2.31724

ALTO VENTURES LTD.

MUD LAKE PROPERTY

REPORT ON

SUMMER 2005
MMI GEOCHEMICAL SAMPLING

ELMHIRST AND WALTERS TOWNSHIPS
THUNDER BAY MINING DISTRICT
ONTARIO
NTS 42 E/13

Mike Koziol
Geologist, P.Geo.
February 28, 2006

SUMMARY

During the summer of 2005, Alto Ventures Ltd. completed a test Mobile Metal Ion (MMI) soil sampling program to determine if the method can identify anomalous gold zones in between known showings, as well as to help locate new targets for further exploration.

A total of 69 samples was collected and analysed but the results of the program are inconclusive. The terrain along the favourable corridor includes either bald outcrop with minimal soil cover or wet cedar swamps with no proper material to sample. Further MMI sampling over the segment of the shear structure extending from the No 3 to Oliver Severn showings is not recommended.

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1.0 INTRODUCTION

This report describes a Mobile Metal Ion (MMI) geochemistry test survey that was completed in June 2005 on the Mud Lake project. The survey was completed as part of a large summer exploration program which included detailed mapping and sampling, line cutting and IP geophysical surveying. The geology and IP surveys are reported under separate covers and the reader is referred to Tremblay (2005) and Rivest (2005) for a description of these programs.

1.1 Property Title

The Mud Lake project is located in the Thunder Bay Mining District and consists of 14 contiguous claims located in Elmhirst and Walters Townships. It is covered by NTS map sheets 42 E/13 and the approximate UTM coordinates in NAD 83 (Zone 16) for the centre of the property are 450000 m E and 5512000 m N.

The claims cover an area of approximately 1,696 hectares. Alto is working towards earning 100% interest in 8 claims from Beardmore prospectors Frank Houghton and Leroy Clark and the remaining 6 claims are 100% owned by Alto Ventures Ltd. Claims making up the Mud Lake project are listed in Table I below.

TABLE I
MUD LAKE PROPERTY CLAIMS LIST

TB 1204947, TB 1204950
TB 1205012, TB 1205082, TB 1205084
TB 1210760
TB 1215312
TB 1232680
TB 3010484
TB 3011482, TB 3011483, TB 3011485, TB 3011486
TB 4203980

The claims on which sampling was carried out include 1205012, 1205082 and 3011485.

1.2 Location, Access and Infrastructure

The project is situated approximately 55 kilometres west of the town of Geraldton, Ontario and 190 kilometres northeast of the city of Thunder Bay. The property can be reached from Thunder Bay or Geraldton by travelling along the Trans-Canada Highway (No. 11) to the intersection with forestry road 801, some 22 km east of the town of Beardmore. The southwest and central portions of the property are easily accessible by following road 801 some 10 km northwest and by turning northeast onto an old logging road which acts as the property's main access road (Main Road). Access to the northeast portion of the property is possible via the Main Road or by

continuing several kilometres further on the 801 to the Namewaminikan (Sturgeon) River and by then turning northeast onto an old road (River Road) just before the bridge on 801. This road follows the river and leads to trails that access the northeast showings.

Labour is readily available from the nearby towns or villages of Jellicoe, Geraldton, Longlac, and Beardmore. Specialized mining equipment and services are available from the more distant towns of Hearst, Timmins, and Thunder Bay.

1.3 Physiography

Forestry operations were carried out some 15 years ago and much of the property was cut over and is now covered by a new growth mainly consisting of grey pine. A few stands of mature timber were left behind here and there, notably in the area spanning the No. 3 to Oliver Severn Showing.

The terrain on the property is generally sandy and well drained and consists of rolling hills with a maximum relief in the order of 30-50 m. Outcrop exposure is locally very abundant and in areas devoid of outcrops, till cover is expected to be thin and in the order of 1 to 2 metres. In the area of the MMI survey, the terrain includes mainly bald outcrop ridges with minimal soil cover and wet cedar swamps which lie between the ridges.

1.4 Property and Regional Geology

A detailed description of the geology was presented by Tremblay (2005) in the report describing the detailed mapping and sampling program that was completed during the same period as the MMI test survey.

2.0 2005 MMI SAMPLING PROGRAM

2.1 Purpose and Description of Program

The purpose of the MMI survey was to test if this method can be applied to better define auriferous zones between surface showings along a known gold bearing shear structure. Sampling was attempted every 20 m along remnants of a grid that was cut by Noranda Explorations in 1989. The baseline was flagged and chained and then 200 m spaced cross lines were flagged and chained for MMI sampling. The sampling grid extended from line 0+50S to 16+00N. The site selection and suitability of sample quality were determined in the field by Mike Koziol, P.Geo and the sampling was carried out by Derek Koziol and Lucas Schimbeckler. The test survey was completed on June 18 to June 21, 2005.

A protocol for the Abitibi area was developed for soil geochemical sampling that takes both depth and medium into consideration. The two types of media that were taken into consideration are peat and mineral soil. The mineral soil includes the Ae horizon, which is the whitish, leached material below the organics; the B horizon, which is the orange zone of metals accumulation; or

the C horizon, which is the relatively unaltered material. The target medium is mineral soil within a target depth of 10-25 cm. This is not always possible because much of the Abitibi is covered by peat that has depths of greater than 25 cm. A 3" diameter Dutch Auger was used to take the samples where good sample material was available. In areas of peat, sampling of organic material at constant depths of 20 to 50 cm was attempted. Descriptions of the sampling protocol followed during this program are presented in Appendix B

On the Mud Lake property, the area of the test survey proved difficult; most of the area is either relatively bald outcrop ridges where the soil cover is less than 10 cm or wet cedar swamps occupying the valleys between the ridges. Generally, the cedar swamps exceeded 1.2 metres in depth before any soils or peat was found.

During the Alto Ventures 2005 summer program a total of 69 samples were taken. Samples were attempted every 20m along the 1989 Noranda lines. Samples were not taken where there was not enough soil cover or in extremely swampy terrain. Figure 3 illustrates the sample sites relative to known gold occurrences.

Samples were analysed at SGS Minerals of Toronto. After the sample was collected following a specific soil sampling procedure, there was no sample preparation or drying in the laboratory. The analysis was done on a 50 gram sample and the extracted solution was analysed via ICP-MS for specific elements in the part per billion ranges.

2.2 Results

In total, 125 sample sites were visited but only 69 samples were collected because the other sites did not meet the sampling protocol described above; many of the samples that were collected did not strictly satisfy the protocol requirements. The sample sites visited and results for Au, Ag and Co are illustrated in Figures 3 to 6 respectively and all the analytical results are presented in Appendix A.

Gold values for the 69 samples range from below detection levels up to 0.19 ppb, silver values range from below detection to 2.75 ppb: and Co values range from detection levels to 67 ppb. Because the sample coverage is so incomplete, the results of the survey do not assist with interpretation regarding the extension of gold mineralized zones beyond the known surface showings.

3.0 RECOMMENDATIONS

The test MMI survey gave inconclusive results because of the very specific surface conditions in the areas of the showings and along the projected shear trend. Use of this method to better delineate mineralized zones that are covered by wet cedar swamps is not recommended on this property.

4.0 REFERENCES

Rivest, H., 2005, Alto Ventures Ltd. Resistivity/Induced Polarization Survey, Mud Lake Project, Elmhirst Township, Geraldton-Beardmore Gold Camp, Ontario, Canada, Logistics and Interpretation Report, 05N872, internal report.

Tremblay, Robert J., 2005, Alto Ventures Ltd. Mud Lake Property, Report on Summer 2005 Geological Mapping and Sampling, internal report

5.0 CERTIFICATE

I, Marian (Mike) Koziol, P.Eng., P.Geo., resident at 137 Cranbrook Crescent, Sudbury, Ontario do hereby certify that:

1. I am currently employed as Vice President, Exploration by Alto Ventures Ltd.

2. I graduated from McGill University, Montreal, Quebec with a B.Sc. degree in Geological Sciences in 1978.

3. I am a licensed member of the Professional Engineers of Ontario (No. 100026045) and a licensed member of the Association of Professional Geoscientists of Ontario (No. 1009). I am also a member of the Association of Professional Engineers and Geoscientists of Saskatchewan (No. 05638).

