01	<0.1	<0.01	<0.1	<0.05	<0.1	<0.5	<1	<0.2
BLK	Blank	<1	<1	<0.01	<1	<0.001	<20	<0.01	<0.001	<0.01	<0.1	<0.01	<0.1	<0.05	<0.1	<0.5	<1	<0.2
BLK	Blank																	
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www.acmelab.com

Client: **TerraLogic Exploration Inc.**
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: October 28, 2011

QUALITY CONTROL REPORT VAN11005319.1

		3B Au ppb 2	1DX Mo ppm 0.1	1DX Cu ppm 0.1	1DX Pb ppm 0.1	1DX Zn ppm 1	1DX Ag ppm 0.1	1DX Ni ppm 0.1	1DX Co ppm 0.1	1DX Mn ppm 1	1DX Fe % 0.01	1DX As ppm 0.5	1DX Au ppb 0.5	1DX Th ppm 0.1	1DX Sr ppm 1	1DX Cd ppm 0.1	1DX Sb ppm 0.1	1DX Bi ppm 0.1	1DX V ppm 2	1DX Ca % 0.01	1DX P % 0.001
BLK	Blank	<2																			
BLK	Blank	<2																			
BLK	Blank	<2																			
BLK	Blank	<2																			
BLK	Blank	<2																			
BLK	Blank	<2																			
BLK	Blank	<2																			
BLK	Blank	<2																			
BLK	Blank	<2																			
BLK	Blank		<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<1	<0.01	<0.5	<0.5	<0.1	<1	<0.1	<0.1	<0.1	<2	<0.01	<0.001

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Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: October 28, 2011

QUALITY CONTROL REPORT VAN11005319.1

		1DX La ppm 1	1DX Cr ppm 1	1DX Mg % 0.01	1DX Ba ppm 1	1DX Ti % 0.001	1DX B ppm 20	1DX Al % 0.01	1DX Na % 0.001	1DX K % 0.01	1DX W ppm 0.1	1DX Hg ppm 0.01	1DX Tl ppm 0.1	1DX S % 0.05	1DX Sc ppm 0.1	1DX Se ppm 0.5	1DX Ga ppm 1	1DX Te ppm 0.2
BLK	Blank																	
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BLK	Blank																	
BLK	Blank																	
BLK	Blank	<1	<1	<0.01	<1	<0.001	<20	<0.01	<0.001	<0.01	<0.1	<0.01	<0.1	<0.05	<0.1	<0.5	<1	<0.2

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Client: **TerraLogic Exploration Inc.**
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Submitted By: Chris Gallagher
Receiving Lab: Canada-Vancouver
Received: October 06, 2011
Report Date: November 08, 2011
Page: 1 of 7

CERTIFICATE OF ANALYSIS VAN11005320.1

CLIENT JOB INFORMATION

Project: Titan
Shipment ID: Ti11-001
P.O. Number
Number of Samples: 167

SAMPLE DISPOSAL

RTRN-PLP Return
DISP-RJT-SOIL Immediate Disposal of Soil Reject

Acme does not accept responsibility for samples left at the laboratory after 90 days without prior written instructions for sample storage or return.

SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

Method Code	Number of Samples	Code Description	Test Wgt (g)	Report Status	Lab
Dry at 60C	159	Dry at 60C			VAN
SS80	159	Dry at 60C sieve 100g to -80 mesh			VAN
3B	159	Fire assay fusion Au by ICP-ES	30	Completed	VAN
1DX	159	1:1:1 Aqua Regia digestion ICP-MS analysis	0.5	Completed	VAN

ADDITIONAL COMMENTS

Invoice To: TerraLogic Exploration Inc.
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7
Canada

CC: Jesse Campbell
Jarrod Brown

BRITISH COLUMBIA CERTIFIED ASSAYER
CLARENCE LEONG
GENERAL MANAGER

This report supersedes all previous preliminary and final reports with this file number dated prior to the date on this certificate. Signature indicates final approval; preliminary reports are unsigned and should be used for reference only.
All results are considered the confidential property of the client. Acme assumes the liabilities for actual cost of analysis only. Results apply to samples as submitted.
"*" asterisk indicates that an analytical result could not be provided due to unusually high levels of interference from other elements.

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Client: **TerraLogic Exploration Inc.**
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: November 08, 2011

CERTIFICATE OF ANALYSIS VAN11005320.1

		Method	3B	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Analyte	Au	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
		Unit	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
		MDL	2	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
TIL019 00+00	Soil		<2	4.5	3.9	8.6	29	<0.1	2.9	3.8	232	1.37	<0.5	2.3	1.8	30	<0.1	<0.1	0.4	40	0.27	0.029
TIL019 00+25E	Soil		<2	4.9	15.6	8.4	35	0.2	4.9	5.4	827	1.27	0.8	1.8	0.9	74	0.2	<0.1	0.4	34	0.93	0.071
TIL019 00+50E	Soil		3	1.9	16.1	6.0	36	<0.1	5.1	4.2	351	1.88	0.6	4.6	3.0	33	<0.1	<0.1	0.4	45	0.33	0.102
TIL019 00+75E	Soil		3	2.4	38.7	10.1	44	<0.1	7.5	7.9	677	2.02	1.3	2.0	7.8	33	<0.1	<0.1	0.7	40	0.32	0.088
TIL019 01+00E	Soil		<2	4.7	21.4	10.7	47	<0.1	9.9	7.9	521	2.08	4.5	1.0	4.2	40	<0.1	<0.1	0.8	41	0.36	0.081
TIL019 01+75E	Soil		22	2.8	7.4	6.2	27	<0.1	3.7	4.0	185	1.88	0.8	<0.5	3.9	38	<0.1	<0.1	0.4	47	0.17	0.062
TIL019 02+00E	Soil		4	1.3	5.1	4.9	21	<0.1	2.6	2.4	160	1.24	<0.5	<0.5	5.8	23	<0.1	<0.1	0.4	31	0.11	0.015
TIL019 00+25W	Soil		<2	1.9	3.3	4.8	15	<0.1	2.3	2.1	111	1.04	<0.5	0.8	1.1	33	<0.1	<0.1	0.4	31	0.12	0.010
TIL019 00+50W	Soil		5	9.2	7.9	8.6	28	<0.1	3.8	3.2	223	1.90	0.6	0.6	2.5	24	<0.1	<0.1	0.7	47	0.12	0.032
TIL019 00+75W	Soil		<2	10.9	7.5	9.7	26	0.2	3.5	2.9	185	1.22	<0.5	24.7	0.3	45	0.1	<0.1	0.5	36	0.29	0.050
TIL019 01+00W	Soil		<2	3.6	8.5	9.7	21	0.1	2.6	1.8	120	0.92	<0.5	1.7	0.3	31	<0.1	<0.1	0.7	22	0.11	0.045
TIL019 01+25W	Soil		2	6.6	11.1	9.5	21	0.3	3.0	2.5	165	1.09	0.6	2.6	0.5	50	0.1	<0.1	0.6	23	0.48	0.077
TIL019 01+50W	Soil		<2	10.4	18.7	10.9	37	0.3	4.8	4.5	306	1.31	0.9	7.9	1.1	47	<0.1	<0.1	0.6	26	0.39	0.071
TIL020 00+25W	Soil		<2	1.6	11.6	12.6	34	0.2	4.0	3.4	305	1.93	1.2	1.5	2.1	15	<0.1	<0.1	0.6	33	0.11	0.046
TIL020 00+50W	Soil		3	2.1	10.0	8.2	30	0.2	4.3	3.8	251	2.14	1.2	2.5	1.3	25	<0.1	<0.1	0.6	56	0.13	0.033
TIL020 00+75W	Soil		<2	3.3	24.5	7.4	40	0.2	6.5	6.7	423	2.07	1.2	8.2	2.2	34	<0.1	<0.1	0.5	45	0.31	0.084
TIL020 01+00W	Soil		3	5.6	58.1	24.4	84	<0.1	9.4	11.3	651	2.94	2.3	3.0	3.5	60	0.1	0.2	0.8	65	0.36	0.089
TIL020 1+25W	Soil		5	3.6	39.4	12.6	57	0.1	7.5	9.0	682	2.45	1.9	7.5	7.2	56	0.1	0.2	4.1	50	0.47	0.103
TIL020 1+50W	Soil		<2	2.7	22.1	9.3	36	<0.1	5.9	5.0	505	1.66	1.2	<0.5	7.1	27	<0.1	0.2	0.5	33	0.19	0.071
TIL020 00+00	Soil		<2	5.5	25.9	10.5	80	<0.1	8.4	9.6	577	2.79	4.3	1.0	1.8	90	0.1	<0.1	0.5	66	0.62	0.059
TIL020 00+25E	Soil		2	1.3	21.1	10.9	42	<0.1	5.7	5.3	521	1.78	1.4	<0.5	6.1	26	<0.1	<0.1	0.5	36	0.22	0.064
TIL020 00+50E	Soil		10	2.0	32.2	10.1	34	0.1	5.4	6.1	447	1.73	1.2	2.1	6.4	23	<0.1	<0.1	0.4	32	0.22	0.066
TIL020 00+75E	Soil		3	4.5	76.3	10.3	64	<0.1	13.9	12.3	536	2.64	2.0	1.9	4.7	73	0.1	<0.1	6.5	56	0.54	0.091
TIL020 01+00E	Soil		<2	7.8	29.9	21.5	53	<0.1	7.4	11.4	571	2.51	4.4	1.2	8.1	34	0.1	<0.1	0.6	51	0.35	0.109
TIL020 01+50E	Soil		<2	2.3	17.9	10.1	37	<0.1	4.6	4.4	297	2.25	1.2	3.8	8.9	22	<0.1	<0.1	0.5	48	0.18	0.070
TIL020 02+00E	Soil		3	2.6	37.0	7.3	28	<0.1	4.9	3.9	270	1.70	1.9	0.9	2.9	24	<0.1	<0.1	0.5	34	0.16	0.065
TIL021 00+25W	Soil		<2	2.3	22.2	9.6	53	<0.1	7.0	7.5	551	2.46	3.8	2.1	4.7	45	<0.1	0.1	0.6	56	0.43	0.113
TIL021 00+50W	Soil		<2	7.6	22.8	16.2	51	0.2	4.6	4.9	495	1.84	1.8	0.6	2.3	46	0.2	0.2	1.4	42	0.22	0.084
TIL021 00+75W	Soil		<2	2.6	6.3	8.0	31	<0.1	3.3	4.0	430	2.01	0.8	<0.5	3.9	42	<0.1	0.2	0.8	55	0.11	0.019
TIL021 01+00W	Soil		3	6.0	35.0	12.0	61	0.1	6.2	6.9	572	2.09	1.8	1.3	1.5	45	0.2	0.2	1.2	47	0.24	0.071

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Client: **TerraLogic Exploration Inc.**
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: November 08, 2011

CERTIFICATE OF ANALYSIS VAN11005320.1

	Method	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
	Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se	Te
	Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
	MDL	1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.1	0.05	1	0.5	0.2
TIL019 00+00	Soil	15	8	0.46	83	0.082	<20	1.04	0.011	0.07	0.6	0.02	0.9	<0.1	<0.05	7	<0.5	<0.2
TIL019 00+25E	Soil	7	13	0.42	158	0.037	<20	0.98	0.016	0.05	5.0	<0.01	1.0	0.1	<0.05	4	<0.5	<0.2
TIL019 00+50E	Soil	10	15	0.45	52	0.053	<20	1.11	0.017	0.05	1.1	0.01	1.5	<0.1	<0.05	5	<0.5	<0.2
TIL019 00+75E	Soil	11	15	0.50	103	0.058	<20	1.30	0.019	0.09	1.5	0.01	1.8	<0.1	<0.05	5	<0.5	<0.2
TIL019 01+00E	Soil	11	22	0.59	88	0.056	<20	1.18	0.014	0.11	3.5	<0.01	1.7	<0.1	<0.05	4	<0.5	<0.2
TIL019 01+75E	Soil	8	11	0.37	47	0.067	<20	0.95	0.011	0.06	0.6	0.03	1.3	<0.1	<0.05	8	<0.5	<0.2
TIL019 02+00E	Soil	10	7	0.27	33	0.059	<20	0.65	0.010	0.04	0.4	<0.01	1.2	<0.1	<0.05	6	<0.5	<0.2
TIL019 00+25W	Soil	9	8	0.18	32	0.048	<20	0.60	0.009	0.03	0.5	<0.01	0.7	<0.1	<0.05	7	<0.5	<0.2
TIL019 00+50W	Soil	10	13	0.35	44	0.051	<20	1.20	0.010	0.05	2.2	0.02	1.2	<0.1	<0.05	6	<0.5	<0.2
TIL019 00+75W	Soil	9	13	0.36	88	0.038	<20	1.16	0.012	0.05	5.1	0.03	0.5	<0.1	<0.05	7	<0.5	<0.2
TIL019 01+00W	Soil	10	8	0.23	58	0.016	<20	1.02	0.011	0.03	5.3	0.02	0.4	0.1	<0.05	6	<0.5	<0.2
TIL019 01+25W	Soil	14	6	0.25	112	0.017	<20	0.98	0.015	0.04	11.5	0.02	0.3	<0.1	0.08	4	<0.5	<0.2
TIL019 01+50W	Soil	13	14	0.37	153	0.028	<20	1.56	0.021	0.09	5.8	0.03	0.9	0.1	<0.05	5	0.8	<0.2
TIL020 00+25W	Soil	10	13	0.36	43	0.036	<20	1.88	0.011	0.05	0.7	0.04	1.3	<0.1	<0.05	6	0.5	<0.2
TIL020 00+50W	Soil	10	13	0.38	49	0.071	<20	0.98	0.012	0.06	1.4	0.02	1.3	<0.1	<0.05	8	<0.5	<0.2
TIL020 00+75W	Soil	9	18	0.51	97	0.059	<20	1.41	0.017	0.07	3.4	0.02	1.6	<0.1	<0.05	5	<0.5	<0.2
TIL020 01+00W	Soil	8	25	0.91	228	0.097	<20	2.08	0.024	0.15	5.2	0.03	3.2	0.1	<0.05	8	<0.5	<0.2
TIL020 1+25W	Soil	12	19	0.70	165	0.079	<20	1.51	0.019	0.15	6.4	0.02	2.5	<0.1	<0.05	6	<0.5	<0.2
TIL020 1+50W	Soil	14	13	0.40	68	0.046	<20	1.18	0.011	0.08	1.0	0.02	1.5	<0.1	<0.05	4	<0.5	<0.2
TIL020 00+00	Soil	6	25	0.92	151	0.091	<20	1.89	0.017	0.09	8.1	0.02	2.4	<0.1	<0.05	9	<0.5	<0.2
TIL020 00+25E	Soil	14	13	0.45	72	0.046	<20	1.29	0.015	0.08	0.6	0.02	1.7	<0.1	<0.05	5	<0.5	<0.2
TIL020 00+50E	Soil	12	11	0.40	84	0.048	<20	1.02	0.013	0.10	1.0	<0.01	1.5	<0.1	<0.05	4	<0.5	<0.2
TIL020 00+75E	Soil	11	23	0.85	147	0.088	<20	1.70	0.017	0.16	2.9	0.02	2.7	0.1	<0.05	6	<0.5	<0.2
TIL020 01+00E	Soil	11	19	0.63	113	0.082	<20	2.14	0.014	0.13	3.9	0.03	2.1	0.1	<0.05	5	<0.5	<0.2
TIL020 01+50E	Soil	10	15	0.42	56	0.060	<20	1.35	0.017	0.06	1.3	0.04	1.7	<0.1	<0.05	6	<0.5	<0.2
TIL020 02+00E	Soil	9	14	0.35	48	0.043	<20	1.29	0.010	0.05	1.7	0.03	1.1	<0.1	<0.05	4	<0.5	<0.2
TIL021 00+25W	Soil	8	18	0.69	97	0.078	<20	1.74	0.014	0.08	3.1	0.03	2.3	<0.1	<0.05	7	<0.5	<0.2
TIL021 00+50W	Soil	12	13	0.40	163	0.035	<20	1.42	0.011	0.08	9.8	0.03	1.2	<0.1	<0.05	7	<0.5	<0.2
TIL021 00+75W	Soil	11	13	0.34	86	0.087	<20	1.14	0.009	0.07	0.6	0.02	1.7	<0.1	<0.05	8	<0.5	<0.2
TIL021 01+00W	Soil	9	16	0.55	153	0.049	<20	1.83	0.012	0.10	3.1	0.03	1.7	0.1	<0.05	7	<0.5	<0.2

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Client: **TerraLogic Exploration Inc.**
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: November 08, 2011

CERTIFICATE OF ANALYSIS VAN11005320.1

		Method	3B	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Analyte	Au	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
		Unit	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
		MDL	2	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
TIL021 01+25W	Soil		5	1.9	35.1	10.6	54	<0.1	6.3	6.9	496	2.03	1.6	2.7	6.9	37	0.1	0.1	1.5	43	0.41	0.105
TIL021 01+50W	Soil		<2	4.1	20.5	13.2	54	0.1	5.4	5.1	546	1.95	1.6	3.6	1.7	39	0.2	0.1	1.8	39	0.23	0.071
TIL021 02+00W	Soil		<2	2.8	16.0	17.1	40	0.1	4.0	3.0	428	1.30	1.3	2.6	2.9	39	0.1	<0.1	2.4	24	0.20	0.047
TIL021 02+25W	Soil		<2	2.6	24.3	11.4	40	<0.1	5.6	5.2	481	1.87	1.6	1.2	5.1	29	<0.1	0.1	1.7	37	0.15	0.033
TIL021 02+50W	Soil		<2	5.8	7.9	13.4	26	<0.1	2.8	2.7	528	1.20	0.5	<0.5	0.6	44	0.1	<0.1	1.3	34	0.09	0.039
TIL021 02+75W	Soil		2	5.2	48.5	19.2	65	0.3	7.3	7.8	722	2.47	1.8	4.9	2.1	72	0.2	0.1	1.4	53	0.37	0.078
TIL021 03+00W	Soil		6	3.2	42.9	13.0	55	0.2	7.6	7.7	693	2.17	1.5	4.8	10.6	50	0.2	0.2	1.2	45	0.35	0.077
TIL021 00+00	Soil		<2	1.9	53.2	14.8	52	0.2	8.1	8.5	754	2.37	1.8	3.3	12.3	50	0.1	0.4	1.1	50	0.35	0.069
TIL021 00+25E	Soil		<2	1.4	24.2	5.7	45	0.5	6.1	6.7	496	2.49	1.3	2.8	1.3	34	<0.1	0.2	0.3	54	0.42	0.133
TIL021 00+50E	Soil		2	1.8	11.6	8.6	36	0.1	4.4	5.1	422	2.15	0.9	0.5	4.9	45	<0.1	<0.1	0.6	48	0.20	0.043
TIL021 00+75E	Soil		5	9.9	32.0	10.3	53	0.1	7.8	10.2	565	2.70	5.3	1.0	4.1	106	<0.1	<0.1	1.1	55	0.48	0.117
TIL021 01+25E	Soil		3	14.9	114.8	12.8	52	0.7	11.2	6.0	340	6.71	2.7	4.1	5.2	108	<0.1	<0.1	1.4	98	0.34	0.168
TIL021 01+50E	Soil		<2	5.0	9.8	8.0	13	<0.1	2.1	1.8	83	1.80	1.2	0.6	0.4	40	<0.1	<0.1	0.9	44	0.08	0.027
TIL021 01+75E	Soil		3	12.0	50.4	8.3	31	0.2	7.1	5.6	244	3.81	1.4	1.2	2.1	41	<0.1	0.1	0.5	70	0.26	0.089
TIL021 02+00E	Soil		<2	7.4	7.0	8.0	20	<0.1	13.4	3.5	215	1.92	1.0	1.8	0.7	33	<0.1	<0.1	0.6	52	0.12	0.027
TIL022 00+25W	Soil		9	1.9	17.1	7.8	38	<0.1	5.8	6.0	402	2.21	1.3	10.4	2.4	42	<0.1	0.1	0.5	47	0.30	0.094
TIL022 00+50W	Soil		7	1.9	22.0	9.4	51	<0.1	3.9	5.6	430	2.17	1.2	4.3	2.0	81	<0.1	<0.1	0.5	47	0.35	0.127
TIL022 00+75W	Soil		<2	1.0	6.7	4.8	24	<0.1	1.7	2.7	354	1.62	<0.5	1.3	0.2	35	<0.1	<0.1	0.3	40	0.16	0.035
TIL022 01+00W	Soil		3	1.7	23.0	9.9	61	0.2	4.5	6.2	547	2.21	1.4	0.8	3.1	60	0.2	<0.1	1.0	45	0.45	0.110
TIL022 01+25W	Soil		<2	1.9	15.6	10.6	40	<0.1	4.9	4.7	481	1.82	1.1	<0.5	1.4	46	0.1	0.1	1.0	39	0.18	0.061
TIL022 01+50W	Soil		<2	1.5	8.2	10.6	31	<0.1	3.6	2.9	350	1.63	1.0	0.6	2.7	27	<0.1	<0.1	0.7	30	0.07	0.036
TIL022 02+25W	Soil		3	3.8	36.3	16.4	74	0.1	7.9	7.7	881	2.17	2.2	4.9	8.0	73	0.2	<0.1	1.2	45	0.38	0.080
TIL022 02+50W	Soil		6	3.9	32.4	15.6	60	0.1	7.0	7.2	861	2.19	2.1	2.5	8.3	73	0.2	0.1	1.1	46	0.38	0.079
TIL022 02+75W	Soil		<2	6.5	19.7	13.2	43	0.1	5.3	5.7	594	1.93	1.8	<0.5	5.7	46	0.1	0.1	0.9	39	0.22	0.058
TIL022 00+00	Soil		<2	2.1	14.4	12.4	36	<0.1	3.3	4.6	510	2.84	1.1	1.0	2.5	35	<0.1	0.1	0.6	69	0.21	0.083
TIL022 00+25E	Soil		2	1.4	12.1	6.8	29	<0.1	3.2	3.8	333	1.79	0.9	0.6	0.6	33	<0.1	<0.1	0.4	38	0.16	0.060
TIL022 00+50E	Soil		<2	1.5	10.3	12.9	36	<0.1	4.1	4.0	418	1.46	1.2	2.7	11.6	24	<0.1	<0.1	0.5	25	0.13	0.057
TIL022 00+75E	Soil		<2	4.9	21.5	11.4	53	<0.1	8.1	6.4	546	2.12	3.7	2.3	2.0	47	0.1	0.1	0.8	46	0.22	0.095
TIL022 01+25E	Soil		I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.
TIL022 01+50E	Soil		16	1.2	26.0	7.5	54	0.1	5.7	8.4	592	2.67	1.3	7.5	3.4	64	0.2	<0.1	0.8	55	0.54	0.106

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Project: Titan
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CERTIFICATE OF ANALYSIS VAN11005320.1

		Method	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se	Te
		Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
		MDL	1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.1	0.05	1	0.5	0.2
TIL021 01+25W	Soil		10	15	0.61	131	0.074	<20	1.23	0.015	0.13	4.6	<0.01	2.0	<0.1	<0.05	5	<0.5	<0.2
TIL021 01+50W	Soil		9	12	0.45	97	0.038	<20	1.31	0.012	0.09	3.6	0.04	1.3	<0.1	<0.05	6	<0.5	<0.2
TIL021 02+00W	Soil		15	9	0.35	95	0.027	<20	1.06	0.010	0.09	1.8	0.03	1.1	0.1	<0.05	4	<0.5	<0.2
TIL021 02+25W	Soil		12	13	0.49	74	0.050	<20	1.42	0.011	0.07	1.3	0.01	1.6	<0.1	<0.05	5	<0.5	<0.2
TIL021 02+50W	Soil		11	11	0.24	85	0.039	<20	1.13	0.013	0.06	0.8	0.02	0.6	<0.1	<0.05	6	<0.5	<0.2
TIL021 02+75W	Soil		15	15	0.64	156	0.054	<20	1.96	0.014	0.11	5.5	0.05	1.9	0.1	0.06	8	<0.5	<0.2
TIL021 03+00W	Soil		15	18	0.66	137	0.084	<20	1.58	0.015	0.15	4.7	0.01	2.6	0.1	<0.05	6	<0.5	<0.2
TIL021 00+00	Soil		13	18	0.73	145	0.087	<20	1.89	0.016	0.13	1.0	0.05	2.7	0.1	<0.05	6	<0.5	<0.2
TIL021 00+25E	Soil		6	16	0.55	74	0.059	<20	1.55	0.018	0.05	7.4	0.02	1.5	<0.1	<0.05	5	<0.5	<0.2
TIL021 00+50E	Soil		10	12	0.40	76	0.051	<20	1.33	0.015	0.06	1.3	0.02	1.6	<0.1	<0.05	7	<0.5	<0.2
TIL021 00+75E	Soil		9	18	0.59	121	0.061	<20	1.67	0.014	0.10	2.9	0.02	1.9	0.1	<0.05	6	<0.5	<0.2
TIL021 01+25E	Soil		4	37	0.93	97	0.136	<20	1.51	0.020	0.33	3.9	0.02	3.6	0.2	0.47	9	2.3	<0.2
TIL021 01+50E	Soil		7	8	0.11	41	0.037	<20	0.75	0.007	0.03	2.2	0.02	0.5	<0.1	<0.05	6	<0.5	<0.2
TIL021 01+75E	Soil		5	22	0.44	62	0.086	<20	1.18	0.010	0.05	2.2	0.05	1.5	<0.1	<0.05	7	0.7	<0.2
TIL021 02+00E	Soil		6	37	0.22	42	0.065	<20	0.61	0.008	0.04	2.2	<0.01	0.8	<0.1	<0.05	7	<0.5	<0.2
TIL022 00+25W	Soil		9	16	0.41	98	0.053	<20	1.68	0.014	0.05	4.8	0.04	1.4	<0.1	<0.05	5	<0.5	<0.2
TIL022 00+50W	Soil		8	10	0.48	122	0.058	<20	1.59	0.014	0.09	7.6	0.02	1.5	<0.1	<0.05	6	<0.5	<0.2
TIL022 00+75W	Soil		6	6	0.22	60	0.036	<20	1.07	0.012	0.03	1.1	0.02	0.4	<0.1	<0.05	6	<0.5	<0.2
TIL022 01+00W	Soil		9	11	0.49	132	0.044	<20	1.22	0.016	0.08	4.6	0.02	1.6	<0.1	<0.05	5	<0.5	<0.2
TIL022 01+25W	Soil		8	13	0.42	85	0.037	<20	1.64	0.012	0.05	1.1	0.05	1.2	<0.1	<0.05	6	<0.5	<0.2
TIL022 01+50W	Soil		15	9	0.24	63	0.027	<20	1.32	0.008	0.04	0.9	0.04	1.0	<0.1	<0.05	6	<0.5	<0.2
TIL022 02+25W	Soil		13	13	0.60	160	0.057	<20	1.94	0.015	0.12	6.3	0.01	2.7	0.1	<0.05	7	<0.5	<0.2
TIL022 02+50W	Soil		15	15	0.56	145	0.063	<20	1.77	0.016	0.11	4.8	0.02	2.2	0.1	<0.05	6	<0.5	<0.2
TIL022 02+75W	Soil		16	12	0.45	98	0.050	<20	1.50	0.012	0.07	4.3	0.03	1.7	<0.1	<0.05	5	<0.5	<0.2
TIL022 00+00	Soil		7	10	0.32	81	0.041	<20	1.00	0.010	0.04	3.2	0.04	1.3	<0.1	<0.05	8	<0.5	<0.2
TIL022 00+25E	Soil		6	9	0.33	60	0.024	<20	1.53	0.009	0.03	1.3	0.04	0.7	<0.1	0.05	5	<0.5	<0.2
TIL022 00+50E	Soil		16	9	0.28	74	0.032	<20	0.81	0.009	0.05	1.0	0.03	1.3	<0.1	<0.05	3	<0.5	<0.2
TIL022 00+75E	Soil		10	18	0.48	111	0.035	<20	1.93	0.013	0.08	3.2	0.04	1.1	0.1	0.07	6	0.8	<0.2
TIL022 01+25E	Soil		I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.
TIL022 01+50E	Soil		7	16	0.63	201	0.073	<20	1.63	0.024	0.11	9.9	<0.01	2.2	<0.1	<0.05	5	<0.5	<0.2

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		Method	3B	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Analyte	Au	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
		Unit	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
		MDL	2	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
TIL022 01+75E	Soil		3	4.2	14.5	10.0	36	<0.1	4.3	4.8	912	1.72	1.2	0.9	1.1	30	0.1	<0.1	0.7	33	0.13	0.065
TIL022 02+00E	Soil		3	2.7	27.5	9.7	62	<0.1	8.7	6.9	548	2.44	2.5	5.9	2.5	33	0.1	0.1	0.7	51	0.25	0.055
TIL023 00+00	Soil		3	1.3	5.7	7.7	25	<0.1	3.0	2.4	195	1.40	0.9	<0.5	4.2	37	<0.1	0.1	0.5	32	0.09	0.023
TIL023 00+25E	Soil		2	1.7	14.0	9.2	39	<0.1	4.5	4.9	405	2.37	1.3	0.7	3.0	38	<0.1	0.1	0.5	48	0.27	0.070
TIL023 00+50E	Soil		6	1.3	16.9	7.2	40	<0.1	5.6	4.8	293	1.49	1.0	1.0	1.1	47	0.1	0.1	0.5	36	0.32	0.070
TIL023 00+75E	Soil		24	11.1	42.3	12.0	59	0.2	12.8	8.3	407	2.20	6.6	4.5	6.0	41	0.3	0.2	1.4	47	0.56	0.071
TIL023 01+00E	Soil		7	5.3	51.7	10.5	62	0.2	13.0	7.8	372	1.95	4.7	1.9	11.0	34	0.2	0.2	1.4	41	0.68	0.059
TIL023 01+25E	Soil		4	16.6	80.8	15.2	77	0.7	19.7	9.8	417	2.61	8.7	3.9	9.6	45	0.3	0.4	2.5	52	0.79	0.067
TIL023 01+50E	Soil		4	9.8	52.5	11.0	72	0.2	13.5	10.5	694	2.42	4.3	2.6	4.6	26	0.1	0.2	2.0	54	0.35	0.061
TIL023 01+75E	Soil		5	11.3	118.1	16.5	97	0.8	24.4	15.2	866	3.31	7.8	4.6	11.2	52	0.2	0.3	4.3	64	0.95	0.058
TIL023 02+00E	Soil		<2	2.1	6.3	7.7	21	<0.1	10.2	3.9	140	1.21	0.8	3.5	2.0	39	<0.1	<0.1	0.7	36	0.17	0.029
TIL023 02+25E	Soil		8	3.3	11.3	9.8	27	0.1	4.7	4.3	250	2.17	1.5	2.9	2.3	34	<0.1	0.1	0.8	48	0.13	0.032
TIL023 02+50E	Soil		8	6.5	72.0	20.7	108	0.5	25.7	22.0	1401	4.22	5.2	3.8	8.2	88	0.2	0.3	1.5	90	0.73	0.041
TIL023 00+25W	Soil		21	3.1	35.0	12.8	72	<0.1	6.0	7.3	581	2.49	2.6	3.8	2.6	67	0.1	0.1	1.6	55	0.44	0.111
TIL023 00+50W	Soil		<2	1.3	9.9	11.6	35	<0.1	4.5	3.4	456	1.35	1.7	<0.5	7.3	28	<0.1	0.1	0.7	30	0.12	0.054
TIL023 00+75W	Soil		<2	1.1	8.3	12.4	29	<0.1	4.6	3.3	322	1.24	1.7	1.5	14.5	15	<0.1	0.1	0.9	25	0.10	0.043
TIL023 01+00W	Soil		5	2.2	29.3	10.0	60	0.2	4.6	5.7	409	2.06	2.2	4.3	2.3	69	<0.1	0.1	1.0	47	0.42	0.107
TIL023 01+25W	Soil		<2	1.5	10.7	10.3	37	<0.1	4.7	4.1	433	1.73	1.7	1.5	2.4	26	<0.1	0.1	0.6	37	0.12	0.055
TIL023 01+50W	Soil		<2	2.2	24.4	13.5	56	<0.1	7.2	6.3	652	1.98	2.3	1.3	10.6	50	<0.1	0.1	0.9	45	0.27	0.089
TIL023 01+75W	Soil		6	2.0	35.9	11.5	67	0.2	4.9	7.5	681	2.50	2.3	5.2	7.1	81	0.2	0.1	1.2	56	0.63	0.140
TIL023 02+00W	Soil		37	2.4	32.2	16.1	63	0.2	6.7	7.4	829	2.16	2.4	25.4	22.7	53	<0.1	0.1	1.2	47	0.35	0.093
TIL024 00+25W	Soil		6	2.5	30.1	9.8	57	<0.1	8.7	7.6	583	2.39	3.2	1.5	13.0	37	<0.1	0.2	0.7	55	0.41	0.114
TIL024 00+50W	Soil		<2	1.6	13.9	8.2	37	<0.1	6.7	4.8	346	1.80	2.0	1.3	1.7	42	<0.1	0.1	0.4	42	0.22	0.088
TIL024 00+75W	Soil		2	3.4	17.3	10.1	50	<0.1	4.4	6.1	642	2.26	2.1	2.6	0.8	57	<0.1	0.1	0.8	50	0.33	0.100
TIL024 01+00W	Soil		4	2.3	23.2	10.2	52	0.2	4.4	6.2	506	2.24	2.3	69.7	1.4	55	<0.1	0.1	0.8	51	0.39	0.119
TIL024 01+25W	Soil		4	2.2	25.4	9.2	57	0.2	4.6	7.5	635	2.50	1.9	6.3	2.2	68	<0.1	<0.1	0.9	59	0.47	0.121
TIL024 01+50W	Soil		188	7.1	54.2	85.0	90	0.3	10.5	9.8	658	2.62	4.1	67.2	11.3	68	0.4	0.2	3.3	58	0.46	0.093
TIL024 00+00	Soil		9	2.2	27.2	8.9	57	0.2	4.5	6.3	535	2.22	2.0	1.6	2.6	60	<0.1	<0.1	0.8	51	0.46	0.128
TIL024 00+25E	Soil		<2	7.2	16.3	10.1	75	<0.1	9.9	8.7	645	2.61	6.0	7.9	1.8	39	0.2	0.2	0.8	67	0.34	0.033
TIL024 00+50E	Soil		5	4.2	11.0	14.3	28	0.2	3.9	3.6	357	2.04	2.1	12.3	1.6	33	<0.1	0.1	0.6	52	0.09	0.078

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Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: November 08, 2011

CERTIFICATE OF ANALYSIS VAN11005320.1

		Method	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se	Te
		Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
		MDL	1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.1	0.05	1	0.5	0.2
TIL022 01+75E	Soil		10	11	0.34	79	0.030	<20	1.19	0.011	0.06	1.9	0.04	0.7	<0.1	0.06	5	<0.5	<0.2
TIL022 02+00E	Soil		10	19	0.61	120	0.062	<20	1.72	0.013	0.12	3.6	0.02	2.1	0.1	<0.05	7	<0.5	<0.2
TIL023 00+00	Soil		13	8	0.22	68	0.036	<20	0.97	0.007	0.03	1.2	0.02	1.0	<0.1	<0.05	7	<0.5	<0.2
TIL023 00+25E	Soil		9	12	0.40	87	0.054	<20	1.59	0.013	0.05	2.6	0.03	1.5	<0.1	<0.05	6	<0.5	<0.2
TIL023 00+50E	Soil		9	14	0.43	136	0.039	<20	1.34	0.014	0.05	1.9	0.03	1.3	<0.1	<0.05	5	<0.5	<0.2
TIL023 00+75E	Soil		19	30	0.66	190	0.073	<20	1.75	0.017	0.15	5.1	0.03	2.9	0.1	0.06	6	0.8	<0.2
TIL023 01+00E	Soil		17	29	0.65	148	0.097	<20	1.42	0.031	0.19	3.5	0.02	3.3	0.2	0.05	5	1.8	<0.2
TIL023 01+25E	Soil		25	36	0.75	339	0.080	<20	2.61	0.022	0.25	6.1	0.06	4.7	0.2	0.10	8	2.1	<0.2
TIL023 01+50E	Soil		16	28	0.74	182	0.081	<20	1.88	0.016	0.13	3.0	0.04	3.4	0.1	0.05	6	<0.5	<0.2
TIL023 01+75E	Soil		22	40	0.99	399	0.107	<20	3.21	0.017	0.35	4.0	0.11	5.9	0.3	0.06	8	0.7	<0.2
TIL023 02+00E	Soil		7	40	0.33	64	0.077	<20	0.77	0.013	0.06	1.1	0.03	1.3	<0.1	<0.05	6	<0.5	<0.2
TIL023 02+25E	Soil		7	15	0.29	80	0.064	<20	1.39	0.009	0.04	2.6	0.07	1.3	<0.1	<0.05	7	<0.5	<0.2
TIL023 02+50E	Soil		20	47	1.32	543	0.132	<20	3.30	0.020	0.32	1.5	0.06	6.4	0.3	<0.05	11	<0.5	0.2
TIL023 00+25W	Soil		8	13	0.54	143	0.056	<20	1.97	0.016	0.06	9.6	0.03	1.9	<0.1	<0.05	7	0.7	<0.2
TIL023 00+50W	Soil		18	9	0.27	76	0.039	<20	1.03	0.010	0.07	1.0	0.01	1.3	<0.1	<0.05	4	0.6	<0.2
TIL023 00+75W	Soil		23	8	0.24	60	0.034	<20	0.99	0.008	0.06	0.6	0.02	1.5	<0.1	<0.05	4	<0.5	<0.2
TIL023 01+00W	Soil		8	10	0.48	138	0.040	<20	1.79	0.017	0.07	4.3	0.02	1.8	<0.1	<0.05	5	0.6	<0.2
TIL023 01+25W	Soil		17	11	0.30	83	0.032	<20	1.54	0.009	0.06	0.7	0.04	1.2	<0.1	<0.05	6	0.8	<0.2
TIL023 01+50W	Soil		17	13	0.50	118	0.055	<20	1.64	0.013	0.10	2.1	0.02	2.3	0.1	<0.05	6	0.7	<0.2
TIL023 01+75W	Soil		11	11	0.51	154	0.059	<20	1.32	0.020	0.10	5.4	<0.01	2.6	<0.1	<0.05	5	<0.5	<0.2
TIL023 02+00W	Soil		17	13	0.54	152	0.059	<20	1.70	0.014	0.13	3.6	0.02	2.8	0.1	<0.05	6	0.6	<0.2
TIL024 00+25W	Soil		11	17	0.55	158	0.065	<20	1.41	0.014	0.12	3.4	0.01	2.4	<0.1	<0.05	5	<0.5	<0.2
TIL024 00+50W	Soil		10	17	0.39	95	0.044	<20	1.61	0.010	0.06	2.3	0.06	1.1	<0.1	<0.05	5	0.9	<0.2
TIL024 00+75W	Soil		8	10	0.41	135	0.038	<20	1.45	0.013	0.05	4.1	0.04	1.2	<0.1	<0.05	7	1.1	<0.2
TIL024 01+00W	Soil		9	11	0.45	130	0.037	<20	2.05	0.017	0.05	4.5	0.04	1.5	<0.1	<0.05	6	0.8	<0.2
TIL024 01+25W	Soil		9	10	0.51	154	0.050	<20	1.83	0.018	0.06	4.0	0.02	1.9	<0.1	<0.05	6	0.6	<0.2
TIL024 01+50W	Soil		14	18	0.74	224	0.079	<20	1.60	0.019	0.16	4.2	0.01	2.9	0.2	<0.05	6	0.5	0.3
TIL024 00+00	Soil		9	9	0.47	135	0.043	<20	1.55	0.019	0.07	4.3	0.03	1.8	<0.1	<0.05	5	<0.5	<0.2
TIL024 00+25E	Soil		8	24	0.73	101	0.119	<20	1.31	0.013	0.22	1.9	0.01	2.0	<0.1	<0.05	8	0.6	<0.2
TIL024 00+50E	Soil		10	13	0.25	96	0.051	<20	1.54	0.008	0.05	1.8	0.04	1.4	<0.1	<0.05	7	0.5	<0.2

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Project: Titan
Report Date: November 08, 2011

CERTIFICATE OF ANALYSIS VAN11005320.1

		Method	3B	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Analyte	Au	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
		Unit	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
		MDL	2	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
TIL024 00+75E	Soil		2	3.6	10.0	9.8	30	0.1	4.3	3.7	279	1.79	1.7	<0.5	1.7	29	<0.1	0.1	0.6	41	0.09	0.056
TIL024 01+25E	Soil		6	5.9	35.9	19.8	77	0.1	16.2	11.7	769	3.29	5.6	2.0	6.0	43	0.2	0.2	0.9	70	0.44	0.056
TIL024 01+50E	Soil		<2	5.0	26.5	15.5	74	0.1	14.0	10.2	586	2.96	5.2	1.4	3.5	27	0.2	0.3	1.1	66	0.24	0.053
TIL024 01+75E	Soil		6	5.1	28.3	16.2	61	0.2	14.7	14.1	840	2.59	7.2	<0.5	5.7	26	0.1	0.4	1.2	58	0.34	0.047
TIL024 02+00E	Soil		<2	3.2	16.2	12.4	54	<0.1	9.3	7.5	424	2.50	3.2	2.0	5.4	33	<0.1	0.1	0.8	65	0.37	0.021
TIL024 02+25E	Soil		L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.
TIL025 00+25E	Soil		<2	4.8	30.0	17.3	81	0.2	16.9	10.9	1052	2.85	8.1	1.6	3.2	26	0.2	0.2	1.0	72	0.26	0.055
TIL025 00+50E	Soil		<2	3.0	26.6	12.0	60	0.1	13.6	8.0	440	2.36	6.1	3.9	4.1	21	0.1	0.3	0.7	56	0.22	0.056
TIL025 00+75E	Soil		<2	2.4	19.3	10.6	53	0.2	10.9	5.6	239	1.99	4.1	1.0	3.0	13	<0.1	0.2	0.5	47	0.15	0.050
TIL025 01+00E	Soil		<2	4.6	18.1	11.0	53	0.3	10.7	7.3	396	2.57	3.6	<0.5	1.2	23	<0.1	0.2	0.6	61	0.14	0.046
TIL025 01+25E	Soil		8	5.0	21.5	12.4	64	0.2	15.2	7.5	300	2.84	6.3	1.9	8.7	18	0.1	0.4	0.7	62	0.19	0.054
TIL025 01+50E	Soil		2	11.8	17.7	13.1	47	0.1	9.2	7.2	330	2.47	5.2	2.5	5.5	32	<0.1	0.2	1.0	74	0.36	0.022
TIL025 01+75E	Soil		<2	6.1	30.9	16.0	76	0.2	18.6	7.8	421	2.62	6.7	1.1	5.1	24	0.2	0.3	0.9	62	0.28	0.058
TIL025 02+00E	Soil		2	2.4	30.2	17.2	86	0.1	17.2	11.7	898	3.01	5.2	1.6	3.6	41	0.1	0.2	1.0	71	0.35	0.093
TIL025 02+25E	Soil		<2	2.4	38.1	17.0	87	<0.1	22.1	13.9	649	3.19	8.8	2.1	6.4	29	0.4	0.4	1.0	75	0.29	0.065
TIL025 00+00	Soil		2	9.6	28.5	14.2	68	<0.1	12.4	9.7	672	2.93	8.0	1.4	6.9	31	<0.1	0.2	1.3	63	0.24	0.095
TIL025 00+25W	Soil		31	19.2	152.6	14.3	65	1.9	7.4	8.6	705	3.06	4.3	275.6	2.6	52	<0.1	0.1	1.3	62	0.29	0.073
TIL025 00+50W	Soil		6	9.6	17.9	10.4	51	<0.1	6.8	6.8	556	2.16	3.1	11.9	3.3	44	<0.1	<0.1	0.9	50	0.32	0.075
TIL025 01+00W	Soil		25	5.0	32.6	19.6	68	0.2	7.0	7.6	688	2.39	2.6	10.9	2.4	83	<0.1	0.1	1.2	56	0.38	0.105
TIL025 01+25W	Soil		29	5.5	27.6	15.5	61	0.2	5.9	6.6	625	2.16	2.5	14.5	1.8	75	0.1	0.1	1.3	50	0.35	0.092
TIL025 01+50W	Soil		8	4.4	29.1	15.3	73	<0.1	8.2	8.4	732	2.63	3.0	16.1	2.3	70	0.3	0.1	1.2	55	0.37	0.102
TIL026 00+25W	Soil		3	4.7	25.0	11.9	51	<0.1	8.5	7.8	659	2.09	4.5	6.4	7.2	34	0.1	<0.1	0.7	41	0.25	0.089
TIL026 00+50W	Soil		21	9.8	43.5	23.2	89	0.4	9.4	9.0	529	2.46	3.8	3.1	5.7	79	0.3	0.1	2.2	50	0.41	0.111
TIL026 00+75W	Soil		2	11.5	22.2	15.8	54	0.2	5.7	6.4	628	2.32	2.6	1.6	4.0	39	0.2	<0.1	1.2	46	0.21	0.113
TIL026 01+25W	Soil		5	7.8	48.0	30.9	90	0.5	6.4	10.3	869	2.75	3.1	10.9	4.5	116	0.4	<0.1	3.1	48	0.60	0.133
TIL026 01+50W	Soil		6	6.3	47.4	29.9	88	0.6	6.0	9.6	862	2.57	2.8	4.4	5.1	140	0.4	<0.1	5.3	46	0.65	0.128
TIL026 01+75W	Soil		8	5.9	39.3	27.3	80	0.5	6.4	9.3	835	2.68	2.6	2.2	4.5	132	0.3	<0.1	3.0	49	0.66	0.133
TIL026 02+00W	Soil		5	7.0	44.8	32.7	85	0.6	6.2	9.8	901	2.77	2.8	3.4	4.7	132	0.4	<0.1	3.5	52	0.68	0.130
TIL026 00+00	Soil		8	5.8	49.5	19.9	63	0.1	24.3	12.0	677	2.73	10.3	1.7	16.4	20	0.2	0.2	3.7	52	0.30	0.113
TIL026 00+25E	Soil		2	10.8	48.0	20.5	91	0.1	16.6	10.1	762	3.27	5.9	0.9	11.1	29	0.2	0.2	3.0	68	0.28	0.058

