

**BC Geological Survey  
Assessment Report  
32097**

**ASSESSMENT REPORT**

on the

**MILLIGAN NORTH PROPERTY**

**MTO Event # 4813022**

**OMINECA MINING DIVISION,  
British Columbia  
Latitude 55°11' N, Longitude 124°8.5' W**

**Prepared for Operator:**

**FJORDLAND EXPLORATION INC.  
1100 – 1111 Melville Street  
Vancouver, B.C., Canada V6E 3V6**

**By:**

**L. John Peters,  
B.Sc., P.Geo.**

**15 February, 2011  
Vancouver, B.C.**

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### **Appendices**

- Appendix A: Laboratory Certificates
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## **1. SUMMARY**

This report covers MTO Event 4813022 dated 29 November 2010.

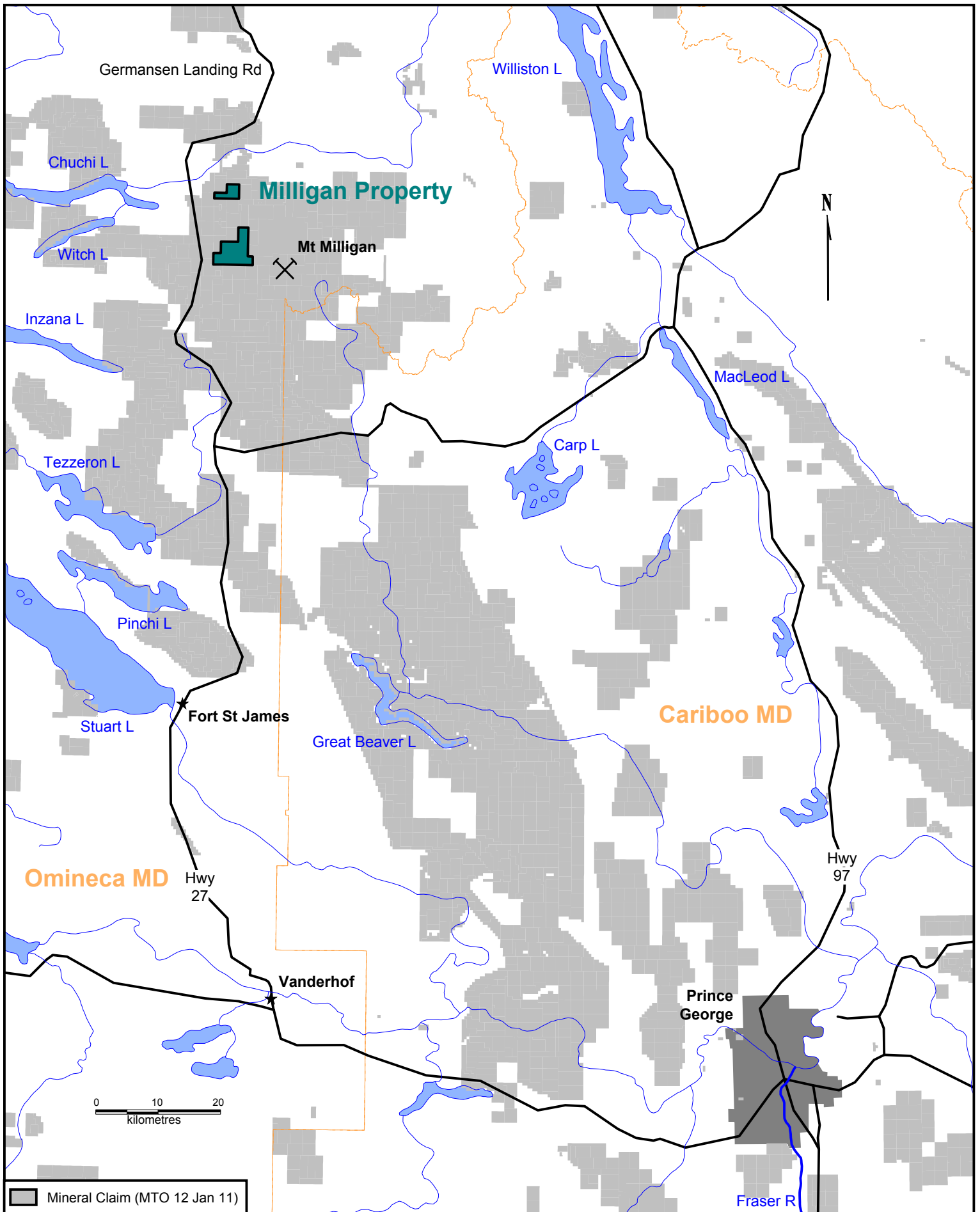
On 8 October 2010 a program consisting of prospecting and soil geochemistry was completed on the Milligan North Property by the author and Vic Tanaka of North Vancouver, BC. The total cost of the survey was \$5,241.95.

The Milligan North Property lies approximately 90 kilometres north of Fort St James 5 kilometres east of the Manson Creek highway (Germansen Landing Road). The Property lies 9 kilometres northwest of the Mount Milligan deposit that is currently being readied for production. At the date of this report, the Milligan North Property consists of 2 mineral tenures with a total area of 646.4 hectares.

The Property is underlain by mid Triassic to Late Jurassic-aged Takla Group volcanic and sedimentary rocks. Jurassic-aged syenitic to monzonitic intrusives are faulted into place in the northeast portion of the Property. Quaternary-aged glacial tills of unknown thickness cover the western portion of the Property.

A program including 11 soil samples over one line was completed over the eastern portion of the Property. Analytical results for soils taken during the survey were uniformly low suggesting that conventional soil sampling may not be the correct tool for any additional surveys in the area due to Quaternary-aged till compositions.

Unpublished historic IP surveys over most of the Property are being held by AMARC Resources Ltd. The author has viewed the data and recommends the purchase before any additional exploration is contemplated.



**Milligan Property**

**Figure 1: Property Location**

## 2.0 PROPERTY LOCATION, SIZE, ACCESS AND PHYSIOGRAPHY

The Milligan North Property, located in the Omineca Mining Division of north-central British Columbia (Figure 1), lies approximately 90 kilometres north of Fort St James 5 kilometres east of the Manson Creek highway (Germansen Landing Road). The Property lies 9 kilometres northwest of the Mount Milligan deposit that is currently being readied for production. The Property is located on NTS map sheet 093N01E at geographic coordinates; latitude 55°11' N, longitude 124°8.5' W as shown on Figure 2.

The Property is helicopter accessible from Fort St James. There are minimal breaks in tree cover, one of which is located near the centre point of the 2010 soil sampling line. Alternative access is via float plane in the western portion of the Property.

At the date of this report, the Milligan North Property consists of 2 mineral tenures with a total area of 646.4 hectares. The Property is surrounded on all sides by competitor claims. The Tenure information, including expiry dates pending the acceptance of this report, follows:

Tenure	Type	Type2	Issue Date	Good To	Area
679149	Mineral	CLAIM	2009-12-04	2013-01-01	462.9
840566	Mineral	CLAIM	2010-12-10	2011-12-04	444.0

**Table 1: List of Claims**

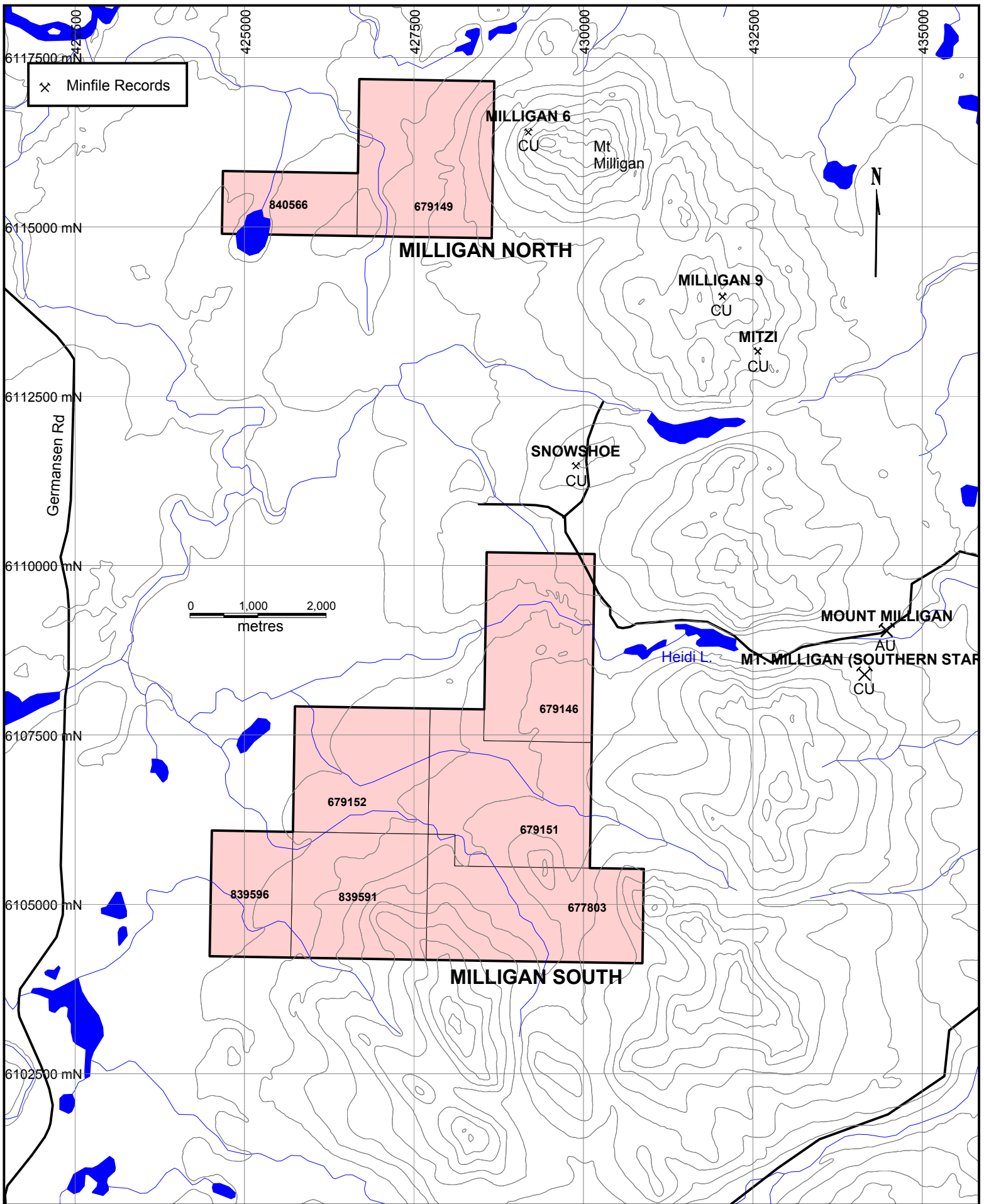
The claims are 100% owned by Fjordland Exploration Inc. Fjordland is a public company incorporated in Canada, with offices at #1100-1111 Melville Street, Vancouver, BC, Canada, V6E 3V6.