4. I have worked continuously as an exploration geologist since my graduation, exploring for gold and base metals deposits in the Canadian Shield including the Churchill Province of Saskatchewan and Manitoba and the Superior Province of Manitoba, Ontario and Quebec.

5. I have read the definition of "Qualified Person" as set out in National Instrument 43-101 and certify that I fulfill the requirements to be a Qualified Person for the purposes of NI43-101 by reason of my education, relevant past work experience and affiliation with professional association as defined in NI43-101.

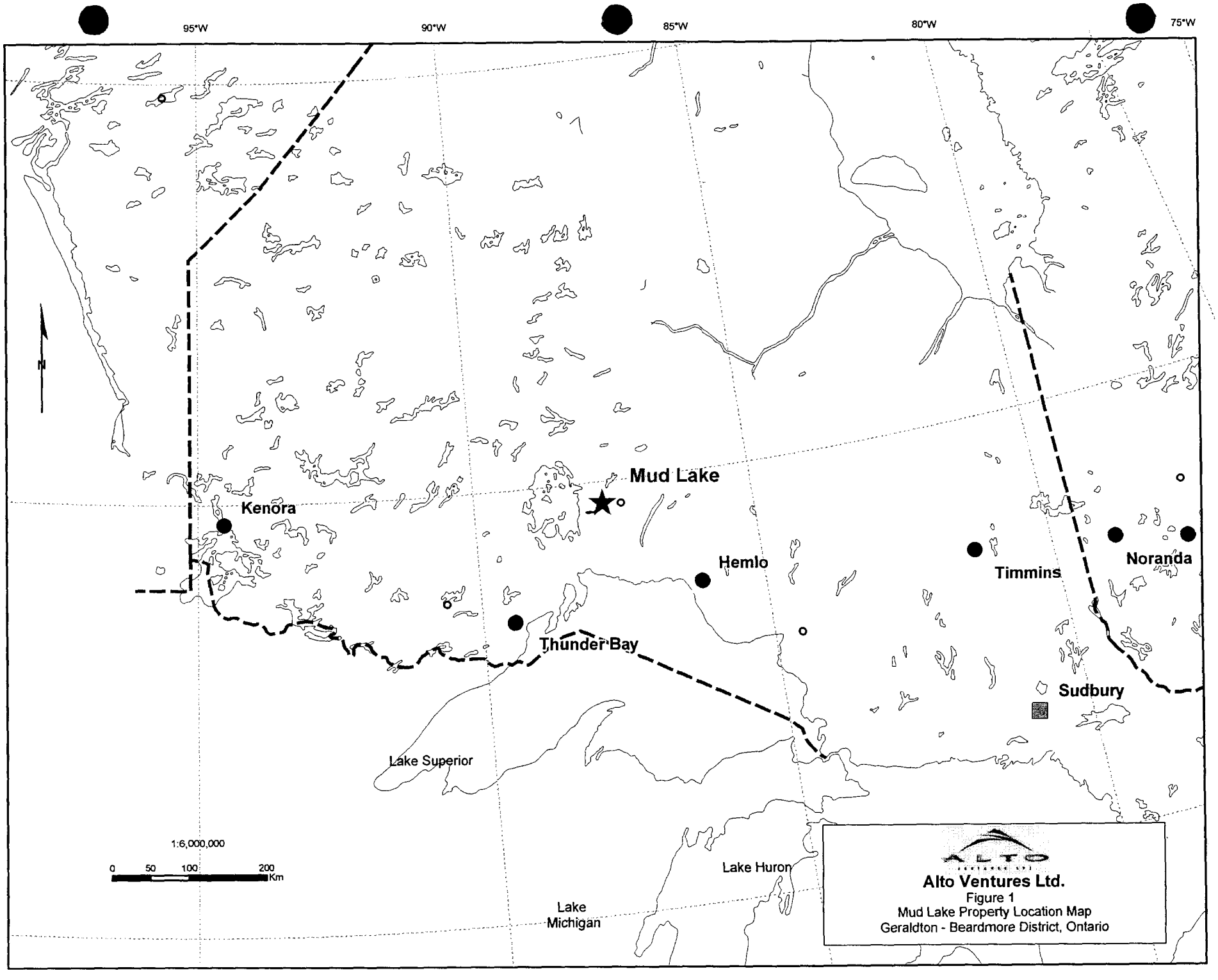
6. I have personally worked on the Mud Lake property and supervised the program described in this report.

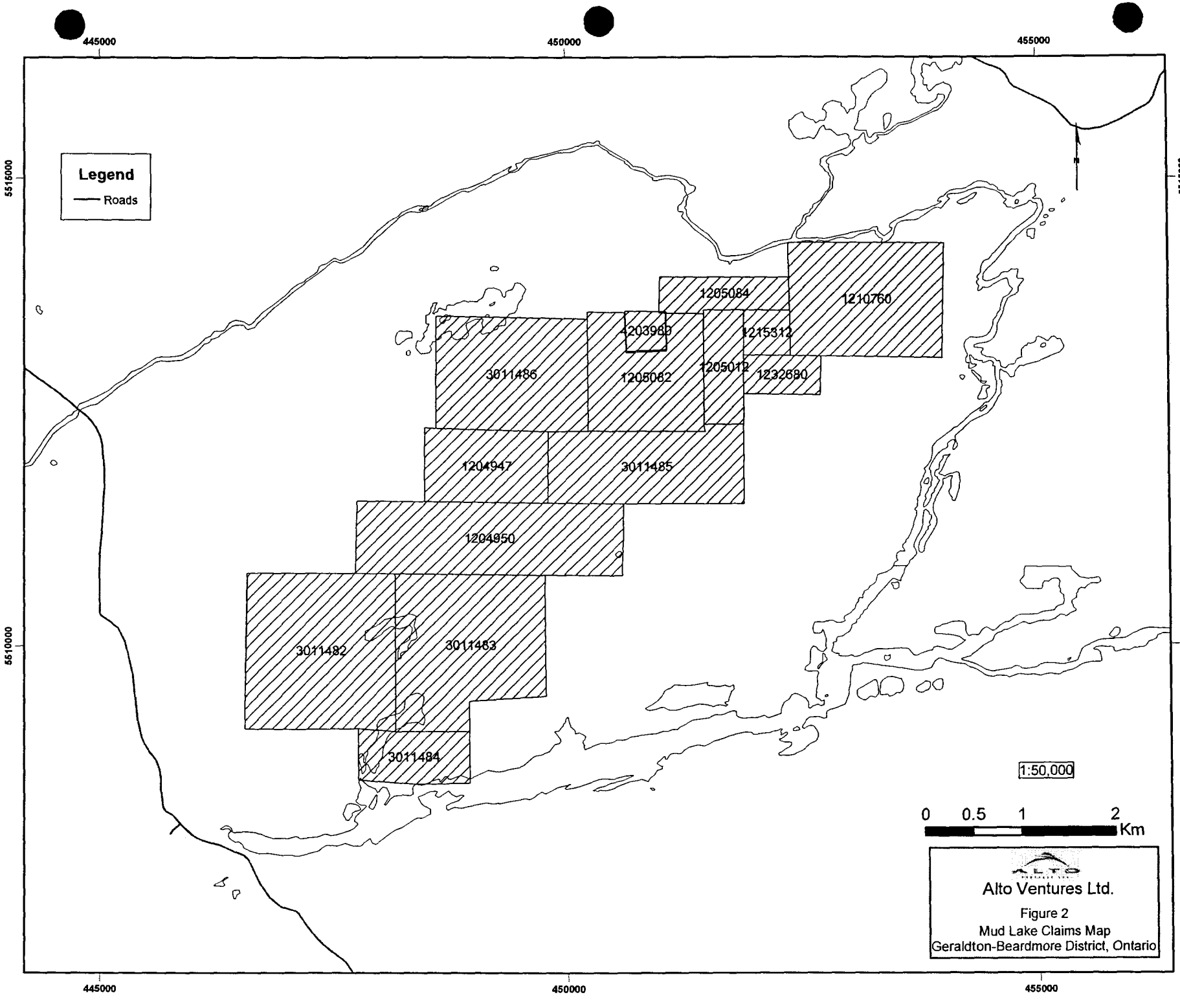
8. As of the date of this certification, I am not aware of any material fact or change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.

9. I do not hold a direct interest in the Mud Lake property but I do own shares of Alto Ventures Ltd and for the purposes of this report I am not an independent Qualified Person as defined by Section 1.5 of NI43-101.