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Project: Titan
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CERTIFICATE OF ANALYSIS VAN11005320.1

		Method	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se	Te
		Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
		MDL	1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.1	0.05	1	0.5	0.2
TIL024 00+75E	Soil		10	12	0.31	81	0.051	<20	1.38	0.009	0.06	1.8	0.03	1.4	<0.1	<0.05	6	0.8	<0.2
TIL024 01+25E	Soil		16	31	0.94	182	0.099	<20	2.31	0.015	0.16	1.6	0.03	3.9	0.1	<0.05	8	0.8	<0.2
TIL024 01+50E	Soil		14	31	0.75	136	0.124	<20	1.84	0.013	0.20	1.8	0.02	3.0	0.2	<0.05	8	0.7	0.2
TIL024 01+75E	Soil		13	15	0.68	156	0.115	<20	1.70	0.012	0.23	1.7	0.03	3.1	0.2	<0.05	7	<0.5	<0.2
TIL024 02+00E	Soil		11	19	0.70	145	0.122	<20	1.54	0.013	0.12	1.0	0.02	2.6	<0.1	<0.05	8	0.5	<0.2
TIL024 02+25E	Soil		L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.
TIL025 00+25E	Soil		13	39	0.67	217	0.117	<20	2.08	0.011	0.28	0.5	0.02	3.8	0.2	<0.05	8	0.8	<0.2
TIL025 00+50E	Soil		22	26	0.54	168	0.100	<20	1.50	0.011	0.26	0.6	0.02	3.2	0.2	<0.05	6	0.9	<0.2
TIL025 00+75E	Soil		15	22	0.50	111	0.083	<20	1.49	0.010	0.12	0.4	0.03	2.3	0.1	<0.05	6	<0.5	<0.2
TIL025 01+00E	Soil		10	25	0.65	75	0.085	<20	1.67	0.010	0.08	0.6	0.04	1.8	<0.1	<0.05	8	<0.5	<0.2
TIL025 01+25E	Soil		13	29	0.64	95	0.115	<20	1.63	0.011	0.14	0.8	0.04	3.0	0.1	<0.05	7	0.6	<0.2
TIL025 01+50E	Soil		9	20	0.52	118	0.137	<20	1.36	0.010	0.15	1.0	0.03	2.5	0.1	<0.05	9	0.6	<0.2
TIL025 01+75E	Soil		17	33	0.74	159	0.114	<20	2.09	0.011	0.26	1.3	0.02	3.4	0.2	<0.05	7	0.8	<0.2
TIL025 02+00E	Soil		18	33	0.85	253	0.103	<20	2.10	0.014	0.21	0.6	0.03	3.2	0.2	<0.05	8	0.7	<0.2
TIL025 02+25E	Soil		18	37	0.94	224	0.141	<20	2.20	0.014	0.36	0.9	0.03	4.4	0.3	<0.05	7	<0.5	<0.2
TIL025 00+00	Soil		16	28	0.69	121	0.091	<20	2.21	0.012	0.17	6.2	0.03	3.0	0.1	<0.05	7	0.8	<0.2
TIL025 00+25W	Soil		10	18	0.61	132	0.065	<20	1.75	0.014	0.08	17.3	0.04	2.2	<0.1	<0.05	8	0.7	<0.2
TIL025 00+50W	Soil		10	14	0.52	119	0.056	<20	1.42	0.012	0.08	9.5	0.02	2.0	<0.1	<0.05	6	<0.5	<0.2
TIL025 01+00W	Soil		10	15	0.53	167	0.047	<20	2.32	0.016	0.07	5.3	0.04	2.1	<0.1	<0.05	7	0.8	<0.2
TIL025 01+25W	Soil		10	12	0.50	160	0.040	<20	2.06	0.013	0.08	5.4	0.04	2.0	<0.1	<0.05	6	1.0	<0.2
TIL025 01+50W	Soil		10	16	0.63	186	0.046	<20	2.56	0.016	0.08	6.6	0.02	2.3	<0.1	0.08	8	0.6	<0.2
TIL026 00+25W	Soil		14	18	0.56	108	0.062	<20	1.33	0.010	0.11	6.9	0.02	2.2	<0.1	<0.05	5	<0.5	<0.2
TIL026 00+50W	Soil		13	18	0.69	211	0.049	<20	2.43	0.024	0.10	7.5	0.03	2.8	0.1	<0.05	8	0.8	<0.2
TIL026 00+75W	Soil		9	15	0.49	112	0.051	<20	2.21	0.010	0.08	6.2	0.04	1.9	0.1	0.06	7	0.7	<0.2
TIL026 01+25W	Soil		9	12	0.61	232	0.037	<20	2.06	0.019	0.08	15.7	0.02	2.4	<0.1	<0.05	6	<0.5	0.2
TIL026 01+50W	Soil		8	12	0.61	261	0.036	<20	2.05	0.020	0.09	11.6	0.02	2.4	<0.1	<0.05	6	<0.5	0.3
TIL026 01+75W	Soil		8	11	0.59	258	0.039	<20	1.94	0.020	0.09	12.4	0.02	2.3	<0.1	<0.05	6	<0.5	0.2
TIL026 02+00W	Soil		8	13	0.63	260	0.040	<20	2.09	0.019	0.10	15.0	0.03	2.5	<0.1	<0.05	6	<0.5	0.2
TIL026 00+00	Soil		19	40	0.70	136	0.082	<20	1.56	0.016	0.19	2.6	<0.01	3.0	0.2	<0.05	5	<0.5	<0.2
TIL026 00+25E	Soil		21	34	0.76	222	0.116	<20	2.77	0.014	0.24	0.8	0.03	5.6	0.3	<0.05	10	<0.5	<0.2

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Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: November 08, 2011

CERTIFICATE OF ANALYSIS VAN11005320.1

	Method	3B	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
	Analyte	Au	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
	Unit	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
	MDL	2	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
TIL026 00+50E	Soil	<2	2.3	32.4	12.2	69	<0.1	17.1	11.2	495	2.58	8.0	<0.5	10.5	23	0.2	0.2	0.8	55	0.31	0.070
TIL026 01+00E	Soil	<2	1.1	27.3	12.6	63	<0.1	17.2	10.6	474	2.49	7.2	<0.5	12.0	20	0.2	<0.1	0.5	52	0.22	0.063
TIL026 01+25E	Soil	2	1.2	28.5	14.2	64	<0.1	16.4	10.5	382	2.62	6.8	<0.5	15.1	20	0.1	<0.1	0.6	52	0.23	0.060
TIL026 01+50E	Soil	<2	1.2	27.3	13.2	74	<0.1	17.4	10.6	456	2.73	6.5	<0.5	13.1	19	0.2	<0.1	0.5	52	0.24	0.071
TIL026 01+75E	Soil	8	1.1	24.6	13.2	58	<0.1	14.5	8.1	395	2.25	5.2	1.2	12.2	17	0.2	<0.1	0.5	45	0.17	0.052
TIL027 00+25W	Soil	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.
TIL027 00+50W	Soil	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.
TIL027 00+75W	Soil	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.
TIL027 01+00W	Soil	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.
TIL027 01+25W	Soil	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.
TIL027 01+50W	Soil	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.
TIL027 01+75W	Soil	12	11.3	41.8	23.4	67	0.2	8.5	8.9	748	1.97	2.7	4.6	10.5	135	0.3	<0.1	1.8	37	0.62	0.073
TIL027 00+00	Soil	4	1.9	33.6	18.4	76	0.1	13.4	11.8	906	2.68	6.9	3.9	11.1	46	0.4	<0.1	0.7	50	0.52	0.115
TIL027 00+25E	Soil	34	6.1	37.7	19.8	74	0.1	11.3	9.9	846	2.53	9.9	1.9	14.3	39	0.2	0.2	1.2	49	0.28	0.103
TIL027 00+50E	Soil	<2	2.0	19.9	11.3	59	0.1	10.9	5.7	499	2.22	4.9	<0.5	7.2	15	0.2	0.1	0.8	45	0.14	0.052
TIL027 00+75E	Soil	4	0.9	33.7	13.4	66	<0.1	22.9	11.5	574	2.82	5.2	0.8	16.7	21	0.1	<0.1	0.7	53	0.22	0.044
TIL027 01+00E	Soil	11	4.0	39.2	11.6	75	0.2	7.7	8.9	817	2.60	2.6	25.6	7.6	93	0.3	<0.1	1.1	50	0.56	0.163
TIL027 01+25E	Soil	<2	2.0	32.0	15.1	72	<0.1	14.0	10.2	677	2.57	4.7	0.9	13.0	16	0.2	<0.1	0.7	52	0.15	0.053
TIL027 01+50E	Soil	12	5.0	40.1	11.9	81	0.2	7.9	9.1	811	2.73	2.8	7.4	7.3	76	0.2	<0.1	1.1	54	0.52	0.154
TIL027 01+75E	Soil	<2	0.8	30.7	16.3	84	<0.1	19.3	12.1	645	2.75	5.6	<0.5	17.6	23	0.5	<0.1	0.7	51	0.26	0.056
TIL028 00+00	Soil	5	2.5	12.7	18.3	56	<0.1	7.8	9.6	1678	2.36	2.3	<0.5	1.4	36	0.3	0.1	0.6	43	0.18	0.115
TIL028 00+25E	Soil	<2	1.7	9.9	16.0	55	<0.1	6.9	5.5	519	2.37	1.9	<0.5	6.3	33	0.1	0.2	0.7	53	0.16	0.067
TIL028 00+50E	Soil	8	5.9	55.4	16.2	95	<0.1	15.8	12.3	682	3.12	6.0	5.6	7.1	32	0.4	0.2	1.4	59	0.29	0.095
TIL028 00+75E	Soil	2	1.8	27.4	12.9	65	<0.1	12.3	8.9	487	2.28	5.9	15.1	10.6	16	0.2	0.3	0.6	43	0.18	0.063
TIL028 01+00E	Soil	<2	1.3	17.7	13.4	50	<0.1	8.3	7.1	441	1.79	4.4	<0.5	7.7	17	0.3	0.1	0.5	31	0.24	0.061
TIL028 01+25E	Soil	<2	0.9	17.2	16.6	55	<0.1	9.0	6.7	434	1.90	5.1	<0.5	11.0	13	0.3	0.1	0.4	32	0.14	0.047
TIL028 01+50E	Soil	3	2.4	36.7	13.3	66	<0.1	13.2	7.4	343	2.25	4.7	<0.5	12.8	32	0.1	<0.1	1.2	42	0.19	0.081
TIL028 01+75E	Soil	<2	1.0	16.9	13.8	50	<0.1	9.3	7.8	480	1.87	4.6	5.8	9.2	21	0.3	<0.1	0.4	32	0.22	0.052
TIL028 00+25W	Soil	3	3.3	27.9	19.4	78	0.1	17.0	9.0	589	2.58	14.7	<0.5	14.1	25	0.2	<0.1	1.0	49	0.25	0.057
TIL028 00+50W	Soil	4	1.1	21.0	9.0	60	<0.1	10.2	9.8	555	2.61	2.7	4.4	6.6	39	0.2	<0.1	0.4	45	0.47	0.145

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Project: Titan
Report Date: November 08, 2011

CERTIFICATE OF ANALYSIS VAN11005320.1

		Method	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se	Te
		Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
		MDL	1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.1	0.05	1	0.5	0.2
TIL026 00+50E	Soil		19	35	0.81	174	0.123	<20	1.77	0.010	0.36	0.3	0.01	4.4	0.3	<0.05	6	<0.5	<0.2
TIL026 01+00E	Soil		19	34	0.73	164	0.111	<20	1.60	0.010	0.33	0.2	0.01	4.3	0.2	<0.05	6	<0.5	<0.2
TIL026 01+25E	Soil		21	31	0.73	169	0.112	<20	1.70	0.009	0.27	0.2	<0.01	4.3	0.2	<0.05	6	<0.5	<0.2
TIL026 01+50E	Soil		20	32	0.81	177	0.118	<20	1.88	0.011	0.35	0.4	0.01	3.7	0.2	<0.05	7	<0.5	<0.2
TIL026 01+75E	Soil		21	26	0.61	141	0.092	<20	1.62	0.011	0.26	0.2	0.02	3.9	0.2	<0.05	6	<0.5	<0.2
TIL027 00+25W	Soil		L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.
TIL027 00+50W	Soil		L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.
TIL027 00+75W	Soil		L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.
TIL027 01+00W	Soil		L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.
TIL027 01+25W	Soil		L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.
TIL027 01+50W	Soil		L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.	L.N.R.
TIL027 01+75W	Soil		13	14	0.59	301	0.034	<20	1.88	0.031	0.10	5.5	0.03	2.8	0.1	<0.05	6	0.6	<0.2
TIL027 00+00	Soil		16	24	0.92	253	0.081	<20	1.70	0.015	0.26	1.7	0.02	3.3	0.2	<0.05	6	<0.5	<0.2
TIL027 00+25E	Soil		19	21	0.74	142	0.080	<20	1.82	0.016	0.16	5.5	0.01	3.3	0.2	<0.05	6	0.6	<0.2
TIL027 00+50E	Soil		15	24	0.53	81	0.075	<20	1.70	0.010	0.07	0.4	0.03	2.6	<0.1	<0.05	6	<0.5	<0.2
TIL027 00+75E	Soil		23	37	0.88	156	0.113	<20	2.01	0.011	0.32	0.1	0.01	5.1	0.3	<0.05	7	<0.5	<0.2
TIL027 01+00E	Soil		10	15	0.63	256	0.059	<20	1.91	0.026	0.13	5.5	0.02	2.8	0.1	<0.05	7	<0.5	<0.2
TIL027 01+25E	Soil		19	28	0.77	140	0.093	<20	1.98	0.009	0.21	0.4	0.03	4.5	0.3	<0.05	7	<0.5	<0.2
TIL027 01+50E	Soil		10	16	0.66	210	0.065	<20	1.96	0.025	0.12	7.3	<0.01	2.8	0.1	<0.05	7	<0.5	<0.2
TIL027 01+75E	Soil		26	35	0.75	178	0.108	<20	1.76	0.010	0.37	<0.1	<0.01	5.0	0.2	<0.05	7	<0.5	<0.2
TIL028 00+00	Soil		8	18	0.52	156	0.036	<20	1.77	0.011	0.11	0.8	0.05	1.4	<0.1	0.11	6	<0.5	<0.2
TIL028 00+25E	Soil		11	16	0.47	141	0.068	<20	1.51	0.009	0.08	0.2	0.04	2.0	0.1	<0.05	8	<0.5	<0.2
TIL028 00+50E	Soil		22	34	1.02	186	0.116	<20	2.57	0.017	0.20	1.6	0.03	4.0	0.2	<0.05	8	<0.5	<0.2
TIL028 00+75E	Soil		17	21	0.57	85	0.079	<20	1.68	0.011	0.14	0.5	0.02	3.4	0.1	<0.05	6	<0.5	<0.2
TIL028 01+00E	Soil		14	14	0.42	109	0.062	<20	1.10	0.009	0.14	0.4	0.01	2.4	<0.1	<0.05	4	<0.5	<0.2
TIL028 01+25E	Soil		17	15	0.42	107	0.064	<20	1.45	0.008	0.13	0.2	0.02	3.0	0.1	<0.05	5	<0.5	<0.2
TIL028 01+50E	Soil		15	22	0.59	126	0.077	<20	1.53	0.014	0.20	1.1	0.01	3.3	0.2	<0.05	6	0.5	<0.2
TIL028 01+75E	Soil		15	16	0.46	109	0.068	<20	1.08	0.009	0.16	0.2	0.01	2.7	0.1	<0.05	4	<0.5	<0.2
TIL028 00+25W	Soil		17	34	0.73	172	0.077	<20	2.35	0.011	0.23	1.2	0.01	4.0	0.2	<0.05	8	<0.5	<0.2
TIL028 00+50W	Soil		12	22	0.81	223	0.089	<20	1.44	0.018	0.19	0.9	<0.01	2.2	0.1	<0.05	5	<0.5	<0.2

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	Method	3B	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
	Analyte	Au	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
	Unit	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
	MDL	2	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
TIL028 00+75W	Soil	4	1.1	19.7	9.0	58	<0.1	9.8	9.1	540	2.55	2.6	0.5	7.6	41	0.2	0.1	0.6	46	0.48	0.137
TIL028 01+00W	Soil	4	9.4	10.9	11.7	36	<0.1	4.0	4.4	597	1.80	2.5	5.0	22.7	35	<0.1	0.1	0.5	32	0.25	0.092
TIL028 01+25W	Soil	11	2.4	21.9	8.2	54	0.1	5.2	5.7	472	1.96	1.7	3.5	3.1	74	0.1	0.1	0.9	41	0.42	0.119
TIL028 01+50W	Soil	13	2.7	22.5	8.1	52	0.2	4.9	6.1	541	2.03	1.7	6.5	5.5	65	0.2	0.1	1.1	41	0.51	0.138
TIL028 01+75W	Soil	20	3.7	32.7	10.3	71	0.1	6.0	8.5	852	2.34	1.7	6.9	1.1	92	0.2	<0.1	1.0	51	0.51	0.134
TIL029 00+00	Soil	<2	5.2	35.3	12.1	51	0.1	10.7	8.9	560	2.32	2.9	<0.5	8.9	22	0.2	0.2	7.3	44	0.32	0.075
TIL029 00+25E	Soil	15	1.9	14.9	11.2	40	<0.1	8.0	3.8	242	1.55	1.7	<0.5	1.1	22	0.1	0.2	0.6	31	0.08	0.053
TIL029 00+50E	Soil	<2	1.5	15.2	14.7	42	<0.1	8.2	4.0	262	1.62	2.6	5.8	3.9	20	<0.1	0.1	0.5	33	0.10	0.052
TIL029 00+75E	Soil	2	17.6	85.1	24.7	86	0.1	14.9	11.9	975	2.89	4.5	0.6	3.8	23	0.2	0.2	1.6	54	0.18	0.093
TIL029 01+00E	Soil	3	13.3	95.5	14.8	95	0.2	18.0	14.0	581	3.25	5.2	0.7	3.2	27	0.3	0.3	2.1	58	0.26	0.157
TIL029 01+25E	Soil	<2	3.3	34.3	11.6	59	<0.1	12.4	9.5	513	2.61	3.4	<0.5	11.2	23	0.2	0.2	3.1	51	0.20	0.067
TIL029 01+50E	Soil	<2	3.9	35.0	11.6	58	<0.1	12.2	9.5	584	2.61	3.8	<0.5	8.0	25	0.3	0.2	2.5	49	0.22	0.066
TIL029 00+25W	Soil	<2	3.3	24.1	21.5	51	0.1	9.1	7.5	743	2.06	2.9	<0.5	7.1	25	0.1	0.1	2.1	36	0.29	0.081
TIL029 00+50W	Soil	4	1.7	28.2	8.9	69	<0.1	13.2	10.6	415	2.71	1.8	<0.5	3.2	20	0.1	<0.1	0.8	53	0.28	0.075
TIL029 00+75W	Soil	4	3.8	11.9	10.7	26	0.1	3.3	3.6	514	1.11	2.1	<0.5	16.0	39	0.2	<0.1	0.5	19	0.24	0.051
TIL029 01+00W	Soil	15	13.2	25.3	14.8	79	0.2	7.1	8.4	914	2.45	8.1	14.9	3.1	55	0.2	0.1	1.8	48	0.42	0.108
TIL029 01+50W	Soil	7	7.8	30.5	16.4	61	0.1	7.6	6.9	1028	2.11	2.6	8.2	9.4	78	0.2	0.1	1.6	41	0.44	0.107

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Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: November 08, 2011

CERTIFICATE OF ANALYSIS VAN11005320.1

	Method	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
	Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se	Te
	Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
	MDL	1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.1	0.05	1	0.5	0.2
TIL028 00+75W	Soil	14	22	0.79	220	0.092	<20	1.36	0.018	0.19	0.8	<0.01	2.2	0.1	<0.05	5	<0.5	<0.2
TIL028 01+00W	Soil	27	9	0.32	111	0.037	<20	0.93	0.008	0.07	7.5	0.02	1.5	<0.1	<0.05	4	<0.5	<0.2
TIL028 01+25W	Soil	8	12	0.46	159	0.060	<20	1.37	0.026	0.08	6.9	0.02	1.8	<0.1	<0.05	5	<0.5	<0.2
TIL028 01+50W	Soil	8	13	0.45	137	0.056	<20	1.08	0.024	0.08	10.4	0.02	1.9	<0.1	<0.05	4	<0.5	<0.2
TIL028 01+75W	Soil	8	16	0.58	171	0.070	<20	1.83	0.028	0.07	21.5	0.03	1.9	<0.1	0.05	6	<0.5	<0.2
TIL029 00+00	Soil	16	23	0.63	142	0.097	<20	1.41	0.026	0.21	6.4	0.01	3.4	0.1	<0.05	5	<0.5	<0.2
TIL029 00+25E	Soil	14	19	0.40	58	0.065	<20	1.51	0.012	0.10	0.8	0.04	1.3	0.2	0.06	6	0.6	<0.2
TIL029 00+50E	Soil	17	18	0.42	68	0.062	<20	1.71	0.016	0.10	0.6	0.04	2.0	0.2	0.06	6	0.6	<0.2
TIL029 00+75E	Soil	22	33	0.83	117	0.110	<20	2.69	0.015	0.19	1.9	0.04	3.9	0.3	<0.05	8	0.5	<0.2
TIL029 01+00E	Soil	18	35	0.91	181	0.125	<20	2.28	0.023	0.33	3.7	0.03	4.4	0.3	<0.05	7	<0.5	<0.2
TIL029 01+25E	Soil	21	25	0.72	115	0.125	<20	1.90	0.020	0.21	2.8	0.04	4.3	0.2	<0.05	6	<0.5	<0.2
TIL029 01+50E	Soil	21	24	0.66	129	0.110	<20	1.91	0.023	0.16	2.9	0.01	3.6	0.2	<0.05	6	<0.5	<0.2
TIL029 00+25W	Soil	18	20	0.58	121	0.076	<20	1.36	0.017	0.16	5.6	0.03	2.7	0.1	<0.05	4	<0.5	<0.2
TIL029 00+50W	Soil	12	31	0.81	110	0.136	<20	2.21	0.026	0.20	0.8	0.01	4.2	0.1	<0.05	7	<0.5	<0.2
TIL029 00+75W	Soil	18	8	0.32	118	0.035	<20	0.55	0.019	0.08	1.9	0.01	1.5	<0.1	<0.05	2	<0.5	<0.2
TIL029 01+00W	Soil	12	12	0.73	182	0.094	<20	1.90	0.021	0.14	25.5	0.06	2.4	0.2	<0.05	7	<0.5	<0.2
TIL029 01+50W	Soil	15	15	0.54	210	0.059	<20	1.50	0.024	0.12	7.8	0.02	2.7	0.1	<0.05	5	<0.5	<0.2

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Project: Titan
Report Date: November 08, 2011

QUALITY CONTROL REPORT VAN11005320.1

		Method	3B	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Analyte	Au	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
		Unit	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
		MDL	2	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
Pulp Duplicates																						
TIL020 00+75E	Soil		3	4.5	76.3	10.3	64	<0.1	13.9	12.3	536	2.64	2.0	1.9	4.7	73	0.1	<0.1	6.5	56	0.54	0.091
REP TIL020 00+75E	QC		6																			
TIL021 01+00W	Soil		3	6.0	35.0	12.0	61	0.1	6.2	6.9	572	2.09	1.8	1.3	1.5	45	0.2	0.2	1.2	47	0.24	0.071
REP TIL021 01+00W	QC			5.8	35.2	12.0	61	0.1	6.3	7.4	602	2.13	1.8	2.6	1.4	44	0.1	0.1	1.3	47	0.24	0.071
TIL022 02+00E	Soil		3	2.7	27.5	9.7	62	<0.1	8.7	6.9	548	2.44	2.5	5.9	2.5	33	0.1	0.1	0.7	51	0.25	0.055
REP TIL022 02+00E	QC		7																			
TIL023 00+75E	Soil		24	11.1	42.3	12.0	59	0.2	12.8	8.3	407	2.20	6.6	4.5	6.0	41	0.3	0.2	1.4	47	0.56	0.071
REP TIL023 00+75E	QC			11.4	43.7	12.1	59	0.2	12.8	8.7	406	2.21	6.6	2.5	6.3	42	0.2	0.2	1.4	48	0.54	0.072
TIL023 00+25W	Soil		21	3.1	35.0	12.8	72	<0.1	6.0	7.3	581	2.49	2.6	3.8	2.6	67	0.1	0.1	1.6	55	0.44	0.111
REP TIL023 00+25W	QC			3.0	35.8	12.8	73	<0.1	5.5	7.3	560	2.41	2.7	2.6	2.4	66	0.1	0.1	1.4	55	0.44	0.111
TIL025 00+75E	Soil		<2	2.4	19.3	10.6	53	0.2	10.9	5.6	239	1.99	4.1	1.0	3.0	13	<0.1	0.2	0.5	47	0.15	0.050
REP TIL025 00+75E	QC		<2																			
TIL026 01+25E	Soil		2	1.2	28.5	14.2	64	<0.1	16.4	10.5	382	2.62	6.8	<0.5	15.1	20	0.1	<0.1	0.6	52	0.23	0.060
REP TIL026 01+25E	QC		<2																			
TIL027 00+25E	Soil		34	6.1	37.7	19.8	74	0.1	11.3	9.9	846	2.53	9.9	1.9	14.3	39	0.2	0.2	1.2	49	0.28	0.103
REP TIL027 00+25E	QC			6.0	38.7	20.0	78	0.1	11.4	10.0	856	2.62	10.0	3.2	13.7	38	0.2	0.2	1.9	50	0.29	0.102
TIL028 01+75E	Soil		<2	1.0	16.9	13.8	50	<0.1	9.3	7.8	480	1.87	4.6	5.8	9.2	21	0.3	<0.1	0.4	32	0.22	0.052
REP TIL028 01+75E	QC		<2																			
Reference Materials																						
STD DS8	Standard			12.2	99.3	127.7	285	1.8	34.2	6.8	546	2.20	22.7	106.5	6.5	66	2.1	3.0	6.5	36	0.63	0.072
STD DS8	Standard			14.4	112.2	127.7	311	1.7	40.4	7.3	614	2.47	23.7	135.6	7.0	66	2.3	3.3	5.9	44	0.72	0.076
STD DS8	Standard			12.9	109.5	121.5	311	1.7	37.0	7.2	582	2.35	23.0	104.5	7.0	62	2.2	2.8	5.5	40	0.68	0.072
STD DS8	Standard			14.3	116.0	126.9	320	1.8	40.2	7.9	624	2.51	27.2	109.9	7.1	65	2.3	4.4	6.7	49	0.70	0.077
STD DS8	Standard			12.2	104.9	126.4	297	1.8	37.1	7.4	583	2.30	24.3	101.3	6.2	61	2.4	2.4	5.1	40	0.64	0.082
STD OREAS45CA	Standard			0.7	471.9	19.9	62	0.3	227.7	84.8	893	16.20	4.7	46.8	6.4	16	0.1	<0.1	0.2	188	0.41	0.037
STD OREAS45CA	Standard			0.5	530.7	19.5	58	0.2	250.9	91.6	910	15.12	3.7	41.6	6.9	14	<0.1	<0.1	0.2	200	0.41	0.037
STD OREAS45CA	Standard			0.6	521.7	19.2	56	0.2	244.6	90.4	876	14.77	3.9	46.1	6.7	14	0.1	<0.1	0.2	197	0.41	0.035
STD OREAS45CA	Standard			0.9	544.8	20.5	61	0.3	255.9	91.0	908	16.44	4.6	45.4	7.0	15	<0.1	0.1	0.2	226	0.41	0.038

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Project: Titan
Report Date: November 08, 2011

QUALITY CONTROL REPORT VAN11005320.1

	Method	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
	Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se	Te
	Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
	MDL	1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.1	0.05	1	0.5	0.2
Pulp Duplicates																		
TIL020 00+75E	Soil	11	23	0.85	147	0.088	<20	1.70	0.017	0.16	2.9	0.02	2.7	0.1	<0.05	6	<0.5	<0.2
REP TIL020 00+75E	QC																	
TIL021 01+00W	Soil	9	16	0.55	153	0.049	<20	1.83	0.012	0.10	3.1	0.03	1.7	0.1	<0.05	7	<0.5	<0.2
REP TIL021 01+00W	QC	9	16	0.55	156	0.048	<20	1.89	0.012	0.10	3.1	0.03	1.7	<0.1	<0.05	7	<0.5	<0.2
TIL022 02+00E	Soil	10	19	0.61	120	0.062	<20	1.72	0.013	0.12	3.6	0.02	2.1	0.1	<0.05	7	<0.5	<0.2
REP TIL022 02+00E	QC																	
TIL023 00+75E	Soil	19	30	0.66	190	0.073	<20	1.75	0.017	0.15	5.1	0.03	2.9	0.1	0.06	6	0.8	<0.2
REP TIL023 00+75E	QC	20	29	0.65	194	0.076	<20	1.77	0.018	0.15	5.2	0.03	3.0	0.1	<0.05	6	0.6	<0.2
TIL023 00+25W	Soil	8	13	0.54	143	0.056	<20	1.97	0.016	0.06	9.6	0.03	1.9	<0.1	<0.05	7	0.7	<0.2
REP TIL023 00+25W	QC	8	12	0.54	141	0.053	<20	1.95	0.015	0.06	9.3	0.03	1.8	<0.1	<0.05	7	1.3	<0.2
TIL025 00+75E	Soil	15	22	0.50	111	0.083	<20	1.49	0.010	0.12	0.4	0.03	2.3	0.1	<0.05	6	<0.5	<0.2
REP TIL025 00+75E	QC																	
TIL026 01+25E	Soil	21	31	0.73	169	0.112	<20	1.70	0.009	0.27	0.2	<0.01	4.3	0.2	<0.05	6	<0.5	<0.2
REP TIL026 01+25E	QC																	
TIL027 00+25E	Soil	19	21	0.74	142	0.080	<20	1.82	0.016	0.16	5.5	0.01	3.3	0.2	<0.05	6	0.6	<0.2
REP TIL027 00+25E	QC	19	22	0.75	145	0.085	<20	1.84	0.017	0.16	7.3	0.01	3.2	0.2	<0.05	6	<0.5	<0.2
TIL028 01+75E	Soil	15	16	0.46	109	0.068	<20	1.08	0.009	0.16	0.2	0.01	2.7	0.1	<0.05	4	<0.5	<0.2
REP TIL028 01+75E	QC																	
Reference Materials																		
STD DS8	Standard	14	107	0.54	279	0.100	<20	0.87	0.090	0.40	1.8	0.19	2.2	5.5	0.14	4	4.2	4.6
STD DS8	Standard	16	126	0.61	293	0.111	<20	0.98	0.114	0.43	2.2	0.17	2.6	5.6	0.14	5	5.5	5.1
STD DS8	Standard	15	116	0.60	274	0.102	<20	0.91	0.102	0.42	1.9	0.16	2.1	5.3	0.15	5	5.0	4.7
STD DS8	Standard	16	118	0.60	301	0.109	<20	0.91	0.087	0.41	2.1	0.21	2.2	5.6	0.13	5	5.2	4.4
STD DS8	Standard	15	111	0.59	300	0.101	<20	0.87	0.083	0.39	1.6	0.18	2.0	5.6	0.16	5	4.7	4.4
STD OREAS45CA	Standard	16	618	0.16	161	0.143	<20	3.78	0.012	0.07	<0.1	0.03	39.6	<0.1	<0.05	19	1.2	<0.2
STD OREAS45CA	Standard	16	767	0.15	150	0.097	<20	3.68	0.013	0.07	<0.1	0.02	37.3	0.1	<0.05	18	0.8	<0.2
STD OREAS45CA	Standard	16	739	0.15	151	0.094	<20	3.55	0.012	0.07	<0.1	0.02	37.8	0.1	<0.05	17	0.7	<0.2
STD OREAS45CA	Standard	17	755	0.14	166	0.124	<20	3.85	0.013	0.08	<0.1	0.03	38.4	<0.1	<0.05	19	1.0	<0.2

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QUALITY CONTROL REPORT VAN11005320.1

		3B	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		Au	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
		ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
		2	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
STD OREAS45CA	Standard		0.5	473.3	20.6	58	0.2	224.5	81.2	851	15.03	4.0	43.4	6.6	14	<0.1	<0.1	0.1	174	0.39	0.040
STD OXC88	Standard	194																			
STD OXC88	Standard	199																			
STD OXC88	Standard	201																			
STD OXC88	Standard	200																			
STD OXC88	Standard	201																			
STD OXC88	Standard	195																			
STD OXC88	Standard	205																			
STD OXC88	Standard	195																			
STD OXC88	Standard	216																			
STD OXC88	Standard	210																			
STD OXC88	Standard	186																			
STD DS8 Expected			13.44	110	123	312	1.69	38.1	7.5	615	2.46	26	107	6.89	67.7	2.38	4.8	6.67	41.1	0.7	0.08
STD OREAS45CA Expected			1	494	20	60	0.275	240	92	943	15.69	3.8	43	7	15	0.1	0.13	0.19	215	0.4265	0.0385
STD OXC88 Expected		203																			
BLK	Blank	<2																			
BLK	Blank	<2																			
BLK	Blank		<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<1	<0.01	<0.5	<0.5	<0.1	<1	<0.1	<0.1	<0.1	<2	<0.01	<0.001
BLK	Blank		<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<1	<0.01	<0.5	<0.5	<0.1	<1	<0.1	<0.1	<0.1	<2	<0.01	<0.001
BLK	Blank		<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<1	<0.01	<0.5	<0.5	<0.1	<1	<0.1	<0.1	<0.1	<2	<0.01	<0.001
BLK	Blank	<2																			
BLK	Blank	<2																			
BLK	Blank		<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<1	<0.01	<0.5	<0.5	<0.1	<1	<0.1	<0.1	<0.1	<2	<0.01	<0.001
BLK	Blank		<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<1	<0.01	<0.5	<0.5	<0.1	<1	<0.1	<0.1	<0.1	<2	<0.01	<0.001
BLK	Blank	<2																			
BLK	Blank	<2																			
BLK	Blank	<2																			
BLK	Blank	<2																			
BLK	Blank	<2																			

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Acme Analytical Laboratories (Vancouver) Ltd.
1020 Cordova St. East Vancouver BC V6A 4A3 Canada
Phone (604) 253-3158 Fax (604) 253-1716
www.acmelab.com

Client: **TerraLogic Exploration Inc.**
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: November 08, 2011

QUALITY CONTROL REPORT VAN11005320.1

		1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
		La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se	Te
		ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
		1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.1	0.05	1	0.5	0.2
STD OREAS45CA	Standard	15	673	0.13	158	0.089	<20	3.64	0.011	0.07	<0.1	0.03	37.1	<0.1	<0.05	17	0.9	<0.2
STD OXC88	Standard																	
STD OXC88	Standard																	
STD OXC88	Standard																	
STD OXC88	Standard																	
STD OXC88	Standard																	
STD OXC88	Standard																	
STD OXC88	Standard																	
STD OXC88	Standard																	
STD OXC88	Standard																	
STD OXC88	Standard																	
STD OXC88	Standard																	
STD DS8 Expected		14.6	115	0.6045	279	0.113	2.6	0.93	0.0883	0.41	3	0.192	2.3	5.4	0.1679	4.7	5.23	5
STD OREAS45CA Expected		15.9	709	0.1358	164	0.128		3.592	0.0075	0.0717		0.03	39.7	0.07	0.021	18.4	0.5	
STD OXC88 Expected																		
BLK	Blank																	
BLK	Blank																	
BLK	Blank	<1	<1	<0.01	<1	<0.001	<20	<0.01	<0.001	<0.01	<0.1	<0.01	<0.1	<0.1	<0.05	<1	<0.5	<0.2
BLK	Blank	<1	<1	<0.01	<1	<0.001	<20	<0.01	<0.001	<0.01	<0.1	<0.01	<0.1	<0.1	<0.05	<1	<0.5	<0.2
BLK	Blank	<1	<1	<0.01	<1	<0.001	<20	<0.01	<0.001	<0.01	<0.1	<0.01	<0.1	<0.1	<0.05	<1	<0.5	<0.2
BLK	Blank																	
BLK	Blank																	
BLK	Blank	<1	<1	<0.01	<1	<0.001	<20	<0.01	<0.001	<0.01	<0.1	<0.01	<0.1	<0.1	<0.05	<1	<0.5	<0.2
BLK	Blank	<1	<1	<0.01	<1	<0.001	<20	<0.01	<0.001	<0.01	<0.1	<0.01	<0.1	<0.1	<0.05	<1	<0.5	<0.2
BLK	Blank																	
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Suite 200, 44 - 12th Ave. S.
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Project: Titan
Report Date: November 08, 2011

QUALITY CONTROL REPORT VAN11005320.1

		3B Au ppb 2	1DX Mo ppm 0.1	1DX Cu ppm 0.1	1DX Pb ppm 0.1	1DX Zn ppm 1	1DX Ag ppm 0.1	1DX Ni ppm 0.1	1DX Co ppm 0.1	1DX Mn ppm 1	1DX Fe % 0.01	1DX As ppm 0.5	1DX Au ppb 0.5	1DX Th ppm 0.1	1DX Sr ppm 1	1DX Cd ppm 0.1	1DX Sb ppm 0.1	1DX Bi ppm 0.1	1DX V ppm 2	1DX Ca % 0.01	1DX P % 0.001
BLK	Blank	<2																			
BLK	Blank	<2																			
BLK	Blank	<2																			

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Project: Titan
Report Date: November 08, 2011

QUALITY CONTROL REPORT VAN11005320.1

		1DX La ppm 1	1DX Cr ppm 1	1DX Mg % 0.01	1DX Ba ppm 1	1DX Ti % 0.001	1DX B ppm 20	1DX Al % 0.01	1DX Na % 0.001	1DX K % 0.01	1DX W ppm 0.1	1DX Hg ppm 0.01	1DX Sc ppm 0.1	1DX Tl ppm 0.1	1DX S % 0.05	1DX Ga ppm 1	1DX Se ppm 0.5	1DX Te ppm 0.2
BLK	Blank																	
BLK	Blank																	
BLK	Blank																	

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www.acmelab.com

Client: **TerraLogic Exploration Inc.**
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Submitted By: Chris Gallagher
Receiving Lab: Canada-Vancouver
Received: October 06, 2011
Report Date: October 27, 2011
Page: 1 of 2

CERTIFICATE OF ANALYSIS VAN11005321.1

CLIENT JOB INFORMATION

Project: Titan
Shipment ID: Ti11-001
P.O. Number
Number of Samples: 6

SAMPLE DISPOSAL

RTRN-PLP Return
DISP-RJT-SOIL Immediate Disposal of Soil Reject

Acme does not accept responsibility for samples left at the laboratory after 90 days without prior written instructions for sample storage or return.

SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

Method Code	Number of Samples	Code Description	Test Wgt (g)	Report Status	Lab
Dry at 60C	6	Dry at 60C			VAN
SS80	6	Dry at 60C sieve 100g to -80 mesh			VAN
3B	6	Fire assay fusion Au by ICP-ES	30	Completed	VAN
1DX	6	1:1:1 Aqua Regia digestion ICP-MS analysis	0.5	Completed	VAN

ADDITIONAL COMMENTS

Invoice To: TerraLogic Exploration Inc.
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7
Canada

CC: Jesse Campbell
Jarrod Brown

BRITISH COLUMBIA CERTIFIED ASSAYER
CLARENCE LEONG
GENERAL MANAGER

This report supersedes all previous preliminary and final reports with this file number dated prior to the date on this certificate. Signature indicates final approval; preliminary reports are unsigned and should be used for reference only.
All results are considered the confidential property of the client. Acme assumes the liabilities for actual cost of analysis only. Results apply to samples as submitted.
"*" asterisk indicates that an analytical result could not be provided due to unusually high levels of interference from other elements.

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Client: **TerraLogic Exploration Inc.**
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: October 27, 2011

CERTIFICATE OF ANALYSIS VAN11005321.1

	Method	3B	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
	Analyte	Au	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
	Unit	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
	MDL	2	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
JBTIS004	Silt	<2	19.2	67.5	13.6	142	0.2	19.1	11.8	701	2.65	5.4	3.5	8.6	26	1.3	0.5	7.2	49	0.33	0.102
JBTIS005	Silt	<2	1.9	2.9	14.1	18	<0.1	1.4	1.6	459	0.74	0.7	2.0	20.7	57	<0.1	<0.1	0.3	10	0.18	0.028
JBTIS006	Silt	4	4.4	34.9	21.4	74	0.3	8.0	7.8	749	2.27	2.8	6.6	9.3	95	0.4	0.1	1.4	41	0.57	0.095
JBTIS007	Silt	<2	6.9	42.1	15.3	78	0.3	7.6	11.0	710	2.84	2.2	7.2	8.3	121	0.3	0.1	1.5	54	0.63	0.110
BRTIS001	Silt	<2	2.2	11.0	8.4	40	0.2	5.5	6.7	854	1.41	3.5	3.7	0.7	45	0.3	0.3	0.3	29	0.61	0.100
BRTIS002	Silt	<2	0.3	11.4	6.6	46	<0.1	4.4	7.4	408	1.95	1.8	11.2	3.5	35	0.2	<0.1	<0.1	34	0.52	0.166

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Client: **TerraLogic Exploration Inc.**
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: October 27, 2011

CERTIFICATE OF ANALYSIS VAN11005321.1

Method		1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
Analyte		La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Tl	S	Sc	Se	Ga	Te
Unit		ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
MDL		1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.05	0.1	0.5	1	0.2
JBTIS004	Silt	16	32	0.77	116	0.108	<20	1.83	0.012	0.22	28.0	<0.01	0.3	<0.05	4.1	<0.5	6	<0.2
JBTIS005	Silt	21	2	0.15	174	0.013	<20	0.38	0.015	0.05	0.4	<0.01	<0.1	<0.05	0.8	<0.5	2	<0.2
JBTIS006	Silt	16	16	0.67	221	0.068	<20	1.93	0.014	0.14	6.2	0.03	0.1	<0.05	2.7	<0.5	7	<0.2
JBTIS007	Silt	13	16	0.85	251	0.097	<20	1.95	0.017	0.20	5.8	0.02	0.3	<0.05	3.3	0.5	8	<0.2
BRTIS001	Silt	13	23	0.34	207	0.024	<20	1.51	0.009	0.04	1.5	0.03	0.1	0.08	1.0	1.1	3	<0.2
BRTIS002	Silt	8	11	0.55	150	0.075	<20	1.13	0.010	0.14	0.2	<0.01	<0.1	<0.05	1.3	<0.5	4	<0.2

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Client: **TerraLogic Exploration Inc.**
Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: October 27, 2011

QUALITY CONTROL REPORT VAN11005321.1

	Method	3B	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
	Analyte	Au	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
	Unit	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
	MDL	2	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
Pulp Duplicates																					
JBTIS005	Silt	<2	1.9	2.9	14.1	18	<0.1	1.4	1.6	459	0.74	0.7	2.0	20.7	57	<0.1	<0.1	0.3	10	0.18	0.028
REP JBTIS005	QC		1.9	3.4	14.4	19	<0.1	1.7	2.0	457	0.78	<0.5	1.3	23.7	58	<0.1	<0.1	0.2	11	0.17	0.031
Reference Materials																					
STD DS8	Standard		14.6	112.3	134.1	326	1.8	38.2	7.6	639	2.59	27.0	92.7	7.1	69	2.4	4.4	6.4	42	0.69	0.089
STD OREAS45CA	Standard		0.9	517.8	21.9	64	0.3	258.1	94.7	973	16.10	3.6	42.3	7.7	16	0.1	<0.1	0.2	233	0.45	0.041
STD OXC88	Standard	185																			
STD OXH82	Standard	1270																			
STD DS8 Expected			13.44	110	123	312	1.69	38.1	7.5	615	2.46	26	107	6.89	67.7	2.38	4.8	6.67	41.1	0.7	0.08
STD OREAS45CA Expected			1	494	20	60	0.275	240	92	943	15.69	3.8	43	7	15	0.1	0.13	0.19	215	0.4265	0.0385
STD OXC88 Expected		203																			
STD OXH82 Expected		1278																			
BLK	Blank		<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<1	<0.01	<0.5	<0.5	<0.1	<1	<0.1	<0.1	<0.1	<2	<0.01	<0.001
BLK	Blank	<2																			
BLK	Blank	<2																			

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Suite 200, 44 - 12th Ave. S.
Cranbrook BC V1C 2R7 Canada

Project: Titan
Report Date: October 27, 2011

QUALITY CONTROL REPORT VAN11005321.1

	Method	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX	1DX
	Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Tl	S	Sc	Se	Ga	Te
	Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	MDL	1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.05	0.1	0.5	1	0.2
Pulp Duplicates																		
JBTIS005	Silt	21	2	0.15	174	0.013	<20	0.38	0.015	0.05	0.4	<0.01	<0.1	<0.05	0.8	<0.5	2	<0.2
REP JBTIS005	QC	21	3	0.16	180	0.014	<20	0.39	0.014	0.05	0.2	<0.01	<0.1	<0.05	0.9	<0.5	2	<0.2
Reference Materials																		
STD DS8	Standard	15	116	0.63	309	0.109	<20	0.94	0.086	0.43	3.2	0.16	5.6	0.16	2.0	5.2	5	4.7
STD OREAS45CA	Standard	17	694	0.15	168	0.131	<20	3.74	0.006	0.08	<0.1	0.04	<0.1	<0.05	39.3	0.6	20	<0.2
STD OXC88	Standard																	
STD OXH82	Standard																	
STD DS8 Expected		14.6	115	0.6045	279	0.113	2.6	0.93	0.0883	0.41	3	0.192	5.4	0.1679	2.3	5.23	4.7	5
STD OREAS45CA Expected		15.9	709	0.1358	164	0.128		3.592	0.0075	0.0717		0.03	0.07	0.021	39.7	0.5	18.4	
STD OXC88 Expected																		
STD OXH82 Expected																		
BLK	Blank	<1	<1	<0.01	<1	<0.001	<20	<0.01	<0.001	<0.01	<0.1	<0.01	<0.1	<0.05	<0.1	<0.5	<1	<0.2
BLK	Blank																	
BLK	Blank																	

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Appendix VI – SkyTem Geophysical Report

SKYTEM Airborne surveys worldwide

SkyTEM Survey:
Titan, Canada
Data report

Client: TerraLogic Exploration Services

Date: October 2011

SkyTEM Surveys ApS, Tofteledet 18, 8330 Beder, Denmark, +45 8620 2050

Contents

This data report covers the data acquisition pertaining to a time domain electromagnetic and magnetic survey carried out in Titan, Canada 2011, by SkyTEM Surveys ApS.