The Property is on the western flank of Mt Milligan. The Property slopes westward from 365 m to 290 m asl where relief is relatively flat. Drainage is west to the Nation River. Vegetation consists of continuous dense growth of pine, fir, spruce, balsam, alder and aspen. The entire Property is below treeline.

## 3.0 HISTORY

The region has had a mining and exploration history starting with small placer mining operations in the late 19<sup>th</sup> century. The earliest documented prospecting activity north of Fort St James took place in the 1920s and resulted in the discovery of the Pinchi Lake mercury mine in the late 1930s. In 1929, placer gold and platinum was discovered on Rainbow Creek (4 km east of the Property) by George Snell.

Exploration for porphyry copper and copper-molybdenum exploration in the Nation Lakes area was conducted in the 1960s and 1970s and government airborne geophysical surveys were completed in the 1960s. During the 1980s exploration focused on structurally controlled precious metal deposits typically found near the Pinchi Fault, located west of the Property. By 1989, because of the discovery of the nearby Mount Milligan deposit, renewed interest in porphyry systems was revitalized in the region. As part of a regional effort Aerodat Ltd flew an airborne magnetic/VLF-EM survey over the most of the Property.



**MILLIGAN PROPERTY**

**Figure 2: Claim Map**

In 1989, Continental Gold Corp. completed a helicopter airborne magnetics and VLF-EM survey over most of the Property. Follow-up surveys, including geological mapping and prospecting over the Mt Milligan summit.

In 1990 Continental Gold Corp. contracted Reliance Geological Services Inc to complete an exploration program consisting of grid layout, linecutting, geological mapping, soil sampling, ground magnetometer and VLF-EM surveys over the Property. The surveys delineated 2 target areas located on the northern portion of the Property.

No other ARIS assessment filings for work completed on the Property are available. It is known that during the early 1990's Amarc Resources Ltd completed a large regional IP survey that extended onto the Property. Results from these surveys are unknown at this time.

#### **4.0 GEOLOGICAL SETTING**

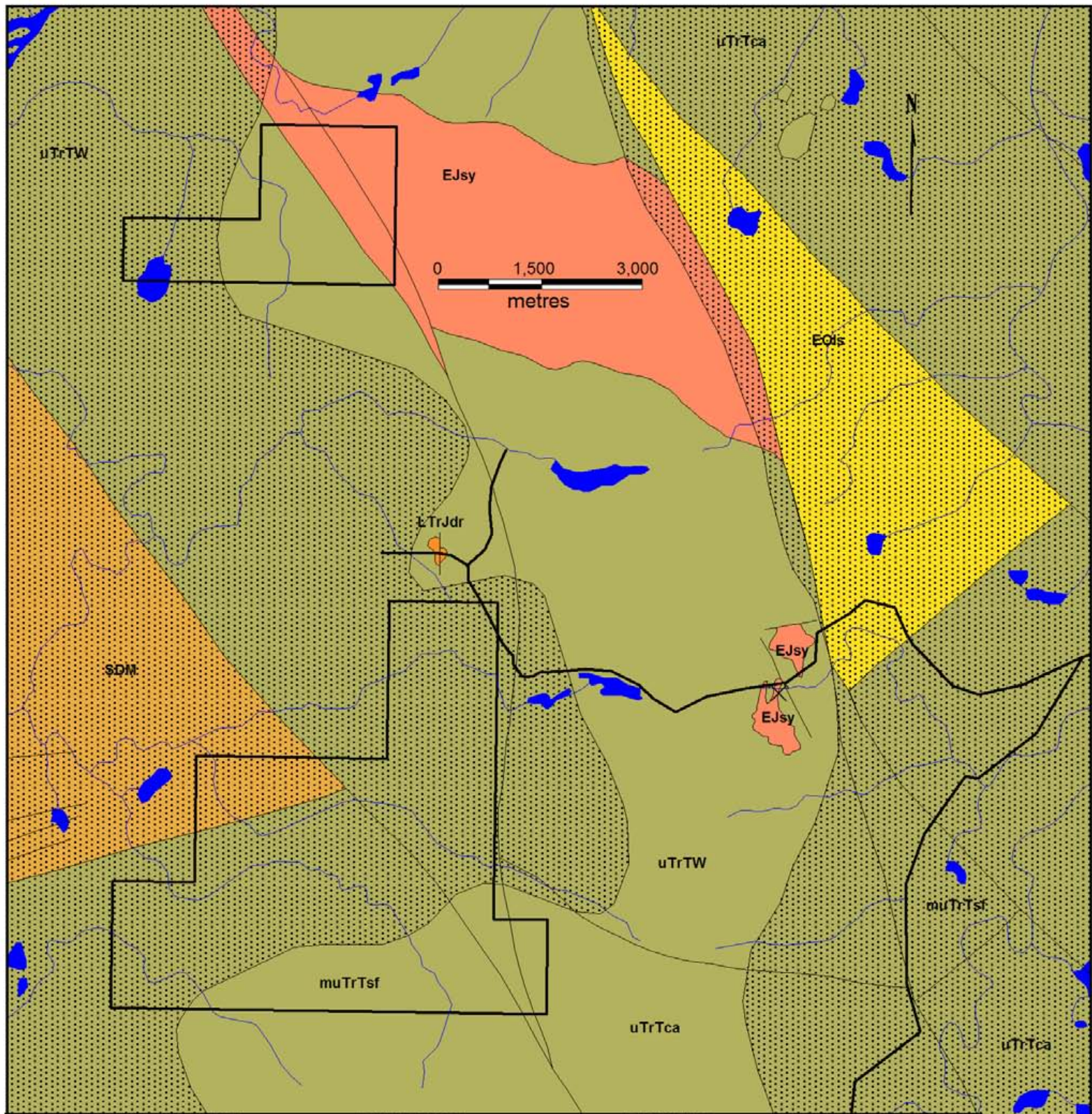
The Milligan North Property lies within the early Mesozoic-aged Quesnel Trough, a large regional depositional feature extending 2000 kilometres from the U.S. border in the south to the Stikine River in the north. The Quesnel Trough assemblage hosts numerous deposits of porphyry gold-copper style mineralization generally related to dioritic or monzonitic sub-volcanic intrusive bodies (Barr, et al., 1976) including the Mount Polley, Quesnel River (QR), and Mt Milligan deposits.

The Quesnel Trough includes equivalent rocks of the Upper Triassic to Lower Jurassic, Takla, Nicola and Stuhini groups consisting of sediments and volcanic assemblages intruded by coeval and comagmatic plutons (Mortimer, 1986). The volcanic assemblages have a wide range of chemical compositions including alkalic, sub-alkalic and calc-alkalic rocks.

Rocks in the area of the Milligan North Property are dominated by Takla Group alkali and sub-alkalic volcanics and intrusives. The volcanics are dominated by subaqueous alkalic to subalkalic dark green tuffs and volcanic breccias of andesitic and basaltic composition interbedded with pyroxene porphyritic flow rocks of similar composition. Intercalated bedded tuffs and argillites are subordinate with black argillites interfingering with volcanic rocks to the east and west of the central volcanic core.

The intrusives, significant due to their association with porphyry deposits, typically have identical chemical compositions to the host volcanic rocks and are interpreted as volcanic centres from which most of the adjacent volcanics were derived. They are associated with regional-scaled linear structures and range from small plugs and stocks to small batholiths. Common intrusive rock types, including gabbros, diorites, monzonites and syenites, are typically magnet and show up well in airborne magnetic surveys. Nelson (1991) considers regional metamorphic grade to be greenschist facies east of the structural depression traversed by the Germansen Landing Road and zeolite facies west of the road.