Original Signed in Sudbury, Ontario on this 28th day of February, 2006

Marian (Mike) Koziol, P.Eng., P.Geo.


95°W
90°W
85°W
80°W
75°W
N
Mud Lake
Kenora
Hemlo
Timmins
Noranda
Thunder Bay
Sudbury
Lake Superior
Lake Huron
Lake Michigan
1:6,000,000
0 50 100 200 Km
Alto Ventures Ltd.
Figure 1
Mud Lake Property Location Map
Geraldton - Beardmore District, Ontario


445000
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5510000
Legend
Roads
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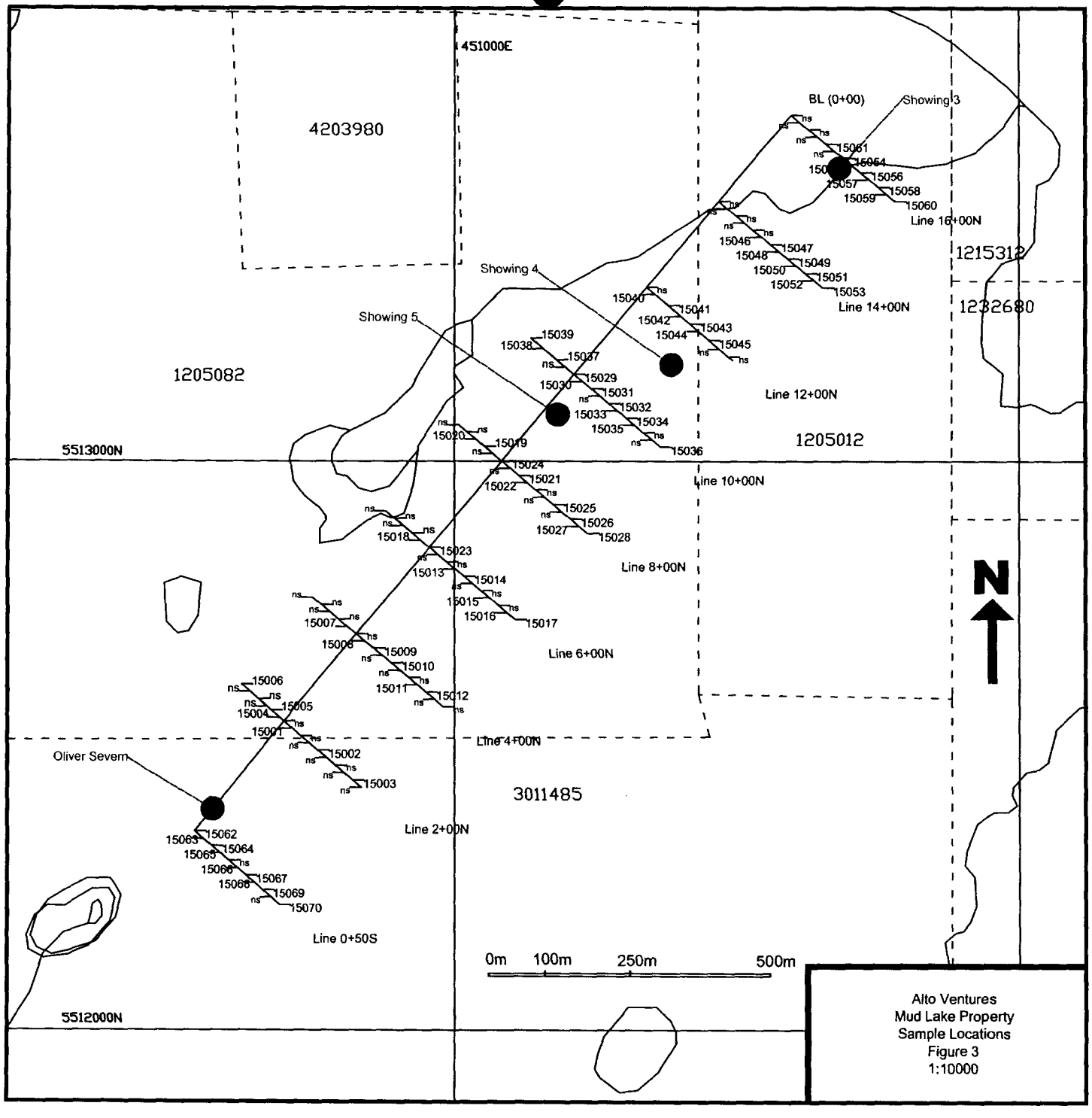
3011486
1205082
1205012
1232680
1204947
3011485
1204950
3011482
3011483
3011484
1:50,000
0 0.5 1 2
Km
Alto Ventures Ltd.
Figure 2
Mud Lake Claims Map
Geraldton-Beardmore District, Ontario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Showing 3
Showing 4
Showing 5
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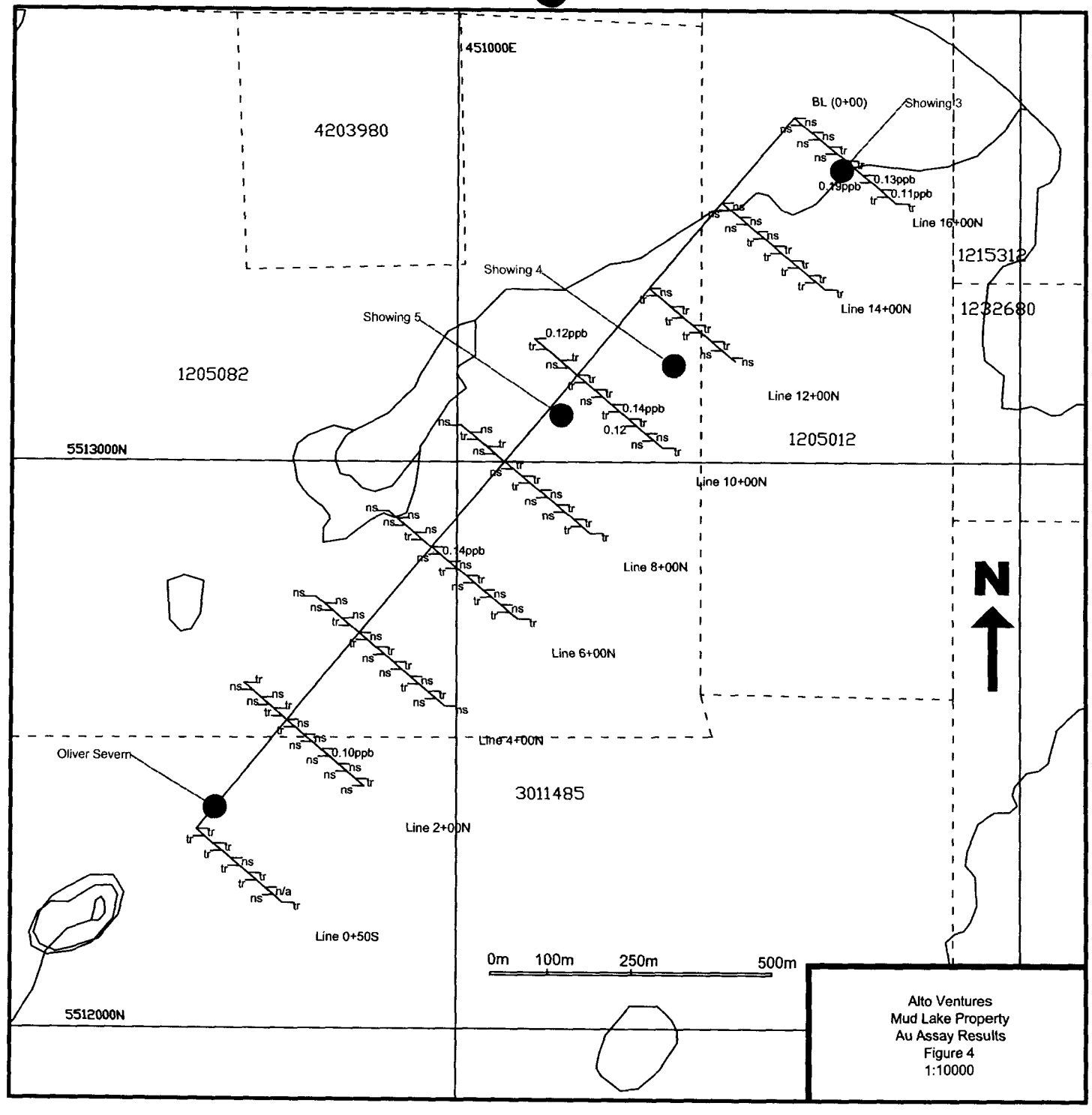
Line 14+00N
Line 12+00N
Line 10+00N
Line 8+00N
Line 6+00N
Line 4+00N
Line 2+00N
Line 0+50S
1215312
1232680
1205082
1205012
3011485
5513000N
5512000N
Oliver Severn
0m 100m 250m 500m
N
Alto Ventures
Mud Lake Property
Sample Locations
Figure 3
1:10000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4203980