Contact person at SkyTEM: Per Gisselø Tel. +45 25 10 82 66
Email: pgg@skytem.com

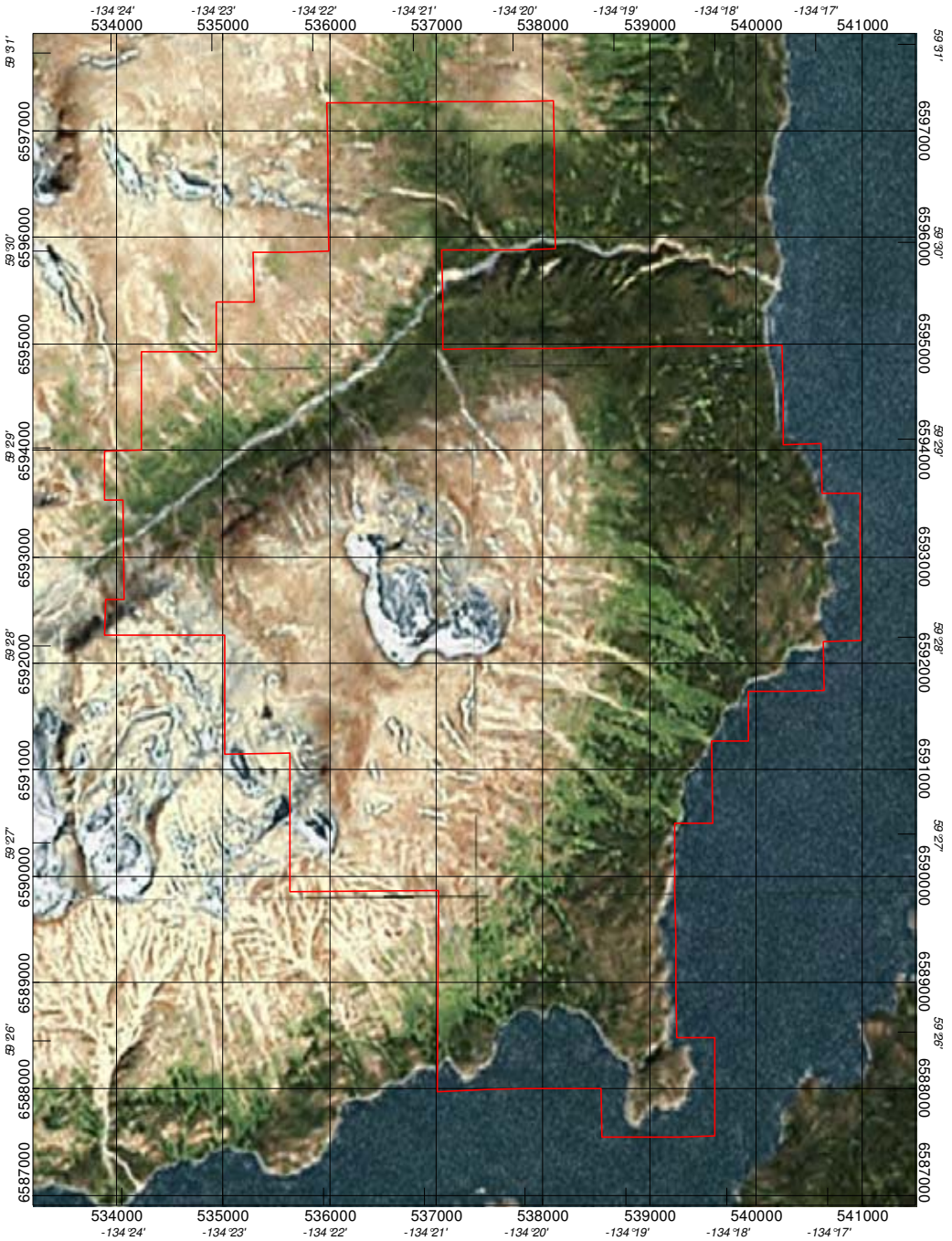


Figure 1 Project overview with the location of the Titan block.

Introduction

From August 9th to August 13th 2011 a combined time domain electromagnetic and magnetic survey was performed by SkyTEM Surveys ApS in Titan, Canada, see Figure 1.

The survey requested by TerraLogic Exploration Services was planned to consist of 418.3 km flight lines in total.

SkyTEM Surveys ApS has agreed to deliver the electromagnetic and magnetic raw data measured during the flights together with the standard SkyTEM processing and inversion.

This report does not include any geological interpretations of the geophysical datasets.

Client		TerraLogic Exploration Services 44 - 12th Avenue South, Suite 200 Cranbrook, B.C, V1C 2R7, Canada
Field crew		Thomas Steensen Jason Marcil
Field work		August 9th to August 13th 2011
Flown line km		424.9 km
Flight operation	Helicopter type Average flight speed Nominal terrain clearance (above any obstacles or hazards)	Eurocopter AS350FX2, operated by Abitibi Helicopters Ltd 20 - 80 km/h 30 - 40 m
Pilot		Pierre Otis
Report	Data processing and presentation QC by	Rasmus Teilmann Solvej Trautner
Contact Person at SkyTEM		Per Gisselø Email: pgg@skytem.com

Definition of the areas

The survey areas are defined below by vertex points given in the following tables.

Coordinate systems used are UTM Zone 8N (NAD83).

The flight line orientations in the Titan blocks are E/W with N/S Tie Lines.

Vertex	UTM E (Z8)	UTM N (Z8)	Orientation/Line# planned
1	534238.57	6593997	E/W 300100 – 309800 N/S 400200 – 400700
2	534234.35	6594460.99	
3	534230.12	6594924.97	
4	534584.08	6594928.2	
5	534938.02	6594931.49	
6	534933.71	6595395.49	
7	535287.61	6595398.78	
8	535283.26	6595862.76	
9	535637.12	6595866.12	
10	535990.97	6595869.48	
11	535986.54	6596333.47	
12	535982.09	6596797.45	
13	535977.65	6597261.45	
14	536331.38	6597264.87	
15	536685.11	6597268.3	
16	537038.83	6597271.78	
17	537392.56	6597275.27	
18	537746.28	6597278.82	
19	538100.01	6597282.38	
20	538104.71	6596818.4	
21	538109.42	6596354.41	
22	538114.12	6595890.44	
23	537760.27	6595886.88	
24	537406.41	6595883.32	
25	537052.55	6595879.83	
26	537057.12	6595415.83	
27	537061.69	6594951.85	
28	537415.63	6594955.35	
29	537769.58	6594958.91	
30	538123.52	6594962.46	
31	538477.47	6594966.08	
32	538831.41	6594969.71	
33	539185.36	6594973.4	
34	539539.3	6594977.09	
35	539893.25	6594980.85	
36	540247.19	6594984.61	
37	540252.15	6594520.62	
38	540257.12	6594056.64	
39	540611.15	6594060.47	
40	540616.15	6593596.48	

41	540970.23	6593600.31	
42	540975.27	6593136.33	
43	540980.33	6592672.35	
44	540985.38	6592208.37	
45	540631.17	6592204.54	
46	540636.17	6591740.56	
47	540281.93	6591736.73	
48	539927.68	6591732.97	
49	539932.6	6591268.99	
50	539584.95	6591265.3	
51	539592.5	6590499.2	
52	539231.99	6590495.65	
53	539233.67	6590333.58	
54	539238.5	6589869.59	
55	539243.33	6589405.62	
56	539248.17	6588941.63	
57	539252.99	6588477.65	
58	539607.54	6588481.34	
59	539612.42	6588017.37	
60	539617.29	6587553.39	
61	539262.65	6587549.69	
62	538908.01	6587545.99	
63	538553.37	6587542.36	
64	538548.62	6588006.34	
65	538194.03	6588002.71	
66	537839.43	6587999.15	
67	537484.82	6587995.59	
68	537010	6587969.32	
69	537021.75	6589869.07	
70	535627.82	6589857.31	
71	535627.83	6591151.26	
72	535016.14	6591145.37	
73	535016.13	6592265.81	
74	533892.76	6592262.87	
75	533897.07	6592601.82	
76	534071.52	6592603.4	
77	534062.39	6593531.37	
78	533888.71	6593529.79	
79	533884.53	6593993.77	

Instruments and parameter setup

The instrumentation includes a time domain electromagnetic system: a data acquisition system, a magnetometer, two DGPS', two inclinometers and two altimeters, see Figure 2.

A more thorough description of the setup is given in Appendix 1.

The equipment setup operates in dual moment configuration including a Low moment (LM) with a peak moment of ~3,140 NIA and a High Moment (HM) with a peak moment of ~150,000 NIA.

The main benefit of the dual moment system is the concurrent measurement of early time gates (LM mode) and late time gates (HM mode), providing near-surface solution as well as deep penetration.

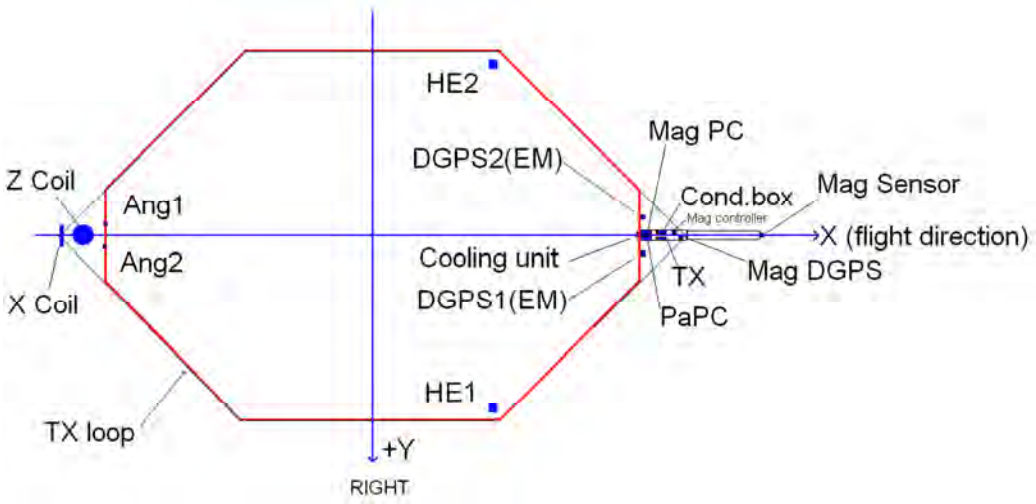


Figure 2 Sketch showing the frame and the position of the instruments. The red line defines the transmitter loop. The horizontal plane is defined by (x, y).

The location of instruments in respect to the frame is shown in Figure 2.

X and Y define the horizontal plane. Z is perpendicular to (X, Y). X is positive in the flight direction, Y is positive to the right of the flight direction, and Z is positive downwards.

The DGPS systems are mounted in the front of the frame.

The generator used for powering the transmitter is positioned 10 m below the helicopter.

A more thorough description of the system and individual instruments can be found in ref /1/ and Appendix 1.

Synchronizing the data

All recorded data are marked with a time stamp used to link the different data types. The time stamp is in UTC/GMT.

The time stamp formats are either

1. yyyy/mm/dd hh:mm:ss.sss – Values defined as year/month/day/hours/minutes/seconds.

or

2. Ddddd.sssssssss - Datetime values defined as the number of days since 1900-01-01 and seconds of the day.

Calibration of the TEM system

Special note on Calibration (50/60 Hz)

Due to the fact that the electrical power supply grid in North America runs with a frequency of 60Hz, whereas the European grid uses 50 Hz, the calibration at the Danish National Reference site has not been conducted with the exact same timing for the transmitter and receiver (referred to as "the script"). This is done in order to avoid noise from the 50 Hz power grid while calibrating the system.
The following table describes the difference between the script used for calibration in Denmark and the script used for production in North America.

Parameter	50 Hz script	60 Hz script
ON-time HM	10000 µs	8000 µs
OFF-time HM	10000 µs	8667 µs
ON-time LM	800 µs	800 µs
OFF-time LM	1450 µs	1283 µs
Base frq. HM	25 Hz	30 Hz
Base frq. LM	222.2 Hz	240 Hz

The calibration parameters found at the reference site is not depending on the timing and can be used regardless of the frequency setup. The following paragraphs and Appendix 3 hence refer to the 50 Hz script calibration, but the parameters are valid for the 60 Hz script as well.

Calibration at the National Danish Reference Site

The complete SkyTEM equipment has been tested and calibrated at the Danish National Reference Site in March 2011.
The calibration includes measurements of the transmitter waveform and data level in different altitudes. By these measurements it has been documented that the instrumentation can reproduce the reference site using constant calibration parameters independent of the flight altitude.

The calibration results and parameters are shown below:

Low moment:
Shift factor: 0.96 (on the raw dB/dt data)
Time shift: -1.1e-6

High Moment:
Shift factor: 0.96 (on the raw dB/dt data)
Time shift: -1.1e-6

All data has been processed using the above stated calibration parameters.
SkyTEM inversion software (iTEM) handles time shift calibration during import of data. If third party processing or inversion software is used the calibrated gate centre times in Appendix 2 should be used.

The waveform, as well as the reproduced soundings in different altitudes, are shown in Appendix 3.

High altitude test

A high altitude test was performed on July 23rd 2011 at 1800 masl. The test was performed in order to establish that the internal noise was below contractual specs and that no drift was present in the system. The test was performed with exactly the same equipment and configuration as used during the survey.

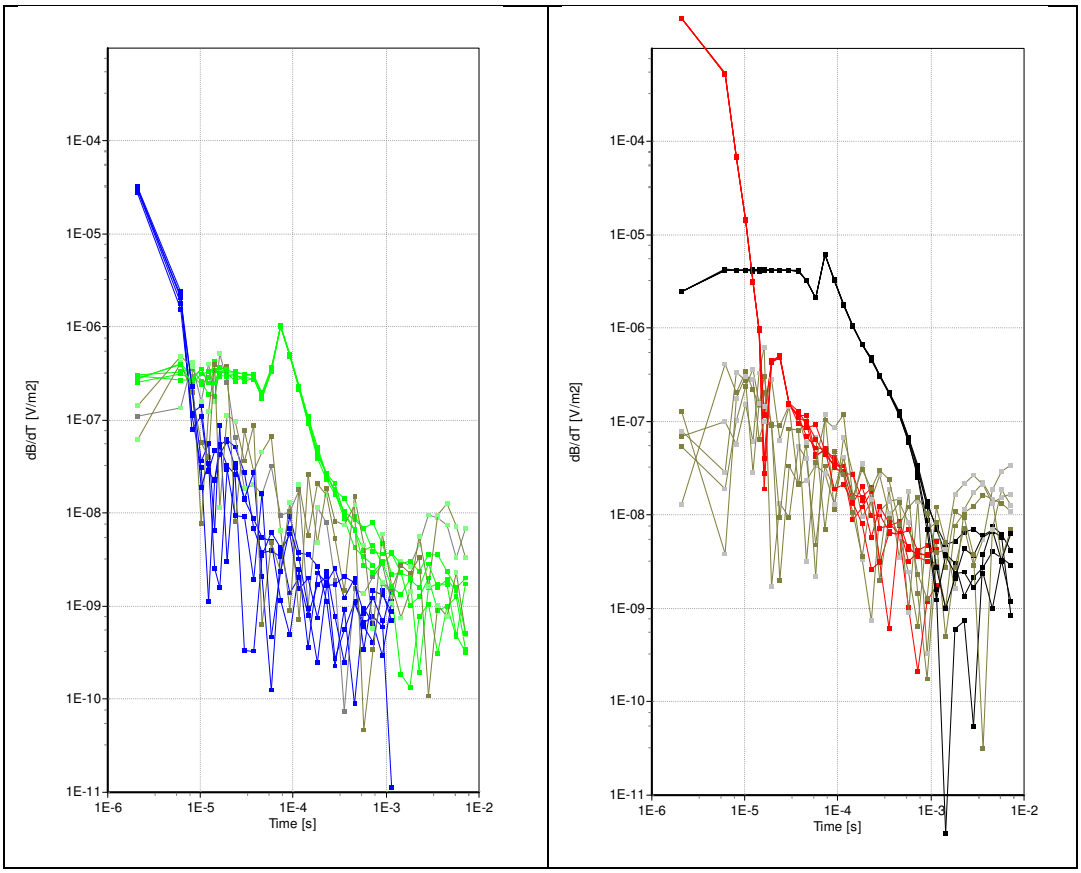


Figure 3 Z-coil and X-coil data. High altitude tests performed July 23rd 2011 at 1800 masl. A comparison of the background noise level (grey curves) with the signal when the transmitter is on (green and blue curves for Z-coil HM and LM, and black and red curves for X-coil HM and LM). The data unit is V/m^2 (data normalized with the receiver coil area only).

In high altitude the background noise and the signal with the transmitter on are very much alike after the front gate opens (Figure 3). Because of the high altitude no signal from the ground is present. Therefore it can be concluded that there was no noise in the system.

Data acquisition

The planned flight lines covering the Titan are shown in Figure 4. The lines are parallel-spaced 100 m apart and striking in an E/W direction.

The flight lines are numbered from 300100 - 309800 and 400200 - 400700 (Tieline).

Block	In-line	Tie-Line
Engineer Mountain	300100 – 309800	400200 - 400700

The nominal terrain clearance is 30 - 40 m above any obstacles or hazards, with an increase over forests, power lines, etc. Demanding mountainous terrain will cause large variations in terrain clearance. It is always the pilot who decides the safety height for the operation.

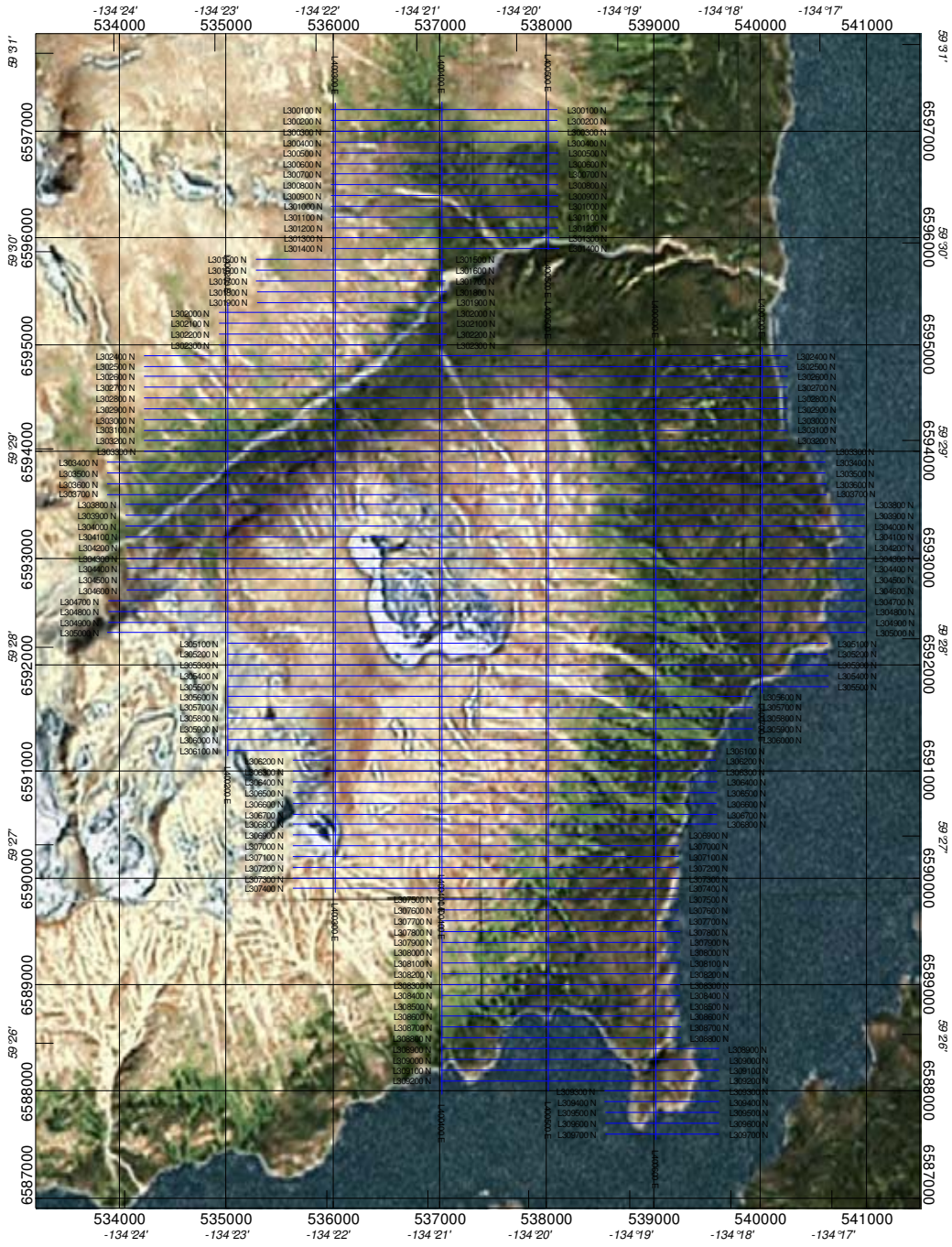


Figure 4 Planned flight lines (blue) for the Titan block UTM Z8 (NAD83).

The helicopter airspeed was planned to be 85 km/h above a flat topography and in no wind. This may vary in areas of rugged terrain and/or windy conditions.
Actually flown lines can be seen in Figure 5. Discrepancies from the planned lines occur when possible noise sources are present, or the nature of the ground like roads, buildings and antennas has called for a diversion.

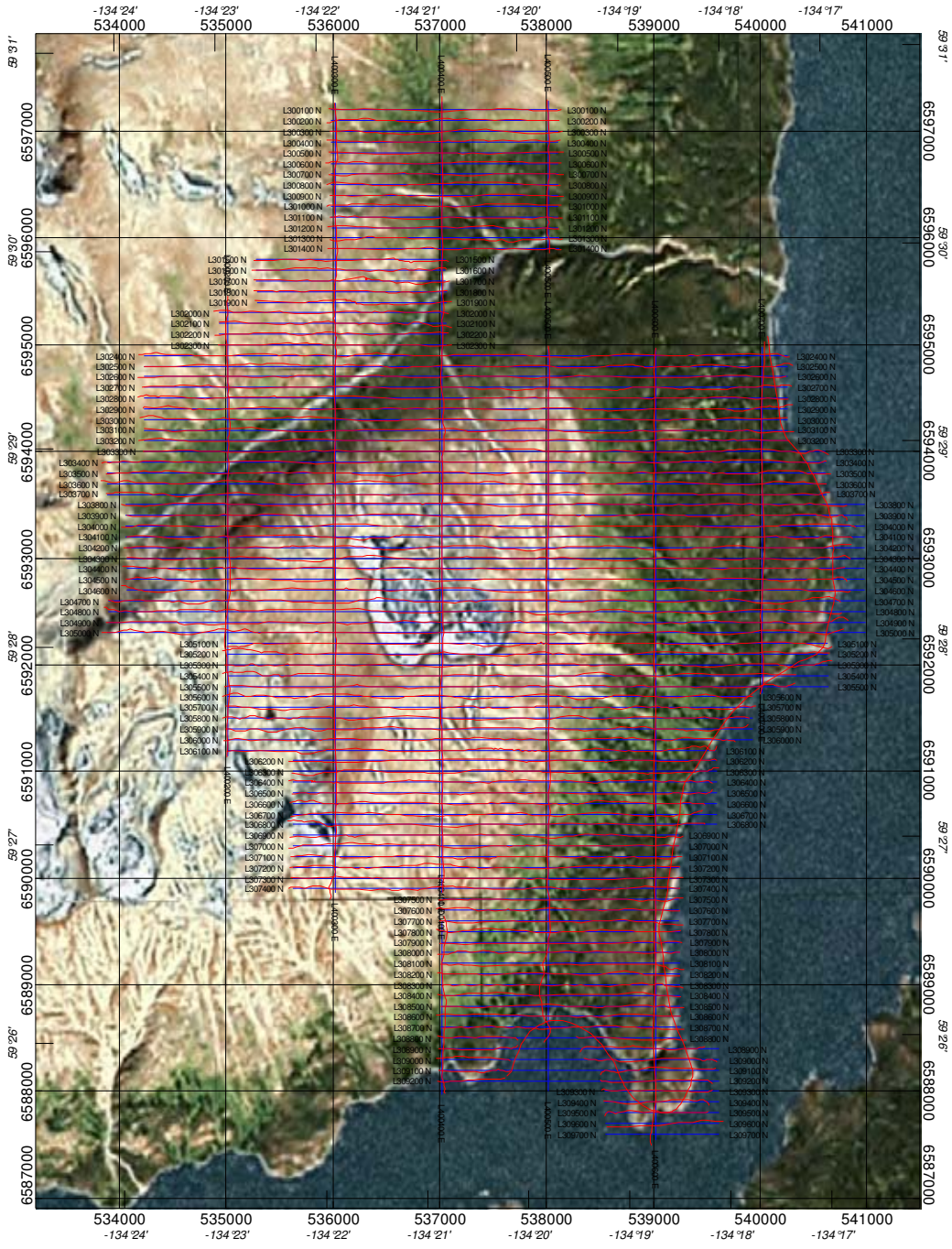


Figure 5 Red lines represent actually flown lines in respect to planned flight lines (blue lines) for the Titan block. Coordinate system: UTM Z8 (NAD83).

Ground Base Stations

The DGPS and magnetic base stations were positioned at Rackla airstrip as the closest accessible place to the survey areas.

DGPS base station

Utmost effort was made to ensure that the DGPS base station was placed at a location of maximum possible view to satellites and out of any metallic objects that could influence the GPS antenna.

Table showing DGPS base station location (lat/Lon (WGS84)):

Area	Lat	Lon	Ell. Height
Titan	59°27”10.88833’	-134°15”11.22814’	664 m

Magnetometer base station

Great effort was made to ensure that the base station magnetometer was placed in a location of low magnetic gradient, away from electrical transmission lines and moving metallic objects, such as motor vehicles and aircrafts.

The location of the magnetic base stations can be seen in the table below (Lat/Lon, WGS84, decimal degrees).

Area	Lat	Lon
Titan	59° 27' 10.2528"	-134° 15' 10.4178"

Flight reports

For each flight, a report with key information regarding the data gathering was made. Listed in the reports are details on the weather, special data parameters and other events which may influence the data. Selected information from the flight reports are shown in the table below:

Weather

Date	Tempera-ture(^{0}C)	Wind (m/s)	Visibility	Description
20110809	10	2 to 4	good	Sunny
20110810	4	2 to 4	ok	Some clouds
20110811	7	5 to 8	Poor	Very cloudy and foggy
20110812	11	From 3 to 6	poor	Cloudy
20110813	15	2 to 4	ok	Slightly foggy / Cloudy

Daily Diary

Date	Description
20110809	Two ferry flights from Trapper to Atlin / One ferry flight to Titan site
20110810	Three production flights made for Titan
20110811	Standby - very cloudy and foggy, flight to survey area not even possible
20110812	Standby - low clouds in survey area
20110813	Two production flights done / Survey finished

Processed data

Selected control parameters are plotted in Appendix 4. The plots contain information about the flight altitude, speed, angle of the frame, transmitted current, transmitter voltage and transmitter temperature.

Mean values and standard deviations of control parameters are found in the table below.

Control parameter		Mean Value	Standard Deviation
Ground speed*)		53.3 km/h	13.8 km/h
Processed height		48.0 m	17.8 m
Tilt angle	X	-0.7 degrees	8.6 degrees
	Y	2.6 degrees	2.6 degrees
Tx Voltage**)	Tx_off	70.5 V	-
	Tx_on	68 V	-
Low moment Current**)		9.6 A	0.06 A
High Moment Current**)		110.5 A	0.86 A
Tx temperature**)		45 °C	-

**) Actual speed varies as a function of day and flight direction due to terrain and different wind directions and magnitude.*
***) Few spikes are seen in the temperature, current and voltage data. These are not caused by errors in the instruments but are a matter of digital drop outs.*

EM processing

All data are resampled to 10 Hz using the SkyTEM in-house software SkyPRO.

The data are normalized in respect to effective Rx coil area, Tx coil area, number of turns and current giving the unit: $pV/(m^4 \cdot A)$.

The raw HM EM data are filtered using a third order polynomial filter with varying filter width increasing at late gate times.

The raw LM EM data are filtered using a Box-car filter with a width of 3.6 s

All auxiliary devices (DGPS, Laser altimeters, inclinometers) are moved to the centre of the frame as based on the values stated in Appendix 1.

After merging auxiliary data together with EM data in SkyPRO additional filters in Oasis Montaj Geosoft has been applied. This include for both LM and HM:

1. Gaps from HM/LM series are interpolated using B-Spline filter
   a) Smoothness= 0.55
   b) Tension= 0.0

2. Transferring data channels into Oasis Montaj Geosoft Array channels

Tilt processing

The X and Y angle processing involves manual and automated routines using a combination of the SkyTEM in-house software SkyPRO and Oasis Montaj Geosoft.
The processing involves the following steps:

1. 3 sec box filter (SkyPRO)
2. Manual editing for spikes (Geosoft)
3. Akima interpolation of edited gaps (Geosoft)
4. Low pass filtering of 3.5 sec. (Geosoft)

Height processing

The height processing involves manual and automated routines using a combination of the SkyTEM in-house software SkyPRO and Oasis Montaj Geosoft.
The processing involves the following steps:

1. Keeping the 2 highest values pr. second and discarding the rest to correct for the canopy effect (treetop filter)
2. 2 sec running box filter (smoothing filter)
3. Tilt correction
4. Averaging of the two laser values
5. Additional filters in Geosoft involving:
   a. Editing of spurious data (i.e. missing data over lakes etc.)
   b. Small data gaps interpolated (Akima interpolation)
   c. Low pass filter of 3.5 sec

DGPS processing

The DGPS has been processed using the Waypoint GrafNav Lite Differential GPS processing tool. The standard airborne settings have been used.

1. Import of base station (Master)
2. Import of Airborne files (Rover)
3. Calculation of forward and reverse DGPS solution
4. Export as .txt file

The DGPS.txt files are used as input to the SkyPRO software assuring DGPS corrected data in the processed files.
In the unlikely event that DGPS data are not available the SkyPRO software will automatically use the raw GPS data as input.

The ground speed, altitude, latitude and longitude from the processed DGPS are merged into the final GDB. Afterwards the coordinates are transformed into UTM Zone 8N (NAD83).
A low pass filter of 3.5 sec has been applied to the above mentioned parameters.

Digital elevation model

A digital elevation model (DEM) channel has been calculated by subtracting the filtered laser altimeter data from the DGPS elevation.
The Processing to the final DEM involves the following steps:

1. Filtering and processing of the laser altimeter height as described above
2. DEM data received by subtraction of final filtered laser data from final processed DGPS altitude data
3. Grids produced using the minimum curvature method – grid cell size 33 m. Afterwards a Hanning filter has been applied to the grid.

The DEM channel was produced and gridded (see Figure 6) as described above in Geosoft format and included in the data delivery catalogue.

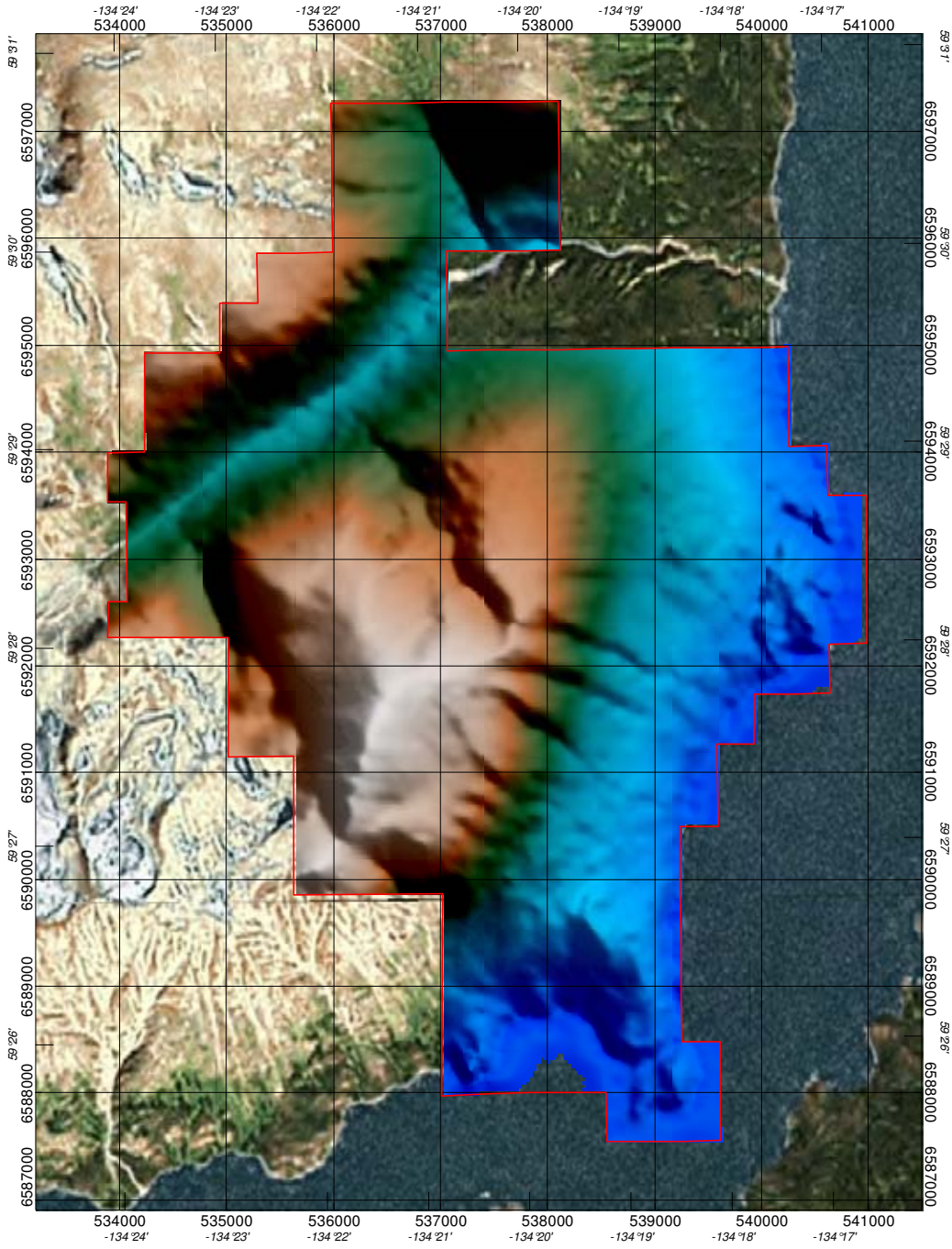


Figure *6 Digital Elevation Model of the Titan block in Meters above sea level. UTM Zone 8N (NAD83).*

EM GDB-files

The EM GDB files are the final result of the SkyTEM survey, containing all the collected and processed EM data and information used for the interpretation and inversion.

Data in the files are split at the beginning and end of each planned flight line.
The raw EM data and auxiliary data are filtered and processed as described above. All parameters in the GDB-file hence refer to the origo of the frame.

The GDB can be used as input for further processing and gridding and as input to inversion and interpretation software.

The projection of the GDB is given as Latitude/longitude, WGS84 and UTM Zone 8N (NAD83).

The header of the EM GDB-file gives the following information:

Parameter	Explanation	Unit
Fid	Unique Fiducial number. Fid with the value of 0.0 is equal to midnight on the date of 2011/08/01	seconds
Line	Line number	LLLLLL
Flight	Name of flight	yyyymmdd.ff
DateTime	DateTime format	Decimal days
Date	Date	yyyymmdd
Time	Time	hhmmss.zzz
AngleX	Angle in flight direction	Degrees
AngleY	Angle perpendicular to flight direction	Degrees
Height	Filtered height measurement	Meters
DEM	Digital Elevation Model	Meters above mean sea level
Lon	Latitude/longitude, WGS84	Decimal degrees
Lat	Latitude/longitude, WGS84	Decimal degrees
E	UTM Zone 8N (NAD83)	Meter
N	UTM Zone 8N (NAD83)	Meter
Alt	DGPS Altitude	Meters above mean sea level
GdSpeed	Ground Speed	[km/h]
Curr_1	Current, high moment	Amps
Curr_2	Current, low moment	Amps
LM_Z_G5[xx]	Normalized LM Z-coil value: gate 5-26. [xx] refer to geosoft array channel number*	pV/(m4*A)
HM_Z_G16 [xx]**	Normalized HM Z-coil value: gate 16-34. [xx] refer to geosoft array channel number*	pV/(m4*A)
LM_X_G10[xx]	Normalized LM X-coil value: gate 10-26. [xx] refer to geosoft array channel number*	pV/(m4*A)
HM_X_G18[xx]**	Normalized HM Z-coil value: gate 18-34. [xx] refer to geosoft array channel number*	pV/(m4*A)

*) If Geosoft array channels are exported, the numbers in the brackets starts from [0]. I.e. LM_Z_G5[4] corresponds to LM Z gate 9. The same names are kept as grid names of the EM channels.

Presentation of GDB-files

High and low moment z coil gates from the GDB-file have been exported as Geosoft .grd files. The files are included in the data delivery catalogue. Figure 7 shows an example of the HM data.

Please note that no height correction has been applied to the raw EM data. This can cause striations in the data set when looking at the grids. This is due to the fact that variations in height will change the magnitude of the EM signal.

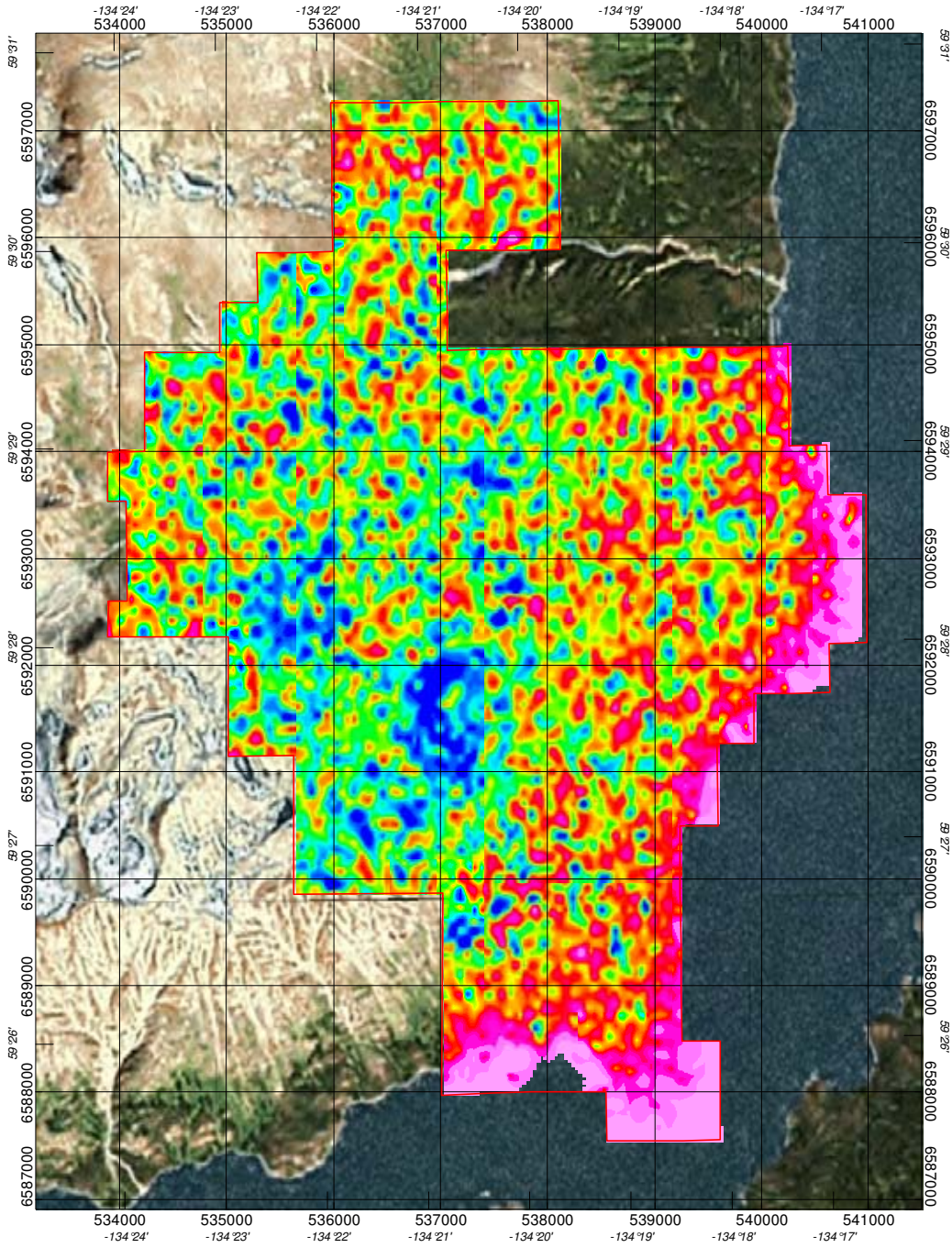


Figure 7 Plot of raw HM Z coil data from Gate 21 of the Titan block. Gate plots can be found as Geosoft Montaj .grd files in the data delivery catalogue. Warm colors (red) represent high signal and cold colors (blue) represent low signal.

Mag processing

Final processing of the magnetic data involved the application of traditional corrections to compensate for diurnal variation and heading effects prior to gridding.

Advanced full processing of magnetic data was implemented in Geosoft's Oasis Montaj software as follows:

- Processing of static magnetic data acquired on magnetic base station
- Pre-processing of airborne magnetic data
    - Stacking of data from 60 Hz to 10 Hz in SkyPro.
    - Moving positions to the centre of the sensor in SkyPro.
    - Adapting auxiliary data channels from EM GDB (processed height, Angles, Speed and DEM)
- Processing and filtering of airborne magnetic data
- Standard corrections to compensate the diurnal variation and heading effect
- IGRF correction
- Levelling
- Gridding

Processing of base station magnetic data

The base station magnetometer data was transferred into the base station Geosoft GDB database on a daily basis for further processing. A non-linear filter to remove spikes and a low-pass filter was applied to smooth the magnetic data.

IGRF was calculated and subtracted from TMI data to obtain residual magnetic field and remove secular variation.
Diurnal variation was calculated from residual magnetic field by subtracting the mean value averaged from all observations received on magnetic base station in course of the survey.

Processing and Filtering of airborne magnetic data

No spikes or data out of range was observed on airborne TMI data therefore no manual editing or non-linear filtering of the data was required. TMI data was filtered and interpolated as follows:

- Adjacent record at the beginning and end of each 0.3 sec gap in magnetic data not measured during low moment TEM data acquisition was deleted. These records may still be influenced by B-field generated during low moment TEM data acquisition.

- Bi-cubic spline (tension of 0.1 and smoothness of 0.6) was applied as low-pass filter – this filter also interpolates the gaps in magnetic data not acquired during low moment TEM data acquisition (0.3 sec gaps)

Corrections to the magnetic data

The processing of the data involved the application of the following corrections:

- Airborne magnetometer data was corrected for diurnal variations. Calculated diurnal variation was subtracted from the filtered airborne magnetic data.

- A lag correction of 0.1 sec was made to account for the distance between the GPS position and the position of the magnetic sensor.

The heading correction test flown during the survey shows the heading errors as indicated in the following table.