The Takla Group volcanics are bounded to the west by deformed and uplifted Permian-aged Cache Creek Group rocks that are separated from the Takla Group by the Pinchi fault zone. To the east, the Manson fault zone separates the Takla rocks from the



	STRAT_UNIT	STRAT_AGE	STRAT_NAME	ROCK_TYPE
	Qal	Quaternary		Unconsolidated Tills
	EOIs	Eocene to Oligocene	Unnamed	undivided sedimentary rocks
	EOIEs	Eocene to Oligocene	Nechako Plateau Group	undivided sedimentary rocks
	EJsy	Early Jurassic	Unnamed	syenitic to monzonitic intrusive rocks
	LTrJdr	Late Triassic to Early Jurassic	Unnamed	dioritic intrusive rocks
	uTrTW	Late Triassic	Takla Group - Witch Lake Formation	volcaniclastic rocks
	uTrTca	Upper Triassic	Takla Group	calc-alkaline volcanic rocks
	muTrTsf	Middle Triassic to Late Jurassic	Takla Group	mudstone, siltstone, shale fine clastic sedimentary rocks

After: B.C. Ministry of Energy and Mines, Geofile 2003-21 (N.W.D. Massey, et al)

Figure 3: Geology Map



uplifted Proterozoic / early Paleozoic–aged Wolverine metamorphic complex and the Mississippian/Permian-aged Slide Mountain Group (Faulkner et al., 1989).

#### **4.1 Property Geology**

Quaternary-aged glacial tills of unknown thickness cover the western lowlands on the Property and no outcrop is evident.

The western half of Property is underlain by Takla Group (Witch Lake Formation) of predominantly augite with or without plagioclase or hornblende porphyritic flows and volcanoclastics. In 1989 Continental Gold Corp completed geological mapping over the Property and located numerous alkaline and calc-alkaline plutons intruding Takla augite porphyry debris flows (Leriche 1990).

Northwest trending transcurrent and block faults and minor folding have offset and juxtaposed major sections of the volcanic stratigraphy with the intrusive rocks. Early Jurassic-aged syenitic to monzonitic intrusives, similar to the stocks reported at the Mt Milligan deposit, are faulted into place in the northeast portion of the Property.

#### **4.2 Mineralization**

No mineral occurrences listed on the BC Ministry of Energy and Mines' Minfile database are evident on the Property. There have been no mineral occurrences reported in any historic document.

The MINFILE Milligan 6 showing is located 500 m east of the Property outline near the summit of Mt Milligan. MINFILE describes the showing as “The Milligan 6 showing occurs about 300 metres northwest of Mount Milligan peak where a rock sample yielded 0.14 per cent (1409 parts per million) copper (Assessment Report 20227). The area is underlain by the Mount Milligan Intrusive Complex which consists of at least two separate Early Jurassic intrusive phases. The sampled rock is described as a medium-grained, massive, equigranular, biotitic, plagioclase porphyritic monzonite. Mineralization consists of disseminated pyrite, magnetite and traces of chalcopyrite

### **5.0 2010 EXPLORATION PROGRAM**

On 8 October 2010 a program consisting of prospecting and soil geochemistry was completed on the Milligan North Property. Work was completed by the author and Vic Tanaka of North Vancouver, BC. Access to the Property was via helicopter from Fort St James.

A total of 11 soil samples were collected in the northern portion of the Property by the author at 50 metre intervals across the mapped geological contact between the Takla volcanics and intrusives, a zone defined by a steep magnetic gradient at the location of a historical copper anomaly (Figure 4).

Sample points were determined in the field using a Garmin 62csx GPS. All samples were taken from the enriched "B" horizon approximately 30 centimetres below surface. Soil samples were taken using a geotool and placed into Kraft paper bags with sample grid locations marked on using a felt pen.

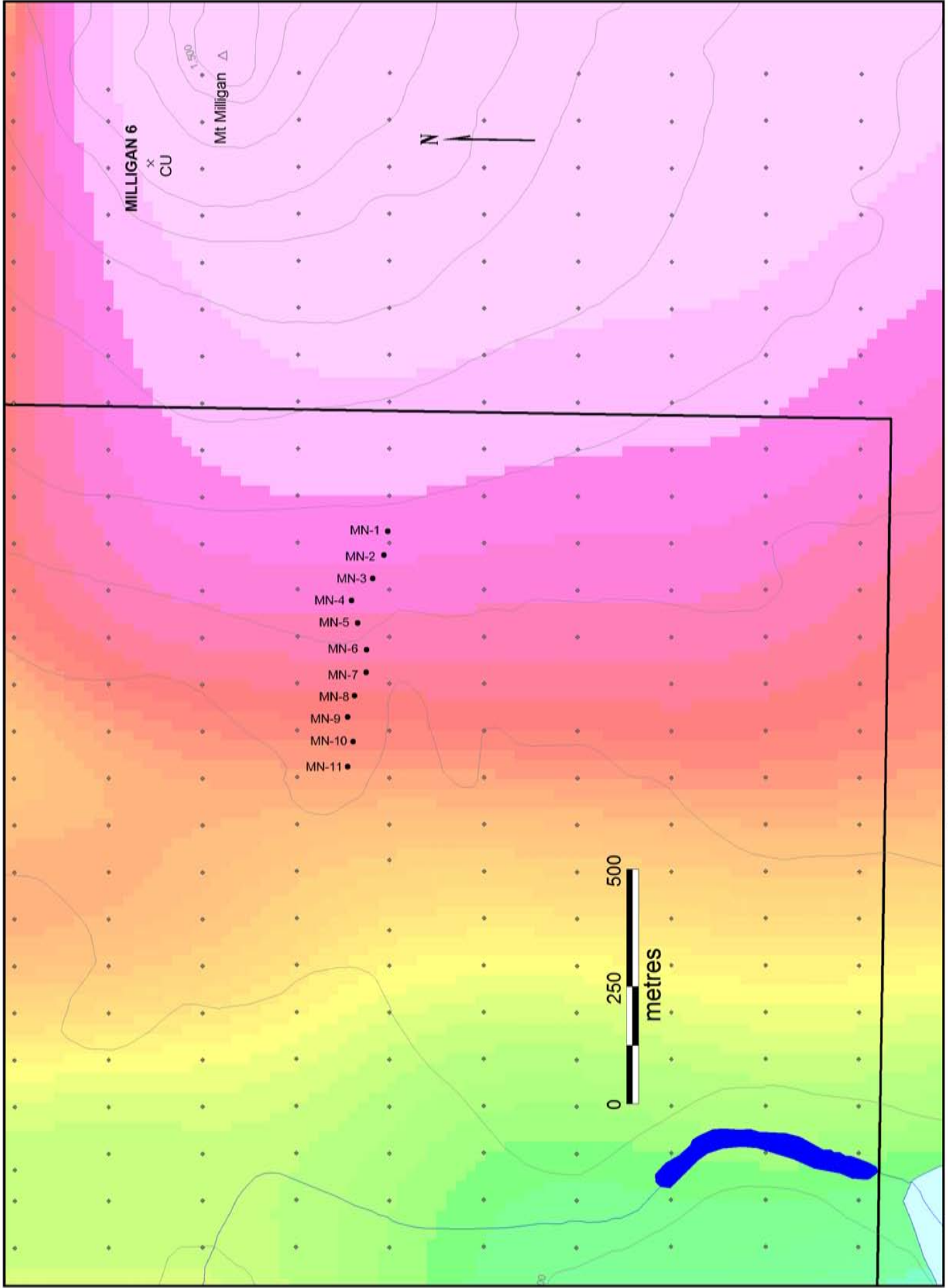


Figure 4: Sample Location

Magnetics (TF) Background

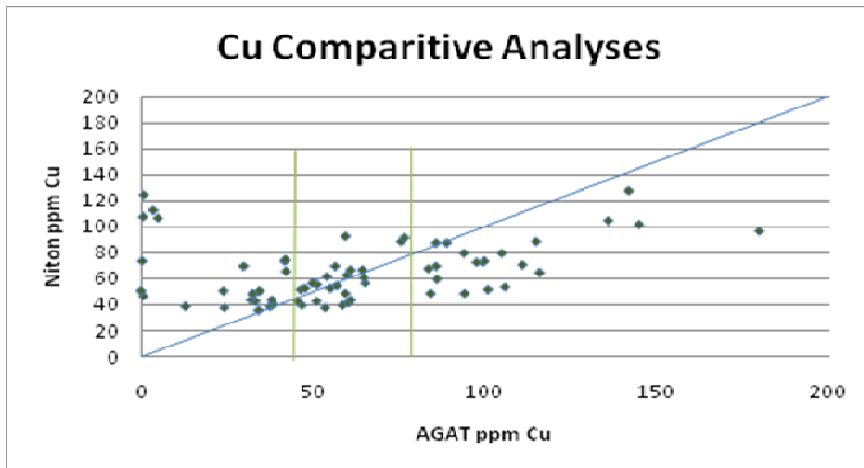
● 2010 soil sample location (Sample #)

○ Historic soil sample location

No sample preparation was conducted by an employee, officer, director or associate of Fjordland prior to delivery to the laboratory for analyses. Samples were delivered by the author to the offices of AGAT Laboratories located at 3104 Beta Avenue, Burnaby, BC.

Samples were analyzed for a 51-element suite of elements. Sample analyses, preparation methods, and QAQC protocols are described in Appendix B. Analytical certificates are located in Appendix A.

The sampling program was in conjunction with a regional sampling program over additional properties during the season. A total of 90 samples (~18%) of the sample pulps from the survey were analyzed for copper using a Niton handheld XRF analyzer. This was to determine the viability of using the analyzer as an alternative to conventional laboratory analyses and as a quality check for AGAT's analyses. It was found that below 50 ppm copper the Niton would consistently over report the copper values and above 80 ppm the Niton would consistently under report copper values (Figure 5). This is simply a calibration problem with the Niton and can be adjusted. A total of 16 samples were suspect and duplicate splits and analyses were requested from the lab. At the time of this report the duplicates were not completed.