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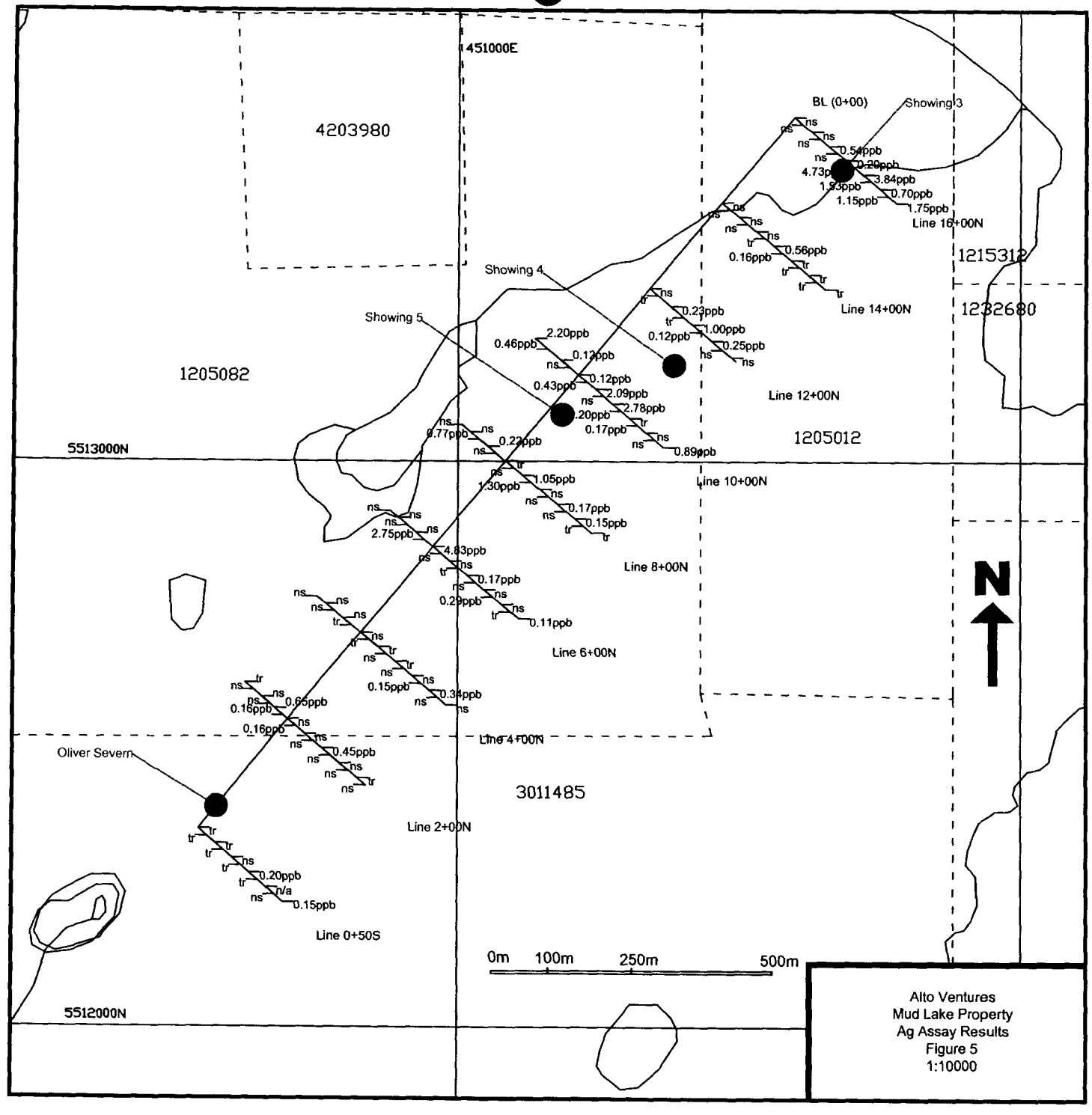
0.19ppb
0.11ppb
Line 16+00N
1215312
Showing 4
Line 14+00N
1232680
Showing 5
0.12ppb
1205082
Line 12+00N
0.14ppb
0.12
1205012
5513000N
Line 10+00N
0.14ppb
Line 8+00N
N
Line 6+00N
Line 4+00N
Oliver Severn
0.10ppb
3011485
Line 2+00N
n/a
Line 0+50S
0m
100m
250m
500m
5512000N
Alto Ventures
Mud Lake Property
Au Assay Results
Figure 4
1:10000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Showing 4
Showing 5
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1205012
Line 16+00N
Line 14+00N
Line 12+00N
Line 10+00N
Line 8+00N
Line 6+00N
Line 4+00N
Line 2+00N
Line 0+50S
5513000N
5512000N
Oliver Severn
3011485
N
0m
100m
250m
500m
Alto Ventures
Mud Lake Property
Ag Assay Results
Figure 5
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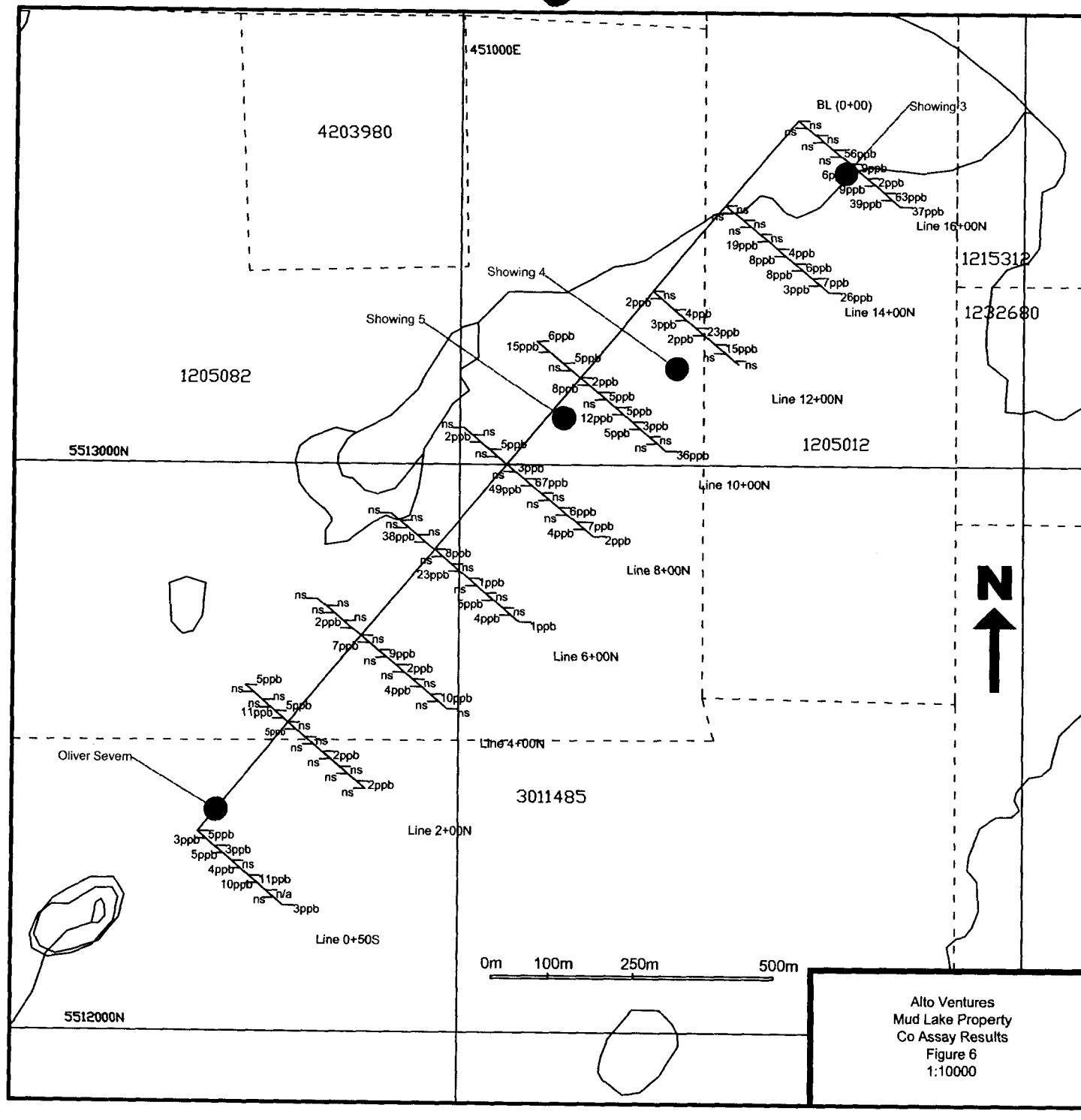
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4203980
BL (0+00)
Showing 3
Line 16+00N
1215312
Showing 4
Showing 5
1205082
Line 14+00N
1232680
Line 12+00N
1205012
5513000N
Line 10+00N
Line 8+00N
N
Line 6+00N
Line 4+00N
Oliver Severn
3011485
Line 2+00N
Line 0+50S
0m
100m
250m
500m
5512000N
Alto Ventures
Mud Lake Property
Co Assay Results
Figure 6
1:10000