Direction	Heading Correction
60 deg	0.16
150 deg	0.22
240 deg	-0.09
330 deg	-0.29

The coefficients listed above were so low that no heading correction was applied to the data.

IGRF correction

The International Geomagnetic Reference Field (IGRF) is a long-wavelength regional magnetic field calculated from permanent observatory data collected around the world. The IGRF is updated and determined by an international committee of geophysicists every 5 years. Secular variations in the Earth's magnetic field are incorporated into the determination of the IGRF.

The IGRF model for all blocks was calculated before levelling using the following parameters for the survey area:

IGRF model year: IGRF 11th generation
Date: variable according to date channel in database
Position: variable according to GPS WGS84 longitude and latitude
Elevation: variable according to magnetic sensor altitude derived from DGPS data

Tie-line levelling and micro-levelling of magnetic data

After applying the above corrections to the profile data, statistical levelling of control lines followed by full levelling of traverse lines and micro-levelling is usually applied as a standard procedure.

The following steps were adapted on the data:

- Statistical levelling on control lines applied
- Statistical levelling on trend lines applied
- Full levelling on traverse lines applied
- Micro levelling applied on traverse lines
    - Decurrogation cutoff wavelength = 450 m
    - Max amplitude limit 5 nT
    - Naudy filter length, tolerance 150 m

The corrected data were then used to generate the final grids free of line directional noise.

TMI recalculation

Residual magnetic field (RMF) was the outcome of processed magnetic data after all corrections and levelling was applied.
Total magnetic intensity was recalculated to add back the IGRF using the following parameters.

IGRF model year: IGRF 11th generation
Date: variable as flown
Position: variable according to GPS WGS84 longitude and latitude
Elevation: variable according to magnetic sensor altitude derived from DGPS data

MAG GDB-files

The GDB file is the main result of the magnetic survey, containing all the processed magnetic data and information for the interpretation and gridding.

The projection of the GDB-file is UTM Zone 8N (NAD83).

The header of the magnetic GDB-file gives the following information:

Channel Name	Description	Units
Line	Line number	LLLLLS
Flight	Flight number	YYYYMMDD.FF
Date	UTC date	YYYYMMDD
Time	UTC time	HH:MM:SS.S
Lon	Longitude using WGS84 datum	Decimal-deg.
Lat	Latitude using WGS84 datum	Decimal-deg.
E	Easting in UTM Zone 8N (NAD83)	Meter
N	Northing in UTM Zone 8N (NAD83)	Meter
Alt	Mag sensor GPS altitude – mean sea level altitude – geoid EGM96	Meter
Height	Processed laser altimetry – mag sensor above ground level	Meter
DEM	Calculated digital elevation model – mean sea level	Meter
IGRF_TMI	calculated IGRF-11 - total magnetic intensity	nT
IGRF_Inc	calculated IGRF-11 - magnetic inclination	Degrees
IGRF_Dec	calculated IGRF-11 - magnetic declination	Degrees
Bmag_TMI	Total Magnetic Intensity – raw magnetic data – magnetic base station	nT
Bmag_diur	Diurnal variation– magnetic base station data	nT
mag_raw	raw magnetic data – total magnetic intensity - despiked	nT
Mag_cor	residual magnetic field - corrected for diurnal, lag, heading and IGRF-11	nT
RMF	Residual magnetic field – IGRF removed - final corrected and levelled magnetic data	nT
TMI	Total magnetic intensity – final corrected and levelled magnetic data; IGRF recalculated.	nT

Gridding of magnetic data

The corrected data was used to generate the Residual Magnetic Field (RMF) and Total Magnetic Intensity (TMI) grid. Corrected magnetic line data was interpolated between survey lines using a minimum curvature gridding algorithm to yield x-y grid values for a standard grid cell size of 33 m. A Hanning filter was used to remove residual noise.

Figure 8 shows a contoured map after processing data from the magnetometer. All grids from the areas can be found in the data delivery folder.

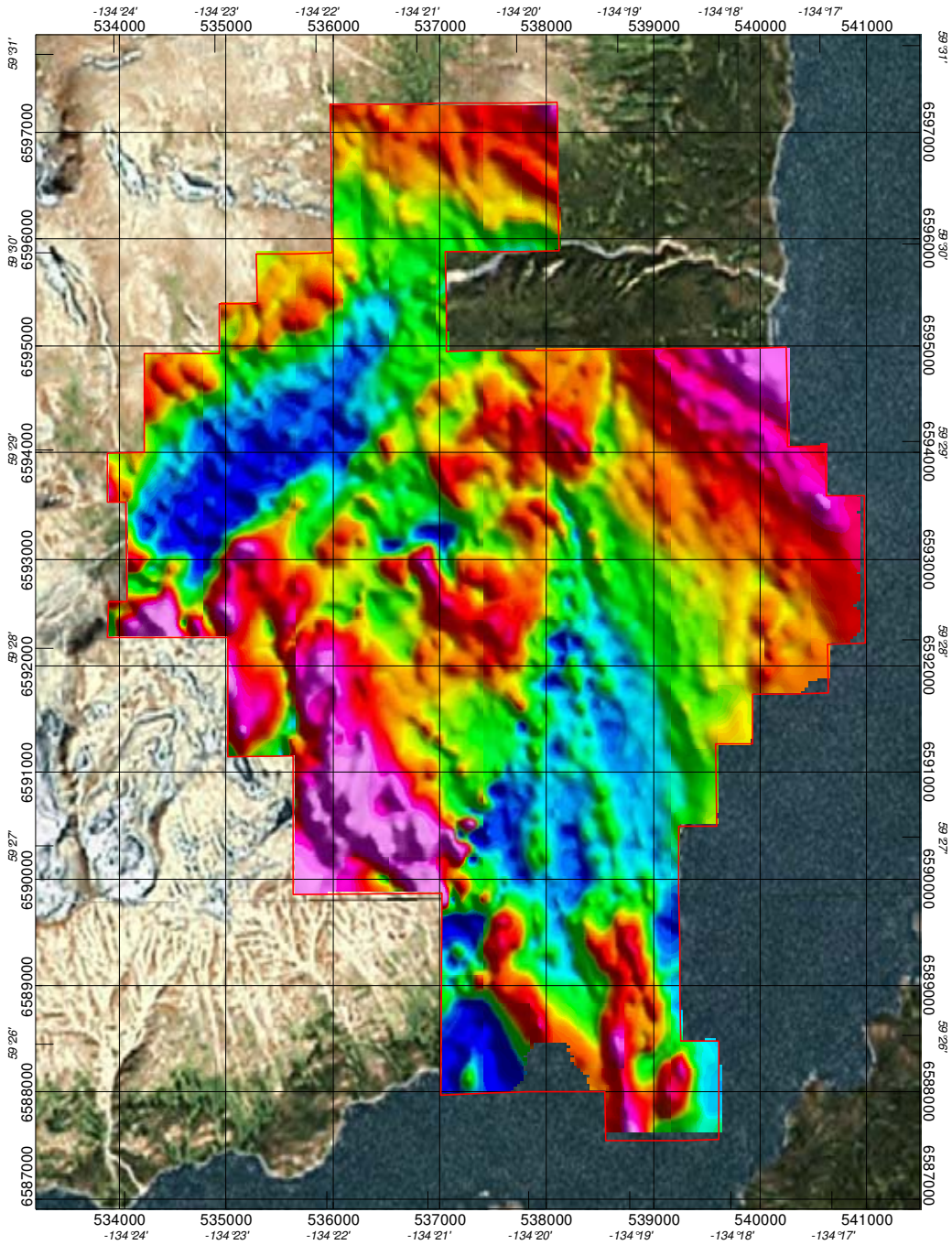


Figure 8. RMF grid for the Titan block.

Inversion of SkyTEM data

In this section, the particulars of modelling and inversion of SkyTEM data from Titan, Canada will be described with reference to the more general material found in Appendix 5. The inversion code is named SELMA, ref /2/ and /3/. However, recent developments including the lateral parameter correlation, not yet published, have enhanced the accuracy of the code.

Initial model and optimization norm

The inversion is performed as a regularized, damped, least-squares inversion on individual sounding data along the profiles with a one-dimensional (1D), multi-layer model (MLM) with 30 layers. In the inversion, the thickness of the layers are kept constant and only the layer resistivities are allowed to vary in order to let the model fit the measured data.
To obtain laterally smooth model sections, the Lateral Parameter Correlation (LPC) procedure is used (/3/ and /4/).

In the inversion the thickness of the first layer is 5 m and the depth to the deepest layer boundary is 500 m. Thicknesses and depths to top of layers for all layers are stated in the table below. In the top of the model, the layer thickness increases slowly, giving a linear sampling of the subsurface, while layer thickness increases exponentially at the deeper parts of the model.

The input data to the inversion is the z-component of the EM-data described in the chapter 'Processed data'.

In the Titan survey the resistivity of the initial model for the inversion is set to 500 Ωm. Resistivities are allowed to vary within the interval of 0.1 to 10000 Ωm. Optimization is performed using the L2-norm.

In the Titan area the inversions are based on a 5 Hz input file giving a model for approx. every 4 m.

Layer #	Layer Thickness [m]	Layer depth [m]
1	5.00	0.00
2	5.06	5.00
3	5.17	10.06
4	5.34	15.22
5	5.56	20.56
6	5.85	26.12
7	6.21	31.97
8	6.63	38.18
9	7.13	44.81
10	7.70	51.93
11	8.36	59.63
12	9.11	67.99
13	9.97	77.11
14	10.93	87.08
15	12.02	98.01
16	13.24	110.03
17	14.60	123.26
18	16.13	137.86
19	17.83	153.99
20	19.74	171.82
21	21.86	191.56
22	24.22	213.41
23	26.85	237.64
24	29.78	264.49
25	33.04	294.27
26	36.66	327.31
27	40.70	363.97
28	45.18	404.67
29	50.16	449.84
30	N/A	500.00

Regularization

A statistical broadband approach is used in the regularization of the multi-layer model. Nine different correlation lengths with a maximum of 10 000 km and a standard deviation of 1 were used to define the correlation matrix. (See Appendix 5 for more detail).

Noise model

In the Titan survey, the noise parameters for both inversions were chosen as:

Low moment
V_0 = 2.5e-12 in field units normalized with Tx moment
t_0 = 1 ms
slope = -0.5

High Moment
V_0 = 2.5e-13 in field units normalized with Tx moment
t_0 = 1 ms
slope = -0.5

Negative data values caused by e.g. capacitive coupling and values lower than 0.01*noise level, were excluded in the inversion.

Inversion results

The results of the inversion are presented in a GDB file included in the data delivery catalogue. The file contains the resistivities for each layer in the model. The header of the GDB file is described in the table below (also see Appendix 6 for more detail).

Parameter	Explanation	Unit
FID	Fiducial number	
LINE	Line number	
E	UTM Zone 8N (NAD83)	Meter
N	UTM Zone 8N (NAD83)	Meter
DTM	Digital Elevation Model	Meters above mean sea level
ResI1	Residual of data	-
ResI4	Residual total	-
Height	Height above ground	Meter
DOI	Depth of Investigation	Meter
Layer	Number of layers in model	-
Elev[xx]	Elevation of top of layer. [xx] refer to geosoft array channel number.	Meter
Res[xx]	Resistivity of layer. [xx] refer to geosoft array channel number.	Ωmeter
RUnc[xx]	Relative uncertainty of layer. [xx] refer to geosoft array channel number.	-

Presentations - Model sections and grids

The models resulting from the inversion are presented as model sections/profiles including analytic sections that display the normalized standard deviation of the resistivity sections along with the DOI (Figure 10) and as grids of resistivity in each model layer (Figure 9).

The model sections and grids are enclosed in digital form. A brief description is given in Appendix 6.

The model sections have a large vertical exaggeration which will make the structures look more vertical than they are.

Residuals

The quality of the inversion results can be evaluated by inspecting the residuals.

The data residual is calculated by comparing the measured data with the response of the resulting model after inversion. If the residual is in the range of 1, the misfit between the response of the final model and the data is, on average, equal to the noise. If the residual is high, it might be caused by data that are noisier than the noise model takes into account. This can be seen where resistivities are very high and the signal consequently very low. A high data residual can also be due to the inconsistency between the model assumed in the inversion and the 2D/3D character of the real world. These are found primarily at the edges of sharp lateral conductivity contrasts. Finally, coupling effects due to power lines and other manmade conductors can also be a source of a high residual.

The total residual is a weighted sum of the data residual and the model residual, where the latter is a measure of the roughness of the model, i.e. the deviation of the final model from the initial homogeneous half space model.

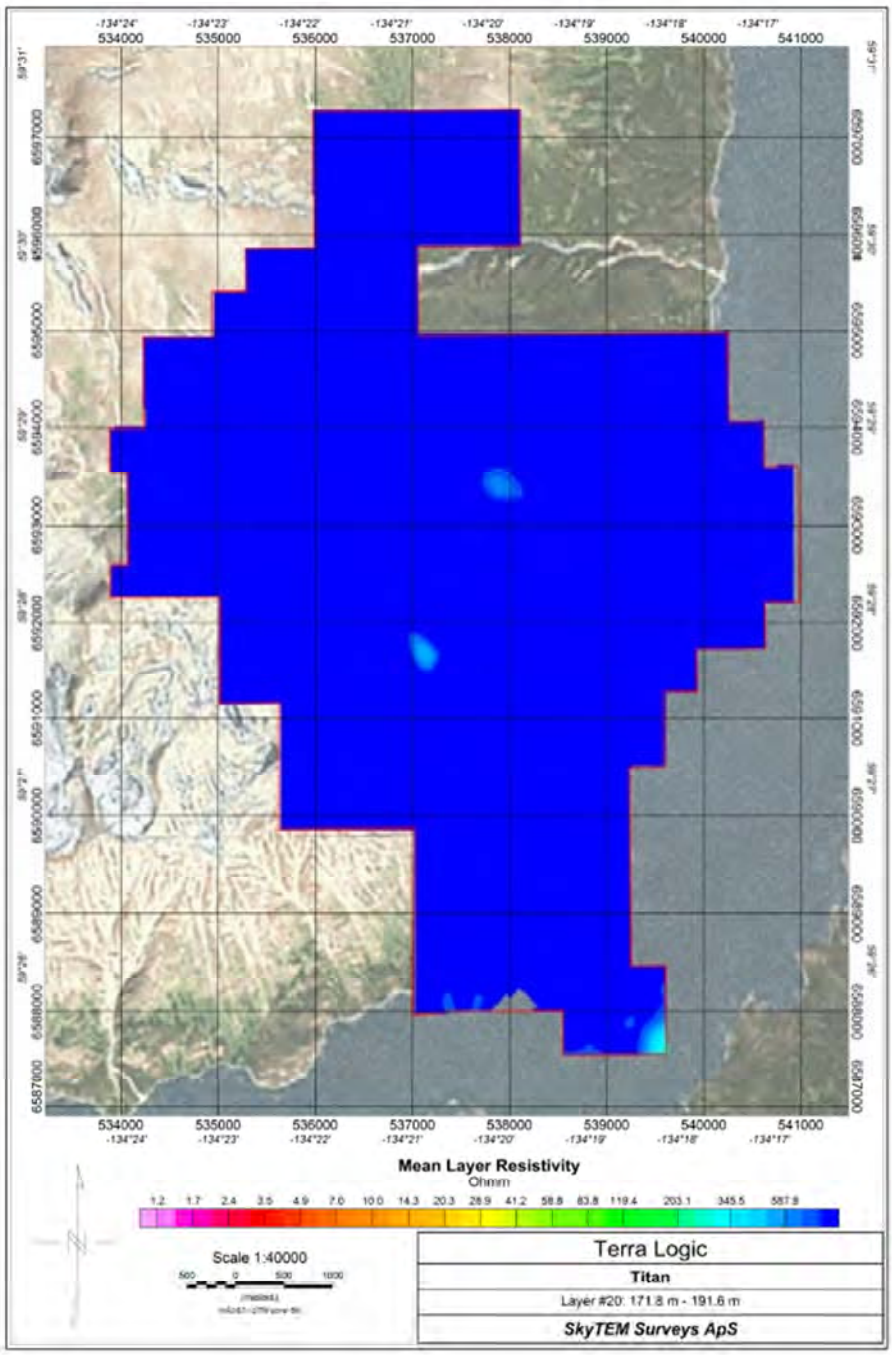


Figure 9. Screen dump of enclosed PDF's displaying the inversion results. Geosoft grids and PDF's are found in the data delivery folder.

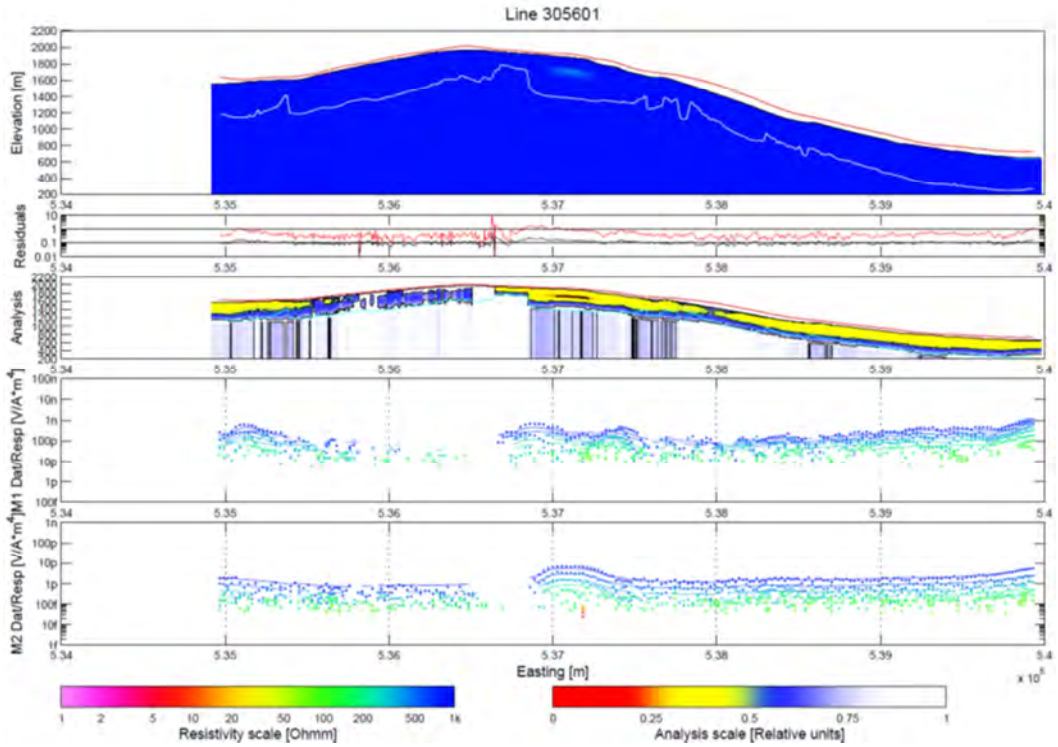


Figure 10. Sample of the model section plots enclosed as PDF's. Top plot: Resistivity section with flight height (red) and depth of investigation (white line) indicated. Data and total residuals are displayed in the second plot. The third plot show the analysis section. The bottom plots are the low and high moment data (dots) and model response (full line). All lines are found as PDF's in the data delivery folder.

References

/1/ Sorensen, K. I. and Auken, E. (2004). SkyTEM - A new high-resolution helicopter transient electromagnetic system, Exploration Geophysics, 35, 191-199.

/2/ Christensen, N. B. (2002). A generic 1-D imaging method for transient electromagnetic data. Geophysics, 67, 438-447.

/3/ Christensen, N.B., Reid, J.E. and Halkjær, M. (2009). Fast, laterally smooth inversion of airborne time-domain electromagnetic data, Near Surface Geophysics, 7, 599-612

/4/ Christensen N.B. and Tølbøll R.J. 2009, A lateral model parameter correlation procedure for one-dimensional inverse modelling. Geophysical Prospecting 57, 919-929. DOI: 10.1111/j.1365-2478.2008.00756.x

Appendix list

Appendix 1: Instruments

Instrument positions

The instrumentation involves a time domain electromagnetic system, two inclinometers, two altimeters and two DGPS'.

The measurements were carried out, using a setup as described below.

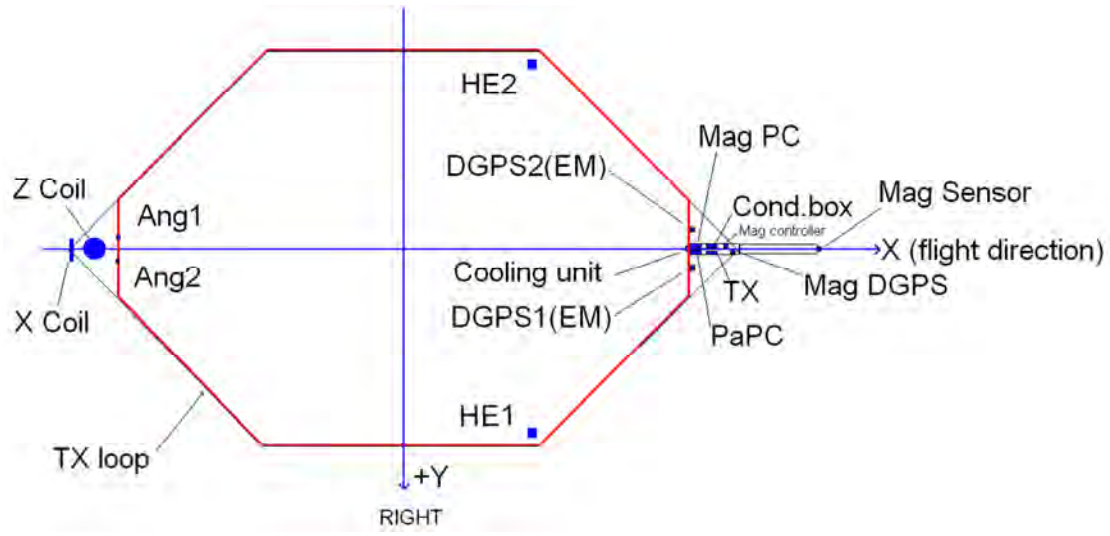


Figure 1 Sketch showing the frame and the position of the basic instruments. The red line defines the transmitter loop. The horizontal plane is defined by (x, y).

The location of instruments in respect to the frame is shown in Figure 1 and is given in (x, y, z) coordinates in the table below.

X and y define the horizontal plane. Z is perpendicular to (x, y). X is positive in the flight direction, y is positive to the right of the flight direction, and z is positive downwards.

The generator used for powering of the transmitter is 10 m below the helicopter.

Device	X	Y	Z
DGPS1 (EM)	12.00	0.80	-020
DGPS2 (EM)	12.00	-0.80	-0.20
HE1 (altim.)	5.14	7.80	0.00
HE2 (altim.)	5.14	-7.80	0.00
Inclinometer 1	-11.80	-0.50	-0.35
Inclinometer 2	-11.80	0.50	-0.35
RX (Z Coil)	-12.82	0.00	-2.18
RX (X Coil)	-13.82	0.00	0.00
TX (transmit.)	12.70	0.10	-0.40
Condensator	12.70	-0.10	-0.40

For the location of instruments see Figure 1.

Transmitter

The time domain transmitter loop can be described as an octagon with the corners listed below:

X	Y
-11.87	-2.03
-5.68	-8.22
5.68	-8.22
11.87	-2.03
11.87	2.03
5.68	8.22
-5.68	8.22
-11.87	2.03

The total area of the transmitter coil defined by the corner points is 314 m² and 65.9 m in circumference.

The key parameters defining the transmitter set up are:

Low moment

Parameter	Value
Number of transmitter turns	1
Transmitter area	314 m²
Peak current	5
Peak moment	~3,140 NIA
Repetition frequency	240 Hz
On-time	800 µs
Off-time	1283 µs
Duty cycle	62 %
Wave form	Square
Turn on wave form exp. decay constant	44000 s^{-1}
Turn off linear ramp	4.46e6 A/s
Turn off current end avalanche mode	1.5 A
Turn off free decay exp. decay constant	-3.00e6 s^{-1}

High Moment

Parameter	Value
Number of transmitter turns	4
Transmitter area	314 m²
Peak current	114.1
Peak moment	~150,000 NIA
Repetition frequency	30 Hz
On-time	8000 µs
Off-time	8667 µs
Duty cycle	52 %
Wave form	Square
Turn on wave form exp. decay constant	410 s^{-1}
Turn off linear ramp	2.38e6 A/s
Turn off current end avalanche mode	1.0 A
Turn off free decay exp. decay constant	-1.29e6 s^{-1}

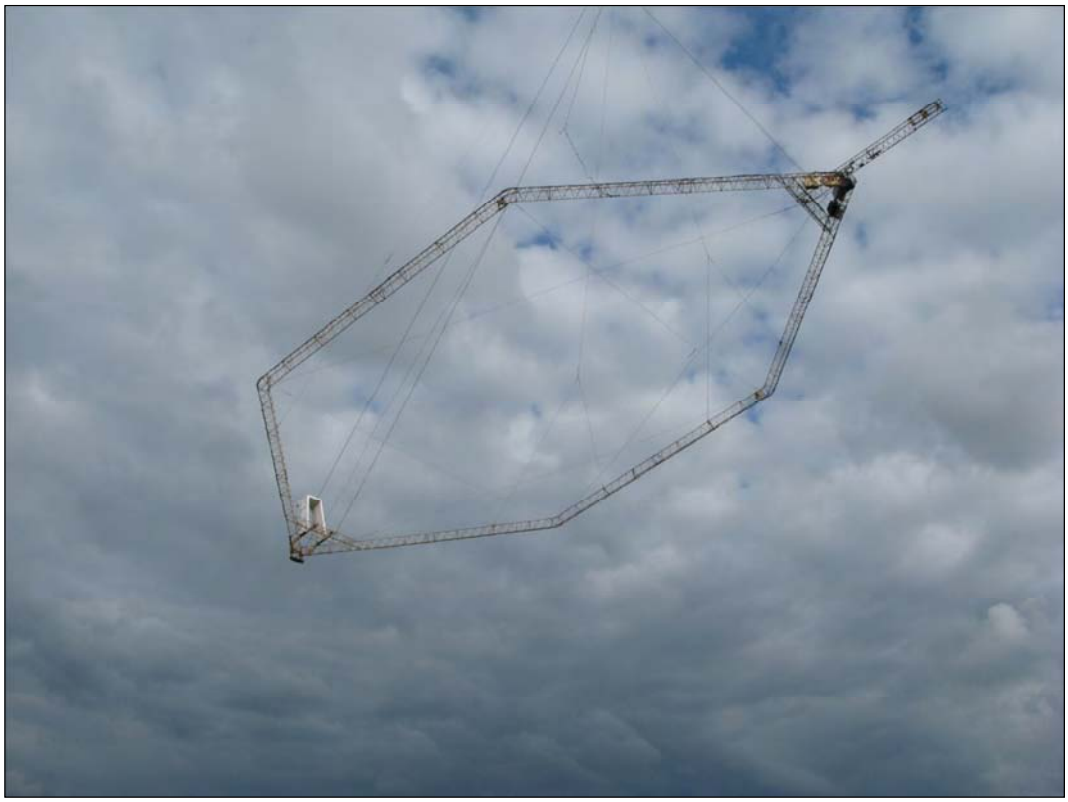


Figure 2 The 314 m² frame in production mode.

Receiver system

The decay of the secondary magnetic field is measured using two independent active induction coils. The Z coil is the vertical component, and the X coil is the horizontal in-line component. Each coil has an effective receiver area of 105 m² .

The receiver coils are placed in a null-position:

Z coil (x, y, z) = (-12.80 m, 0.0 m, -2.22)
X coil (x, y, z) = (-13.75 m, 0.0 m, 0.0 m)

In the null-position, the primary field is damped with a factor of 0.01.

Figure 3 Rudder containing the Z coil located approximately in the top part of the tower.

The key parameters defining the receiver set up are:

Receiver parameters		
Sample rate		All decays are measured
Number of output gates		34 (HM) and 26 (LM)
Receiver coil low pass filter		450 kHz
Receiver instrument low pass filter		300 kHz
Repetition frequency	LM HM	240 Hz 30 Hz
Front gate	LM HM	0.0 µs 60.0 µs

Receiver gate times are measured from the start of the transmitter current turn-off. A complete list describing gate open, close and centre times are listed in Appendix 2.

Inclination

Instrument type: Bjerre Technology

The inclination of the frame is measured with 2 independent inclinometers. The x and y angles are measured 2 times per second in both directions. The inclinometers are placed in the rear of the frame as close to the z coil as possible, see Figure 1.

The angle data are stored as x, y readings. X is parallel to the flight direction and positive when the front of the frame is above horizontal. Y is perpendicular to the flight direction and negative when the right side of the frame is above horizontal.

The angle is checked and calibrated manually within 1.0 degree by use of a level meter.

DGPS airborne unit and base stations

Chipset: OEMV1-L1 14-channel rate.
Antenna: Trimble, Bullet III GPS Antenna

The differential GPS receiver is on top of the boom in front of the frame.

The DGPS delivers one dataset per second. The raw coordinates are given in Latitude/longitude, WGS84.

The uncertainty in the xyz-directions is ± 1 m after processing.
The processed DGPS data is combined with the EM data in the xyz-files, giving the precise position.

DGPS parameters	
Sample rate	1 Hz
Uncertainty	± 1 m

Altimeter

Instrument type: MDL ILM300R

Two independent laser units mounted on each side of the frame measure the distance from the frame to the ground, see Figure 1.

Each laser delivers 30 measurements per second, and covers the interval from 1.5 m to approximately 130 m.

Dark surfaces including water surfaces will reduce the reflected signal. Consequently, it may occur that some measurements do not result in useful values.

The altimeter measurements are given in meters with two decimals. The uncertainty is 10 - 30 cm. The lasers are checked on a regular basis against well defined targets.

Laser parameters	
Sample rate	30 Hz
Uncertainty	10 - 30 cm
Min/ max range	1.5 m / 130 m

Magnetometer airborne unit

Instrument type: Geometrics G822A sensor and Kroum KMAG4 counter.

The Geometrics G822A sensor and Kroum KMAG4 counter is a high sensitivity cesium magnetometer. The basic of the sensor is a self-oscillating split-beam Cesium Vapor (non-radioactive) Principe, which operates on principles similar to other alkali vapor magnetometers.

The sensitivity of the Geometrics G822A sensor and Kroum KMAG4 counter is stated as <0.0005 nT/√Hz rms. Typically 0.002 nT P-P at a 0.1 second sample rate, combined with absolute accuracy of 3 nT over its full operating range.

The magnetometer is synchronized with the TEM system. When the TEM signal is on, the counter is closed. In the TEM off-time the magnetometer data is measured from 100 microseconds until the next TEM pulse is transmitted. The data are averaged and sampled as 60 Hz.

Parameter	Value
Sample frequency	60 Hz (in between each HM EM pulse)
Magnetometer on	HM Cycles
Magnetometer off	LM Cycles

Magnetometer base station

Instrument type: GEM Overhauser.

The GEM Overhauser is a portable high-sensitivity precession magnetometer.

The GEM Overhauser is a secondary standard for measurement of the Earth's magnetic field with 0.01 nT resolutions, and 1 nT absolute accuracy over its full temperature range.

The base station data are sampled with 1 Hz frequency.

Appendix 2: Time gates

Gate	GateOpen (µs)	Gatewidth (µs)	GateClose (µs)	Raw GateCenter (µs)	GateCenter Applied time shift calibration for HM and LM (µs)	Comment
1	0.390	5.610	6.000	3.195	2.095	Not used
2	6.390	1.610	8.000	7.195	6.095	Not used
3	8.390	1.610	10.000	9.195	8.095	Not used
4	10.390	1.610	12.000	11.195	10.095	Not used
5	12.390	1.610	14.000	13.195	12.095	LM Z only
6	14.390	1.610	16.000	15.195	14.095	LM Z only
7	16.390	1.610	18.000	17.195	16.095	LM Z only
8	18.390	3.610	22.000	20.195	19.095	LM only
9	22.390	4.610	27.000	24.695	23.595	LM only
10	27.390	6.610	34.000	30.695	29.595	LM only
11	34.390	7.610	42.000	38.195	37.095	LM only
12	42.390	9.610	52.000	47.195	46.095	LM only
13	52.390	12.610	65.000	58.695	57.595	LM only
14	65.390	15.610	81.000	73.195	72.095	LM only
15	81.390	20.610	102.000	91.695	90.595	LM only
16	102.390	25.610	128.000	115.195	114.095	LM & HM Z
17	128.390	31.610	160.000	144.195	143.095	LM & HM Z
18	160.390	41.610	202.000	181.195	180.095	LM & HM
19	202.390	50.610	253.000	227.695	226.595	LM & HM
20	253.390	64.610	318.000	285.695	284.595	LM & HM
21	318.390	81.610	400.000	359.195	358.095	LM & HM
22	400.390	102.610	503.000	451.695	450.595	LM & HM
23	503.390	129.610	633.000	568.195	567.095	LM & HM
24	633.390	162.610	796.000	714.695	713.595	LM & HM
25	796.390	205.610	1002.000	899.195	898.095	LM & HM
26	1002.390	258.610	1261.000	1131.695	1130.595	LM & HM
27	1261.390	325.610	1587.000	1424.195	1423.095	HM only
28	1587.390	409.610	1997.000	1792.195	1791.095	HM only
29	1997.390	516.610	2514.000	2255.695	2254.595	HM only
30	2514.390	649.610	3164.000	2839.195	2838.095	HM only
31	3164.390	818.610	3983.000	3573.695	3572.595	HM only
32	3983.390	1030.610	5014.000	4498.695	4497.595	HM only
33	5014.390	1297.610	6312.000	5663.195	5662.095	HM only
34	6312.390	1632.610	7945.000	7128.695	7127.595	HM only

Note: The first gates are not used in any of the moments in the present survey as it is in the transition zone.

SkyTEM inversion software (iTEM) handles time shift calibration during import of data.
If third party processing software is used the calibrated Gate centre times should be used.

Appendix 3: Calibration of the TEM system

As described in the main document the system has been calibrated in a 50 Hz power supply grid setting (In Denmark), but the data was recorded in a 60 Hz environment (USA).

The wave form is measured with the 60 Hz script with a repetition frequency of 240 Hz for LM and with a repetition frequency of 30 Hz HM. Figure 1 to Figure 4 show the up and down ramp, respectively.

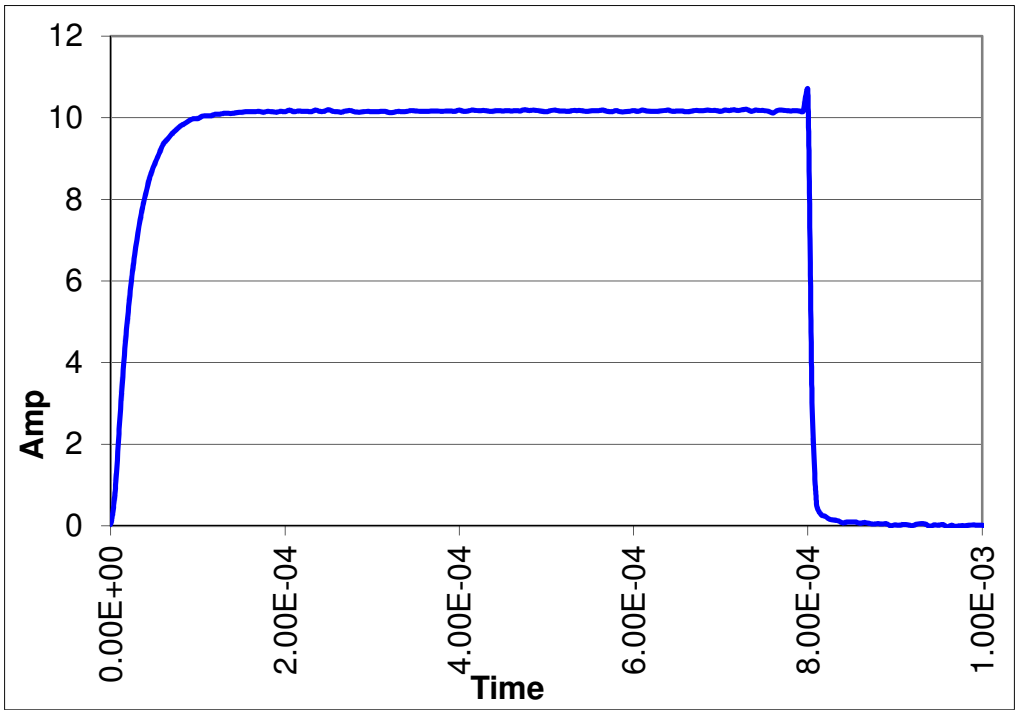


Figure 1 Ramp up at 240 Hz. Blue curve is the measured wave form. Red curve is the function that fits the data. The current is 10 A and the decay constant $\tau = 44000\ s^{-1}$.

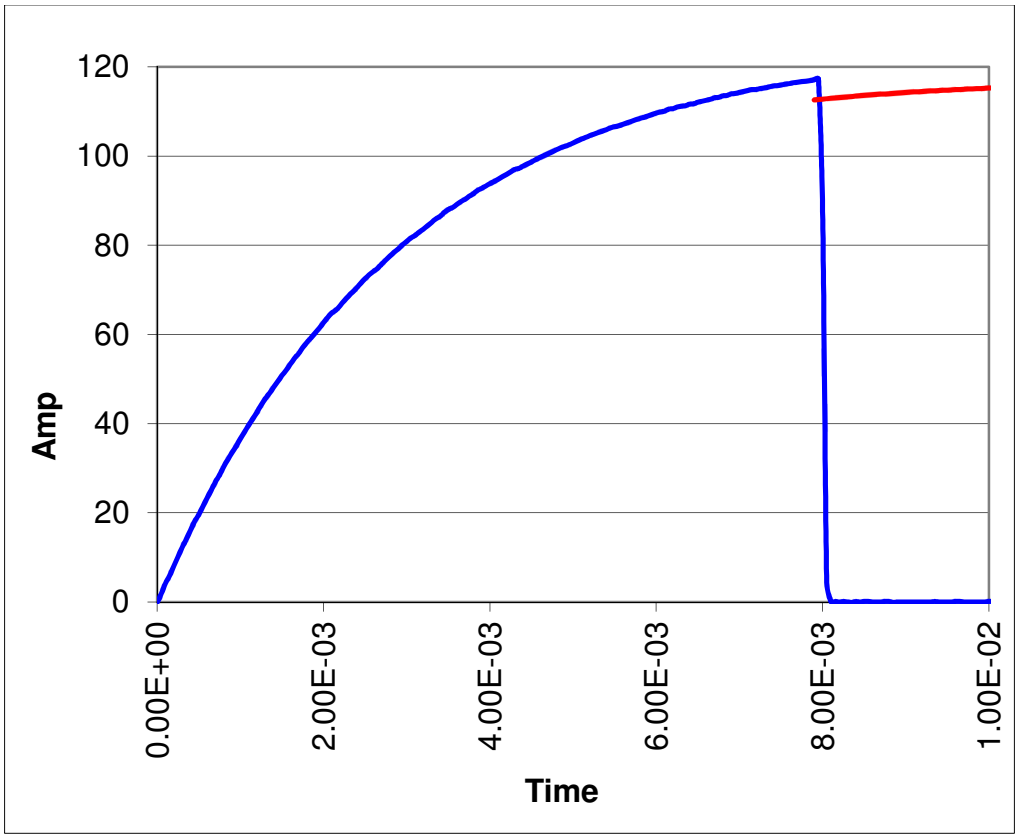


Figure 2 Ramp up at 30 Hz. Blue curve is the measured wave form. Red curve is the function that fits the data. The current is 117 A and the decay constant τ = 410 s^{-1}.

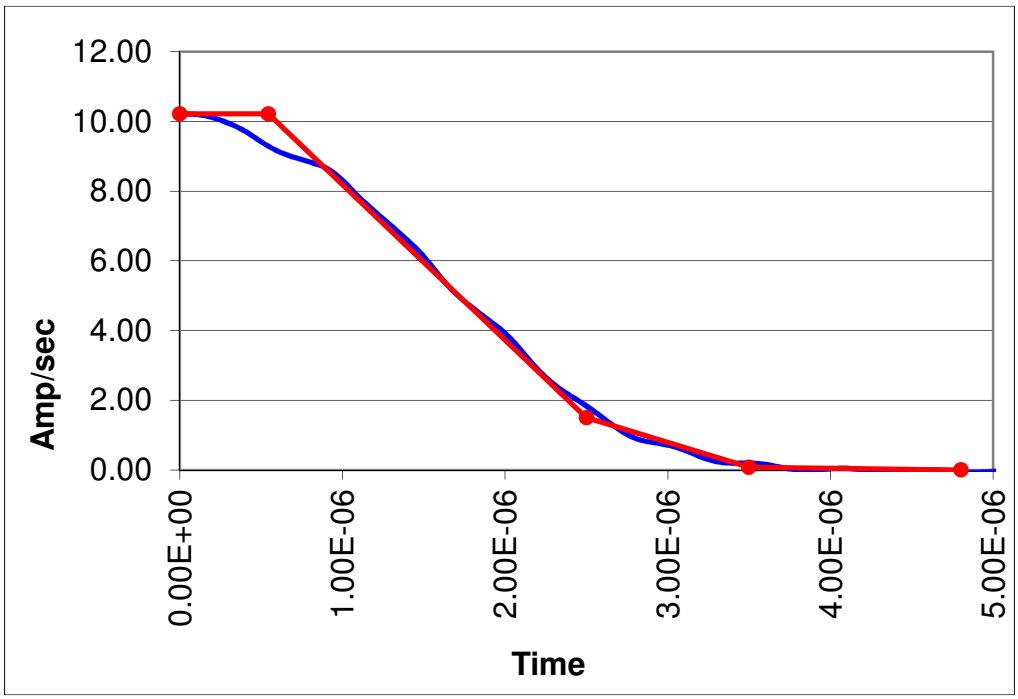


Figure 3 Ramp down at 240 Hz. Blue curve is the measured wave form. Red curve is the piecewise linear function that fits the data. Decay constant -3.00e6 s^{-1}.

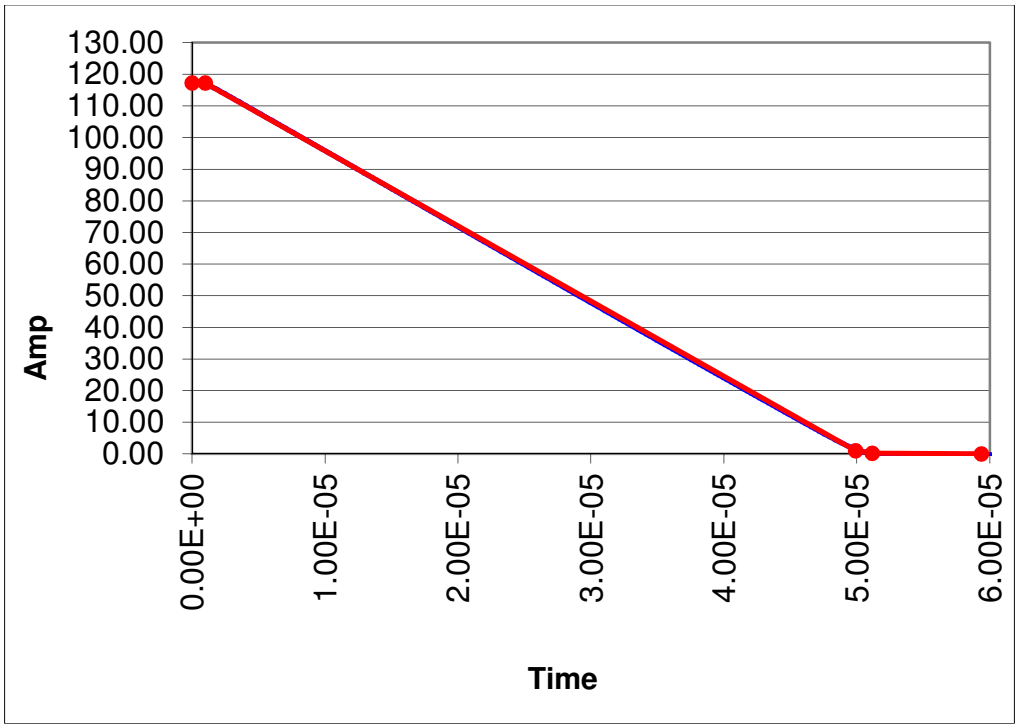


Figure 4 Ramp down at 30 Hz. Blue curve is the measured wave form. Red curve is the piecewise linear function that fits the data. Decay constant - 1.29e6 s^{-1}.

LM

	Parameter	Value
Ramp up	Repetition frequency	240 Hz
	Decay constant, τ	44000 s^{-1}
Ramp Down	Avalanche mode	1.96 µs
	Linear ramp dI/dt	4.46e6 A/s
	End avalanche mode current	1.5 A
	Decay const exp mode, τ	-3.00e6 s^{-1}

HM

	Parameter	Value
Ramp up	Repetition frequency	30 Hz
	Decay constant, τ	410 s^{-1}
Ramp Down	Avalanche mode	48.9 µs
	Linear ramp dI/dt	2.38e6 A/s
	End avalanche mode	1.0 A
	Decay const exp mode, τ	-1.29e6 s^{-1}

The complete SkyTEM equipment has been calibrated at the National Danish Reference Site. The following plots, Figure 5 to Figure 8, show the measured data as well as the expected response in altitudes 5 m, 10 m, 15 m, 20 m and 30 m.