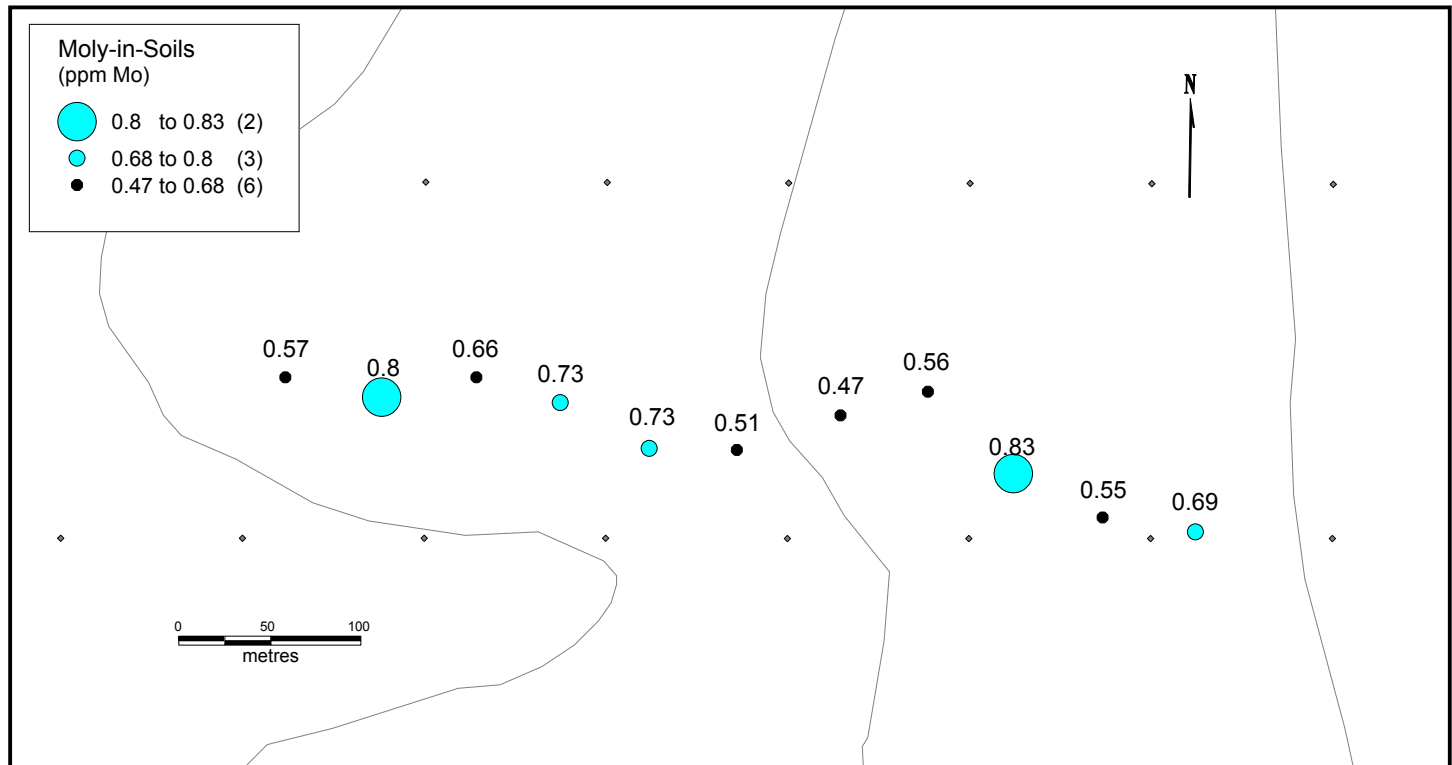
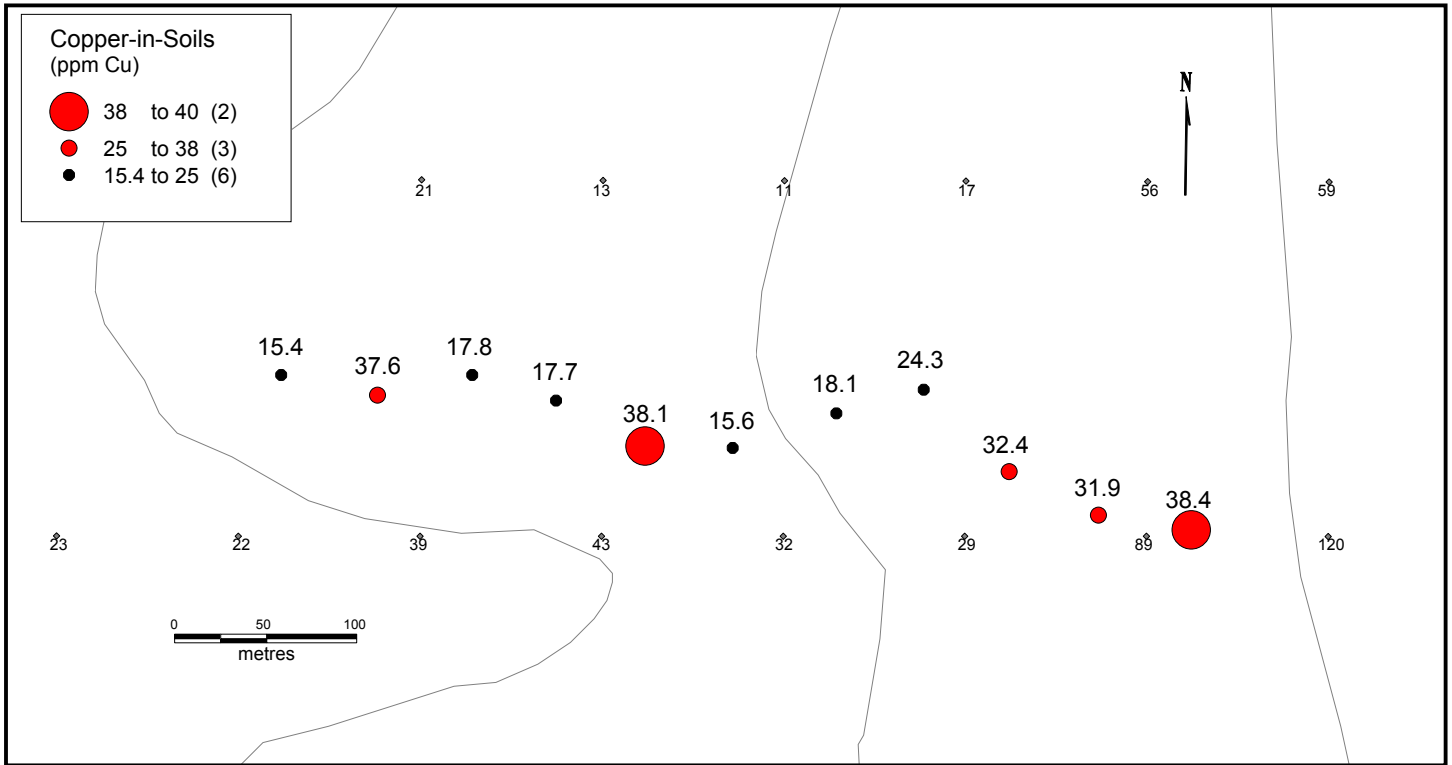


**Figure 5: Analytical Comparison Chart (Cu)**

Sample results for copper, molybdenum, gold and silver were plotted and presented on Figures 6 + 7. Statistically anomalous samples were displayed using graduated symbols.