APPENDIX A

ASSAY CERTIFICATES

Mud Lake. MMI.

Az BL = 40°
Ln 0-16W

CERTIFICATE OF ANALYSIS

Work Order: 084469

To: **Alto Ventures Ltd.**
Attn: Mike Koziol

Date : 17/08/05

1351D Kelly Lake Rd, Unit 8
SUDBURY
ON/CANADA/P3E 5P5

Copy 1 to :

P.O. No.	:	
Project No.	:	Mud Lake
No. of Samples	:	69 Soil (MMI)
Date Submitted	:	05/07/05
Report Comprises	:	Cover Sheet plus Pages 1 to 3

Distribution of unused material:
Pulps: STORE
Rejects: STORE

Certified By :

Tim Elliott, Operations Manager

ISO 9002 REGISTERED

ISO 17025 Accredited for Specific Tests. SCC No. 456

Report Footer:

L.N.R.	= Listed not received	I.S.	= Insufficient Sample
n.a.	= Not applicable	--	= No result
*INF	= Composition of this sample makes detection impossible by this method		

M after a result denotes ppb to ppm conversion, % denotes ppm to % conversion

SGS

Work Order: 084469 **Date:** 17/08/05 **FINAL**

Element.	Au	Co	Ni	Pd	Ag
Method.	MMI-B5	MMI-B5	MMI-B5	MMI-B5	MMI-B5
Det.Lim.	0.1	1	3	0.1	0.1
Units.	ppb	ppb	ppb	ppb	ppb
15001	<0.1	5	18	<0.1	0.16
15002	0.10	2	11	<0.1	0.45
15003	<0.1	2	17	<0.1	<0.1
15004	<0.1	11	17	<0.1	0.16
15005	<0.1	5	50	<0.1	0.65
15006	<0.1	5	17	<0.1	<0.1
15007	<0.1	2	19	<0.1	<0.1
15008	<0.1	7	25	<0.1	<0.1
15009	<0.1	9	12	<0.1	<0.1
15010	<0.1	2	15	<0.1	<0.1
15011	<0.1	4	24	<0.1	0.15
15012	<0.1	10	17	<0.1	0.34
15013	<0.1	23	29	<0.1	<0.1
15014	<0.1	1	12	<0.1	0.17
15015	<0.1	5	12	<0.1	0.29
15016	<0.1	4	8	<0.1	<0.1
15017	<0.1	1	8	<0.1	0.11
15018	<0.1	38	41	<0.1	2.75
15019	<0.1	5	22	<0.1	0.22
15020	<0.1	2	4	<0.1	0.77
15021	<0.1	67	52	<0.1	1.05
15022	<0.1	49	78	<0.1	1.30
15023	0.14	8	43	<0.1	4.83
15024	<0.1	3	19	<0.1	<0.1
15025	<0.1	6	20	<0.1	0.17
15026	<0.1	7	16	<0.1	0.15
15027	<0.1	4	10	<0.1	<0.1
15028	<0.1	2	6	<0.1	<0.1
15029	<0.1	2	12	<0.1	0.12
15030	<0.1	8	13	<0.1	0.43

SGS

Work Order: 084469 **Date:** 17/08/05 **FINAL**

Element.	Au	Co	Ni	Pd	Ag
Method.	MMI-B5	MMI-B5	MMI-B5	MMI-B5	MMI-B5
Det.Lim.	0.1	1	3	0.1	0.1
Units.	ppb	ppb	ppb	ppb	ppb
15031	<0.1	5	25	<0.1	2.09
15032	0.14	5	40	<0.1	2.78
15033	<0.1	12	10	<0.1	0.20
15034	<0.1	3	5	<0.1	<0.1
15035	0.12	5	8	<0.1	0.17
15036	<0.1	36	40	<0.1	0.89
15037	<0.1	5	9	<0.1	0.12
15038	<0.1	15	10	<0.1	0.46
15039	0.12	6	23	<0.1	2.20
15040	<0.1	2	6	<0.1	<0.1
15041	<0.1	4	29	<0.1	0.23
15042	<0.1	3	22	<0.1	<0.1
15043	<0.1	23	43	<0.1	1.00
15044	<0.1	2	7	<0.1	0.12
15045	<0.1	15	36	<0.1	0.25
15046	<0.1	19	58	<0.1	<0.1
*Blk BLANK	<0.1	<1	<3	<0.1	<0.1
*Std MMISRM14	42.4	32	200	41.0	19.6
15047	<0.1	4	12	<0.1	0.56
15048	<0.1	8	74	<0.1	0.16
15049	<0.1	6	19	<0.1	<0.1
15050	<0.1	8	16	<0.1	<0.1
15051	<0.1	7	12	<0.1	<0.1
15052	<0.1	3	11	<0.1	<0.1
15053	<0.1	26	20	<0.1	<0.1
15054	<0.1	9	11	0.13	0.29
15055	<0.1	6	69	<0.1	4.73
15056	0.13	2	56	<0.1	3.84
15057	0.19	9	17	<0.1	1.53
15058	0.11	63	35	<0.1	0.70

SGS

Work Order: 084469 **Date:** 17/08/05 **FINAL**

Element.	Au	Co	Ni	Pd	Ag
Method.	MMI-B5	MMI-B5	MMI-B5	MMI-B5	MMI-B5
Det.Lim.	0.1	1	3	0.1	0.1
Units.	ppb	ppb	ppb	ppb	ppb
15059	<0.1	39	44	0.16	1.15
15060	<0.1	37	120	<0.1	1.75
15061	<0.1	56	57	0.16	0.54
15062	<0.1	5	20	<0.1	<0.1
15063	<0.1	3	14	<0.1	<0.1
15064	<0.1	3	10	<0.1	<0.1
15065	<0.1	5	22	<0.1	<0.1
15066	<0.1	4	22	<0.1	<0.1
15067	<0.1	11	11	<0.1	0.20
15068	<0.1	10	10	<0.1	<0.1
15070	<0.1	3	11	<0.1	0.15
*Dup 15001	<0.1	4	14	<0.1	0.16
*Dup 15013	<0.1	20	23	<0.1	<0.1
*Dup 15025	<0.1	5	22	<0.1	0.13
*Dup 15037	<0.1	4	10	<0.1	0.23
*Dup 15049	<0.1	6	25	<0.1	<0.1
*Dup 15061	<0.1	44	46	0.18	0.74
*Blk BLANK	<0.1	<1	<3	<0.1	<0.1
*Std MMISRM14	39.9	34	211	42.6	19.1

APPENDIX B

MMI GEOCHEMISTRY AND SAMPLE PROTOCOL

MOBILE METAL ION GEOCHEMISTRY - MMI

SGS Minerals in Toronto Canada is licensed exclusively in the Americas to perform MMI analyses. SGS has 10 years experience in MMI analysis. The technology is accepted worldwide as an excellent geochemical tool for finding buried mineral deposits.