The reference data for both LM and HM data are shown as blue curves and the measured data for LM and HM as red curves.

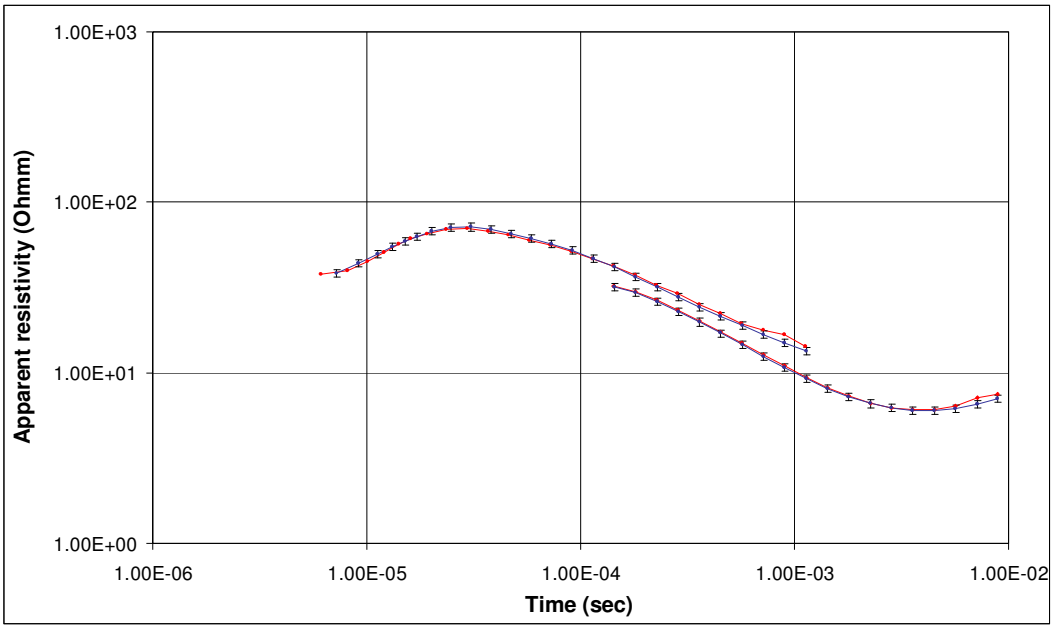


Figure 5 The frame is in 5 m altitude. Blue curves with 5% error bars are the expected response, and red curves are the actual measurements.

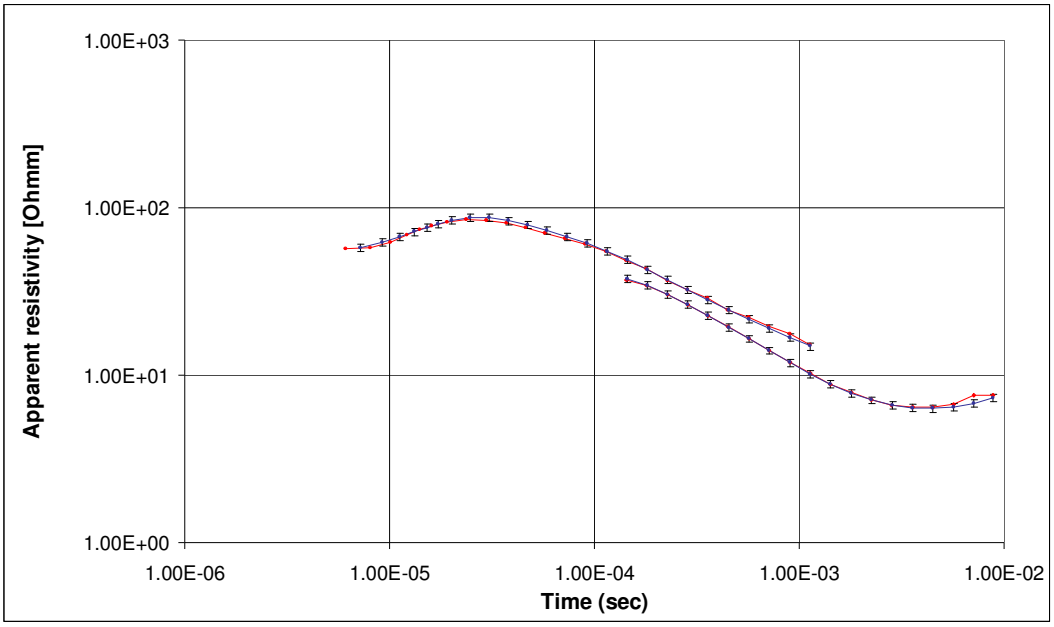


Figure 6 The frame is in 10 m altitude. Blue curves with 5% error bars are the expected response, and red curves are the actual measurements.

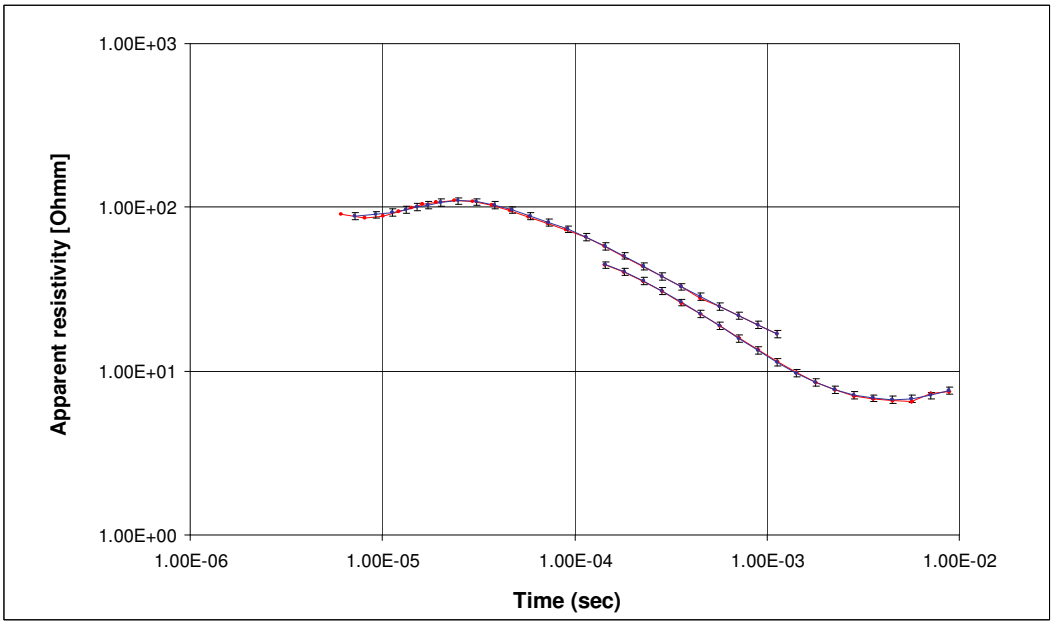


Figure 7 The frame is in 15 m altitude. Blue curves with 5% error bars are the expected response, and red curves are the actual measurements.

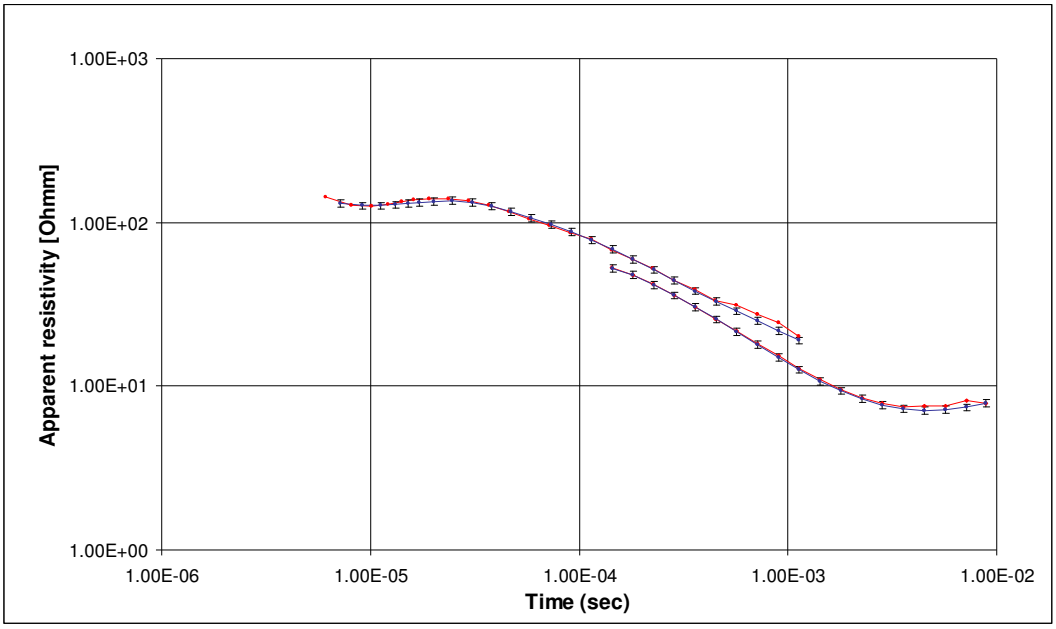


Figure 8 The frame is in 20 m altitude. Blue curves with 5% error bars are the expected response and red curves are the actual measurements.

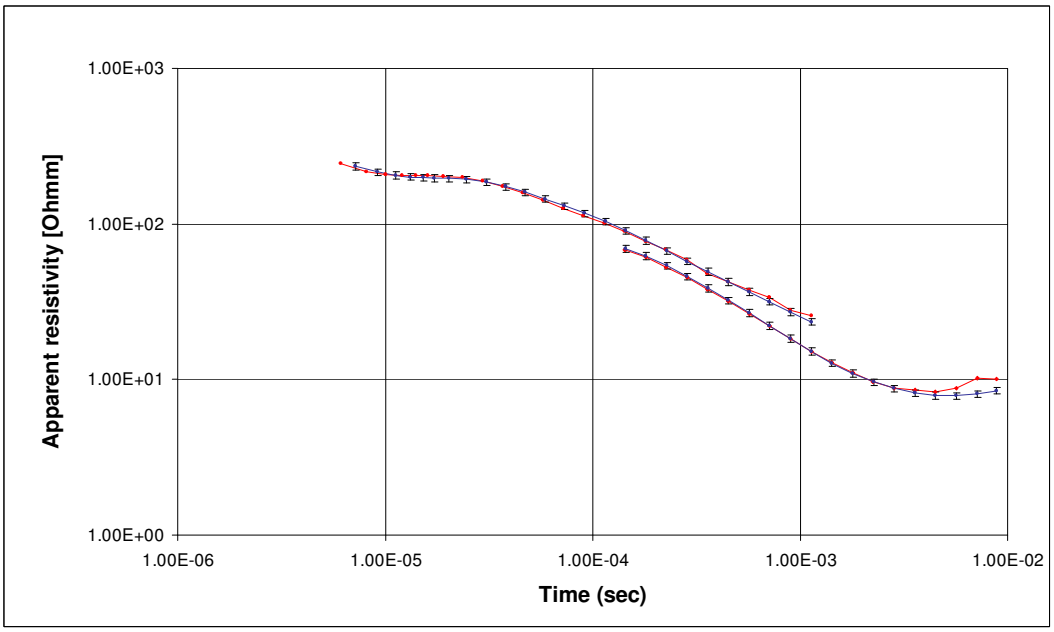


Figure 9 The frame is in 30 m altitude. Blue curves with 5% error bars are the expected response and red curves are the actual measurements

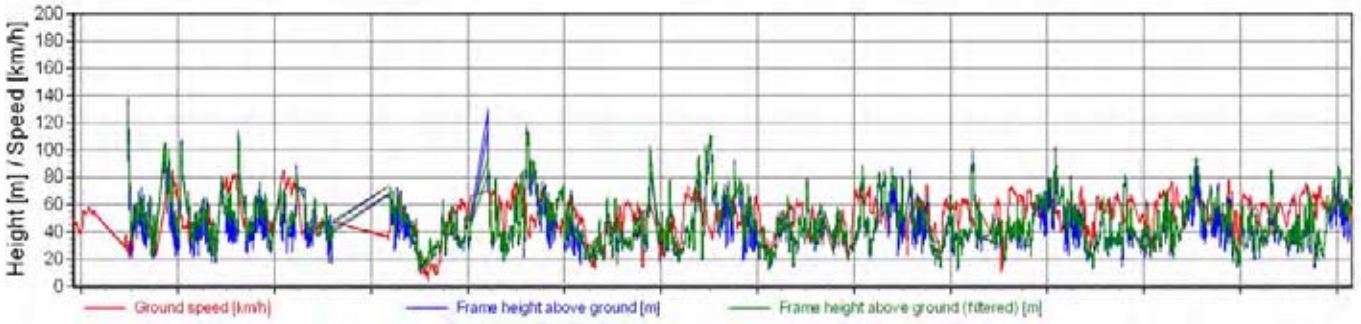
Appendix 4: Control parameters

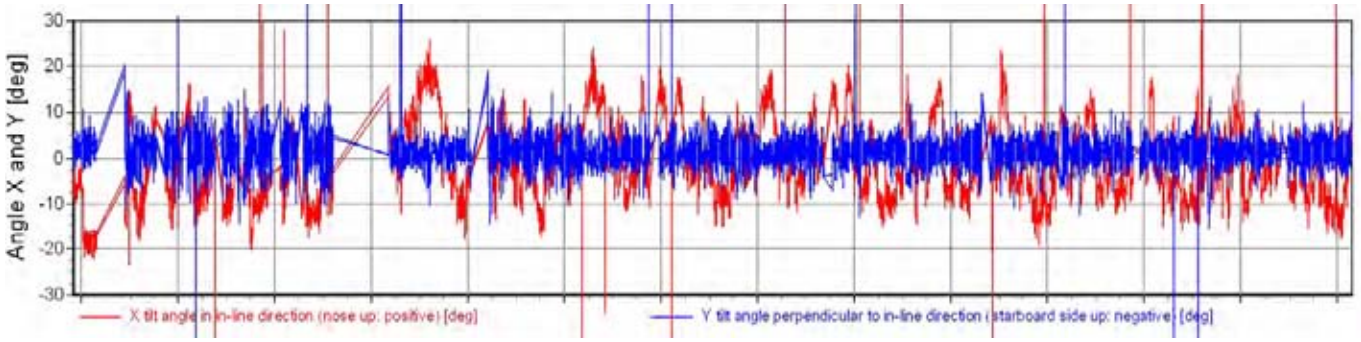
The following plots show the speed, altitude and the angle of the frame for every flight. Variations in the current, voltage on the transmitter and transmitter temperature are also shown.

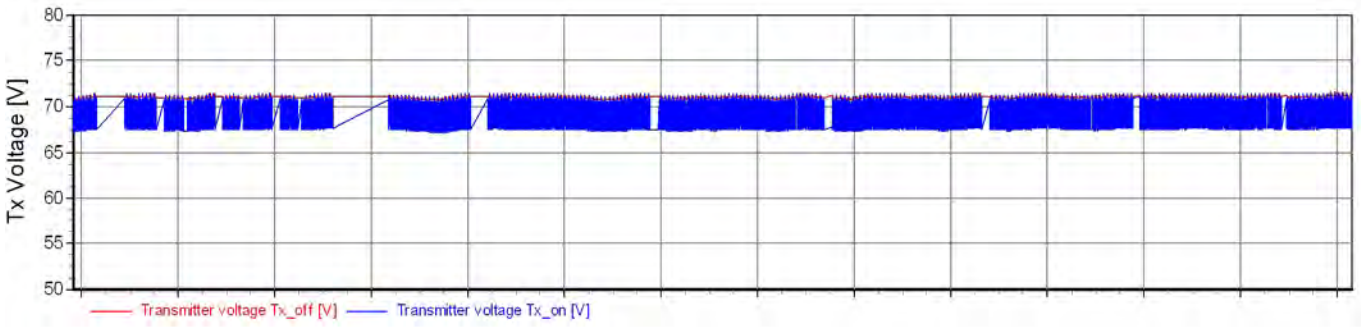
The green line, depicting processed frame height, shows the SkyPRO input from HE1 and HE2 after the frame has been corrected from deviations, away from the horizontal plane and any obstacles on the ground e.g. trees.

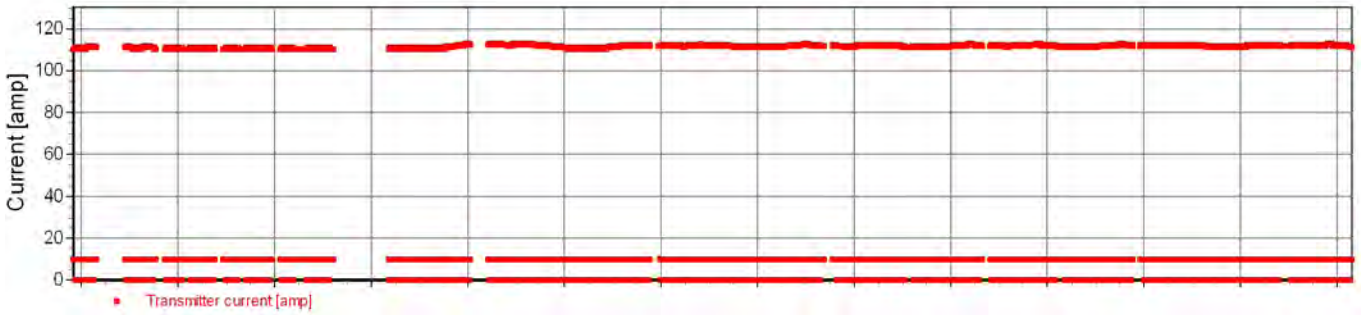
Turns at the end of flight lines and transport are shown as gaps in the bottom of the display.

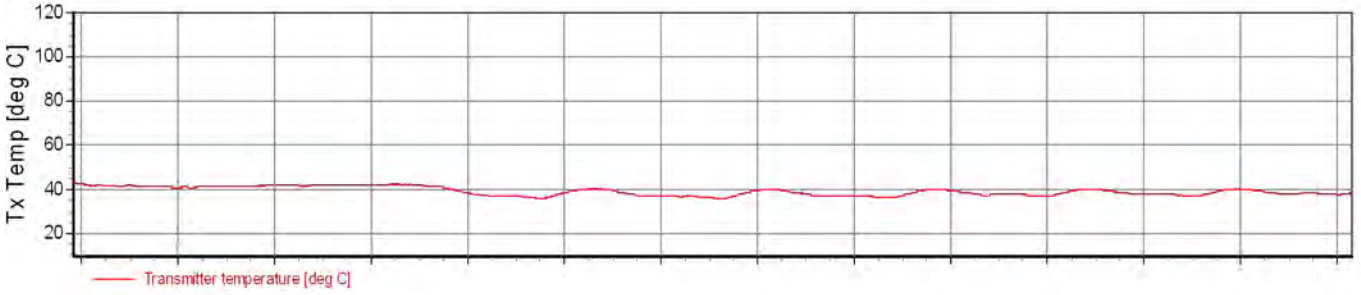
The ground speed in the uppermost window displays the signal from both gps GP1 and GP2.

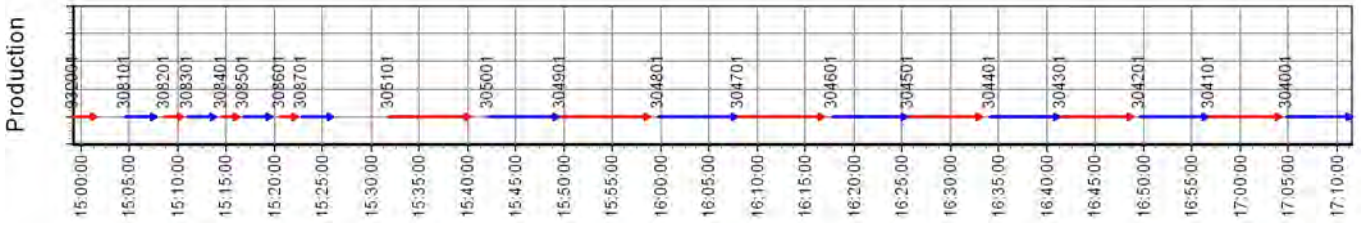

Height [m] / Speed [km/h]
Ground speed [km/h]
Frame height above ground [m]
Frame height above ground (filtered) [m]


Angle X and Y [deg]
X tilt angle in in-line direction (nose up: positive) [deg]
Y tilt angle perpendicular to in-line direction (starboard side up: negative) [deg]


Tx Voltage [V]
Transmitter voltage Tx_off [V]
Transmitter voltage Tx_on [V]


Current [amp]
Transmitter current [amp]


Tx Temp [deg C]
Transmitter temperature [deg C]


Production
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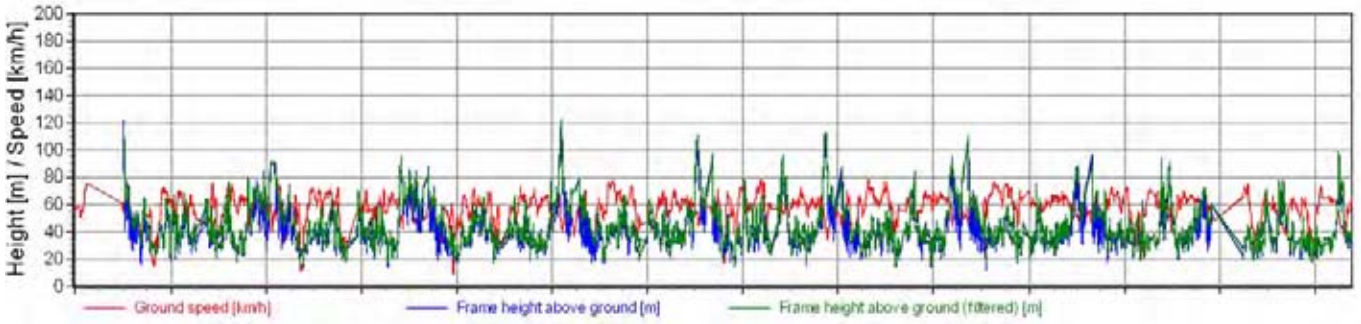
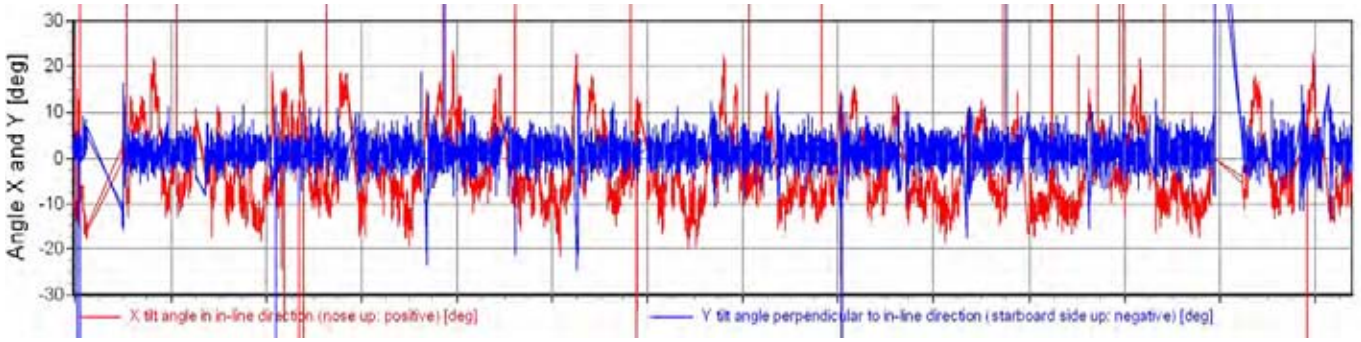
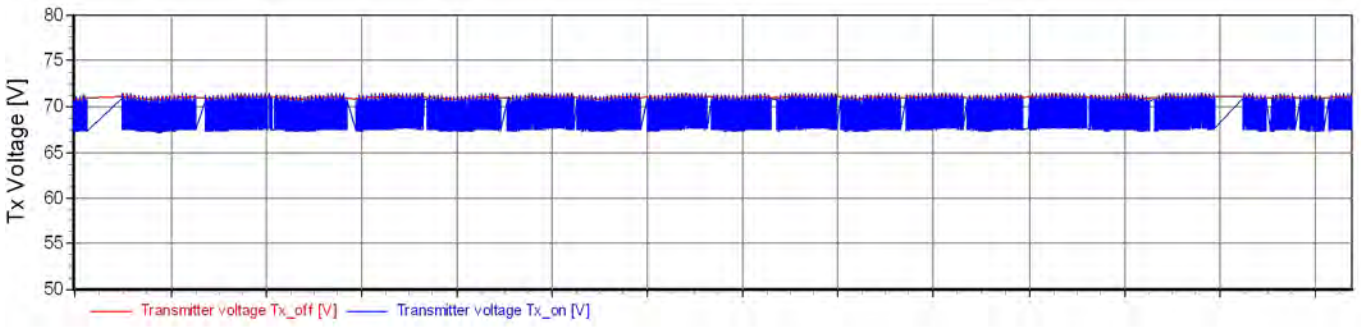
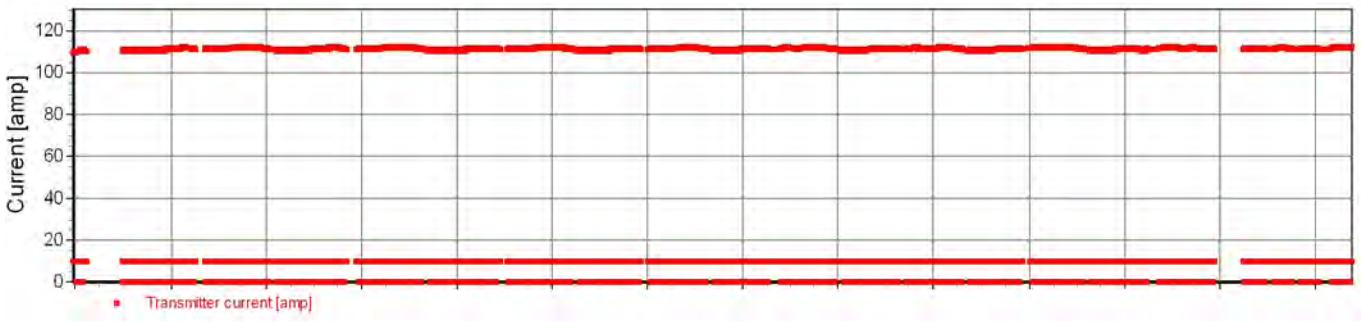
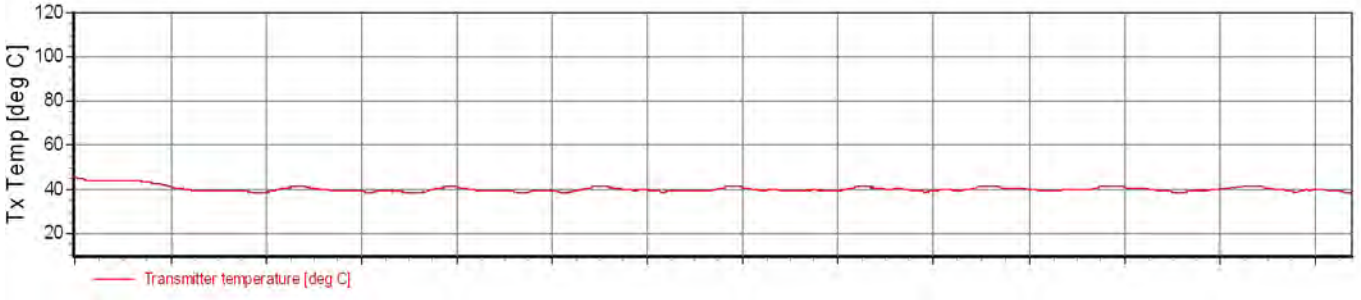
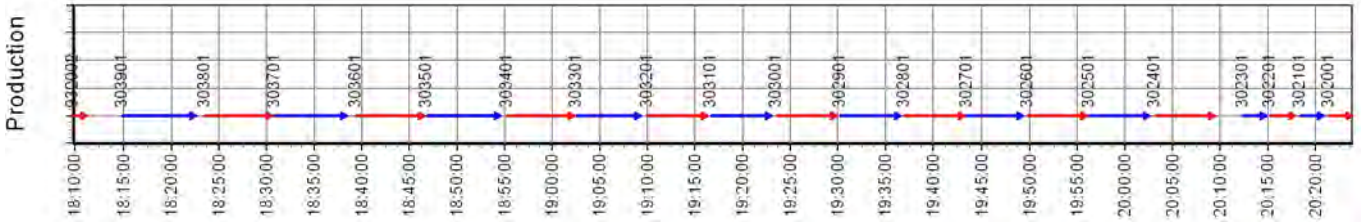

Height [m] / Speed [km/h]
Ground speed [km/h]
Frame height above ground [m]
Frame height above ground (filtered) [m]

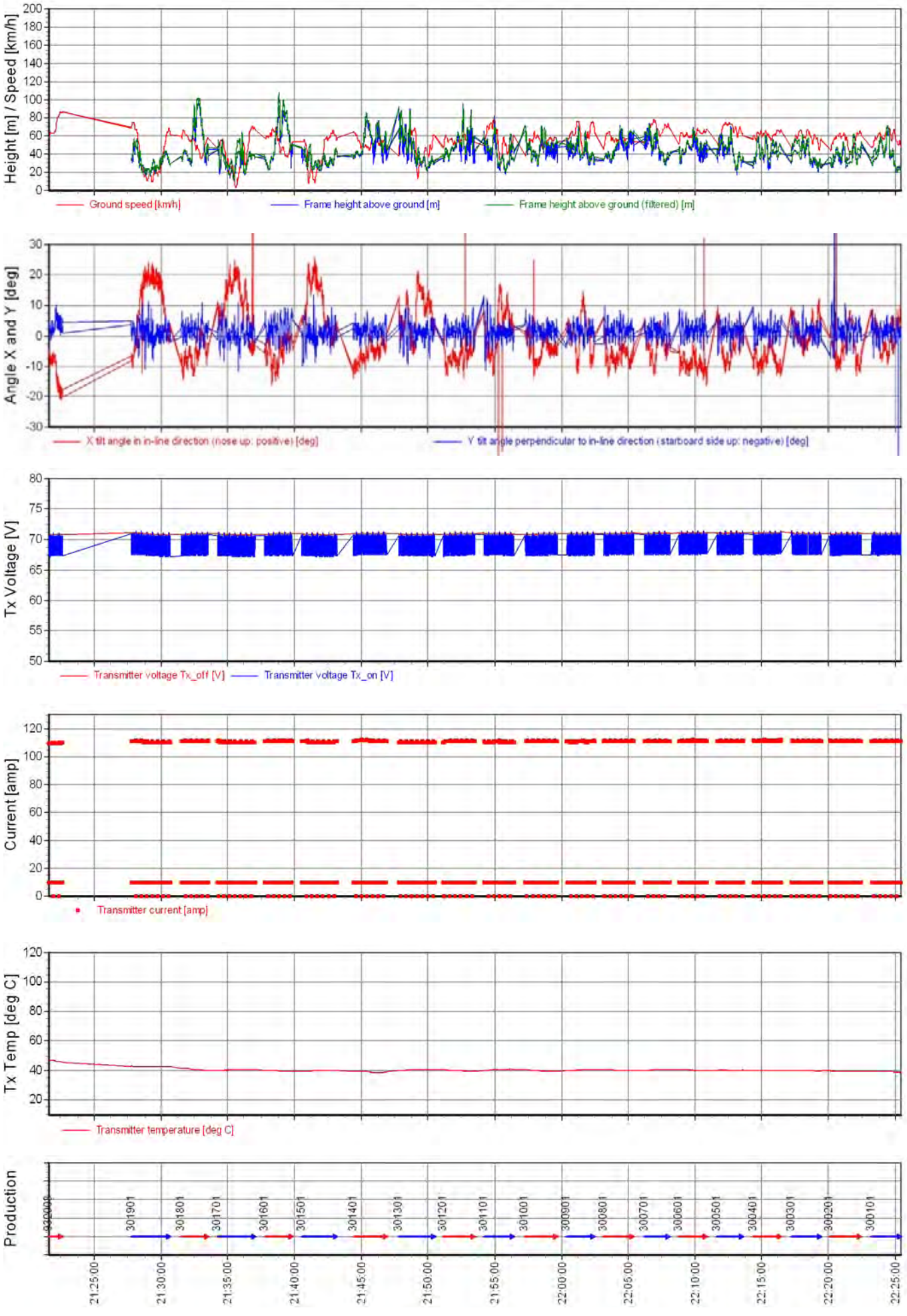

Angle X and Y [deg]
X tilt angle in in-line direction (nose up: positive) [deg]
Y tilt angle perpendicular to in-line direction (starboard side up: negative) [deg]


Tx Voltage [V]
Transmitter voltage Tx_off [V]
Transmitter voltage Tx_on [V]


Current [amp]
Transmitter current [amp]


Tx Temp [deg C]
Transmitter temperature [deg C]


Production


Height [m] / Speed [km/h]
Ground speed [km/h]
Frame height above ground [m]
Frame height above ground (filtered) [m]
Angle X and Y [deg]
X tilt angle in in-line direction (nose up: positive) [deg]
Y tilt angle perpendicular to in-line direction (starboard side up: negative) [deg]
Tx Voltage [V]
Transmitter voltage Tx_off [V]
Transmitter voltage Tx_on [V]
Current [amp]
Transmitter current [amp]
Tx Temp [deg C]
Transmitter temperature [deg C]
Production
21:25:00
21:30:00
21:35:00
21:40:00
21:45:00
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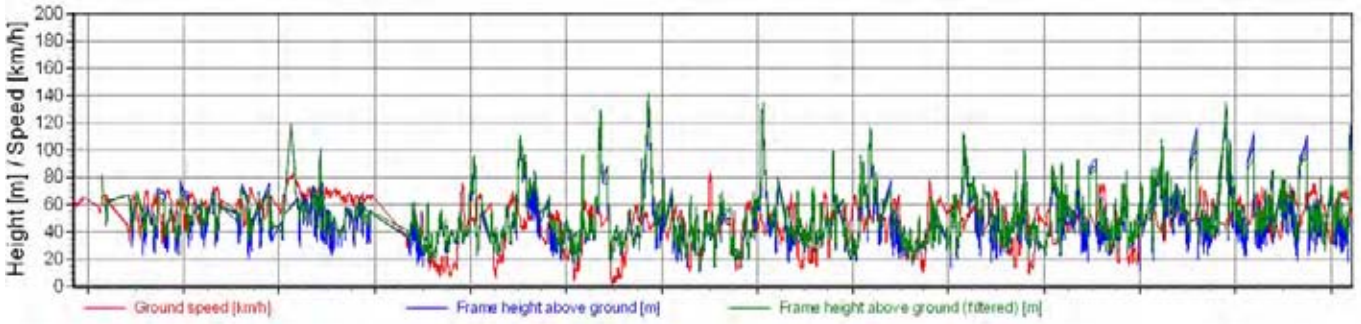
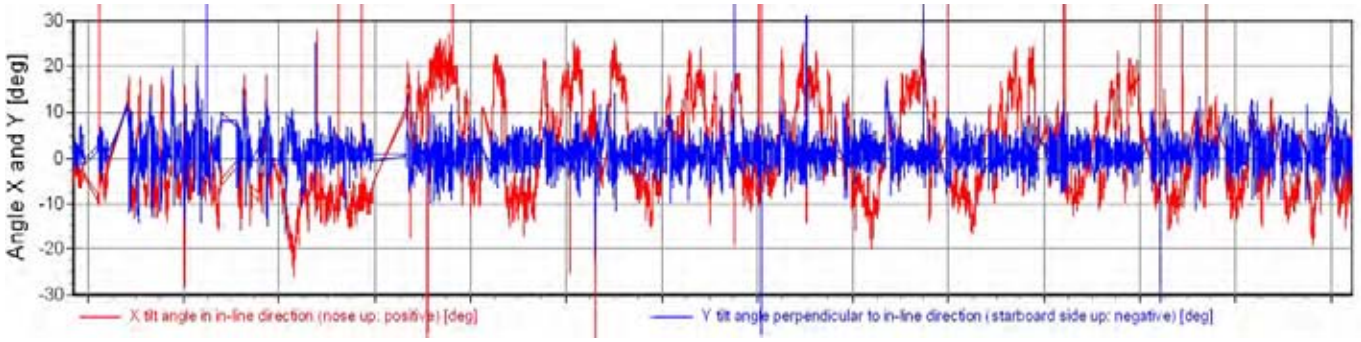
22:15:00
22:20:00
22:25:00


Height [m] / Speed [km/h]
Ground speed [km/h]
Frame height above ground [m]
Frame height above ground (filtered) [m]


Angle X and Y [deg]
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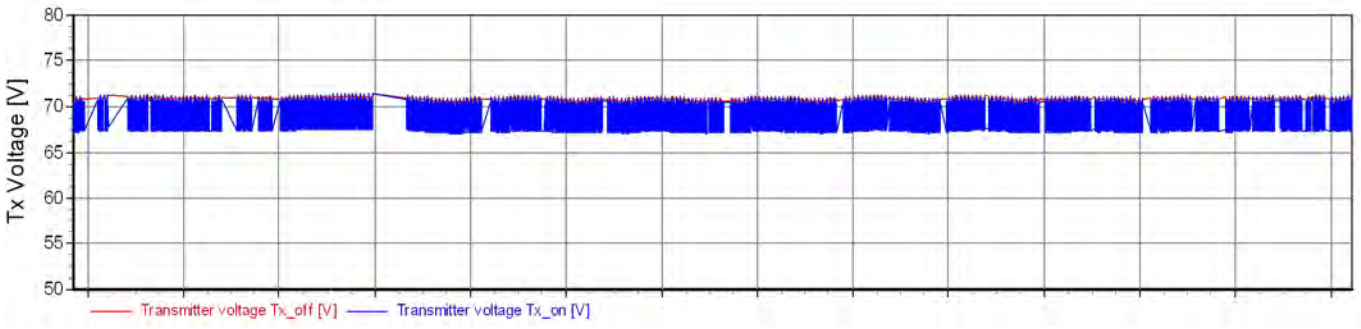
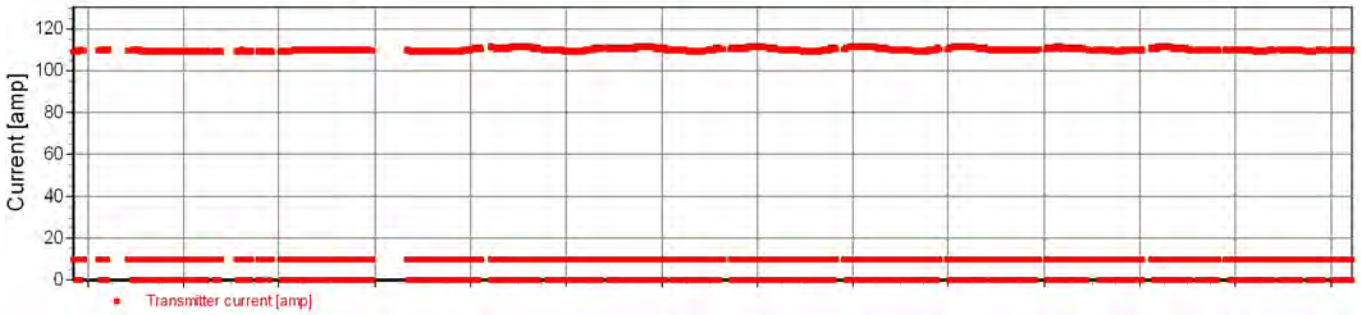
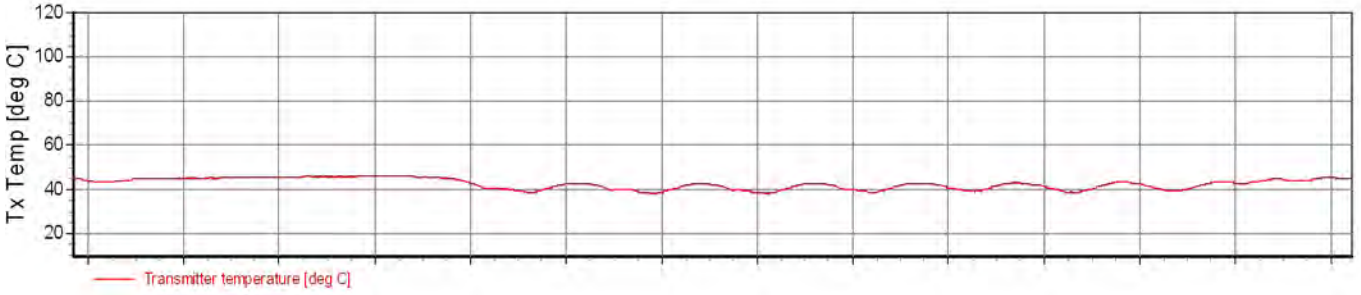
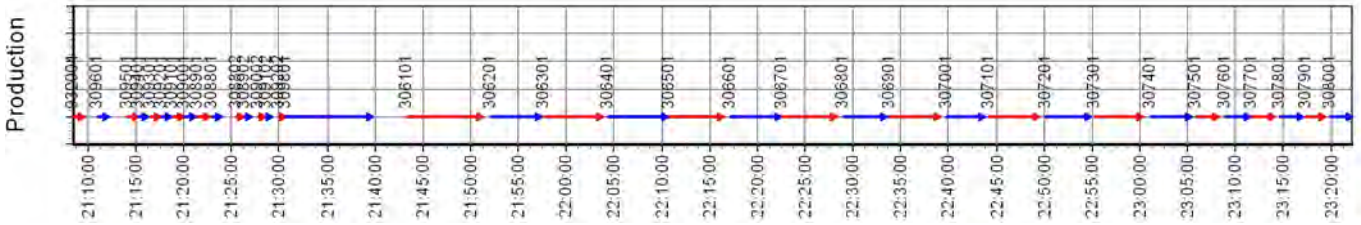
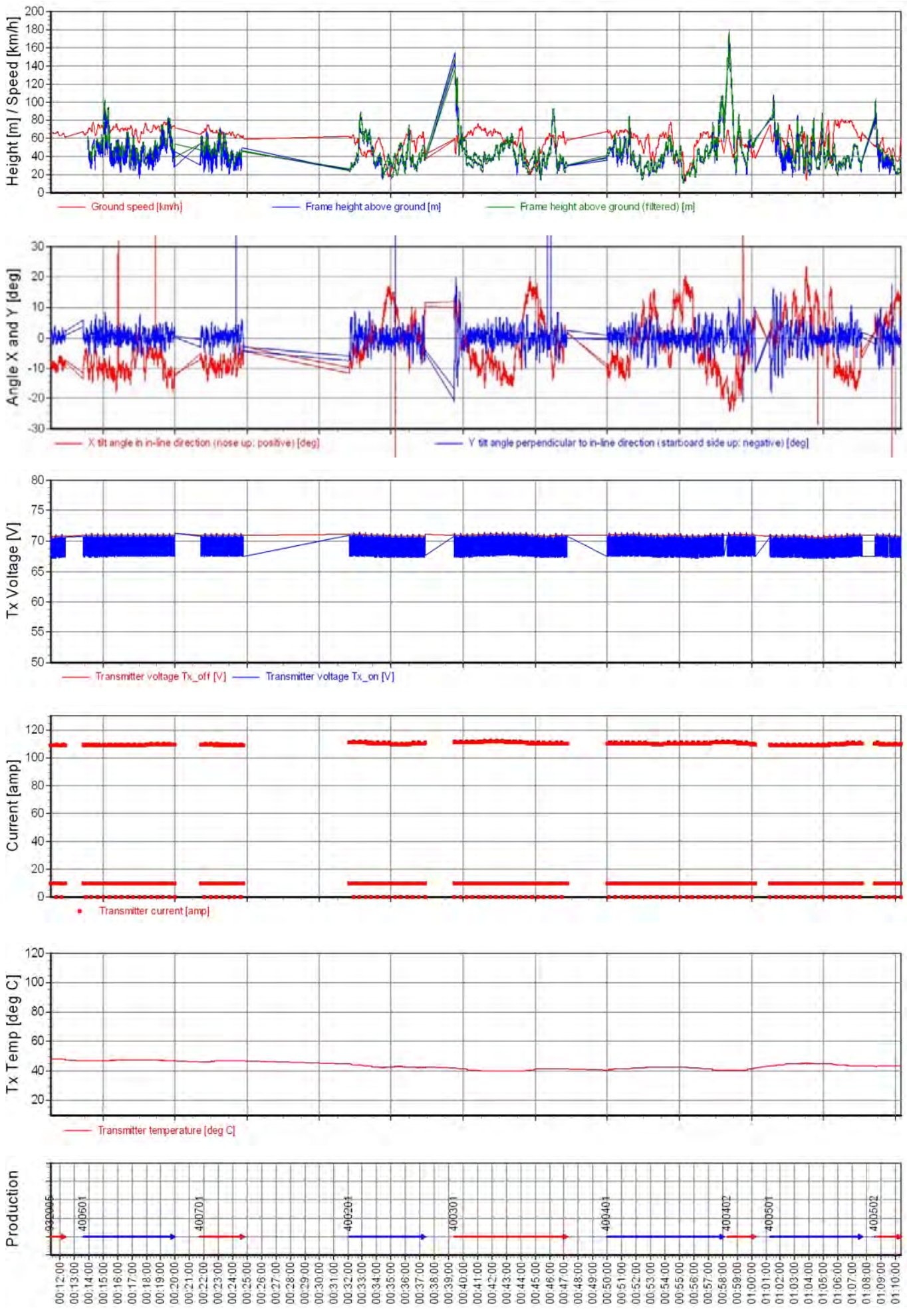
Y tilt angle perpendicular to in-line direction (starboard side up: negative) [deg]


Tx Voltage [V]
Transmitter voltage Tx_off [V]
Transmitter voltage Tx_on [V]


Current [amp]
Transmitter current [amp]


Tx Temp [deg C]
Transmitter temperature [deg C]


Production


Height [m] / Speed [km/h]
Ground speed [km/h]
Frame height above ground [m]
Frame height above ground (filtered) [m]
Angle X and Y [deg]
X tilt angle in in-line direction (nose up: positive) [deg]
Y tilt angle perpendicular to in-line direction (starboard side up: negative) [deg]
Tx Voltage [V]
Transmitter voltage Tx_off [V]
Transmitter voltage Tx_on [V]
Current [amp]
Transmitter current [amp]
Tx Temp [deg C]
Transmitter temperature [deg C]
Production
400501
400701
400201
400301
400401
400402
400501
400502

Appendix 5: Modelling and inversion of TEM Data

This appendix gives a brief introduction to modelling and inversion of SkyTEM data.