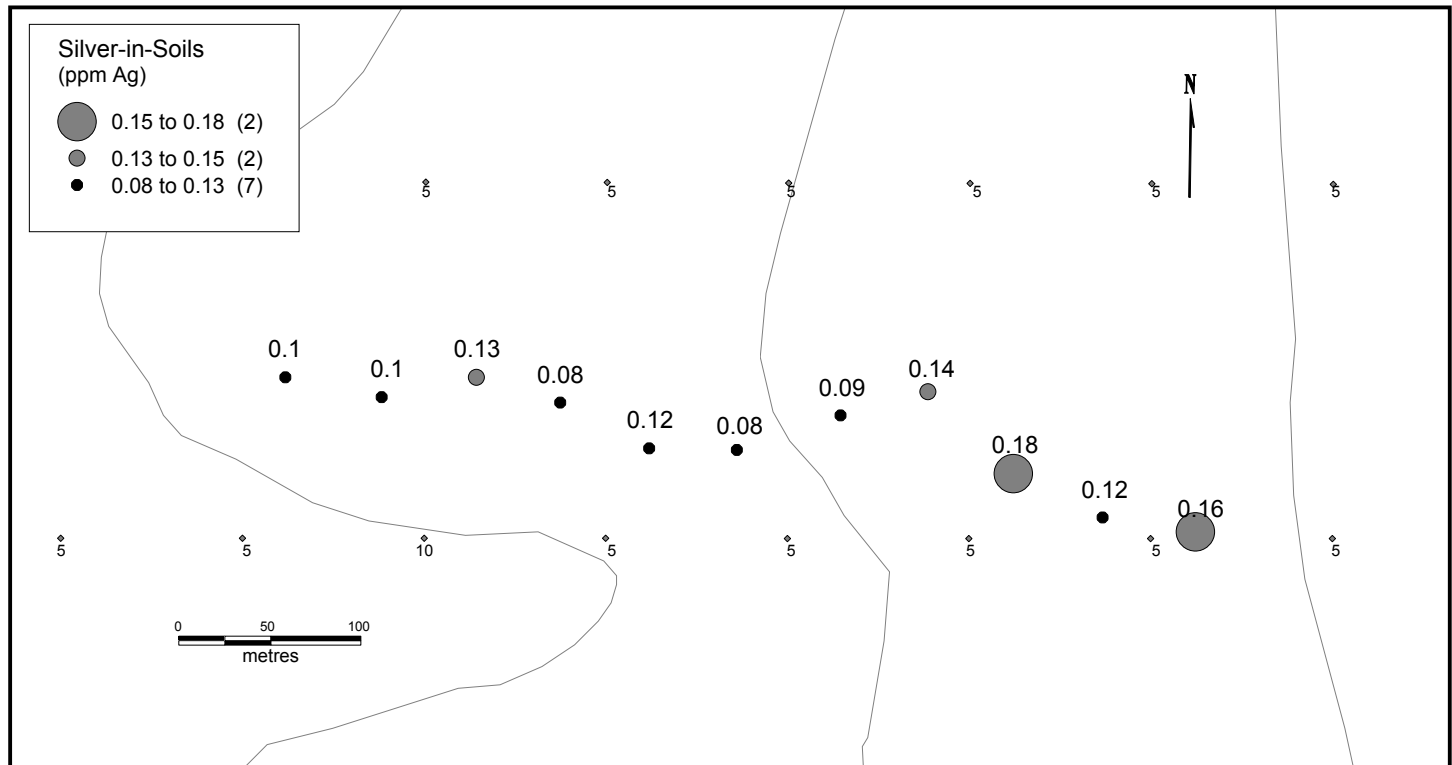
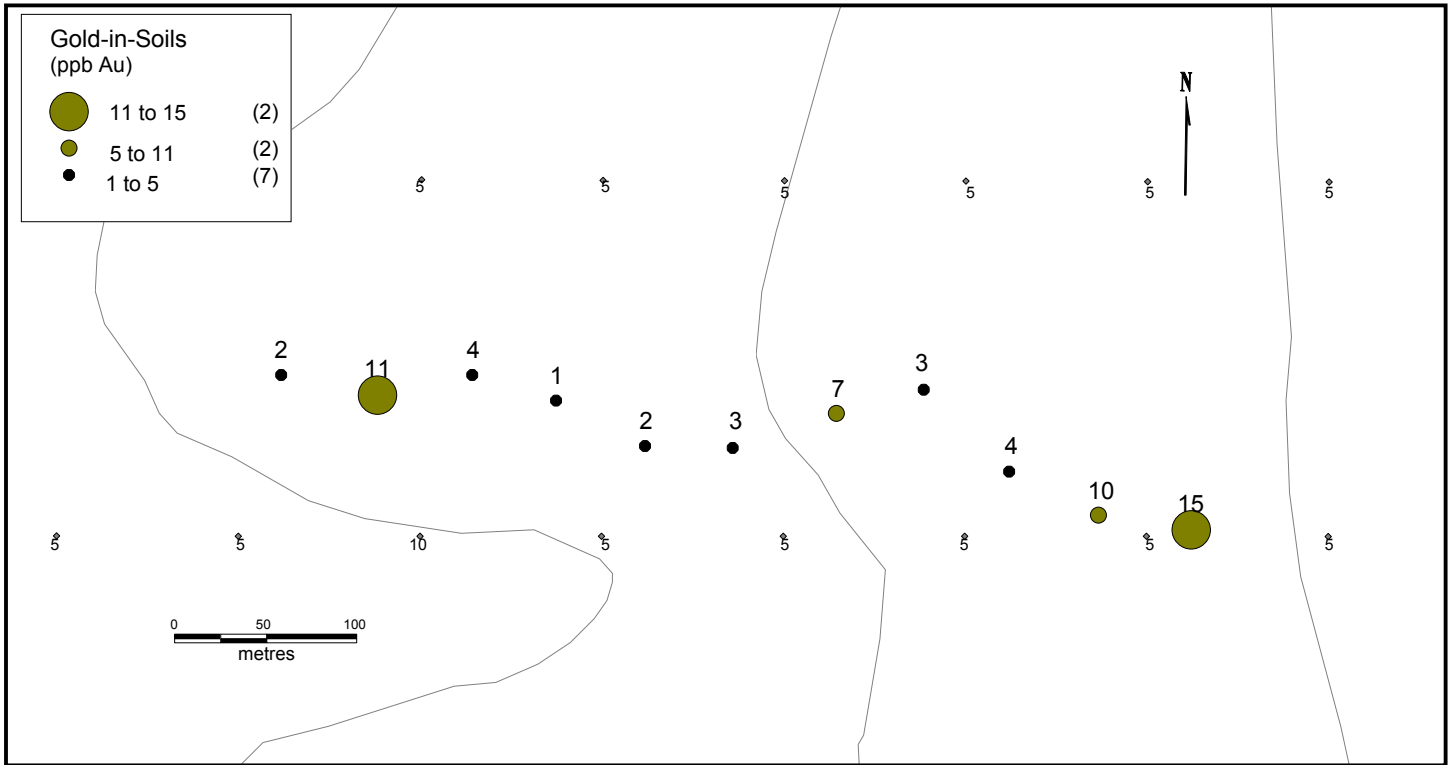
The soil survey was completed entirely over glacial tills and no outcrop was apparent. The upper B horizon was not well developed and soil consisted primarily of a fine matrix of sand and silt. The latest regional ice direction in the area was determined to be from the southwest to the northeast (Climie, 1991) and as a result no contamination is suspected from the nearby Mount Milligan deposit.

Analytical results for soils taken during the survey were relatively low, ranging from 15 to 40 ppm Cu, 0.5 to 0.8 ppm Mo, 1 to 15 ppb Au, and 0.08 to 0.18 ppm Ag. Multi-element values across the high potassium zone were consistently low with several low isolated anomalous values. Statistically elevated grades for copper, molybdenum, gold and silver are coincident to the eastern extreme of the sample line between 2 historical copper-in-soil sample points grading 89 and 120 ppm Cu .



◆ Historic soil samples

**Figure 6: Soil Geochemistry - Copper + Molybdenum**



◆ Historic soil samples

**Figure 7: Soil Geochemistry - Gold + Silver**

## 6.0 INTERPRETATION AND CONCLUSIONS

The low geochemical response may be due to excessive overburden depths or compositional factors in the tills. Due to the low values encountered during the sampling program and because of the sporadic nature of previous sampling, it is concluded that conventional soil sampling may not be the correct tool for any additional surveys in the area. Ah sampling or bio-geochemical testing may prove more successful.

## 7.0 RECOMMENDATIONS

Unpublished historic IP surveys over most of the Property are being held by AMARC Resources Ltd. The author has viewed the data and recommends the purchase before any additional exploration is contemplated. The purchase cost is being negotiated at this time.

## 8.0 STATEMENT OF EXPENDITURES

Item	Description		Total
Geology	L. John Peters	\$	1,012.50
Assistant	Vic Tanaka	\$	900.00
Analytical		\$	487.52
Accommodations		\$	230.98
4x4 Rental/Fuel		\$	125.40
Food		\$	112.36
Supplies		\$	43.09
Travel		\$	557.65
Helicopter		\$	921.32
Report Writing		\$	500.00
Management		\$	476.54
Total		\$	5,241.95

## 9.0 REFERENCES

- Bradley, D., (1989):** Geophysical Report on a Combined Helicopter Borne Magnetic and VLF-EM Survey. Assessment Report 19268A.
- Forster, D., (1989):** Geological and Prospecting Report, Mount Milligan Property, BC. Assessment Report 19268B.
- Leriche, P. et al, (1990):** Geological, Geochemical and Geophysical Report on the Nation River Property. Assessment Report 20227.
- Massey, N. et al, (2003):** BC ministry of Energy and Mines Geofile 2003-21.
- McMillan, W.J. (1991):** Porphyry Deposits in the Canadian Cordillera; in Ore Deposits, Tectonics and Metallogeny in the Canadian Cordillera, B. C. Ministry of Energy, Mines and Petroleum Resources, Paper 1991-4, pages 253-276.
- McMillan, W.J. and Panteleyev, A. (1988):** Porphyry Copper Deposits; in Ore Deposit Models, Roberts, R.G. and Sheahan, P.A, Editors, Geoscience Canada, Reprint Series 3, pages 45-58.
- Panteleyev, A. (1995):** Porphyry Cu-Au: Alkalic, in Selected British Columbia Mineral Deposit Profiles, Volume 1 -Metallics and Coal, Lefebure, D.V. and Ray, G.E., Editors, British Columbia Ministry of Energy of Employment and Investment, Open File 1995-20, pages 83-86.

## 10.0 AUTHOR'S STATEMENT OF QUALIFICATIONS – L. John Peters

I, **L. John Peters, P.Ge**o do hereby certify that:

- a. I am a consulting geologist with addresses at 6549 Portland Street, Burnaby, BC, Canada, V5E 1A1.
- b. I graduated with a Bachelor of Science degree (Geology) from the University of Western Ontario in 1984.
- c. I am a Professional Geoscientist (P.Ge.) in good standing with the Association of Professional Engineers and Geoscientists of British Columbia (#19010).
- d. I have worked as a geologist for a total of 25 years since my graduation from university.
- e. I am responsible for the preparation of all sections of the technical report titled "Assessment Report on the Milligan North Property" and dated 15 February 2011 relating to the Milligan North Property. I performed the work on the Milligan North Property and represent Fjordland as the Exploration Manager.
- f. I was not involved in any of the historic work programs on the Milligan North Property, however, I have been involved in all aspects of Fjordland's exploration activities on the Property since 2010.
- g. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.

Dated this 15<sup>th</sup> day of February 2011.

**"Lawrence John Peters"**



**Appendix A:  
Laboratory Certificates**

CLIENT NAME: FJORDLAND EXPLORATIONS  
11TH FLOOR-1111 MELVILLE ST  
VANCOUVER, BC V6E3V6

ATTENTION TO: John Peters, Vic Tanaka

PROJECT NO:

AGAT WORK ORDER: 10V443039

SOLID ANALYSIS REVIEWED BY: Ron Cardinall, General Manager

DATE REPORTED: Oct 15, 2010

PAGES (INCLUDING COVER): 8

Should you require any information regarding this analysis please contact your client services representative at (905) 501 9998, or at 1-800-856-6261

\*NOTES

All samples are stored at no charge for 90 days. Please contact the lab if you require additional sample storage time.