The MMI Technology is an innovative geochemical process that uses a unique approach to the analysis of metals in soils and weathered materials. It involves sample extraction using weak solutions of organic and inorganic compounds rather than the conventional aggressive acid or cyanide-based digest solutions. MMI solutions contain strong ligands, which are used to detach and hold in solution metal ions loosely bound to soil particles by weak atomic forces. The digests are formulated to avoid dissolving the bound forms of the metals. The metal ions held in solution are therefore the chemically active or 'mobile' component. These mobile forms occur in very low concentrations that are measurable by ICP-MS.

As in all soil geochemistry techniques, the most critical aspect of MMI analysis is the sampling of the soils. It is critical to contact SGS lab personnel for detailed instructions on the sampling protocols.

There are many benefits to using this MMI Technology for soil geochemistry programs. These include:

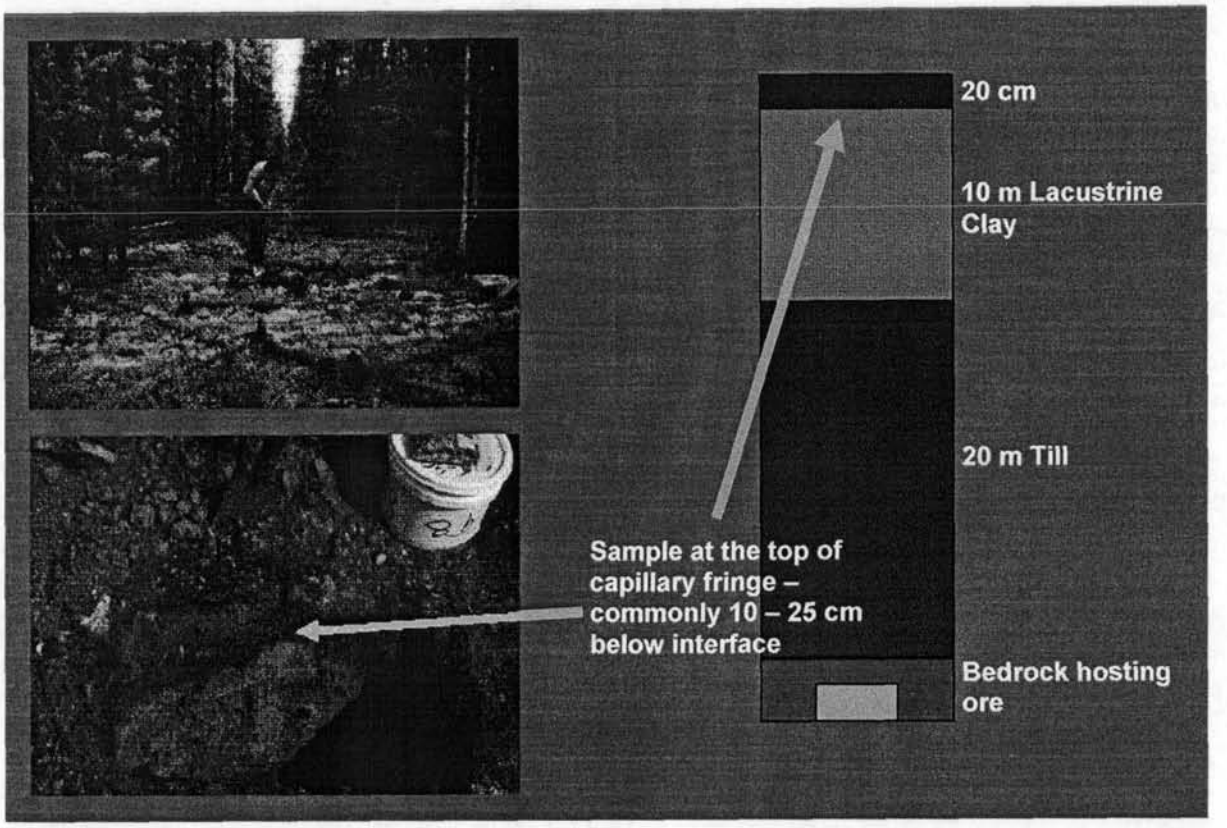
- few false anomalies
- high repeatability
- minimal nugget effects
- focused anomalies

For further details please contact SGS Minerals in Toronto or visit the MMI website at: www.mmigeochem.com

Sampling for MMI in Boreal Zones

Mobile Metal Ion Geochemistry

Sampling for MMI in Boreal Climatic Zones



WHERE TO SAMPLE

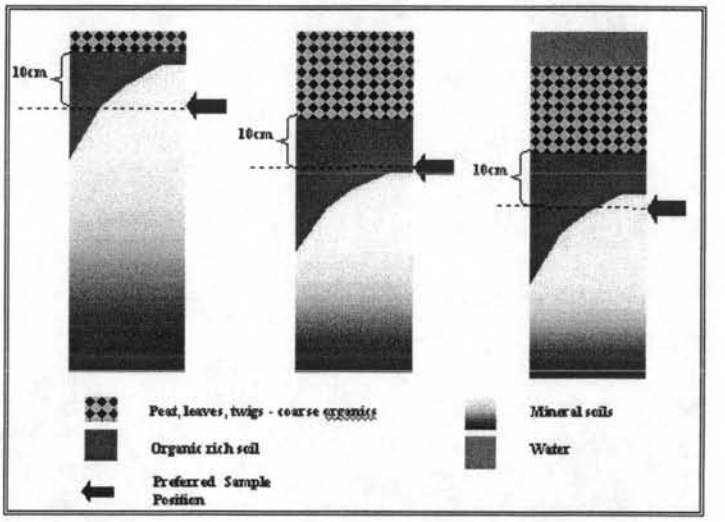
Experience in MMI sampling in Europe and North America demonstrates that the mobile metal ion geochemical technique works best when samples are collected at a constant depth (10-25 cm) **BELOW** the interface between leaf and twig litter on surface, and completely decomposed material. This sampling interval below the leaf and twig litter can vary from A to B horizon.

SAMPLING PROCEDURE

To sample for MMI geochemistry in boreal climates, particularly in areas with substrates that contain overlying peat blankets;

- Before actually taking the sample, brush sampling equipment to eliminate residue from previous samples and flush it with soil from the new sample site.
- Scrape away any extensive organic horizon (O or Ao) and eliminate loose non-decomposed matter, debris, and any possible cultural contamination.

- Penetrate the leaf litter and organic material that still has structure (i.e. decomposing leaves, bark, twigs and peat). Once through to a true A-horizon (where the soil resembles a decomposed mass without any obvious leaf or vegetation visible), discard the top 10cm of this A-horizon material and then collect the sample between the 10 to 25 cm below this horizon. Using a plastic scoop take a cross section of the material between the 10 to 25 cm depth, put into clean, properly labeled plastic bags. Collect approx. 300 to 400 grams of material.



- Ensure not to mix organic and inorganic soils in the collected sample. For example, if the material within the 10 to 25 cm zone has a mixture of humus and inorganic soil then proceed to the base of this "mixed zone" and collect the sample from the inorganic material. If the thickness of the humified organic layer exceeds 25 cm then the sample should be collected from the organic layer. Note the soil type in your field description of the site.

- Different soil types may be characterized by variable geochemical backgrounds for some or all elements. To avoid mixing MMI data populations based on soil type, interpret data for organic and inorganic soils separately. If significant differences between soil types are not noted in the lower 25th percentile and background calculations of the data set, then the data populations may be combined for interpretation based on response ratios. For further details on calculating response ratios, please contact an SGS or MMI representative or visit the MMI web site at www.mmigeochem.com.

- During sample collection and handling, no jewelry (watches, rings, bracelets, and chains) should be worn, as this can be a major source of contamination.

- Regardless of topographic influences and associated variability in the soil profile the sample should be collected 10 to 25 cm below the interface with the non-decomposed surface leaf / twig matter.

- Clear and concise notes should be kept at each site, paying close attention to the location of the sample with respect to the thickness and nature of the soil horizons. Parameters such as soil moisture, development of a "b-horizon", organic content, presence or absence of suspended aqueous material within the soil and general

characteristics of the overburden in the survey area can be very useful for data interpretation.