The model

The model used for inversion of SkyTEM data is a 1D multi-layer model (MLM) with typically 30 layers. The layer thicknesses increase downwards as a hyperbolic sine function of the layer number. This means that the depth to the layer boundaries increases linearly for small depths, so that the top layers are all of approximately the same thickness. For large depths, the depth to the layer boundaries increases exponentially with depth, so that the thickness of a layer is a factor times the previous one.

Inversion - The initial model

The initial model for the deep inversion is a 30-layer MLM with a homogeneous resistivity for all layers, i.e. the initial model is essentially a homogeneous half space. Model optimization can be carried out in both a L1- and a L2- norm formulation where the former produces more blocky models than the latter.

Data and noise model

The inaccuracy of TEM data is influenced by the ambient noise. This noise is reduced by selective stacking of delay time series, and by applying appropriate filters in the receiver system.

Experience with SkyTEM data suggests that the noise voltage most often can be described with a simple model: log(noise) is a linear function of log(time). When the width of the time gates increases proportional to delay time - as is the case with the SkyTEM system - the slope of the linear function is close to -0.5. The noise model used can therefore be described as:

$$V = V_0 \cdot \left(\frac{t}{t_0} \right)^{\alpha}$$

Where V is the noise voltage, V_0 is the noise voltage at time t_0 and α is the slope of the noise voltage as a function of time in a double logarithmic plot. Choosing t_0 = 1 ms, the noise model is defined by the values of V_0 and α. These values are chosen pragmatically by inspection of a subset of the data volume.

V_0 = 2.5e-12 in field units normalized with Tx moment (LM)
V_0 = 2.5e-13 in field units normalized with Tx moment (HM)
t_0 = 1 ms
slope = -0.5

Regularization

Inversion of TEM data is highly non-linear which means regularization is needed in order to guide the inversion routine to produce feasible geological models. In the initial inversion, a vertical smoothness constraint is implemented through a broadband model covariance matrix. This matrix is constructed by stacking single-scale exponential covariance functions with different correlation lengths, describing the covariance between any two points in the sub-surface. This approach has proven to be very robust and stable as the expected subsurface variability can be described through the prior covariance matrix (/3/).

To obtain laterally smooth model sections, the Lateral Parameter Correlation (LPC) procedure is used (/3/ and /4/). Through an inversion process, a smooth version of the resistivity variation is predicted from the results of the initial inversion. In this approach, all parameter values are correlated with all other values in the plane. After the LPC procedure, data are subjected to a final inversion constrained by the LPC models to improve the data fit.

Data insufficiency

For SkyTEM data, the insufficiency lies primarily in the limited delay time range that can be obtained. The earliest obtainable time gate is determined by the turnoff of the Tx current, and the latest useful time gate is determined by the signal to noise ratio. Increasing the Tx moment will give better measurements at late times, and thus improve the depth penetration, but also increase the turnoff time and thus remove early-time gates, thereby making the near-surface resolution poorer. This trade-off is solved by transmitting an alternating sequence of (1) a low moment that can be turned off quickly to give good near-surface resolution, and (2) a high moment that will improve the signal-to-noise ratio at late times, thus improving depth penetration.

Model inconsistency

When using 1D models in the interpretation of SkyTEM data, inconsistency arises where the lateral gradient of conductivity is not small, e.g. typically in mining applications. However, also in environmental investigations, inconsistencies can arise, typically where near-surface good conductors have abrupt boundaries. Often such inconsistency is indicated by the data residual being high and one should look upon the inversion results with some caution at these locations. 3D effects can also reveal themselves by the so-called 'pant legs', i.e. conductive or resistive structures projecting at an angle of approximately 30 degrees from the horizontal at the edges of high contrast structures.

Appendix 6: Model sections and resistivity intervals

Model sections and analysis sections are delivered in digital form as PDF files.

Model sections

The Model sections can be found in the data delivery folder as PDF's.

The model section plot consists of five subplots. The top plot shows the inverted models, with topography, where the resistivity of the individual layers is colour coded according to the colour bar. The resistivity is shown on a logarithmic scale and conductive and resistive features appear with the same weight. The actual flight elevation is shown with a red line above the model section. The white line in the model section indicates the estimated depth of investigation (DOI). Starting from the bottom layer of the model, the DOI is equal to the depth of the first layer having a conductance uncertainty of less than 0.5. If the resistivity uncertainty is too high, the layer resistivity is unresolved.

Below the model section is a plot of the normalized data residual (red line) and normalized total residual (black line) of the inversions. The total residual is a weighted sum of the data residual and the model residual, where the latter is a measure of the roughness of the model, i.e., the deviation of the final model from the initial homogeneous halfspace model.

Below the residual section is the analysis section. The resistivity of the inverted models is determined partly by the measured data and partly by the regularization – the vertical and horizontal smoothness constraints – used in the inversion. To illustrate the relative importance of the data and the smoothness constraints an analysis section is produced. The analysis section has the same appearance as the model section, but rather than plotting the layer resistivities the normalized relative uncertainty of the layer resistivities are plotted. The values of the normalized relative uncertainty are colour coded according to the colour scale. The colour scale consists of four colours: red, yellow, blue, and blue fading into white.

The red colour indicates that data have contributed considerably to the inverted resistivity, i.e., the resistivity is well determined.

The yellow colour indicates that data has had more influence on the inverted resistivity than the regularization, i.e., the resistivity is fairly well determined.

The blue colour indicates that the regularization has had more influence than the data in determining the inverted resistivity, i.e., the resistivity is poorly determined.

Where the blue colour fades into the white, the inverted resistivity is determined almost exclusively by the regularization, i.e., the resistivity is essentially undetermined.

In short, one can say that data has had more influence than the regularization when values are below 1 – the red and yellow colours – and that the regularization has had more influence than the data where the values are above 1 – the blue and white colours.

Please take note that in some parts of the analysis sections, where the near-surface resistivity is very high, the top part of the model can be seen as undetermined. In this situation the TEM method cannot determine the resistivity.

Below the analysis section are two plots of the measured data (dots) together with the response of the inverted models (solid lines). M1 is low moment data and M2 is high moment data. For both plots, every second gate is plotted starting with the earliest gate, and data are plotted with a density of 8 points per centimetre along the profile.

Layer Resistivity Maps

The Model sections can be found in the data delivery folder as PDF's as well as geosoft . grd files.

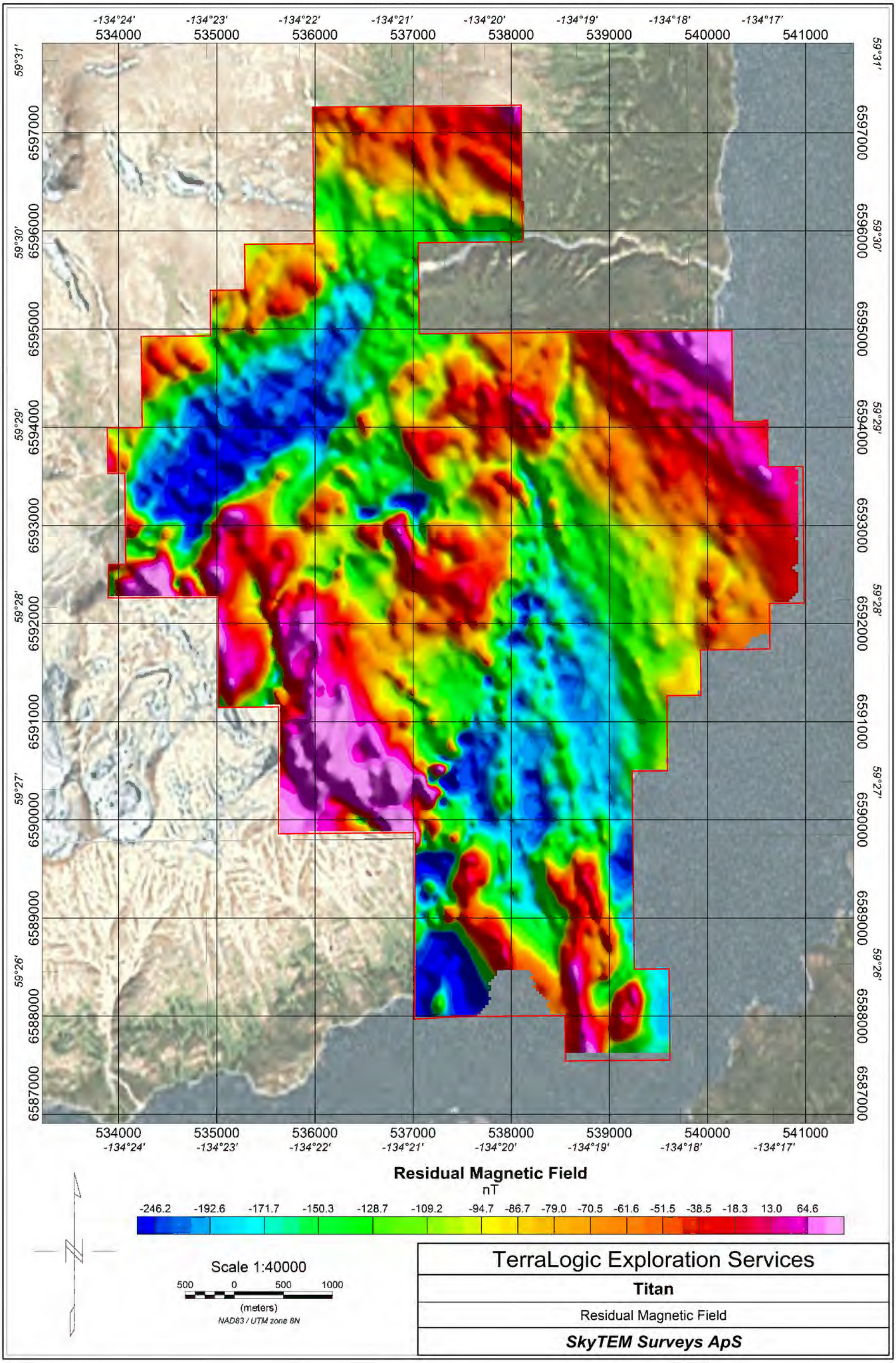
The resistivity maps show the inverted resistivity for each of the model layers.

As the thickness of the model layers increases downwards the maps represent a varying thickness interval. The depth interval is stated on the pdf files and is in meters below the surface.

Appendix 7: Digital data

The digital data are listed in the following folders.