## Certificate of Analysis

AGAT WORK ORDER: 10V443039

PROJECT NO:

5623 McADAM ROAD  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1N9  
TEL (905)501-9998  
FAX (905)501-0589  
<http://www.agatlabs.com>

CLIENT NAME: FJORDLAND EXPLORATIONS

ATTENTION TO: John Peters, Vic Tanaka

### Aqua Regia Digest - Metals Package, ICP/ICP-MS finish (201074)

DATE SAMPLED: Oct 13, 2010

DATE RECEIVED: Oct 13, 2010

DATE REPORTED: Oct 15, 2010

SAMPLE TYPE: Soil

Analyte:	Ag	Al	As	Au	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cs	
Unit:	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	
Sample Description	RDL:	0.01	0.01	0.1	0.01	5	1	0.05	0.01	0.01	0.01	0.1	0.5	0.05	
MN 1 (-)		0.16	1.72	4.0	<0.01	<5	192	0.28	0.06	0.78	0.17	15.9	11.1	43.6	0.73
MN 2 (-)		0.12	1.55	5.3	0.03	<5	125	0.26	0.05	0.71	0.07	15.9	10.9	40.8	0.61
MN 3 (-)		0.18	1.91	4.1	<0.01	<5	156	0.30	0.07	0.69	0.13	14.0	11.8	38.3	0.90
MN 4 (-)		0.14	1.62	3.6	<0.01	<5	132	0.27	0.06	0.63	0.10	12.7	12.6	36.6	0.83
MN 5 (-)		0.09	1.40	3.6	<0.01	<5	102	0.22	0.05	0.56	0.11	11.2	9.9	37.3	0.64
MN 6 (-)		0.08	1.55	3.8	<0.01	<5	84	0.26	0.06	0.40	0.06	10.2	10.7	45.8	0.70
MN 7 (-)		0.12	1.70	2.1	<0.01	<5	232	0.24	0.11	0.60	0.17	11.4	16.8	55.3	1.13
MN 8 (-)		0.08	1.67	4.8	<0.01	<5	142	0.29	0.06	0.51	0.11	10.7	12.5	51.0	0.67
MN 9 (-)		0.13	0.90	2.2	<0.01	<5	88	0.14	0.06	0.53	0.06	9.09	6.6	29.8	0.48
MN 10 (-)		0.10	1.64	4.2	<0.01	<5	117	0.20	0.10	0.56	0.06	12.3	13.5	72.2	0.94
MN 11 (-)		0.10	1.53	3.4	<0.01	<5	93	0.26	0.08	0.33	0.08	11.7	10.9	56.3	0.86
Analyte:	Cu	Fe	Ga	Ge	Hf	Hg	In	K	La	Li	Mg	Mn	Mo	Na	
Unit:	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	
Sample Description	RDL:	0.1	0.01	0.05	0.05	0.02	0.01	0.005	0.01	0.1	0.1	0.01	1	0.05	0.01
MN 1 (-)		38.4	3.00	5.28	0.08	<0.02	0.03	0.017	0.08	9.3	7.5	0.55	716	0.69	0.02
MN 2 (-)		31.9	2.92	4.89	0.08	0.03	0.04	0.017	0.07	8.5	5.6	0.50	412	0.55	0.02
MN 3 (-)		32.4	2.90	6.02	0.07	<0.02	0.04	0.017	0.05	8.2	7.7	0.52	655	0.83	0.02
MN 4 (-)		24.3	2.55	5.51	0.07	<0.02	0.02	0.014	0.05	6.9	7.4	0.53	820	0.56	0.02
MN 5 (-)		18.1	2.47	4.82	0.07	<0.02	0.03	0.014	0.05	6.2	7.4	0.40	398	0.47	0.02
MN 6 (-)		15.6	2.74	4.90	0.08	0.03	0.03	0.014	0.05	5.9	6.1	0.34	236	0.51	0.01
MN 7 (-)		38.1	2.88	7.49	0.08	<0.02	0.03	0.016	0.10	6.8	14.9	0.51	912	0.73	0.02
MN 8 (-)		17.7	3.83	5.57	0.08	0.03	0.05	0.019	0.07	5.9	7.9	0.38	524	0.73	0.02
MN 9 (-)		17.8	1.86	4.48	0.07	0.02	0.03	0.010	0.06	5.7	4.0	0.25	351	0.66	0.01
MN 10 (-)		37.6	4.27	7.39	0.09	0.02	0.03	0.018	0.08	6.9	10.5	0.64	404	0.80	0.02
MN 11 (-)		15.4	2.92	5.57	0.08	0.03	0.03	0.016	0.06	6.8	9.1	0.35	270	0.57	0.01

Certified By:

*Ron Cardinali*



## Certificate of Analysis

AGAT WORK ORDER: 10V443039

PROJECT NO:

5623 McADAM ROAD  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1N9  
TEL (905)501-9998  
FAX (905)501-0589  
<http://www.agatlabs.com>

CLIENT NAME: FJORDLAND EXPLORATIONS

ATTENTION TO: John Peters, Vic Tanaka

### Aqua Regia Digest - Metals Package, ICP/ICP-MS finish (201074)

DATE SAMPLED: Oct 13, 2010

DATE RECEIVED: Oct 13, 2010

DATE REPORTED: Oct 15, 2010

SAMPLE TYPE: Soil

Analyte:	Nb	Ni	P	Pb	Rb	Re	S	Sb	Sc	Se	Sn	Sr	Ta	Te
Unit:	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Sample Description	RDL:	0.05	0.2	10	0.1	0.1	0.001	0.005	0.05	0.1	0.2	0.2	0.2	0.01
MN 1 (-)		0.91	26.4	623	5.8	20.9	<0.001	0.020	0.34	3.7	<0.2	1.7	53.8	<0.01
MN 2 (-)		1.15	26.0	735	3.5	12.3	<0.001	0.014	0.38	3.7	<0.2	0.7	46.9	<0.01
MN 3 (-)		1.22	22.7	424	5.0	14.9	<0.001	0.017	0.30	3.4	<0.2	1.3	49.6	<0.01
MN 4 (-)		1.03	21.4	417	4.0	15.3	<0.001	0.014	0.28	3.1	<0.2	0.9	40.8	<0.01
MN 5 (-)		0.95	18.1	834	4.2	15.7	<0.001	0.010	0.29	2.7	<0.2	1.1	37.9	<0.01
MN 6 (-)		1.26	23.0	1070	3.7	14.2	<0.001	0.009	0.24	2.6	<0.2	0.6	29.1	<0.01
MN 7 (-)		1.14	25.1	1690	17.4	27.2	<0.001	0.015	0.25	3.3	<0.2	19.5	37.1	<0.01
MN 8 (-)		0.91	20.0	3090	5.5	11.7	<0.001	0.015	0.34	2.9	<0.2	2.2	27.2	<0.01
MN 9 (-)		1.03	12.2	320	7.2	16.0	<0.001	0.016	0.21	2.1	<0.2	5.3	38.6	<0.01
MN 10 (-)		1.26	39.7	1700	13.4	18.6	<0.001	0.012	0.37	3.6	<0.2	12.0	40.2	<0.01
MN 11 (-)		1.16	21.7	1410	4.8	16.5	<0.001	0.007	0.21	2.6	<0.2	1.0	24.0	<0.01
Analyte:	Th	Ti	Tl	U	V	W	Y	Zn	Zr					
Unit:	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm					
Sample Description	RDL:	0.1	0.005	0.02	0.05	0.5	0.05	0.5	0.5					
MN 1 (-)		0.7	0.104	0.04	0.43	102	0.17	6.03	48.1	0.7				
MN 2 (-)		1.3	0.130	0.04	0.49	107	0.20	5.77	32.5	1.3				
MN 3 (-)		0.9	0.127	0.06	0.44	101	0.20	4.62	43.8	0.6				
MN 4 (-)		0.8	0.116	0.05	0.32	94.3	0.18	3.96	44.1	0.7				
MN 5 (-)		1.1	0.109	0.04	0.35	89.9	0.20	3.18	37.2	0.6				
MN 6 (-)		1.2	0.100	0.03	0.26	96.9	0.20	2.68	35.5	1.1				
MN 7 (-)		0.9	0.101	0.05	0.24	93.0	0.17	2.76	88.4	0.6				
MN 8 (-)		1.2	0.086	0.03	0.27	130	0.24	3.01	48.8	0.8				
MN 9 (-)		0.7	0.096	0.03	0.27	75.7	0.18	2.42	24.5	0.8				
MN 10 (-)		1.4	0.130	0.04	0.31	153	0.25	3.09	49.1	1.4				
MN 11 (-)		1.4	0.095	0.04	0.26	96.7	0.21	2.52	45.4	1.4				

Comments: RDL - Reported Detection Limit

Certified By:

*Ron Cardinal*



## Certificate of Analysis

AGAT WORK ORDER: 10V443039

PROJECT NO:

5623 McADAM ROAD  
 MISSISSAUGA, ONTARIO  
 CANADA L4Z 1N9  
 TEL (905)501-9998  
 FAX (905)501-0589  
<http://www.agatlabs.com>