OPTIMIZED PARTIAL EXTRACTION SAMPLING PROTOCOL FOR VARIABLE TERRAIN IN THE ABITIBI CLAY BELT

February, 2005

Field sampling protocol is the most important component of a partial extraction geochemical sampling program in areas of thick cover. Many surficial processes affect the geochemical signal and these must be minimized by careful sampling or the signal to noise ratio will be too high to detect a response due to deeply buried mineralization. If proper and very consistent protocols are not followed in the field the likelihood of success is greatly decreased.

It was determined during the "Deep Penetrating Geochemistry" project that the depth of sample is as critical as the medium sampled to partial extraction geochemistry. A protocol was developed for the Abitibi area that takes into consideration both depth and medium. As part of this protocol, there are only two target media: mineral soil and peat. The mineral soil includes: the Ae horizon, which is the whitish, leached material below the organics; the B horizon, which is the orange zone of metals accumulation; or the C horizon, which is the relatively unaltered material. It does not include the A_1 horizon, which contains significant organic material.

The primary target medium is the mineral soil but this is not always available within the target depth interval of 10 – 25 cm because much of the Abitibi is covered by peat accumulations of greater than 25 cm. To resolve this problem, we have developed a protocol that collects either mineral soil *or* peat at a given site and then treats the data as 2 separate media during later interpretation. Notes ***must be taken*** to differentiate which of the two media was collected or interpretation of results will be impossible. In addition, a pH sample or a field pH measurement must also be taken, since pH cannot be properly carried out on a sample pulped and dried for Enzyme Leach analysis.

Equipment

- 3" diameter Dutch Auger
- Whirl-pac® polyethylene bags or equivalent (minimum 5" x 9" bags for Enzyme Leach sample; smaller bag for pH sample)
- Field pH meter *calibrated daily* with pH 7 and 4 buffer solution
- Note-book, preferably with pre-printed forms to avoid unrecorded data. Alternatively a Palm-pilot or equivalent digital data entry system could be used.

Selection of protocol

At each site the auger is used to extract the top 25 cm of soil. If at least 5 cm of mineral soil is present in the interval from 10 to 20 cm, the "dry protocol" is used. If only peat is available, the "peat protocol" is used.

Dry Protocol

The leaf litter at a site is brushed off and the Dutch Auger is used to extract the mineral soil from 10-20 cm depth, measuring from the base of the leaf-litter. If at least 5 cm of mineral soil exists within the 10-20 cm zone, this is collected as the sample for that station. The ideal target

medium for the mineral soil sample is the Ae horizon or the uppermost B-horizon if the Ae horizon is not present. Generally, one or the other of these would be developed immediately under the organics where the latter is <20 cm thick. The C-horizon would rarely be encountered in such cases during the sampling, but would be sampled if it was.

Notes must be taken recording (1) the medium (mineral soil); (2) the type of soil material (i.e. sand, etc.), (3) site conditions, especially with respect to drainage and soil moisture. Notes are discussed further below.

Peat Protocol

In the Abitibi region if mineral soil does not occur in the first 20 cm, the organic material will almost invariably be peat as opposed to humus and the "peat protocol" must be used. Avoiding hummocks, the sampler should stand on level ground and insert the Dutch auger through the compressed sphagnum under which he/she is standing. The sample should be taken from a consistent depth between 20 and 50 cm. Samples taken near the base of peat can sometimes have entrained clastic material so if the region has relatively thin peat, the sample depth should on the shallower end of the range (20-30 cm). In thicker peat, the sample should be taken at 50 cm. After the sample is taken the auger should be inserted to it's full length to determine if the base of peat exists within one auger's length and the result should be recorded. This will help to later identify any geochemical anomalies related to bog "edge effects" and depth effects. Other notes should particularly record the presence of clastic material in the sample and the proximity to creeks that can shed clastics into the peat during flood events.

pH Determination

pH is the single most important parameter in selective leach geochemical surveys. When sampling peat, the pH probe can be inserted into a sample placed in a cup and the measurement taken in the field. The peat around the probe should be squeezed to exclude air and bubbles and to ensure a liquid contact around the bulb of the probe. The pH readings should be taken after 1 minute of probe immersion. When sampling mineral soil a slurry must be mixed. A constant amount of distilled water (2 – 5 ml) should be added to a constant amount of mineral soil (1-2 g) and mixed into a paste or slurry. The probe is then inserted into the paste and stirred to ensure complete liquid coverage on the bulb and reference junction. The reading should be taken after 1 minute of probe immersion. Because the slurry is a more involved procedure, it is easier to carry it out at the end of the day once the fieldwork is completed. A separate sample must be taken for pH, or a subsample removed from the main sample when measurements are being taken at the end of each day.

At least daily calibration of the pH probe is essential and records should be kept after each calibration. Probes used for slurry measurements have a shorter life than probes used for water measurements. Generally a probe will last a field season but care should be taken to replace the probe if calibration becomes difficult, since this is an indication of probe degradation.

Recording of field data

Notes must be taken when sampling because the two media are treated separately at the data interpretation stage. Notes should include the following:

Dry protocol

1. Medium, i.e. mineral soil
2. Moisture and drainage conditions, i.e. wet / dry, "near creek", "on slope"
3. The type of material sampled, i.e. sand, silt, clay or alluvium, till
4. The predominant soil horizon sampled, i.e. Ae (the whitish leached zone), B (the zone of iron oxides, C (relatively unaltered parent material).

Peat protocol

1. Medium, i.e. peat; dry peat; humus
2. Peat thickness (up to the length of the auger).
3. The presence of any clastic material in the peat such as sand, silt, or clay.
4. Presence of watercourses.

Alto Ventures Soil Sample Sheet

	15001	15002	15003	15004
Sample Number	1 (200N, 20E)	(200N, 80E)	(200N, 160E)	(200N, 10W)
Dry Protocol				
Medium		Dry		
Moisture and Drainage		edge of valley no waterway		
Type of Material (ex. sand, silt, alluvium)		silt		
Predominant Soil Horizon		B		
Peat Protocol				
Medium	peat		peat	peat
Peat Thickness (up to length of auger)	1.25m		1.5m	1.0m
Clastic Material (ex. sand, silt, clay)	none		none	none
Presence of Watercourses	intermittent creek bed		swamp	swamp beside puddle

10 m between
2 ridges

Alto Ventures Soil Sample Sheet

	15005	15006	15007	15008
Sample Number	200W, 400W 30W	200W, 100W	400N, 20E/W	400N, 20E
Dry Protocol				
Medium				
Moisture and Drainage				
Type of Material (ex. sand, silt, alluvium)				
Predominant Soil Horizon				
Peat Protocol				
Medium	peat	peat	peat	peat
Peat Thickness (up to length of auger)	10-15cm	40cm	35cm	40cm
Clastic Material (ex. sand, silt, clay)	none (sticks)	little clay	none	none
Presence of Watercourses	swamp	swampy creek	dry swamp	dry swamp

Note: 400W, 40W is organic covered rock

" , 60W is organic covered rock

" , 80W is organic covered rock in a bit of clay but not rough

" , 100W is organic covered rock

Alto Ventures Soil Sample Sheet

	15069	15010	15011	15012
Sample Number	400N, 40E	400N, 80E	400N, 140E	400N, 160E
Dry Protocol				
Medium				
Moisture and Drainage				
Type of Material (ex. sand, silt, alluvium)				
Predominant Soil Horizon				
Peat Protocol				
Medium	peat	peat	peat	peat
Peat Thickness (up to length of auger)	40cm	60cm	1.5m	1.5m
Clastic Material (ex. sand, silt, clay)	none	none	none	none
Presence of Watercourses	cedar swamp	cedar swamp	cedar swamp	cedar swamp

400N, 80E not taken because of organic covered rock

400N, 100E is a ridge

" 120E is organic covered rock

15012: is it peat?