Data delivery folder	Sub folder	Sub folder	File format	Comment
01_TEM_data	01_Data		Geosoft.gdb	Database ready for import in Geosoft
	02_EM_Channels_ grid	HM_Z	Geosoft.grd	Channel plots of raw data. Gate 16-34
		LM_Z	Geosoft.grd	Channel plots of raw data. Gate 5-26
02_MAG_data	01_Data		Geosoft.gdb	Database ready for import in Geosoft
	02_Grids		Geosoft.grd	TMI and RMF
	03_Maps		.pdf .map	Maps and PDF's of RMF and TMI
03_Inversion	01_Data		Geosoft.gdb	Database ready for import in Geosoft
	02_Layer_Resistivity_Grids		Geosoft.grd	Grids of the resistivity in each layer
	03_Layer_Resistivity_Maps		.pdf .map	Maps and pdf's of the resistivity in each layer
	04_Sections		.pdf	Resistivity and analysis of all lines
04_MISC	DEM		Geosoft.grd .pdf .map	Digital Elevation Model of the area.
	LinePath		.pdf .map	Line Path in UTM z8N.
	PlannedFlightLines		.pdf .map .gdb	Planned flight lines in UTM z8N
05_Report			.pdf	The report and appendices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-134°18'
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-134°17'
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59°31'
59°30'
59°29'
59°28'
59°27'
59°26'
6597000
6596000
6595000
6594000
6593000
6592000
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6590000
6589000
6588000
6587000
Residual Magnetic Field
nT
-246.2
-192.6
-171.7
-150.3
-128.7
-109.2
-94.7
-86.7
-79.0
-70.5
-61.6
-51.5
-38.5
-18.3
13.0
64.6
Scale 1:40000
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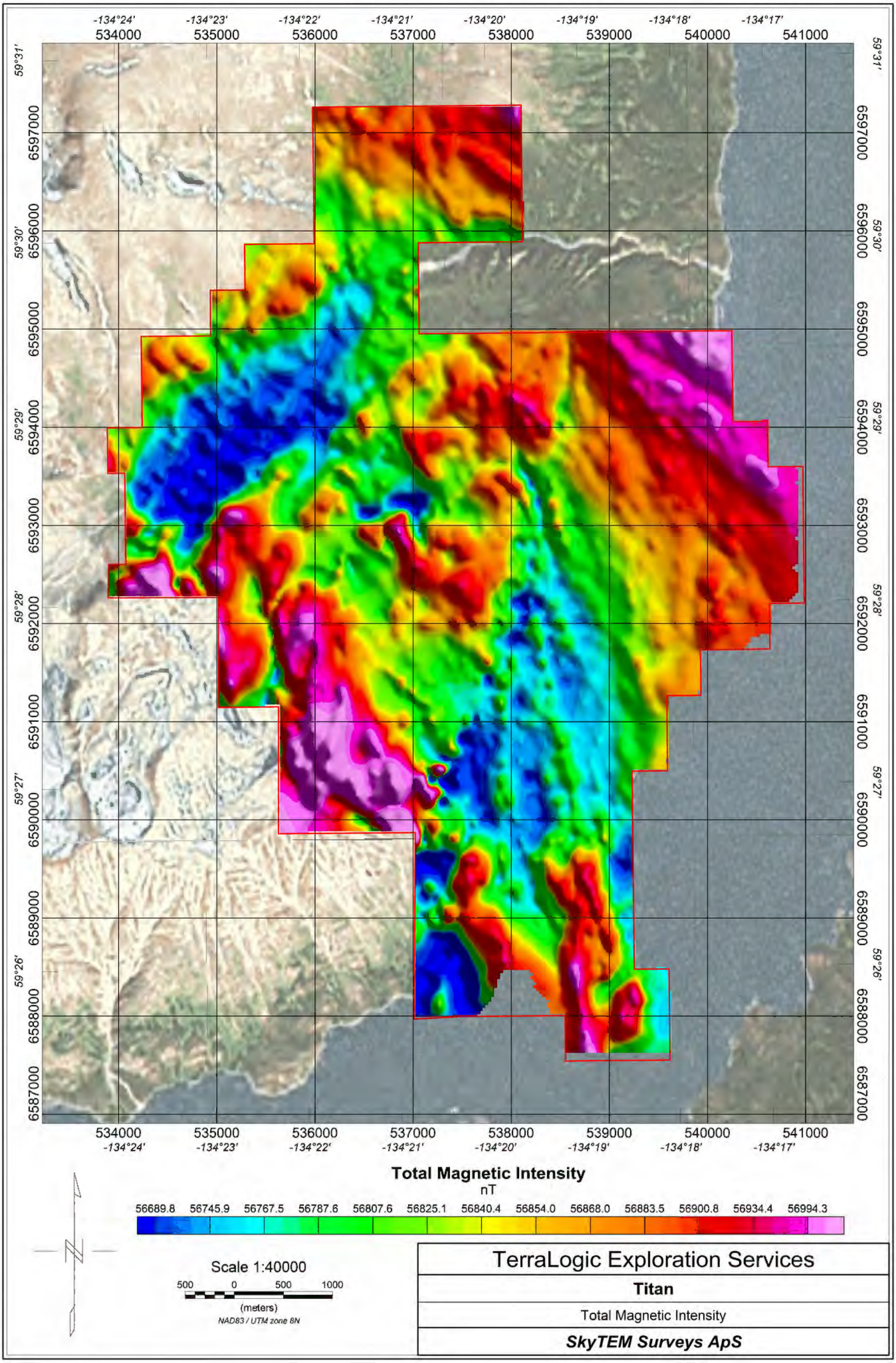
500
1000
(meters)
NAD83 / UTM zone 8N
TerraLogic Exploration Services
Titan
Residual Magnetic Field
SkyTEM Surveys ApS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6591000
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6589000
6588000
6587000
Total Magnetic Intensity
nT
56689.8
56745.9
56767.5
56787.6
56807.6
56825.1
56840.4
56854.0
56868.0
56883.5
56900.8
56934.4
56994.3
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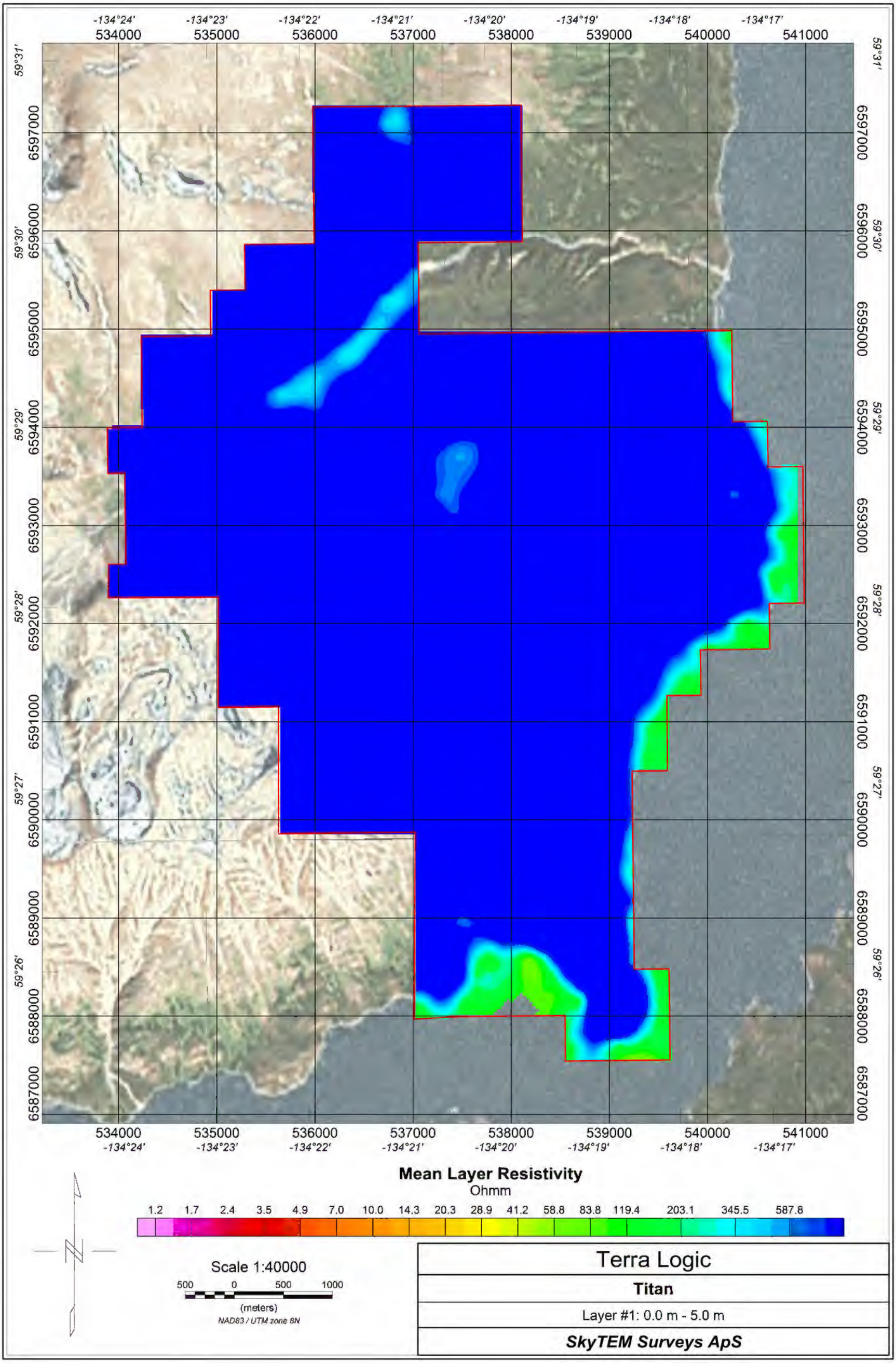
(meters)
NAD83 / UTM zone 8N
TerraLogic Exploration Services
Titan
Total Magnetic Intensity
SkyTEM Surveys ApS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Mean Layer Resistivity
Ohmm
1.2
1.7
2.4
3.5
4.9
7.0
10.0
14.3
20.3
28.9
41.2
58.8
83.8
119.4
203.1
345.5
587.8
Scale 1:40000
500
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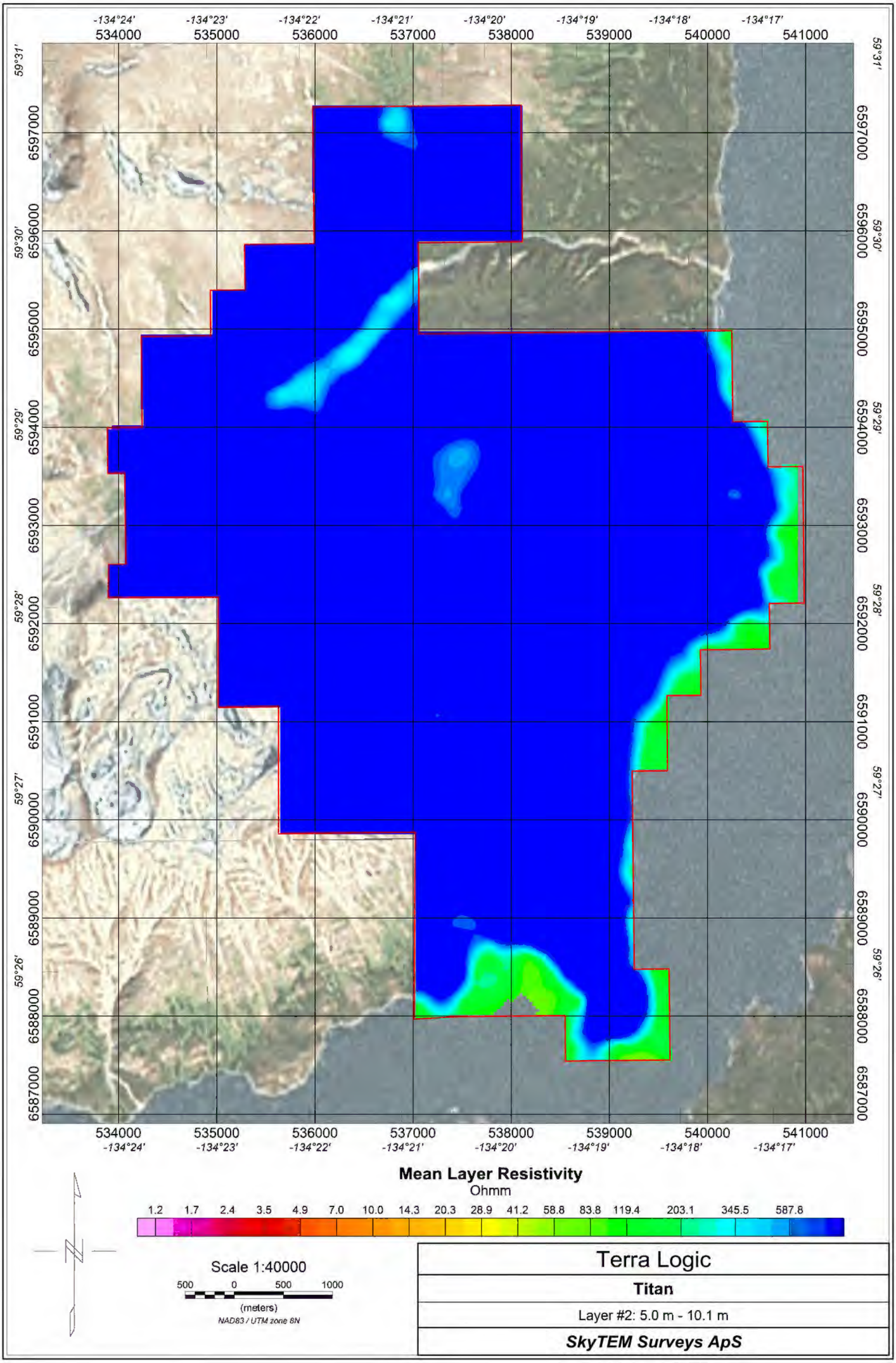
500
1000
(meters)
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #1: 0.0 m - 5.0 m
SkyTEM Surveys ApS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Mean Layer Resistivity
Ohmm
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1.7
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3.5
4.9
7.0
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14.3
20.3
28.9
41.2
58.8
83.8
119.4
203.1
345.5
587.8
Scale 1:40000
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(meters)
NAD83 / UTM zone 8N
Terra Logic
Titan
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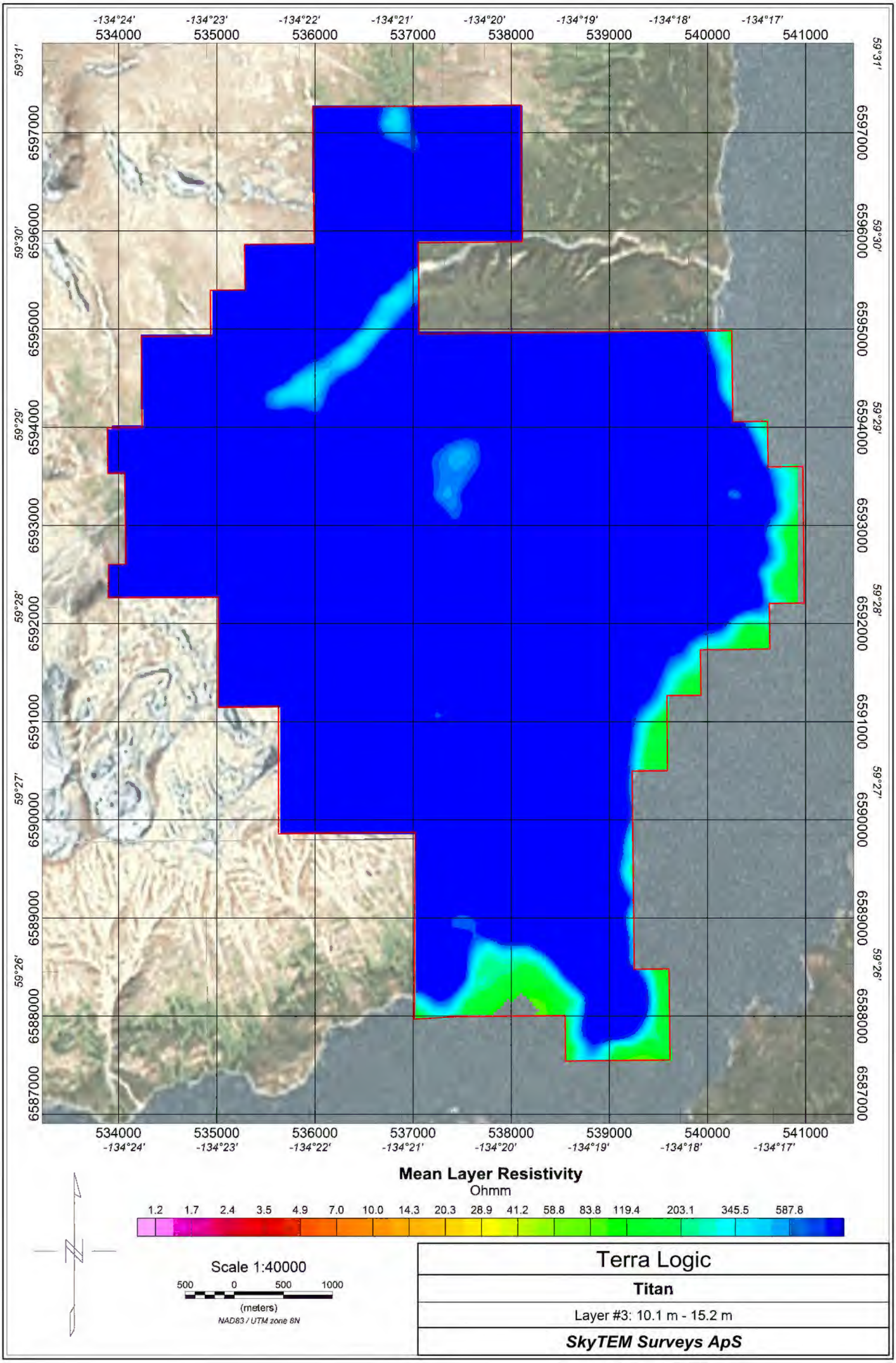
SkyTEM Surveys ApS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Mean Layer Resistivity
Ohmm
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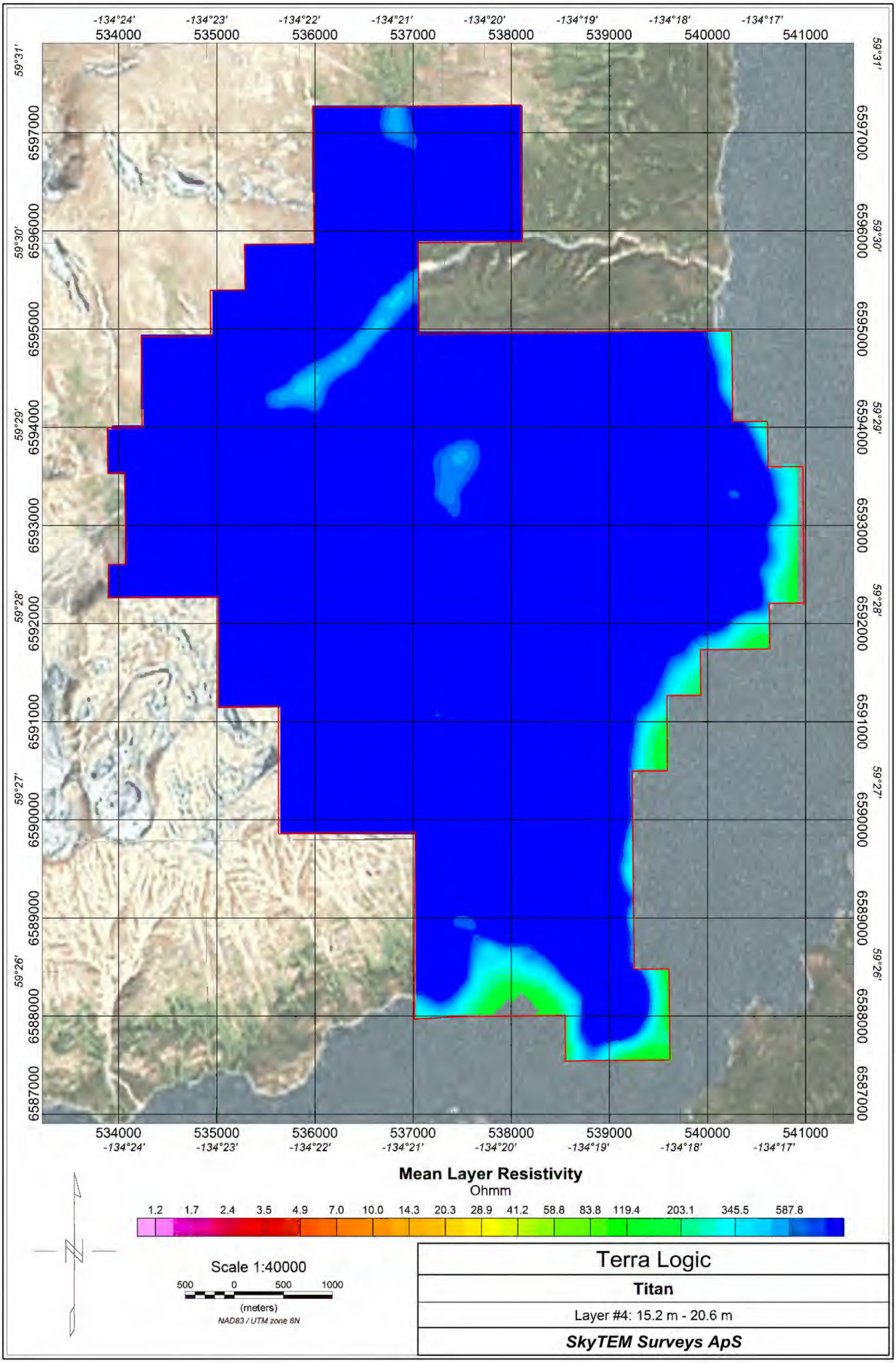
Scale 1:40000
500 0 500 1000
(meters)
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #3: 10.1 m - 15.2 m
SkyTEM Surveys ApS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Mean Layer Resistivity
Ohmm
1.2 1.7 2.4 3.5 4.9 7.0 10.0 14.3 20.3 28.9 41.2 58.8 83.8 119.4 203.1 345.5 587.8
Scale 1:40000
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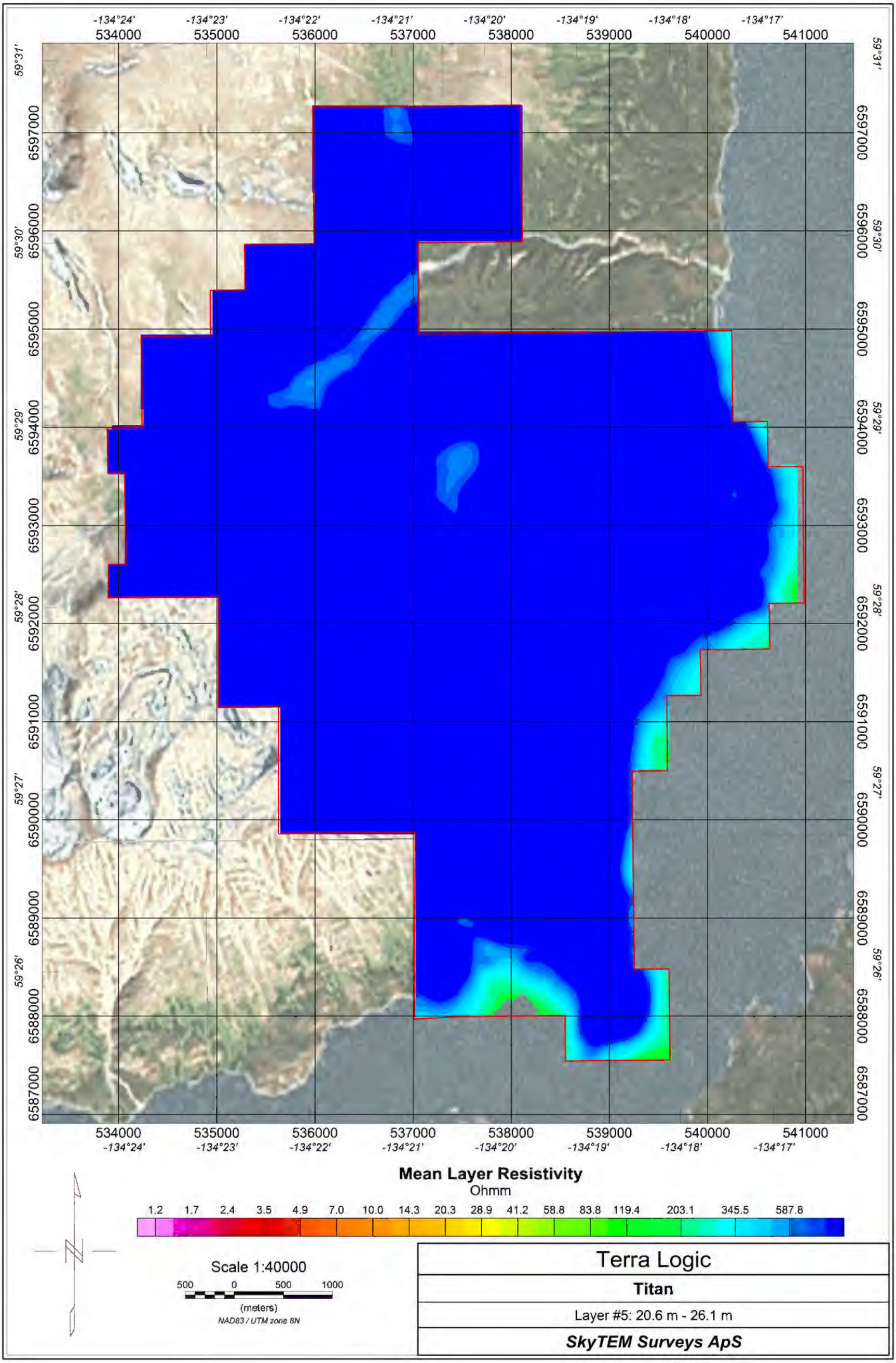
(meters)
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #4: 15.2 m - 20.6 m
SkyTEM Surveys ApS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Mean Layer Resistivity
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2.4
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14.3
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41.2
58.8
83.8
119.4
203.1
345.5
587.8
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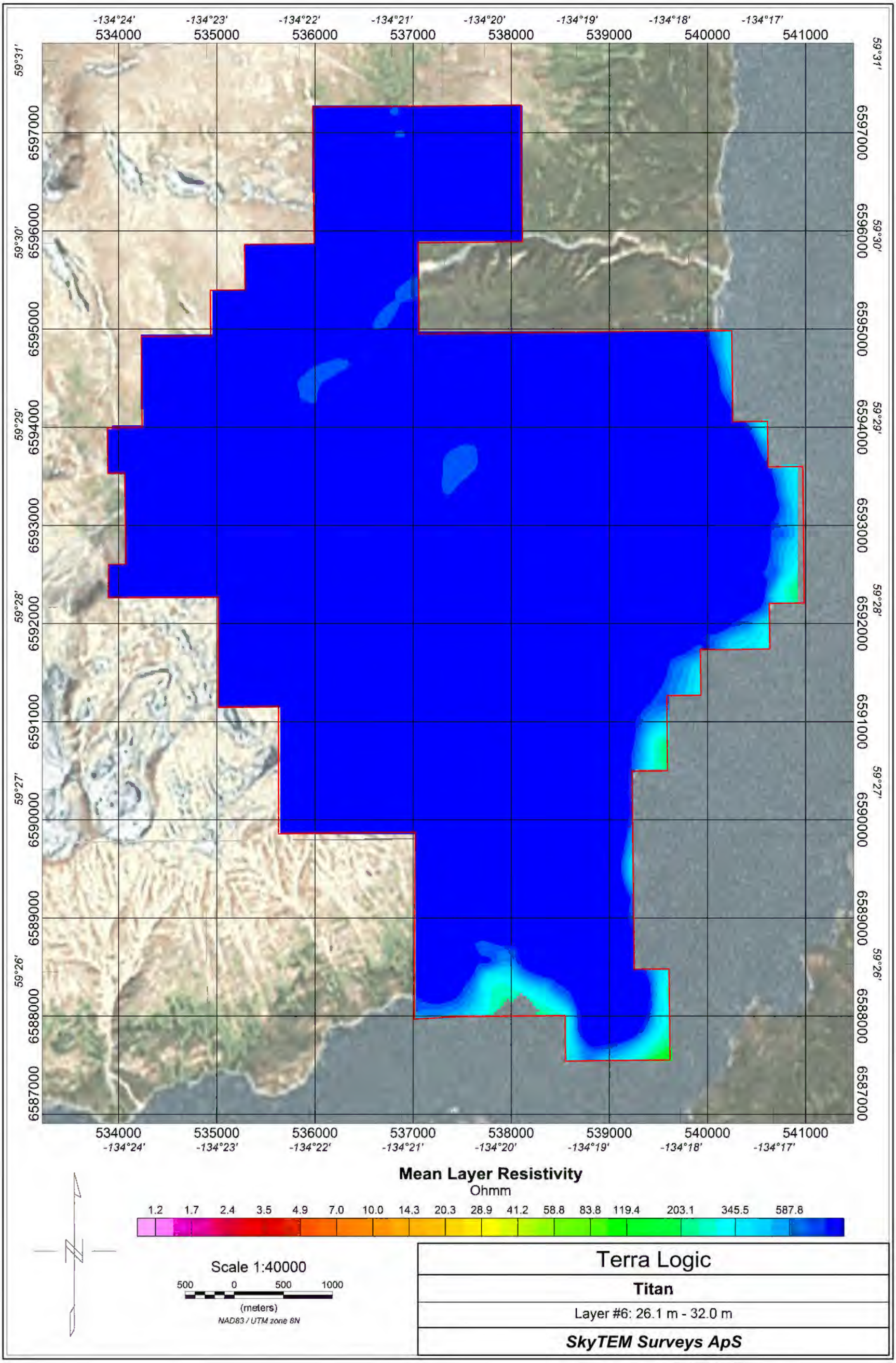
(meters)
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #5: 20.6 m - 26.1 m
SkyTEM Surveys ApS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6590000
6589000
6588000
6587000
Mean Layer Resistivity
Ohmm
1.2 1.7 2.4 3.5 4.9 7.0 10.0 14.3 20.3 28.9 41.2 58.8 83.8 119.4 203.1 345.5 587.8
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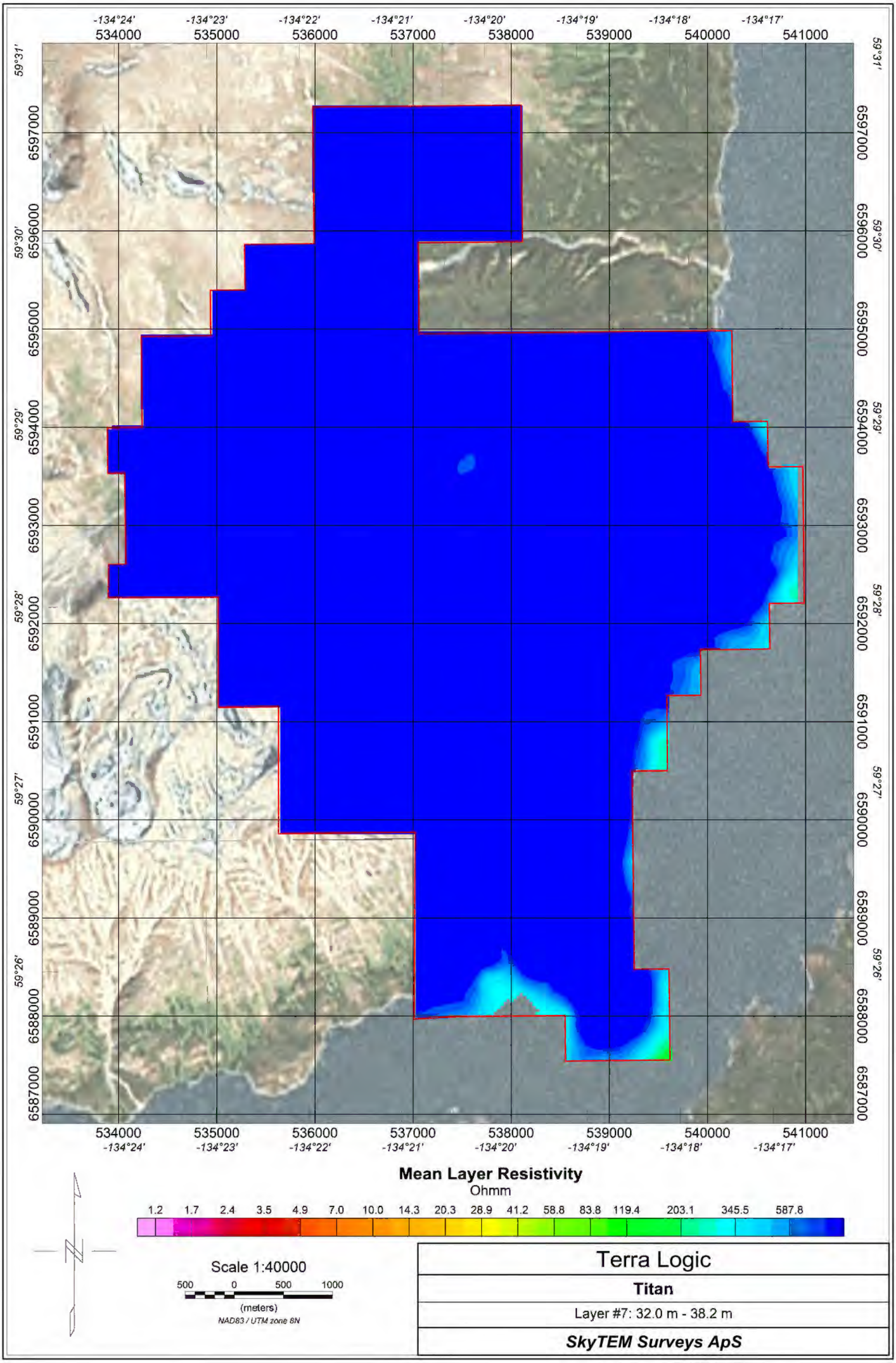
(meters)
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #6: 26.1 m - 32.0 m
SkyTEM Surveys ApS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Mean Layer Resistivity
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Scale 1:40000
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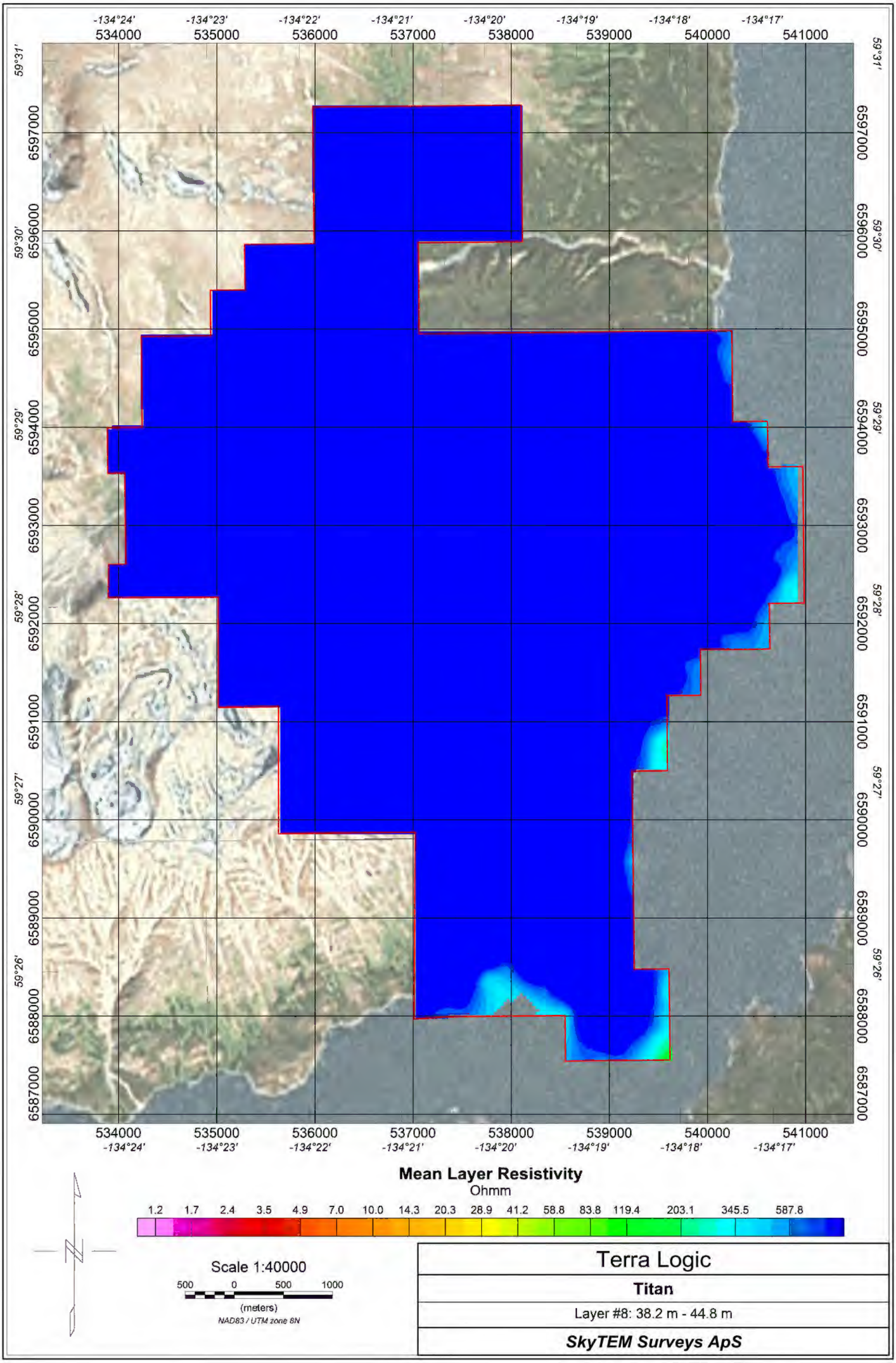
(meters)
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #7: 32.0 m - 38.2 m
SkyTEM Surveys ApS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Mean Layer Resistivity
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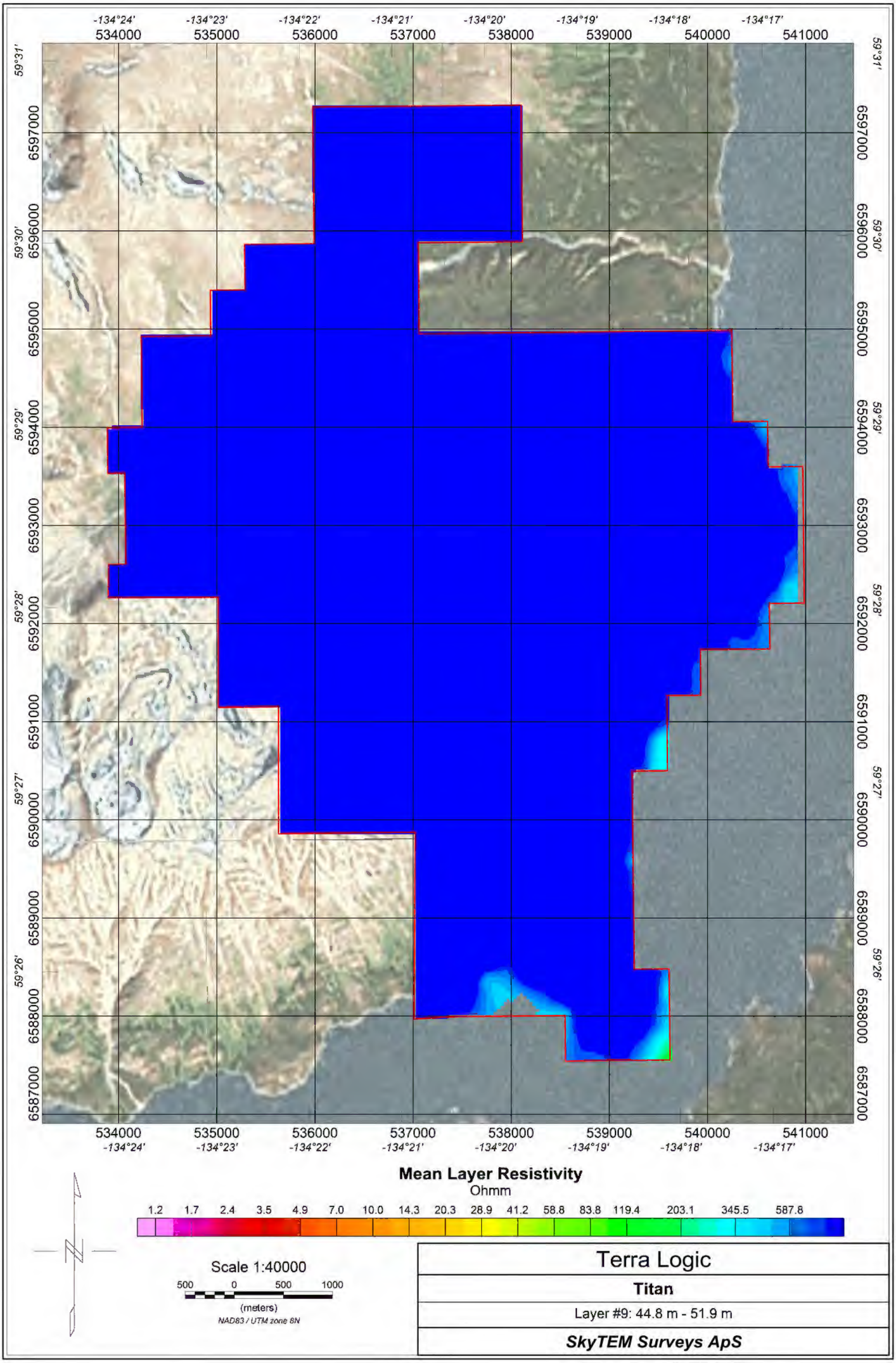
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #8: 38.2 m - 44.8 m
SkyTEM Surveys ApS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Mean Layer Resistivity
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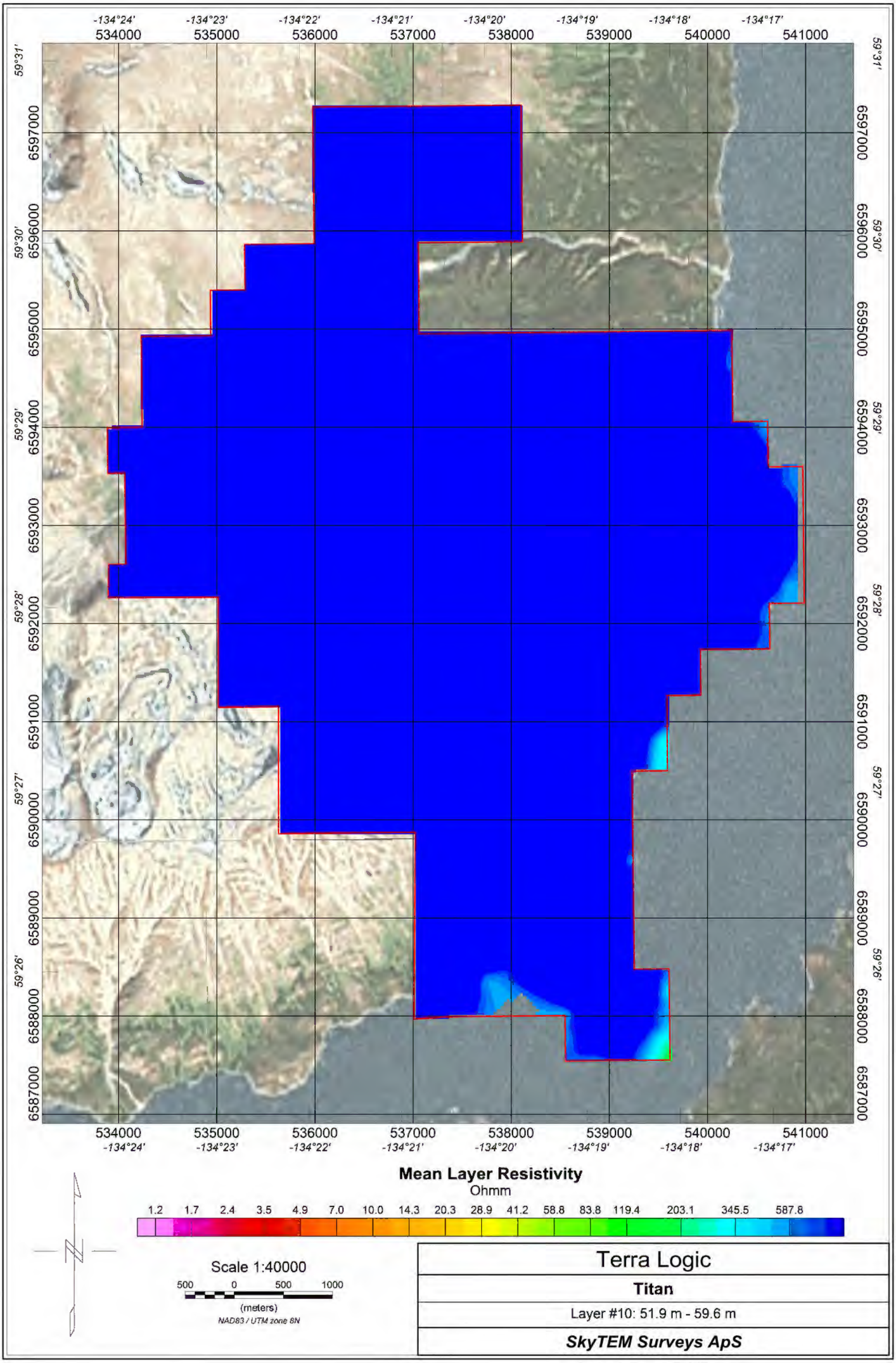
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #9: 44.8 m - 51.9 m
SkyTEM Surveys ApS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Mean Layer Resistivity