CLIENT NAME: FJORDLAND EXPLORATIONS

ATTENTION TO: John Peters, Vic Tanaka

### Fire Assay - Trace Au, ICP-OES finish (201052)

DATE SAMPLED: Oct 13, 2010

DATE RECEIVED: Oct 13, 2010

DATE REPORTED: Oct 15, 2010

SAMPLE TYPE: Soil

Sample Description	Analyte:	Sample	Au
	RDL:	Login Weight	
	Unit:	kg	ppm
MN 1 (-)		0.26	0.015
MN 2 (-)		0.39	0.010
MN 3 (-)		0.27	0.004
MN 4 (-)		0.43	0.003
MN 5 (-)		0.37	0.007
MN 6 (-)		0.32	0.003
MN 7 (-)		0.42	0.002
MN 8 (-)		0.40	0.001
MN 9 (-)		0.38	0.004
MN 10 (-)		0.34	0.011
MN 11 (-)		0.37	0.002

Comments: RDL - Reported Detection Limit

Certified By:

*Ron Cardinal*

## Quality Assurance

CLIENT NAME: FJORDLAND EXPLORATIONS

AGAT WORK ORDER: 10V443039

PROJECT NO:

ATTENTION TO: John Peters, Vic Tanaka

Solid Analysis											
RPT Date: Oct 15, 2010		REPLICATE				Method Blank	REFERENCE MATERIAL				
PARAMETER	Batch	Sample Id	Original	Rep #1	RPD		Result Value	Expect Value	Recovery	Acceptable Limits	
						Lower				Upper	
Aqua Regia Digest - Metals Package, ICP/ICP-MS finish (201074)											
Ag	1	2052591	0.163	0.181	10.5%	0.06			70%	130%	
Al	1	2052591	1.72	1.62	6.0%	< 0.01	4.30		70%	130%	
As	1	2052591	4.0	4.2	4.9%	0.2	2.49		70%	130%	
Au	1	2052591	< 0.01	< 0.01	0.0%	< 0.01	0.2		80%	120%	
B	1	2052591	< 5	< 5	0.0%	< 5			70%	130%	
Ba	1	2052591	192	198	3.1%	< 1	350		70%	130%	
Be	1	2052591	0.28	0.30	6.9%	< 0.05	0.4		70%	130%	
Bi	1	2052591	0.06	0.06	0.0%	< 0.01	2.73		70%	130%	
Ca	1	2052591	0.781	0.752	3.8%	< 0.01	2.21		70%	130%	
Cd	1	2052591	0.17	0.18	5.7%	< 0.01	3		70%	130%	
Ce	1	2052591	15.9	15.9	0.0%	< 0.01	35		70%	130%	
Co	1	2052591	11.1	12.2	9.4%	< 0.1	672		70%	130%	
Cr	1	2052591	43.6	44.6	2.3%	< 0.5	320		70%	130%	
Cs	1	2052591	0.734	0.773	5.2%	< 0.05	0.3		70%	130%	
Cu	1	2052591	38.4	38.3	0.3%	0.5	11850		70%	130%	
Fe	1	2052591	3.00	2.83	5.8%	< 0.01	25.54		70%	130%	
Ga	1	2052591	5.28	5.41	2.4%	< 0.05	10		70%	130%	
Ge	1	2052591	0.08	0.08	0.0%	< 0.05			70%	130%	
Hf	1	2052591	< 0.02	< 0.02	0.0%	< 0.02			70%	130%	
Hg	1	2052591	0.03	0.04	28.6%	< 0.01			70%	130%	
In	1	2052591	0.017	0.017	0.0%	< 0.005			70%	130%	
K	1	2052591	0.08	0.08	0.0%	< 0.01	0.6		70%	130%	
La	1	2052591	9.34	9.72	4.0%	< 0.1	17		70%	130%	
Li	1	2052591	7.48	8.15	8.6%	< 0.1			70%	130%	
Mg	1	2052591	0.55	0.52	5.6%	< 0.01	1.790		70%	130%	
Mn	1	2052591	716	720	0.6%	< 1	703		70%	130%	
Mo	1	2052591	0.69	0.71	2.9%	< 0.05	269	280	96%	90%	
Na	1	2052591	0.02	0.02	0.0%	< 0.01	1.6		70%	130%	
Nb	1	2052591	0.913	0.989	8.0%	< 0.05	3		70%	130%	
Ni	1	2052591	26.4	27.4	3.7%	< 0.2	19530		70%	130%	
P	1	2052591	623	685	9.5%	< 10		600		70%	130%
Pb	1	2052591	5.79	5.88	1.5%	0.6	25	30	83%	80%	
Rb	1	2052591	20.9	22.2	6.0%	< 0.1		13		70%	130%
Re	1	2052591	< 0.001	< 0.001	0.0%	< 0.001			70%	130%	
S	1	2052591	0.020	0.019	5.1%	< 0.005		14.14		70%	130%
Sb	1	2052591	0.340	0.378	10.6%	< 0.05		0.2		70%	130%
Sc	1	2052591	3.71	3.91	5.2%	< 0.1		9		70%	130%
Se	1	2052591	< 0.2	< 0.2	0.0%	< 0.2		20.7		70%	130%
Sn	1	2052591	1.7	1.7	0.0%	< 0.2			70%	130%	
Sr	1	2052591	53.8	52.6	2.3%	< 0.2		280		70%	130%
Ta	1	2052591	< 0.01	< 0.01	0.0%	< 0.01			70%	130%	
Te	1	2052591	0.02	0.02	0.0%	< 0.01			70%	130%	
Th	1	2052591	0.7	0.7	0.0%	< 0.1			70%	130%	
Ti	1	2052591	0.104	0.108	3.8%	< 0.005			70%	130%	

## Quality Assurance

CLIENT NAME: FJORDLAND EXPLORATIONS

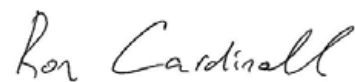
AGAT WORK ORDER: 10V443039

PROJECT NO:

ATTENTION TO: John Peters, Vic Tanaka

Solid Analysis (Continued)											
RPT Date: Oct 15, 2010			REPLICATE				Method Blank	REFERENCE MATERIAL			
PARAMETER	Batch	Sample Id	Original	Rep #1	RPD	Result Value		Expect Value	Recovery	Acceptable Limits	
							Lower			Upper	
Tl	1	2052591	0.04	0.04	0.0%	< 0.02	0.3	70%	130%		
U	1	2052591	0.431	0.438	1.6%	< 0.05	0.2	70%	130%		
V	1	2052591	102	106	3.8%	< 0.5	82.5	70%	130%		
W	1	2052591	0.17	0.21	21.1%	< 0.05		70%	130%		
Y	1	2052591	6.03	6.31	4.5%	< 0.05	7	70%	130%		
Zn	1	2052591	48.1	50.2	4.3%	< 0.5	235	70%	130%		
Zr	1	2052591	0.65	0.53	20.3%	< 0.5		70%	130%		
Fire Assay - Trace Au, ICP-OES finish (201052)											
Au	1	2052591	0.015	0.007		< 0.001	1.019	1.002	102%	90% 110%	
Fire Assay - Trace Au, ICP-OES finish (201052)											
Au	1					< 0.001	0.595	0.615	97%	90% 110%	

Certified By:



## Method Summary

CLIENT NAME: FJORDLAND EXPLORATIONS

AGAT WORK ORDER: 10V443039

PROJECT NO:

ATTENTION TO: John Peters, Vic Tanaka

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Solid Analysis			
Ag	MIN-200-12017		ICP-MS
Al	MIN-200-12017		ICP/OES
As	MIN-200-12017		ICP-MS
Au	MIN-200-12017		ICP-MS
B	MIN-200-12017		ICP/OES
Ba	MIN-200-12017		ICP-MS
Be	MIN-200-12017		ICP-MS
Bi	MIN-200-12017		ICP-MS
Ca	MIN-200-12017		ICP/OES
Cd	MIN-200-12017		ICP-MS
Ce	MIN-200-12017		ICP-MS
Co	MIN-200-12017		ICP-MS
Cr	MIN-200-12017		ICP/OES
Cs	MIN-200-12017		ICP-MS
Cu	MIN-200-12017		ICP-MS
Fe	MIN-200-12017		ICP/OES
Ga	MIN-200-12017		ICP-MS
Ge	MIN-200-12017		ICP-MS
Hf	MIN-200-12017		ICP-MS
Hg	MIN-200-12017		ICP-MS
In	MIN-200-12017		ICP-MS
K	MIN-200-12017		ICP/OES
La	MIN-200-12017		ICP-MS
Li	MIN-200-12017		ICP-MS
Mg	MIN-200-12017		ICP/OES
Mn	MIN-200-12017		ICP/OES
Mo	MIN-200-12017		ICP-MS
Na	MIN-200-12017		ICP/OES
Nb	MIN-200-12017		ICP-MS
Ni	MIN-200-12017		ICP-MS
P	MIN-200-12017		ICP/OES
Pb	MIN-200-12017		ICP-MS
Rb	MIN-200-12017		ICP-MS
Re	MIN-200-12017		ICP-MS
S	MIN-200-12017		ICP/OES
Sb	MIN-200-12017		ICP-MS
Sc	MIN-200-12017		ICP-MS
Se	MIN-200-12017		ICP-MS
Sn	MIN-200-12017		ICP-MS
Sr	MIN-200-12017		ICP-MS
Ta	MIN-200-12017		ICP-MS
Te	MIN-200-12017		ICP-MS
Th	MIN-200-12017		ICP-MS
Ti	MIN-200-12017		ICP/OES
Tl	MIN-200-12017		ICP-MS
U	MIN-200-12017		ICP-MS
V	MIN-200-12017		ICP/OES
W	MIN-200-12017		ICP-MS
Y	MIN-200-12017		ICP-MS



## Method Summary

CLIENT NAME: FJORDLAND EXPLORATIONS

AGAT WORK ORDER: 10V443039

PROJECT NO:

ATTENTION TO: John Peters, Vic Tanaka

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Zn	MIN-200-12017		ICP-MS
Zr	MIN-200-12017		ICP-MS
Sample Login Weight			BALANCE
Au	MIN-200-12006	BUGBEE, E: A Textbook of Fire Assaying	ICP-OES

**Appendix B:  
Laboratory Procedures**



## **Fjordland TAK Soils Project Sample Preparation Methodology Summary**

### **DRYING OF MINERAL TESTING SAMPLES – MINING BRANCH OFFICES OVERVIEW: MIN-200-12008**

#### **INTRODUCTION AND SCOPE**

This procedure describes the process for drying samples that will undergo analysis in the Mining Geochemistry Assay Division. Most samples contain certain amount of water as a hydrate or as occluded or surface absorbed water. There are several factors affecting moisture content including atmospheric humidity and particle size. Drying is the first step for sample preparation and is required to ensure that a homogeneous sample can be obtained. This will reduce error and bias in the analyses. Upon arrival the samples may appear dry, wet or excessively wet, however most samples require drying, as a pretreatment for the assigned tests such as sieving, fusions, digestions, etc. The types of samples include rocks, core and other drill samples, minerals, concentrates, tills, sands, soils, stream sediments, and dump and grab samples.

#### **PRINCIPLE OF THE METHOD**

The purpose of drying is usually to make the sample anhydrous or to remove absorbed moisture but retain chemically combined water. Drying temperatures above 100°C result in the loss of the water of hydration of some minerals, which affects the mass balance of whole rock analysis. It is preferred to dry samples at lower temperatures for extended periods of time (12 – 24 hours). Once the samples are received, they are placed into trays that will go in the oven at  $60 \pm 10^\circ\text{C}$  for a period of time depending on the sample. Afterwards, the samples will be ready for the next step of analysis.

#### **SAMPLE REQUIREMENTS**

The whole amount of sample received should be dried. The temperature of the drying oven should be set at  $60 \pm 10^\circ\text{C}$ .



## **SCREEN ANALYSIS AND PARTICLE SIZE DISTRIBUTION OF MINERALOGICAL SAMPLES OVERVIEW: MIN-200-12007**

### **INTRODUCTION AND SCOPE**

Many natural and manufactured materials occur in a disperse form, which means that they consist of differently shaped and sized particles. Sieving is used to isolate a particular particle size or to determinate the particle size distribution of the samples (i.e. the number of particles of different sizes), which can be related to important physical and chemical properties of solids, such as mechanical bulk behavior, surface reaction, miscibility, filtration properties, conductivity, etc. The types of samples include rocks, core and other drill samples, minerals, concentrates, tills, sands, soils, stream sediments, and dump and grab samples.

This overview focuses on one of two types of sieve analyses described in this procedure: Screen Analysis, where the sample is passed through a single sieve.

### **PRINCIPLE OF THE METHOD**

Screen Analysis is used to determine the retained and passing fraction through a specific sieve. For the majority of client soils projects 80 mesh (180  $\mu\text{m}$ ) sieves are used. The retained portion is also referred as plus (+) portion and the passing is called minus (-) portion. The results are reported as percentage of the passing fraction relative to the total mass of sample.

During sieving the sample is subjected to horizontal and vertical movement. This causes a relative movement between the particles and the sieve; depending on their size the individual particles either pass through the sieve mesh or are retained on the sieve surface. The likelihood of a particle passing through the sieve mesh is determined by the ratio of the particle size to the sieve openings, the orientation of the particle and the number of encounters between the particle and the mesh openings.

### **SAMPLE REQUIREMENTS**

The samples received may need preparation, or may be prepared by the customer (ready as received), or prepared by a different company. Thus, unless the sample is specifically defined as dry, the sample needs to be dried at  $60 \pm 10^\circ\text{C}$  as described in the SOP for drying. For samples with high clay content (particles under  $75\mu\text{m}$  are classified as clay particles) some clumping could be present. In this case the clumps must be broken up with (gloved) fingers or mortar and pestle, and returned to the oven for further drying. The minimum amount of sample required is 100g.



## **DETERMINATION OF GOLD, PLATINUM AND PALLADIUM IN GEOLOGICAL SAMPLES BY LEAD FUSION FIRE ASSAY WITH INDUCTIVELY COUPLED PLASMA – OPTICAL EMISSION SPECTROSCOPY (ICP-OES) FINISH OVERVIEW: MIN-200-12006**

### **INTRODUCTION AND SCOPE**

This method determines the concentration of gold, platinum and palladium in many types of solid matrices by Inductively Coupled Plasma - Optical Emission Spectroscopy (ICP-OES) following fire assay and aqua regia digestion of the raw material. The types of samples include rocks, core and other drill samples, minerals, concentrates, tills, sands, soils, stream sediments, slurries, and dump and grab samples.

### **PRINCIPLE OF THE METHOD**

Once the samples have undergone Fire Assay treatment, the resultant doré bead is attacked by wet chemical digestion (aqua regia) and then the instrumental finish is carried out using ICP-OES.

Inductively Coupled Plasma – Optical Emission Spectroscopy is an analytical technique used for the detection of trace metals. It is a type of emission spectroscopy that uses the inductively coupled plasma to produce excited atoms and ions that emit electromagnetic radiation at wavelengths characteristic of a particular element. The intensity of this emission is indicative of the concentration of the element within the sample.

### **SAMPLE REQUIREMENTS**

The samples received may need preparation, or may be prepared by the client (ready as received), or prepared by a different company. Thus, unless the sample is specifically defined as dry, the sample needs to be dried at 60°C. Some samples may also require crushing, splitting and/or milling depending on the package selected by the client and the type of material to be analyzed. The samples are treated to fire assay and then the bead doré is submitted to digestion.

### **Quality Control**

Reagent Blank: is run every 20 samples or once per fire assay set.

QC Solutions: are run at the beginning and end of the instrument data acquisition and also run every 20 samples for Calibration Verification.



Certified Reference Materials (CRM): a reference materials is used to verify calibration and fire assay conditions. A certified reference material must be weighed at least every 20 samples or once per fire assay set.

Replicates: every 20 samples or once per fire assay set a sample is chosen at random and weighed and fused in replicate.

Method Blank: every 40 samples or once per fire assay set a blank is fused (containing no sample).



## **DETERMINATION OF METALS IN GEOLOGICAL SAMPLES USING AN AQUA REGIA (NITRIC AND HYDROCHLORIC ACID) DIGESTION AND A COMBINATION OF INDUCTIVELY COUPLED PLASMA – OPTICAL EMISSION SPECTROSCOPY (ICP-OES) AND INDUCTIVELY COUPLED PLASMA MASS SPECTROSCOPY (ICP-MS) OVERVIEW: MIN-200-12018**

### **INTRODUCTION AND SCOPE**

This method describes the digestion with four acids in many types of solid matrices prior to instrumental determination by Inductively Coupled Plasma - Optical Emission Spectroscopy (ICP-OES) and Inductively Coupled Plasma – Mass Spectrometry (ICP-MS). The types of samples include metal bearing ores and related materials, rocks, core and other drill samples, minerals, concentrates, tills, sands, soils, stream sediments, and dump and grab samples.

### **PRINCIPLE OF THE METHOD**

Aqua Regia digestions are used in the digestion of certain geological samples and are effective for most base metal sulphates, sulphides, oxides and carbonates. It is noted that aqua regia only provides a partial digestion for most rock forming elements and elements of a refractory nature. Each sample of ~ 1.0 g is digested with a 3:1 hot mixture of hydrochloric and nitric acids for one hour. The resultant product is dissolved and diluted to 50 mL with deionized water. An aliquot is measured by a suitable spectrometry instrument.

### **SAMPLE REQUIREMENTS**

The samples received may need preparation, or may be prepared by the client (ready as received), or prepared by a different company. Thus, unless the sample is specifically defined as dry, the sample needs to be dried at 60°C. Some samples may also require crushing, splitting and/or milling depending on the package selected by the client and the type of material to be analyzed.

There are no holding times; however there is the possibility of sulfide oxidation (sample has been received already prepared but the sample is hard). The minimum amount of sample required is 0.5g.

### **QUALITY CONTROL**

Reagent Blank: is run randomly once in every group of up to 30 samples.

QC Solutions: are run at the beginning and end of the instrument data acquisition and also run every 20 samples for Calibration Verification.



Certified Reference Materials (CRM): a reference materials is used to verify digestion conditions. A certified reference material must be weighed at least every 20 samples or once per digestion set.

Replicates: every 20 samples or once per digestion set a sample is chosen at random and weighed and digested in replicate.

## REPORTING

The analyst reviews the results ensuring the blanks, certified reference materials, QC and replicates satisfy acceptance criteria. Data is transferred into the LIMS system by the analyst and the Lab Supervisor or General Manager authorizes the release to the customer. The results are reported in either weight % or mg/L, with a maximum of six significant figures (3 or 4 decimal places depending on the element). All data is kept with each file folder containing the COC and all relevant documentation.

### 51 Elements

Ag	Ni
Al	P
As	Pb
Au*	Rb
B	Re
Ba	S
Be	Sb
Bi	Sc
Ca	Se
Cd	Sn
Ce	Sr
Co	Ta
Cr	Te





Cs	Th
Cu	Ti
Fe	Tl
Ga	U
Ge	V
Hf	W
Hg	Y
In	Zn
K	Zr
La	
Li	
Mg	
Mn	
Mo	
Na	
Nb	

**\* Please note Gold detection is only suitable for exploration purposes**