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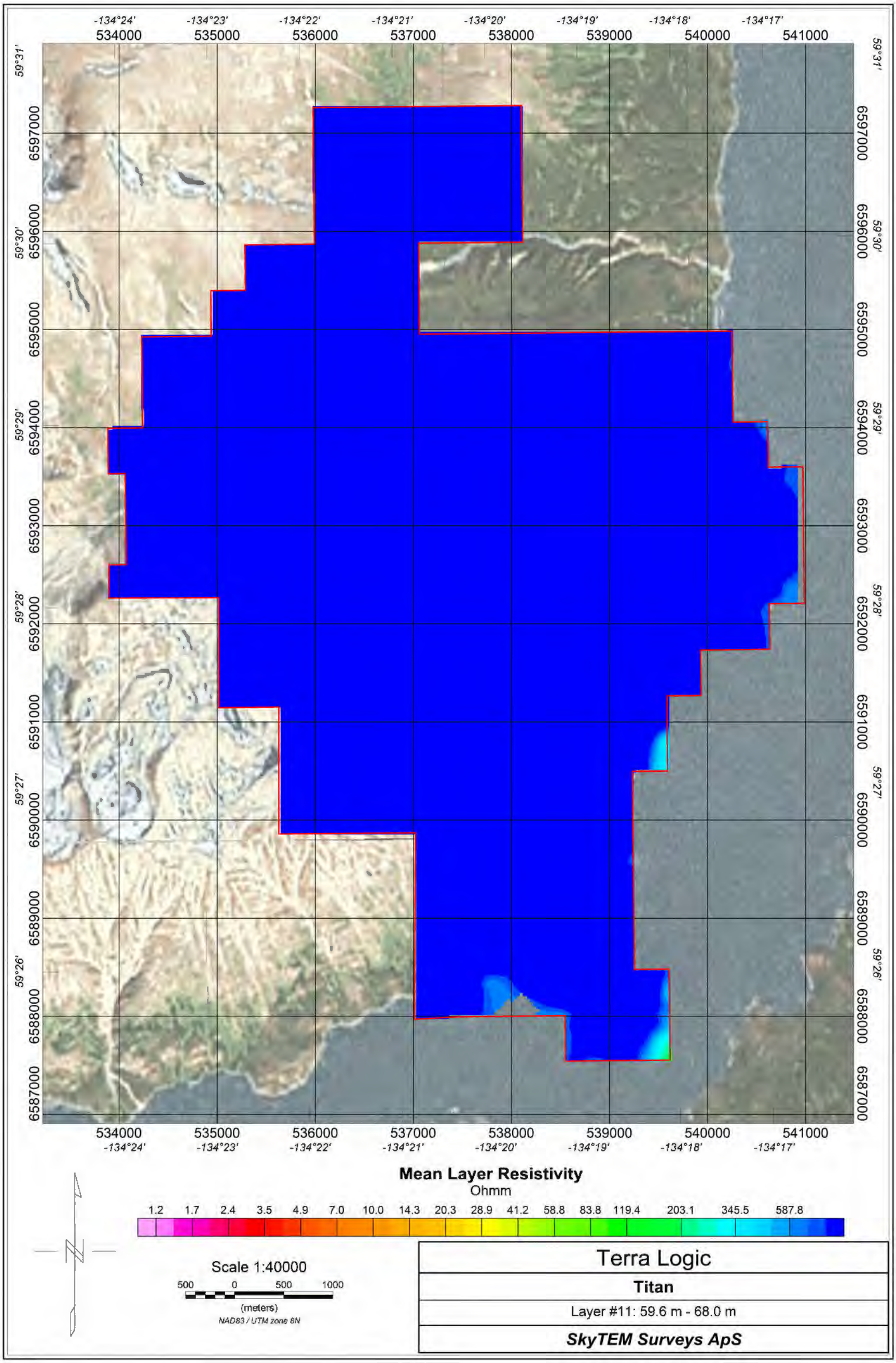
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #10: 51.9 m - 59.6 m
SkyTEM Surveys ApS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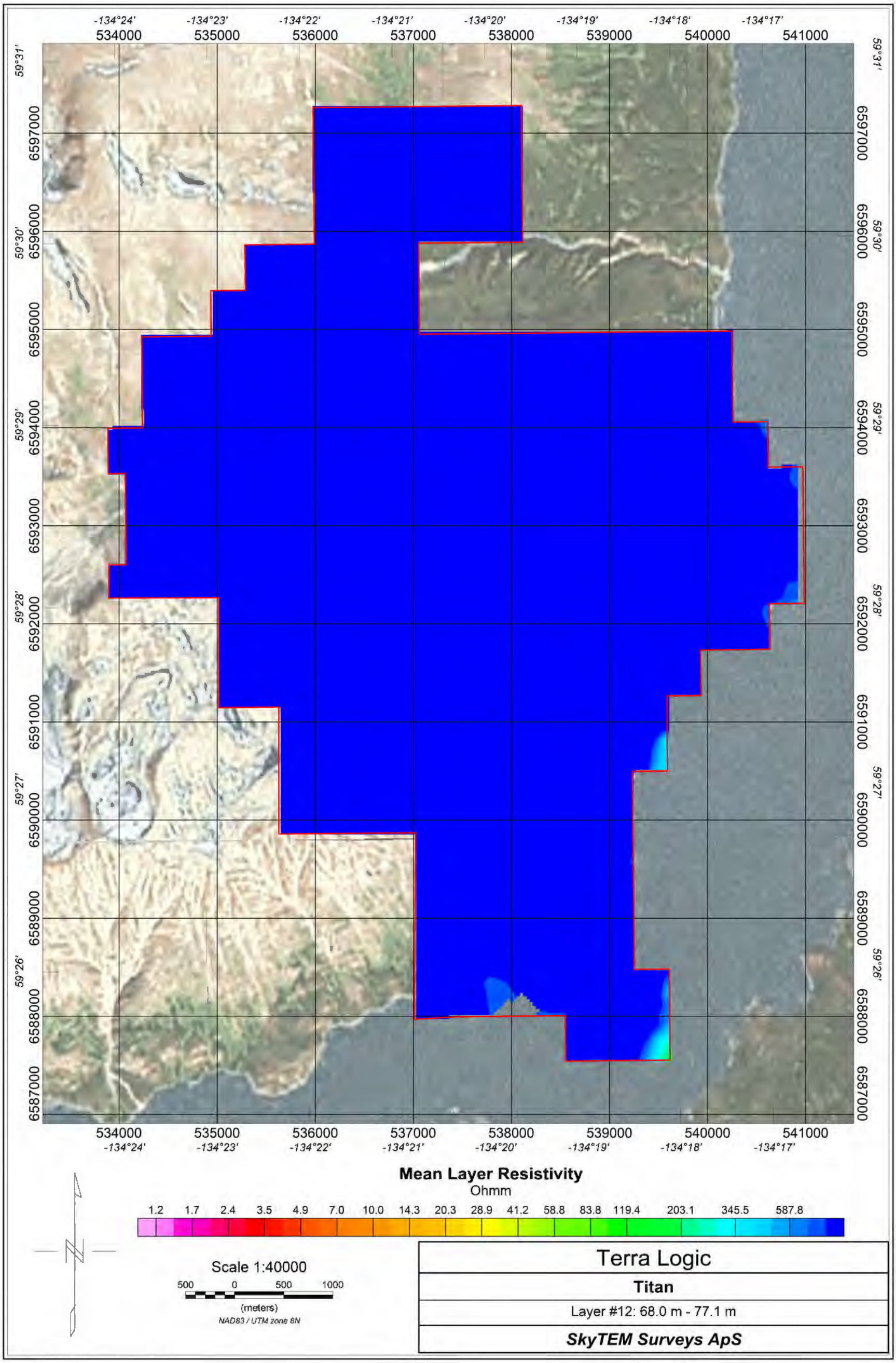
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #11: 59.6 m - 68.0 m
SkyTEM Surveys ApS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Mean Layer Resistivity
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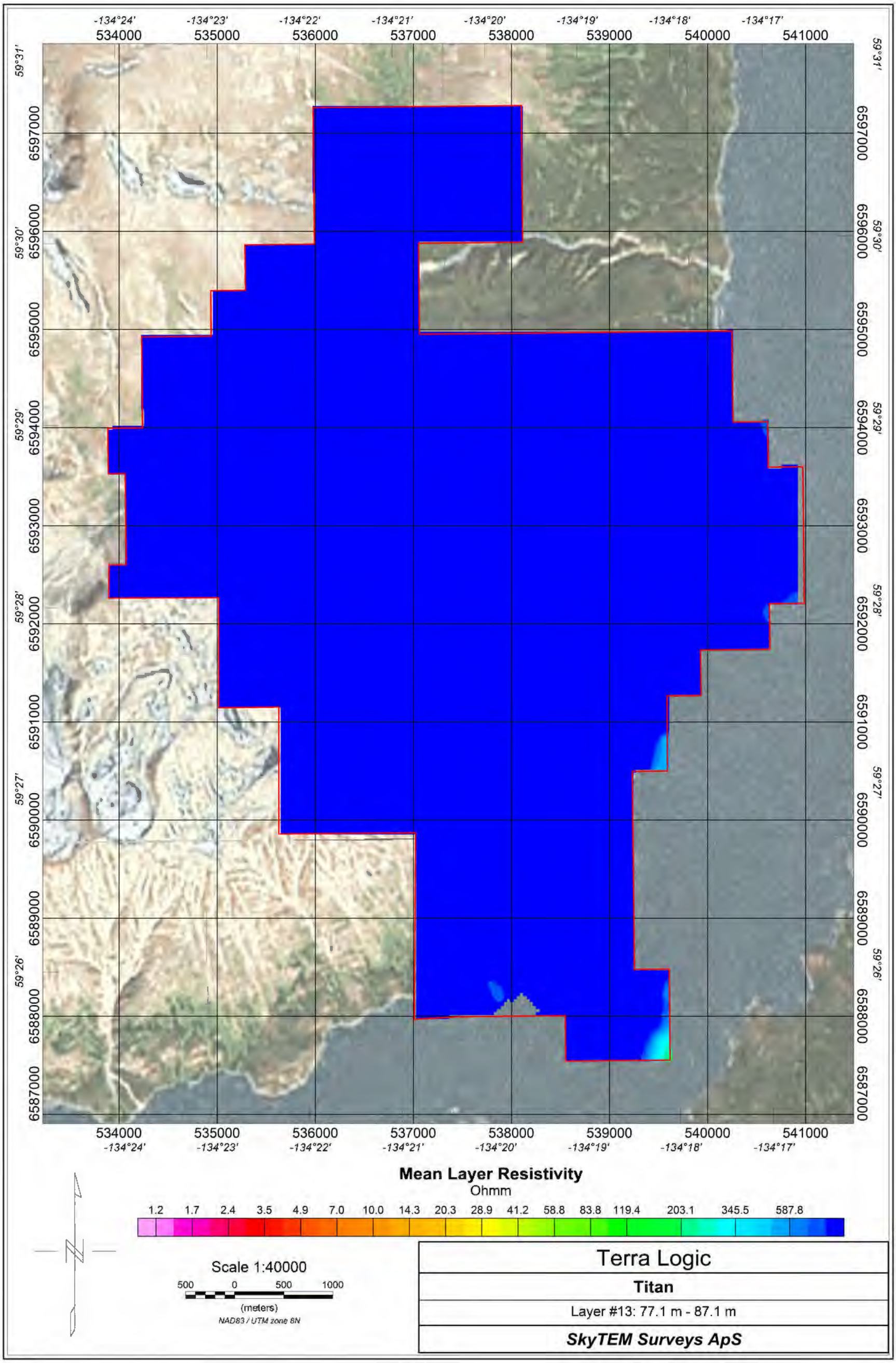
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #12: 68.0 m - 77.1 m
SkyTEM Surveys ApS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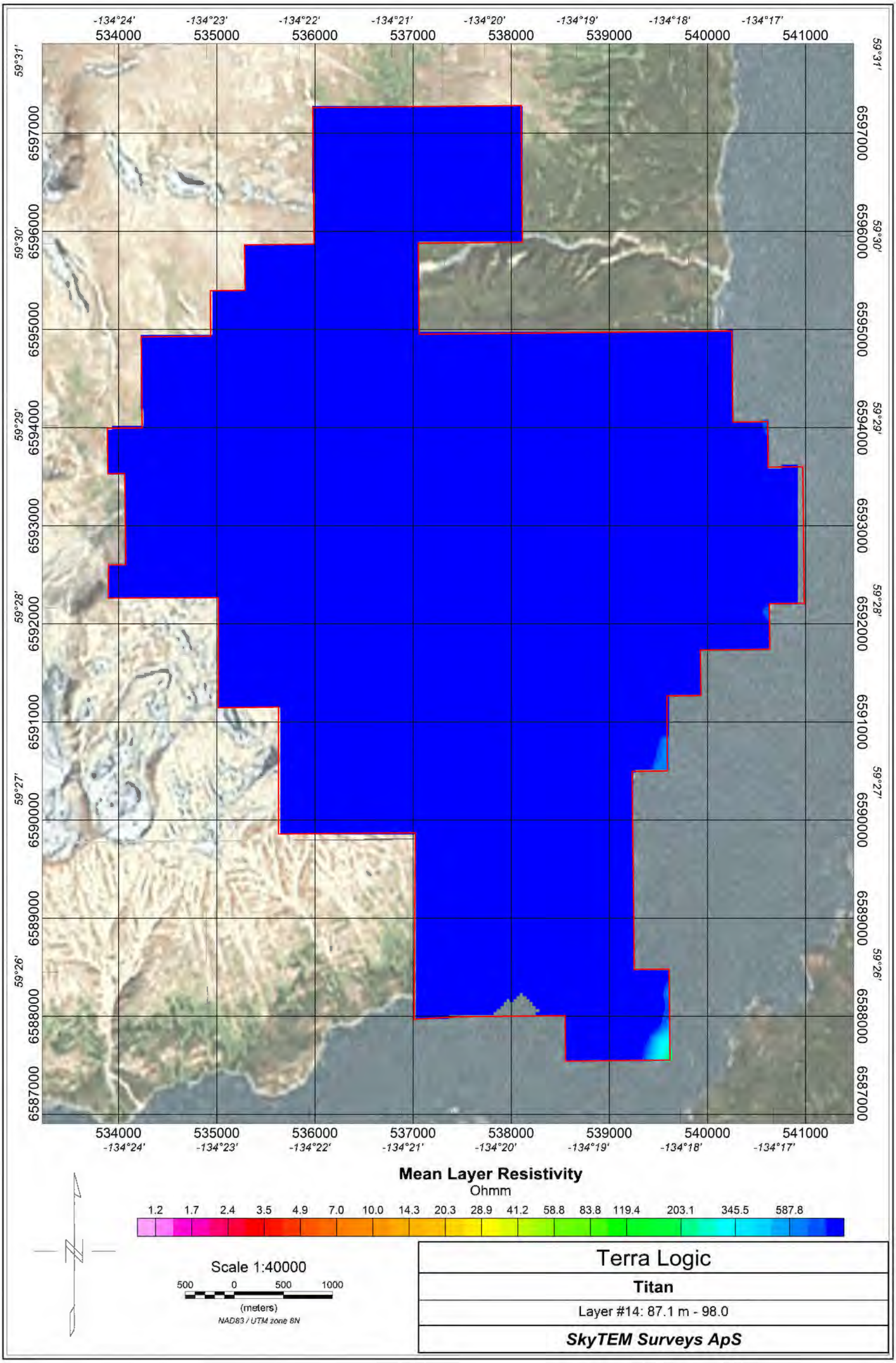
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #13: 77.1 m - 87.1 m
SkyTEM Surveys ApS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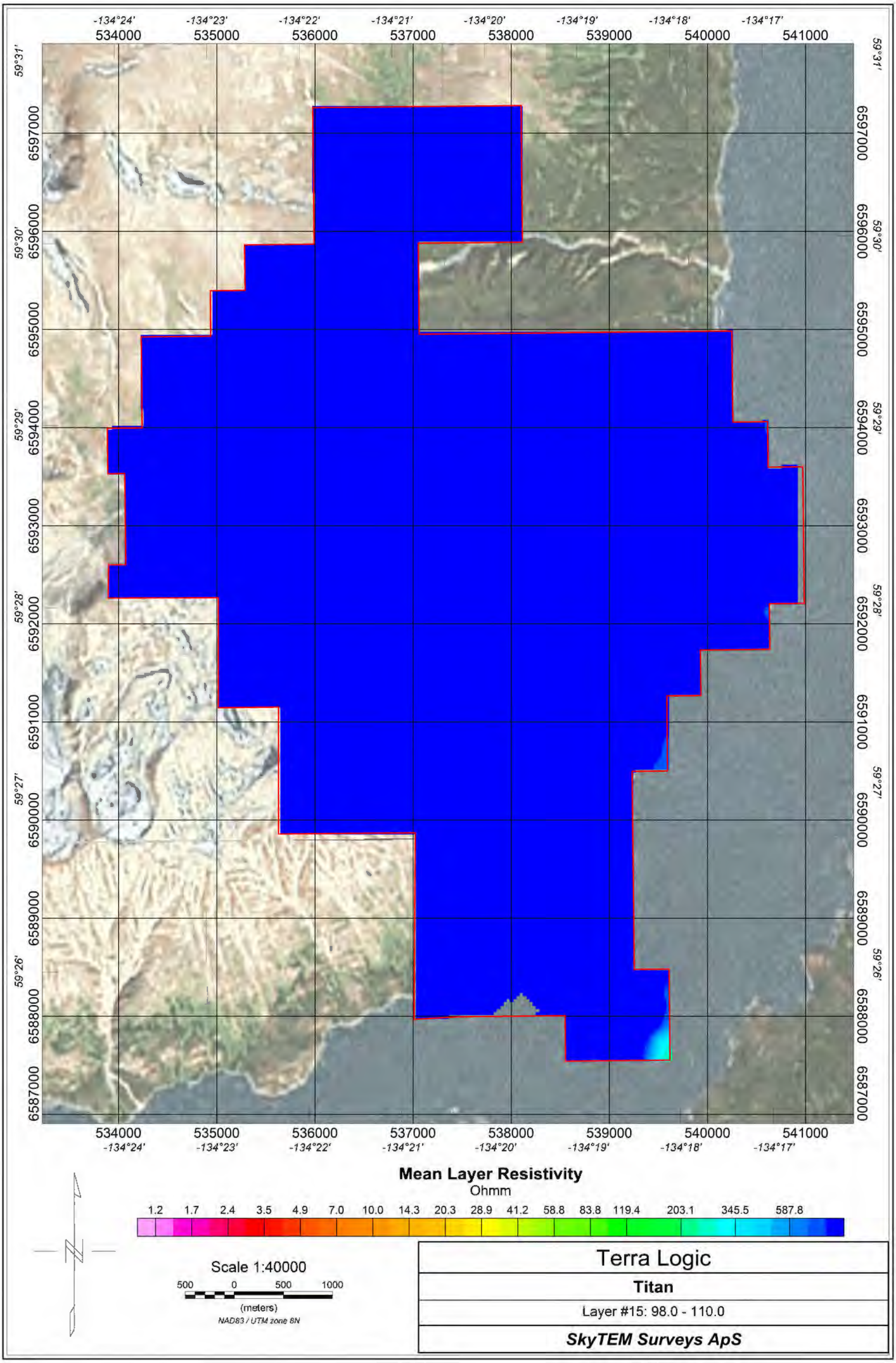
(meters)
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #14: 87.1 m - 98.0
SkyTEM Surveys ApS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Mean Layer Resistivity
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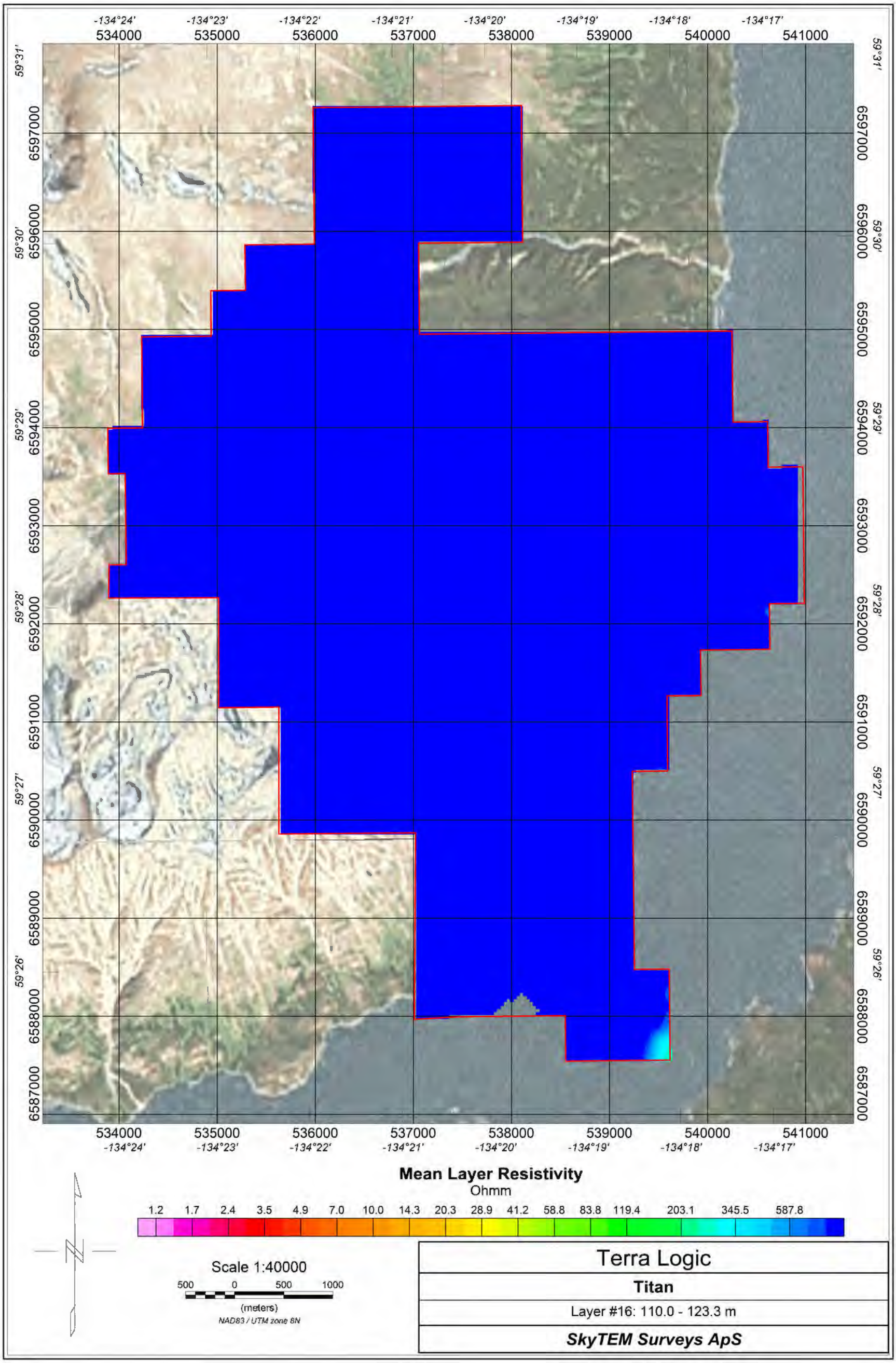
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #15: 98.0 - 110.0
SkyTEM Surveys ApS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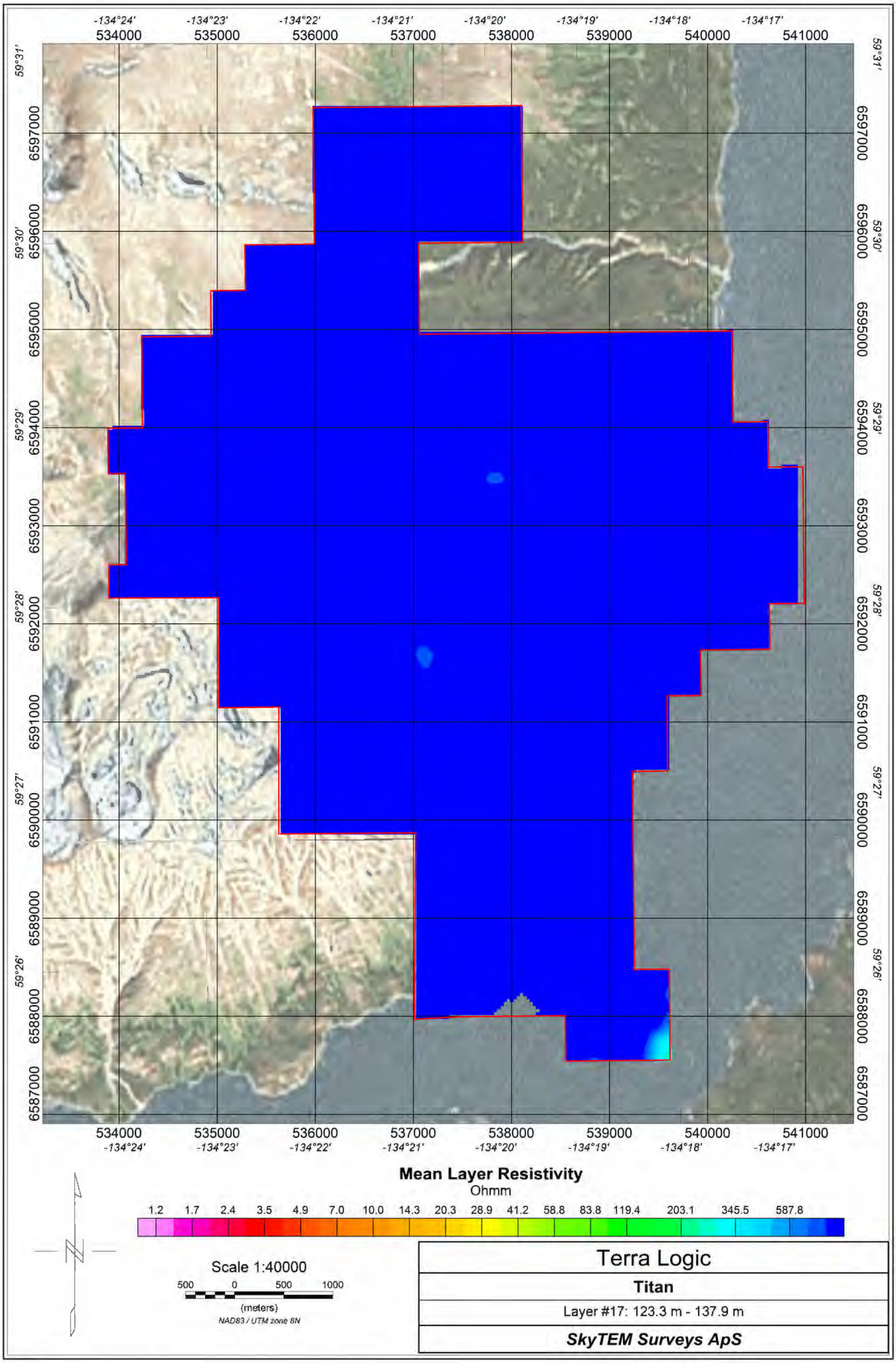
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #16: 110.0 - 123.3 m
SkyTEM Surveys ApS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Mean Layer Resistivity
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587.8
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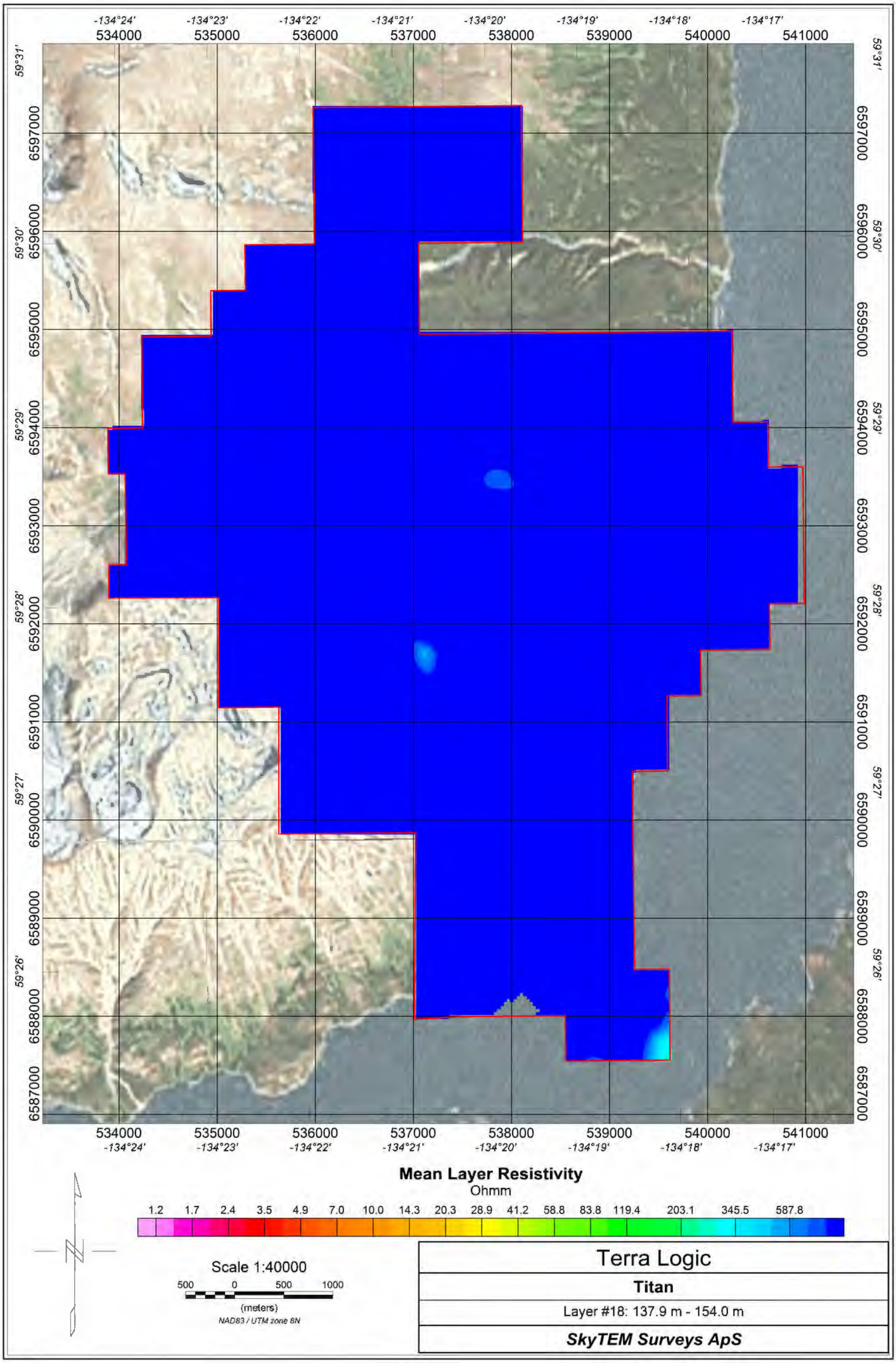
(meters)
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #17: 123.3 m - 137.9 m
SkyTEM Surveys ApS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Mean Layer Resistivity
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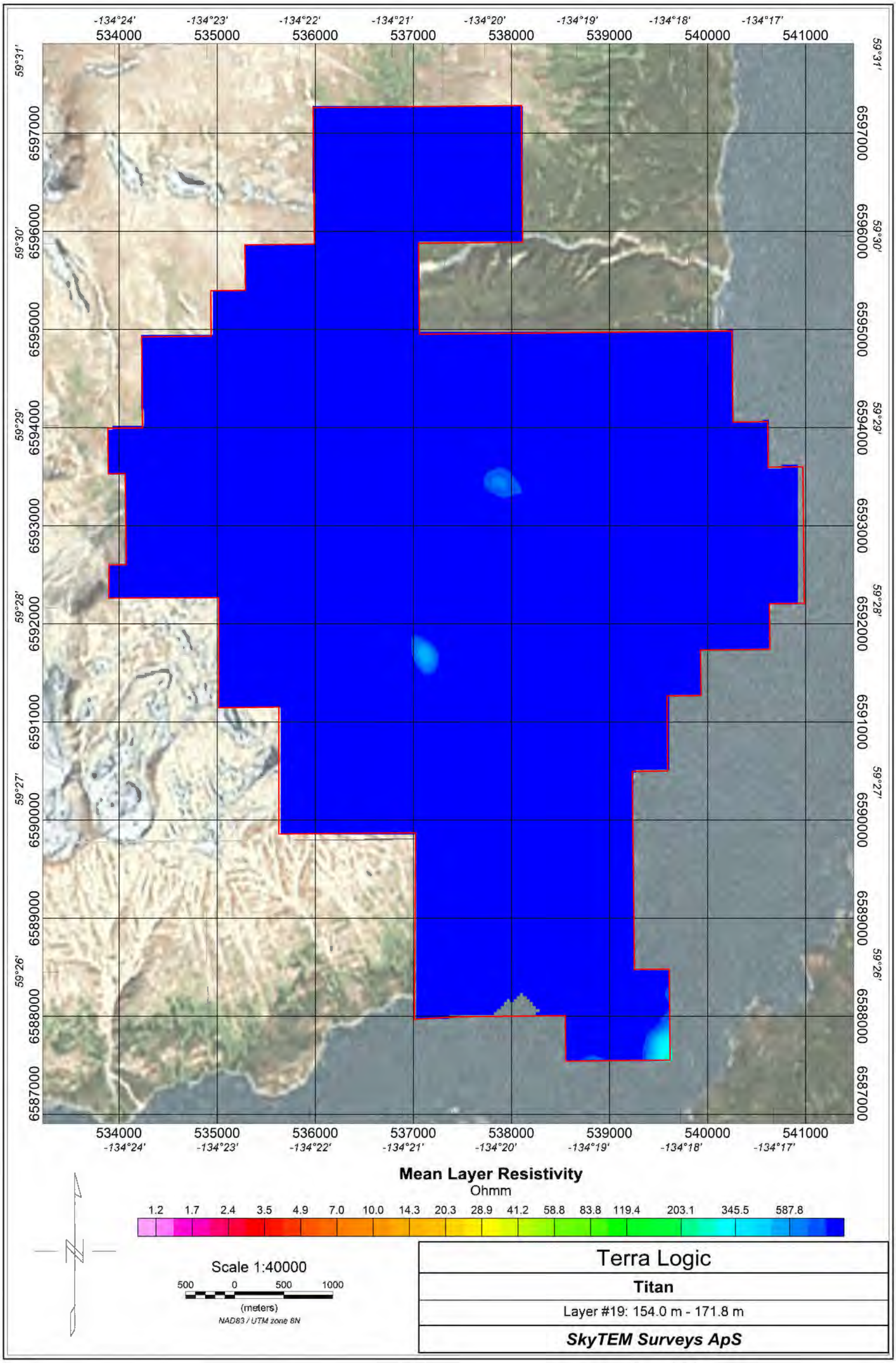
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #18: 137.9 m - 154.0 m
SkyTEM Surveys ApS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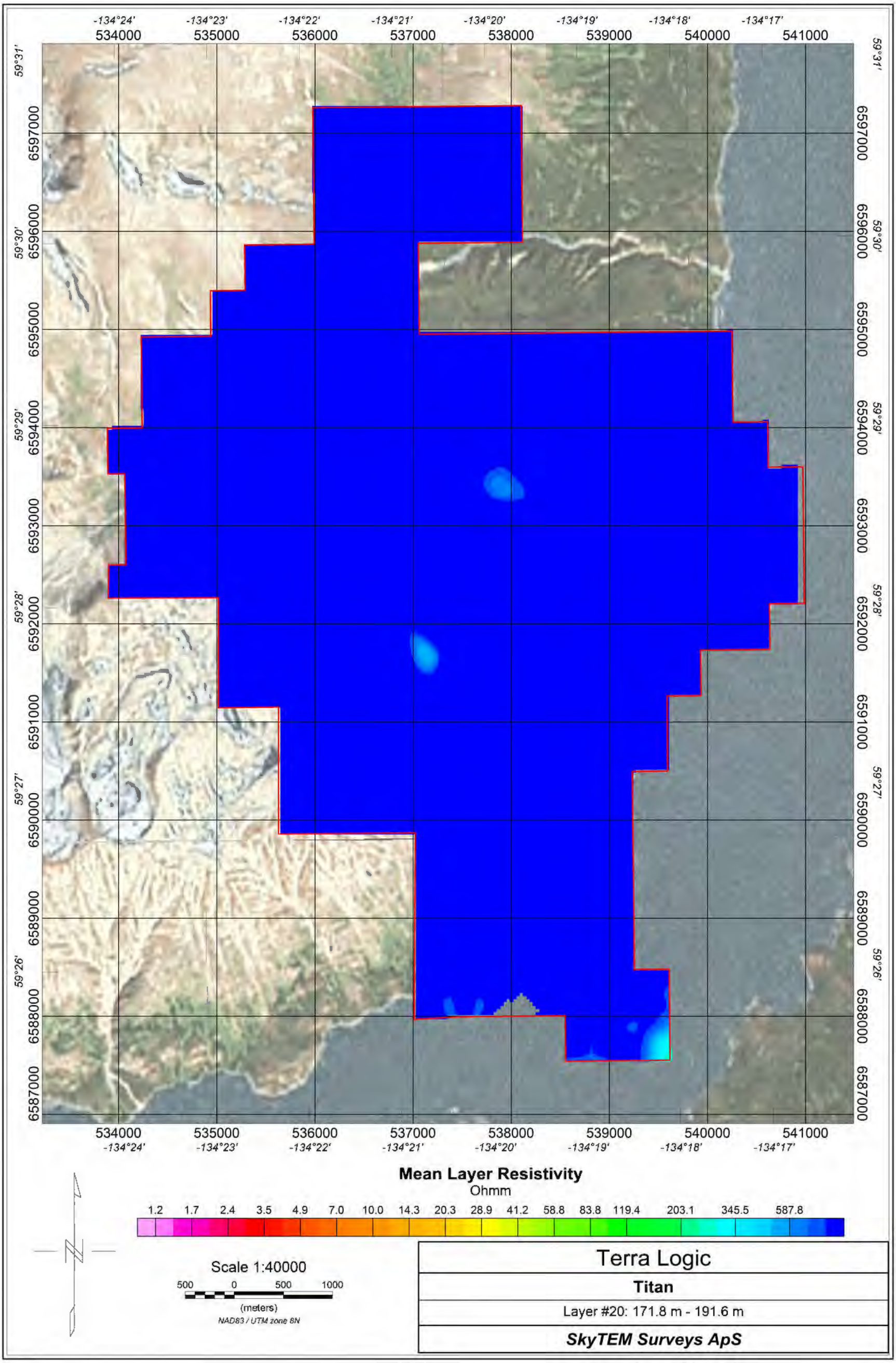
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #19: 154.0 m - 171.8 m
SkyTEM Surveys ApS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Mean Layer Resistivity
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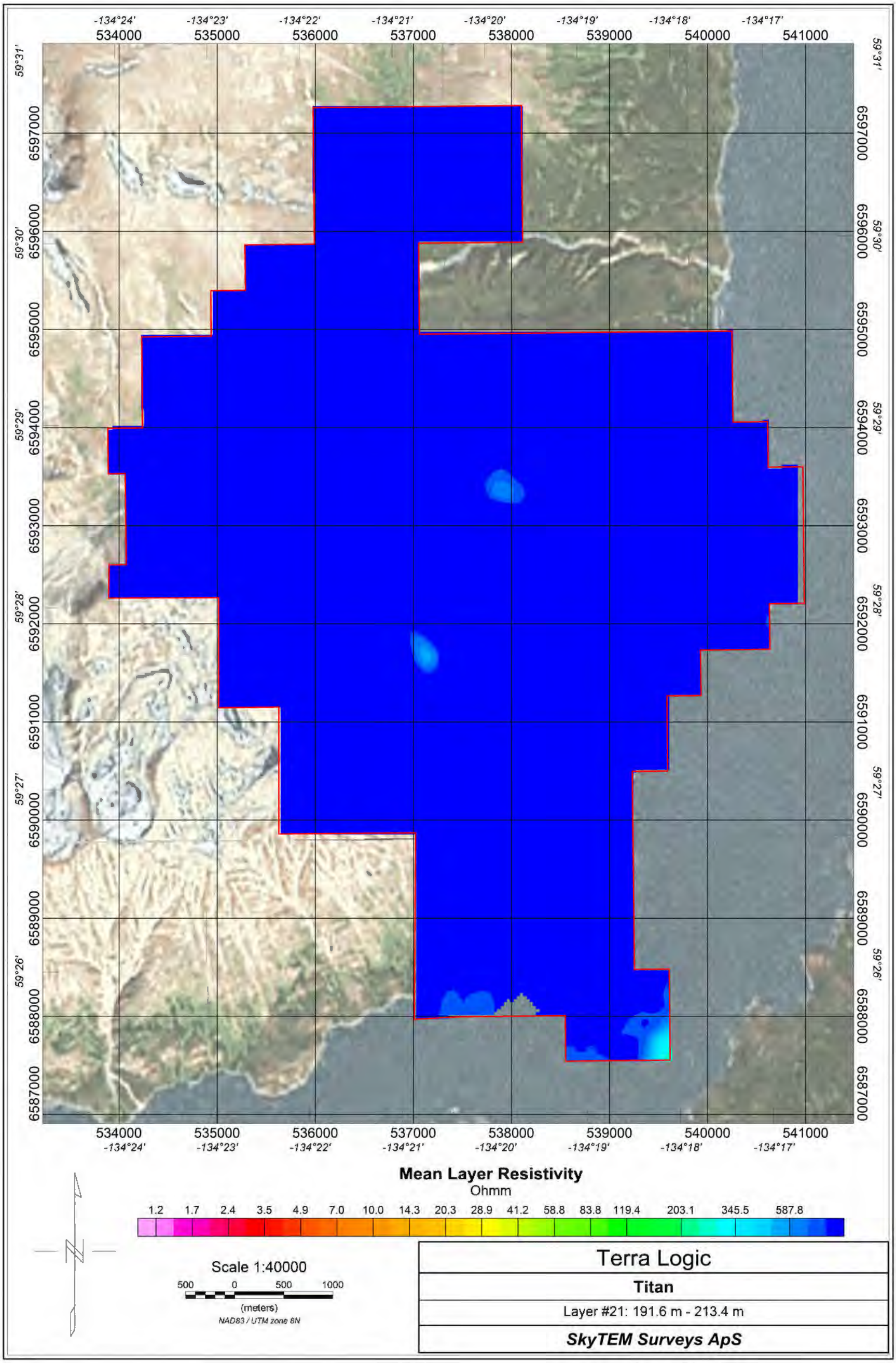
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #20: 171.8 m - 191.6 m
SkyTEM Surveys ApS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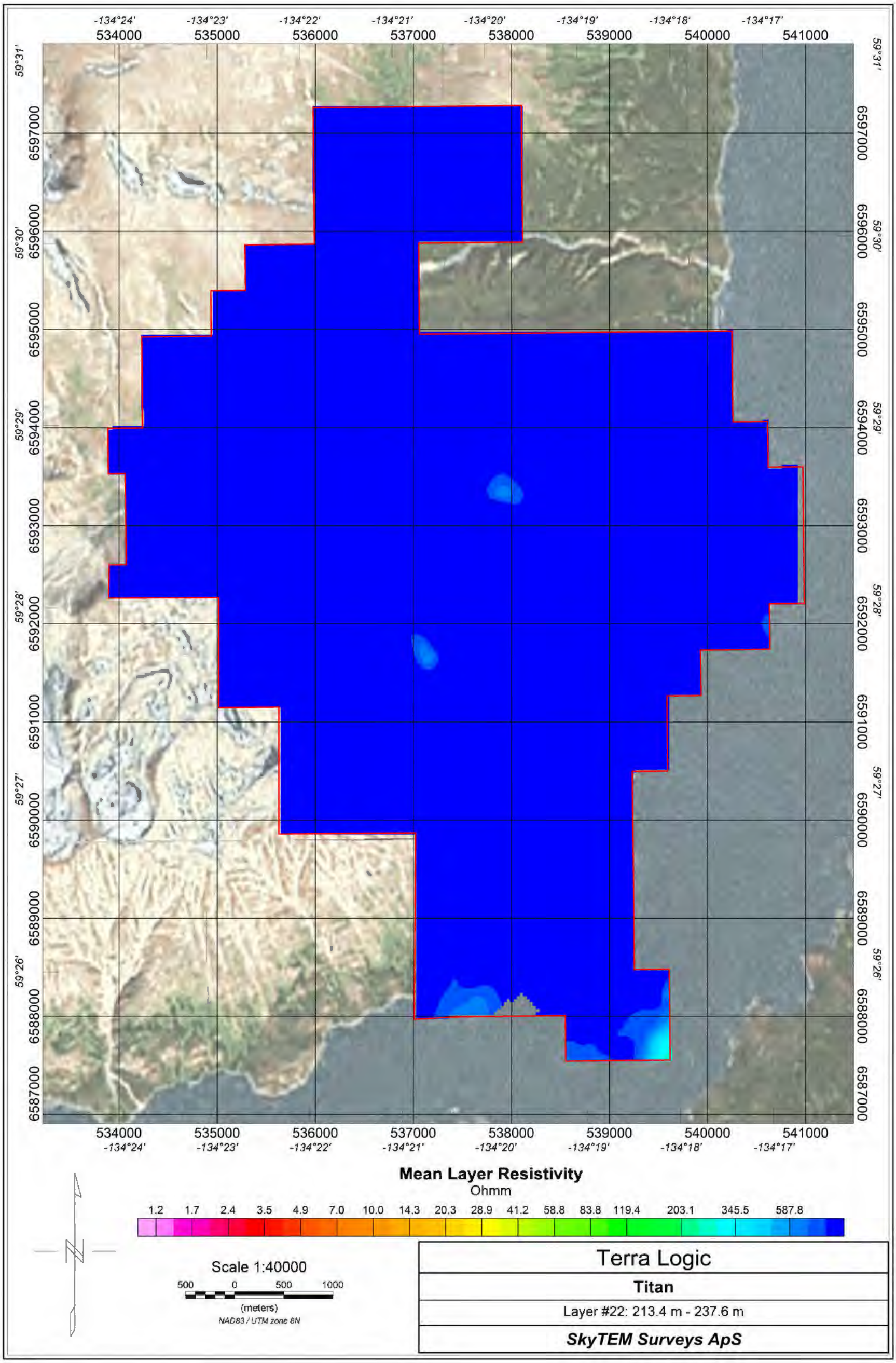
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #21: 191.6 m - 213.4 m
SkyTEM Surveys ApS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Mean Layer Resistivity
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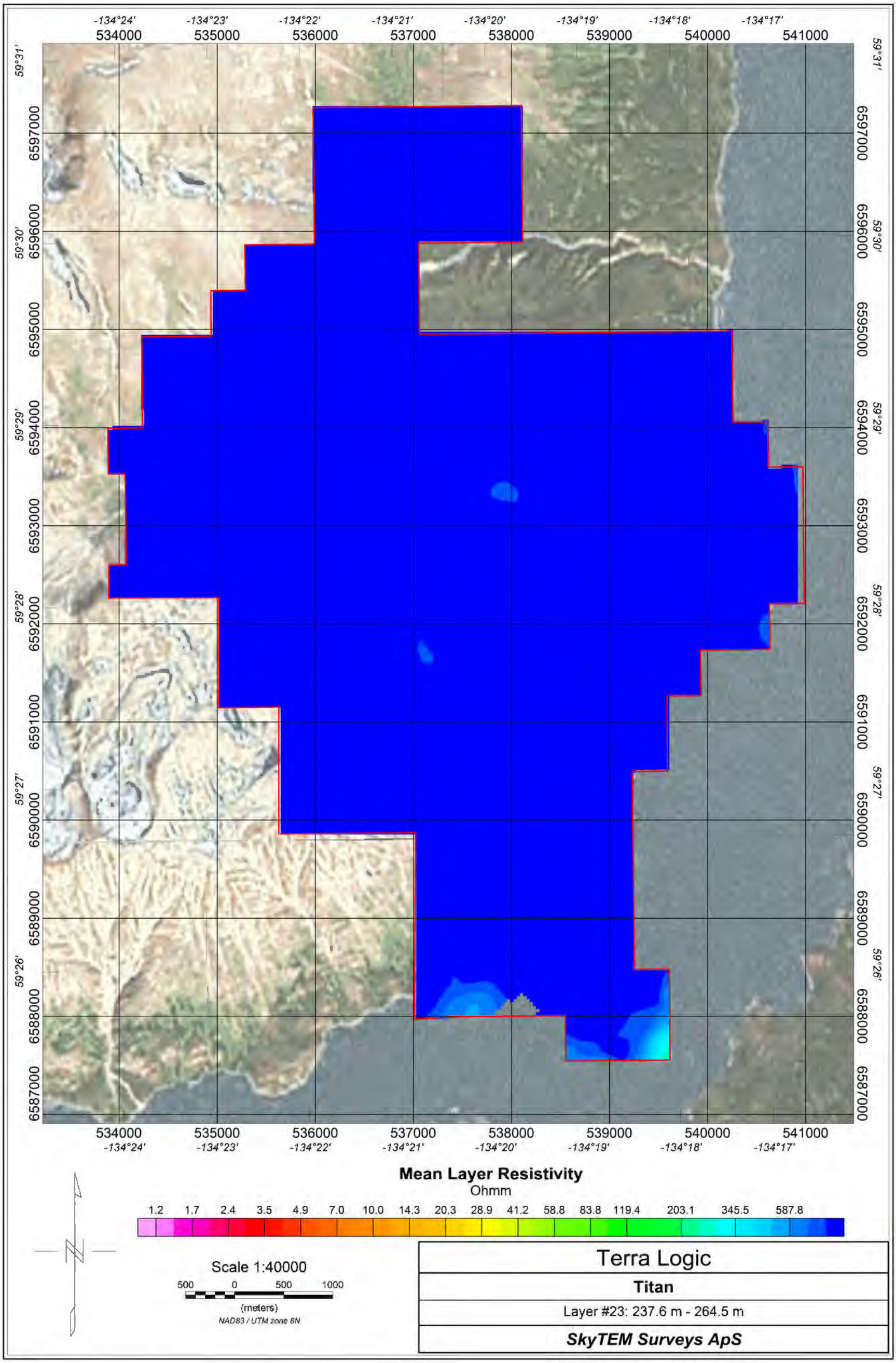
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #22: 213.4 m - 237.6 m
SkyTEM Surveys ApS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Mean Layer Resistivity
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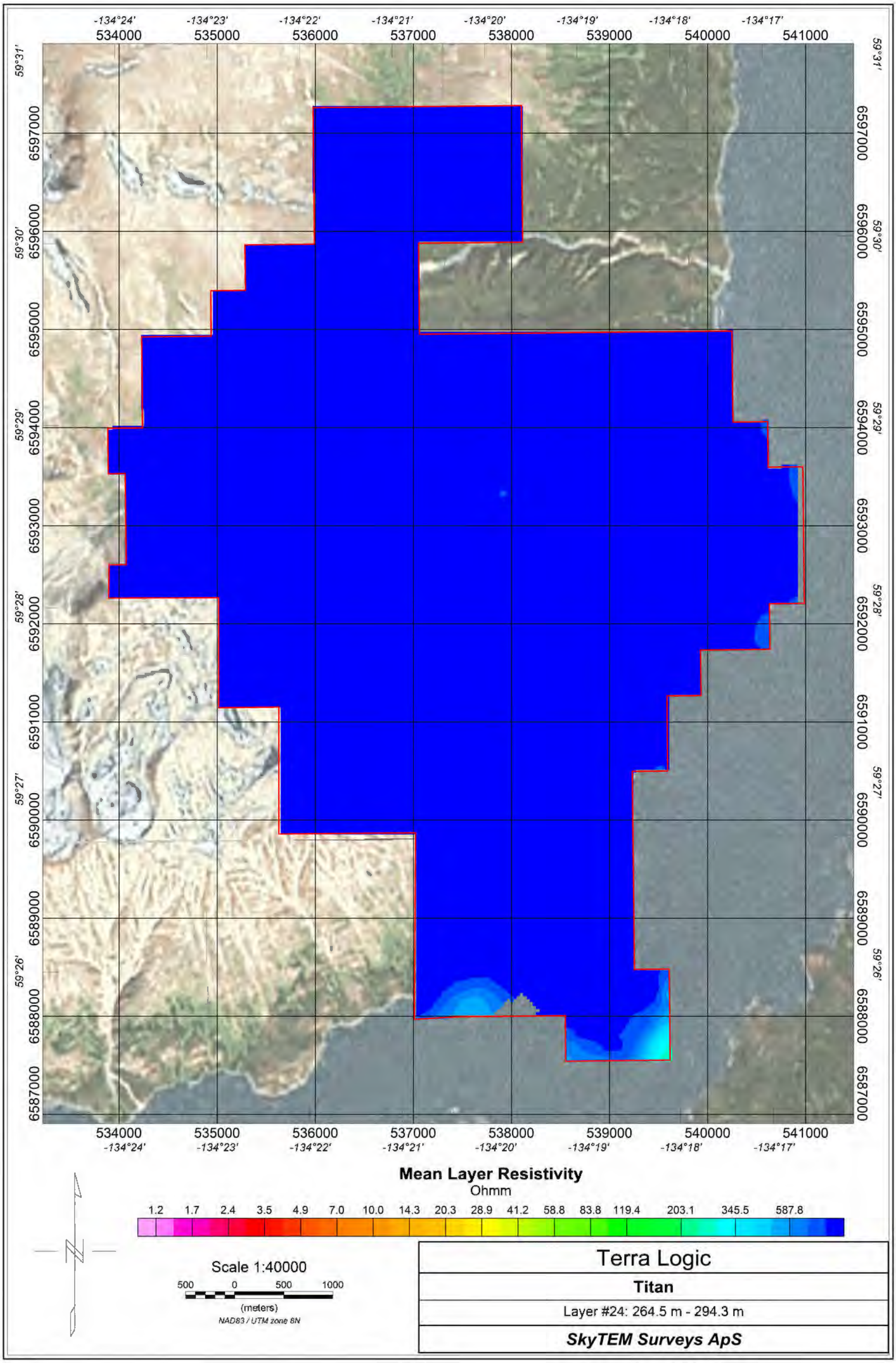
(meters)
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #23: 237.6 m - 264.5 m
SkyTEM Surveys ApS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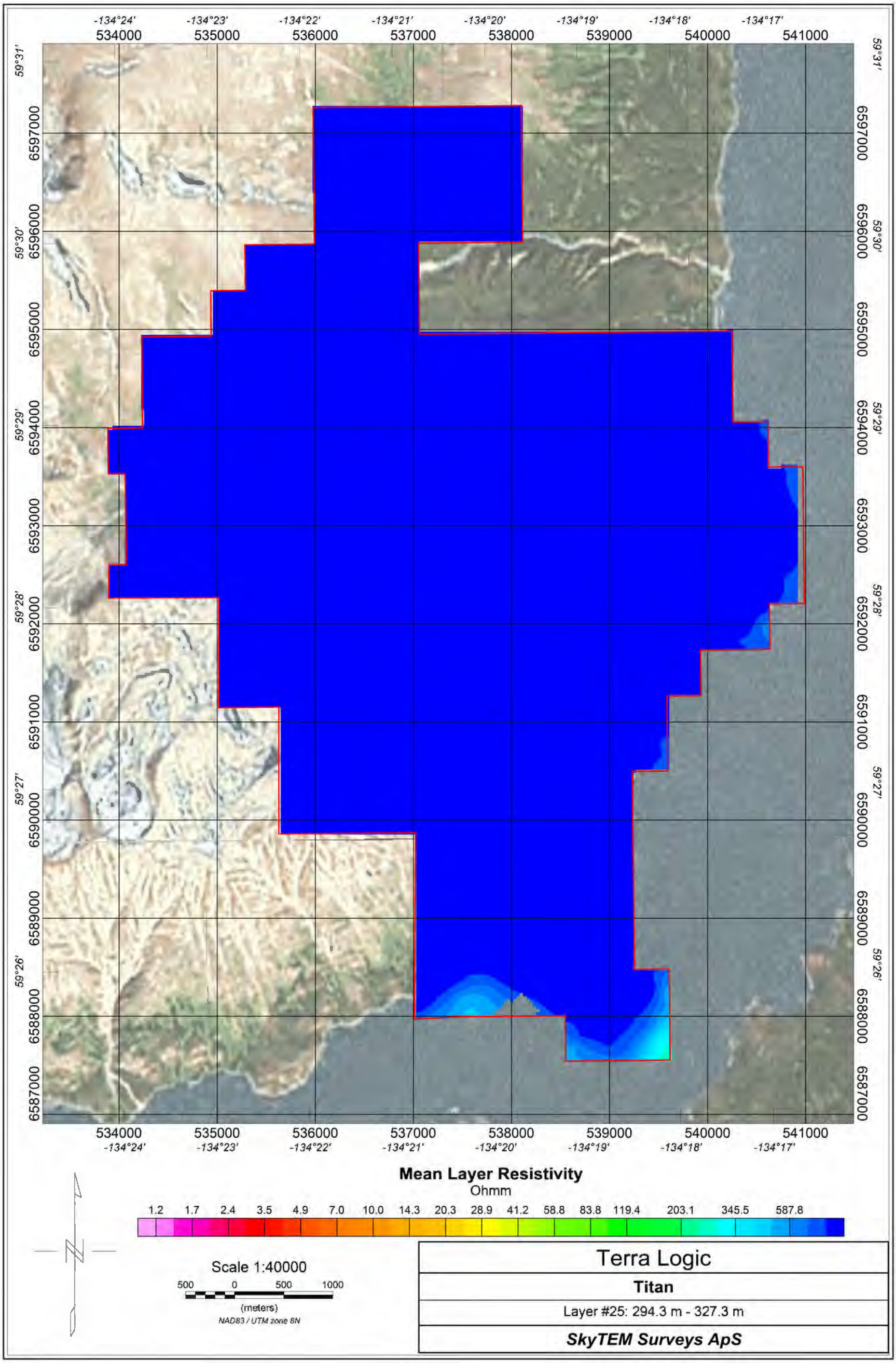
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #24: 264.5 m - 294.3 m
SkyTEM Surveys ApS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Mean Layer Resistivity
Ohmm
1.2 1.7 2.4 3.5 4.9 7.0 10.0 14.3 20.3 28.9 41.2 58.8 83.8 119.4 203.1 345.5 587.8
Scale 1:40000
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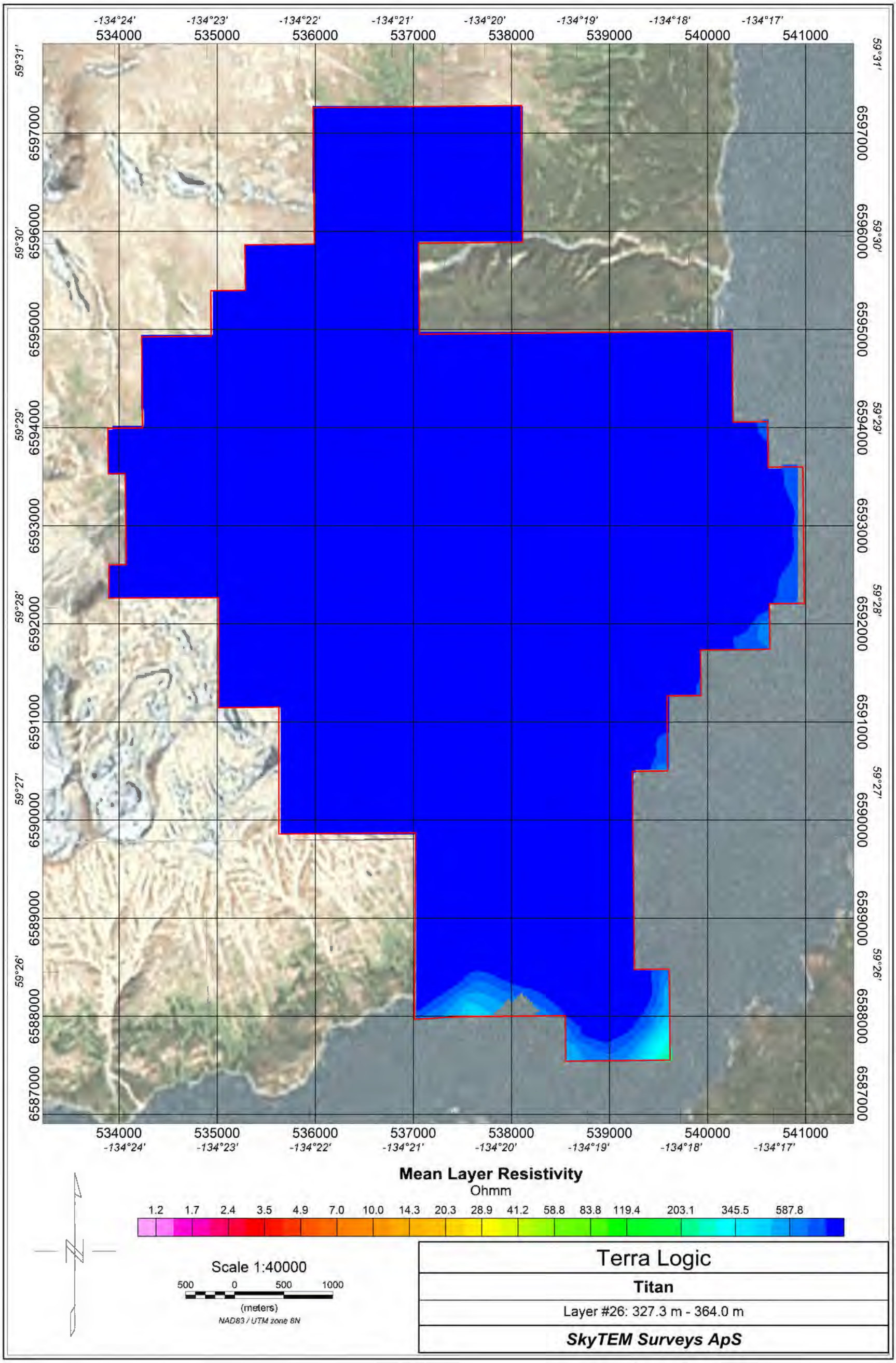
(meters)
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #25: 294.3 m - 327.3 m
SkyTEM Surveys ApS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Mean Layer Resistivity
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587.8
Scale 1:40000
500
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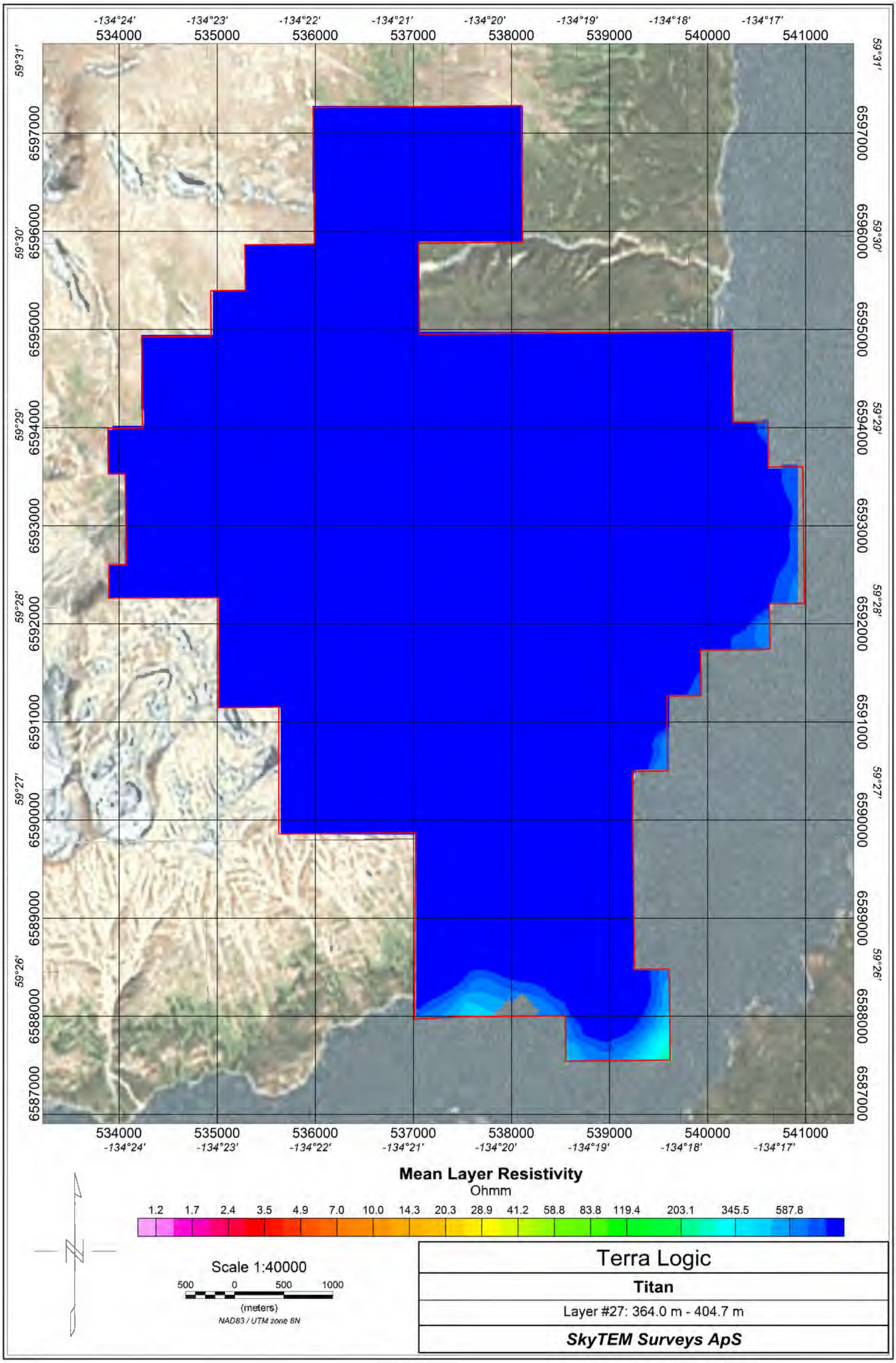
(meters)
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #26: 327.3 m - 364.0 m
SkyTEM Surveys ApS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Mean Layer Resistivity
Ohmm
1.2 1.7 2.4 3.5 4.9 7.0 10.0 14.3 20.3 28.9 41.2 58.8 83.8 119.4 203.1 345.5 587.8
Scale 1:40000
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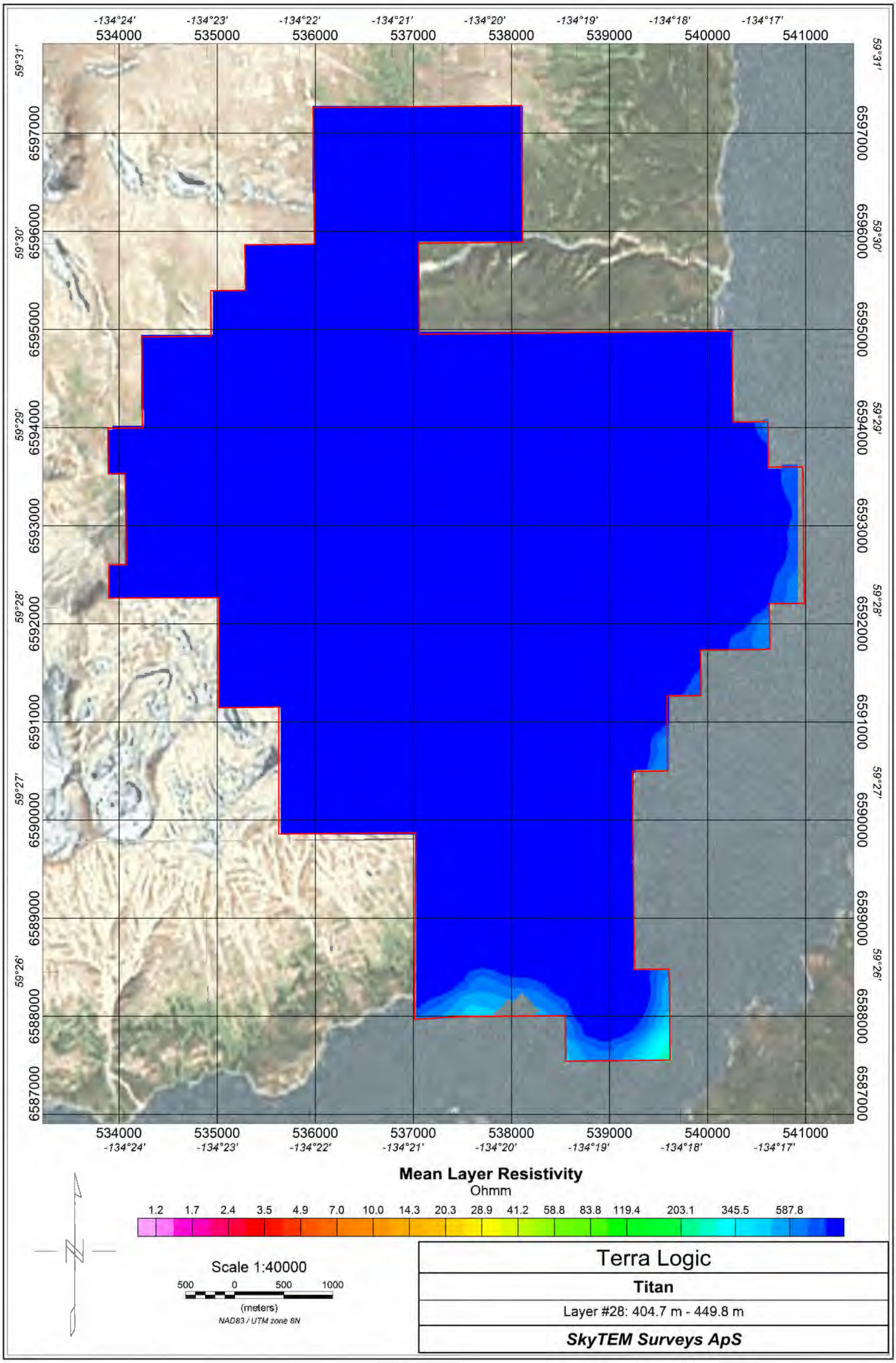
(meters)
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #27: 364.0 m - 404.7 m
SkyTEM Surveys ApS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Mean Layer Resistivity
Ohmm
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Scale 1:40000
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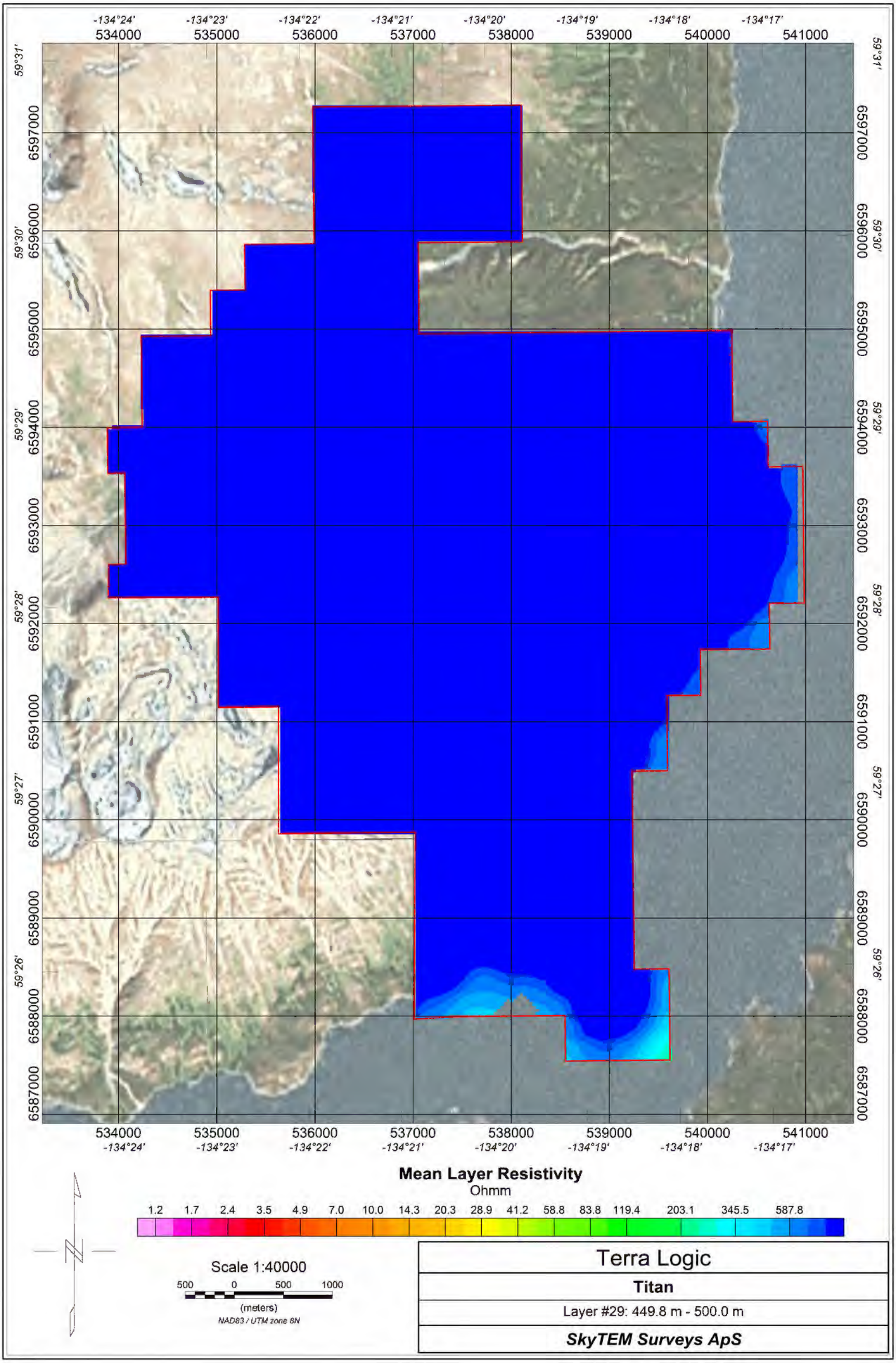
(meters)
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #28: 404.7 m - 449.8 m
SkyTEM Surveys ApS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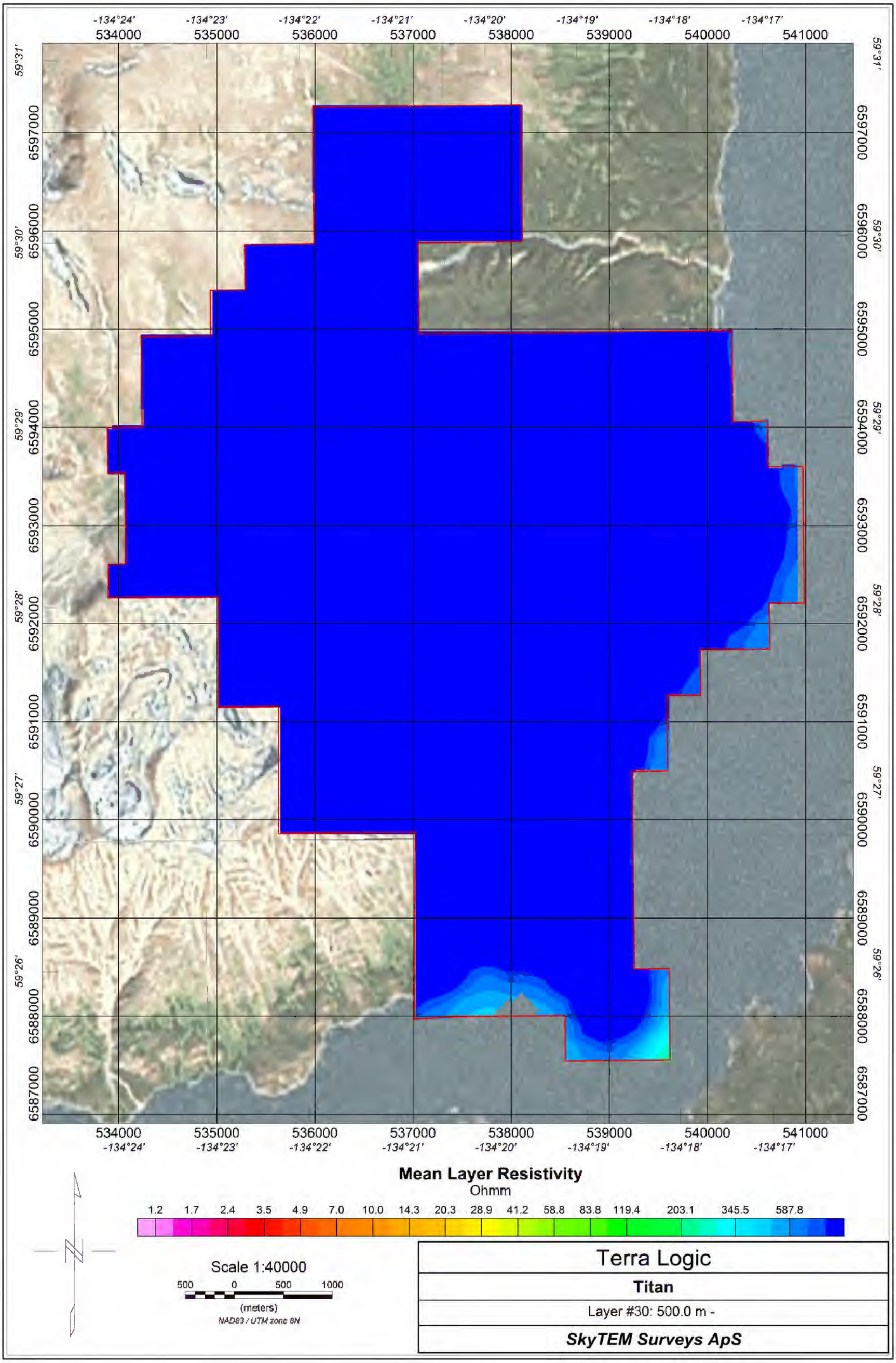
Mean Layer Resistivity
Ohmm
1.2 1.7 2.4 3.5 4.9 7.0 10.0 14.3 20.3 28.9 41.2 58.8 83.8 119.4 203.1 345.5 587.8
Scale 1:40000
500 0 500 1000
(meters)
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #29: 449.8 m - 500.0 m
SkyTEM Surveys ApS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Mean Layer Resistivity
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4.9
7.0
10.0
14.3
20.3
28.9
41.2
58.8
83.8
119.4
203.1
345.5
587.8
Scale 1:40000
500
0
500
1000
(meters)
NAD83 / UTM zone 8N
Terra Logic
Titan
Layer #30: 500.0 m -
SkyTEM Surveys ApS