15013: 1.5 m and no peat, only mud

400N, 180E

400N, 200E "

Alto Ventures Soil Sample Sheet

	~~1S013~~ 1S013	1S014	1S015	1S016
Sample Number	~~600N, 60E~~	600N, 80E	600N, 140E	600N, 180E
Dry Protocol				
Medium				
Moisture and Drainage				
Type of Material (ex. sand, silt, alluvium)				
Predominant Soil Horizon				
Peat Protocol				
Medium	peat	peat	peat	Peat?
Peat Thickness (up to length of auger)	40 cm	40 cm	1.5m	1.5m
Clastic Material (ex. sand, silt, clay)	none	none	none	none
Presence of Watercourses	dry cedar swamp	dry cedar swamp	dry cedar swamp	cedar swamp

600N, 20E: organic colored rock
" , 40E: rock ridge/oc
" , 100E: cedar swamp, no peat
" , 120E: cedar swamp w rock right underneath
" 160E: cedar swamp w rock right underneath

Alto Ventures Soil Sample Sheet

Sample Number	1S017 600W, 200S	4E		
Dry Protocol				
Medium				
Moisture and Drainage				
Type of Material (ex. sand, silt, alluvium)				
Predominant Soil Horizon				
Peat Protocol				
Medium	peat?			
Peat Thickness (up to length of auger)	1.5m			
Clastic Material (ex. sand, silt, clay)	none			
Presence of Watercourses	dry cedar swamp			

Alto Ventures Soil Sample Sheet

Sample Number	15018	15019	15020	15021
	600N, 20W	800N, 40W	800N, 60W	800N 40W
Dry Protocol				
Medium	Dry	Dry	Dry	Dry
Moisture and Drainage	Bott-m of Ridge	flat area	flat area	slight slope towards S
Type of Material (ex. sand, silt, alluvium)	Silt	silt	silt	silt
Predominant Soil Horizon	B	B	B	B
Peat Protocol				
Medium				
Peat Thickness (up to length of auger)				
Clastic Material (ex. sand, silt, clay)				
Presence of Watercourses				

600N, 40W - Moss covered Rock Ridge
600N, 60W - Lake Wetland
" 80W - "
" 100W - "
800N, 20W: organic covered rock
800N, 80W: "
" 100W: "
800N, 20E: "

Alto Ventures Soil Sample Sheet

Sample Number	1S022	1S023	1S024	1S025
	800N, ~~80E~~	600W, 0	800N, 0	800N, 120E
Dry Protocol				
Medium	Dry	Dry	Dry	
Moisture and Drainage	slight slope down	reasonably flat area	reasonably flat area	
Type of Material (ex. sand, silt, alluvium)	silt	silt	silt	
Predominant Soil Horizon	B	B	B	
Peat Protocol				
Medium				peat
Peat Thickness (up to length of auger)				50cm
Clastic Material (ex. sand, silt, clay)				rock
Presence of Watercourses				cedar swamp

800N, 80E: organic covered rock although not high ground

" 100E: "

800N, 140E: ~~B~~ cedar swamp in rock right underneath

Alto Ventures Soil Sample Sheet

Sample Number	18046	18027	18028	18029
	800N, 160E	800N, 180E	800N, 200E	10+00N, 0
Dry Protocol				
Medium				Dry
Moisture and Drainage				outcrop ridge, flat area
Type of Material (ex. sand, silt, alluvium)				silt, oxidized and grey leach
Predominant Soil Horizon				B
Peat Protocol				
Medium	peat	peat	peat	
Peat Thickness (up to length of auger)	45cm	45cm	50cm	
Clastic Material (ex. sand, silt, clay)	none	none	none	
Presence of Watercourses	cedar swamp	cedar swamp	cedar swamp	

Below recovered level

Alto Ventures Soil Sample Sheet

Sample Number	15030	31	32	33
	1000N, 20E	1000N, 40E	1000N, 80E	1000N, 100E
Dry Protocol				
Medium	Dry	Dry	Dry	Dry
Moisture and Drainage	same as 29	a little dust	valley above steep, in	west facing slope (right below)
Type of Material (ex. sand, silt, alluvium)	fine sand	silt	clay	silt
Predominant Soil Horizon	B	B	B?	B
Peat Protocol				
Medium				
Peat Thickness (up to length of auger)				
Clastic Material (ex. sand, silt, clay)				
Presence of Watercourses				

1000N, 60E: on road to S trench (rock)

Alto Ventures Soil Sample Sheet

Sample Number	34	35	~~36~~	36
	1000N, 120E	1000W, 140E		1000W, 200E
Dry Protocol				
Medium	Dry	Dry		Dry
Moisture and Drainage	westerly slope/ atop ridge	~~outer~~ rock ridge ~~cold~~ ~~eastward~~ slope		bottom of easterly slope beginning of wetter swamp
Type of Material (ex. sand, silt, alluvium)	silt	silt / fine sand		silt
Predominant Soil Horizon	B	B		B
Peat Protocol				
Medium			Peat	
Peat Thickness (up to length of auger)			1m	
Clastic Material (ex. sand, silt, clay)			little silt rocks	
Presence of Watercourses			boggy/wet	

1000N, 160E : rock ridge, moss & rock underneath

" , 180E : " "

" , 20W. overburden too shallow

Alto Ventures Soil Sample Sheet

Sample Number	15037	38	39	40
	1000N, 40W	1000W, 20W	1000N, 100W	1200W, 20E
Dry Protocol	Dry			
Medium	Dry	Dry	Dry	Dry
Moisture and Drainage	rock underneath flat.	little valley	Beginning of cedar swamp by west slope	slight slope West w rock right underneath
Type of Material (ex. sand, silt, alluvium)	silt w leach	silt	silt	silt
Predominant Soil Horizon	B	B	B	B
Peat Protocol				
Medium				
Peat Thickness (up to length of auger)				
Clastic Material (ex. sand, silt, clay)				
Presence of Watercourses				

1200N, 0: rock ridge (right by road)
1200N, 16E: old trench
" , 40E - rock ridge

Alto Ventures Soil Sample Sheet

Sample Number	41	42	43	44
	1200N, 50E	1200N, 80E	1200N, 100E	1200N, 120E
Dry Protocol			Dry	
Medium			Dry	Dry
Moisture and Drainage			flat, poor drainage	flat, by pond on outcrop
Type of Material (ex. sand, silt, alluvium)			sand	silt + leach
Predominant Soil Horizon			B?	B
Peat Protocol				
Medium	peat	peat		
Peat Thickness (up to length of auger)	bottom @ 20cm 1m	40cm		
Clastic Material (ex. sand, silt, clay)	clay	none		
Presence of Watercourses	cedar swamp @ edge of east slope west edge of swamp	cedar & spruce swamp east edge of swamp		

trench 4 @ 135m extension

Alto Ventures Soil Sample Sheet

Sample Number	45	46	47	48
	1200N, 145E	1400N, 100E	1400N 120E	1400N 140E
Dry Protocol				
Medium	Dry			
Moisture and Drainage	flat area on top of strik project for 4 zone			
Type of Material (ex. sand, silt, alluvium)	silt in leach			
Predominant Soil Horizon	B?			
Peat Protocol				
Medium		peat	peat	peat
Peat Thickness (up to length of auger)		50cm	40cm	40cm
Clastic Material (ex. sand, silt, clay)		fair amount of sand	none	silt
Presence of Watercourses		periphery of cedar swamp	cedar + spruce swamp	cedar + spruce swamp

1200N, 170E: cedr swamp; no good sample
1200N, 190E: "
1400N, 60E: on road; moss on top of rock, rock ridge
" , 80E: eastward slope, moss on rock

Alto Ventures Soil Sample Sheet

Sample Number	U9 1900W, 160E	S0 1900W, 120E	S1 1900W, 200E	S2 1900W, 220E
Dry Protocol				
Medium				
Moisture and Drainage				
Type of Material (ex. sand, silt, alluvium)				
Predominant Soil Horizon				
Peat Protocol				
Medium	Peat	Peat	Peat	Peat
Peat Thickness (up to length of auger)	60cm	50cm	50cm	60cm
Clastic Material (ex. sand, silt, clay)	None	none	none	none
Presence of Watercourses	cedar & spruce swamp	spruce swamp	spruce swamp	spruce swamp

Alto Ventures Soil Sample Sheet

Sample Number	S3	S4	S5	S6
	1400N, 240E	1600N, 120E	1600N, 140E	600N, 160E
Dry Protocol				
Medium		Dry	Dry	Dry
Moisture and Drainage		flat area	flat area	flat area
Type of Material (ex. sand, silt, alluvium)		silt/fine sand	sand	silt/fine sand
Predominant Soil Horizon		B	B	
Peat Protocol				
Medium	peat			
Peat Thickness (up to length of auger)	50cm			
Clastic Material (ex. sand, silt, clay)	none			
Presence of Watercourses	spruce stamp			

1600N, 100E = dirt disturbed by road to skidway 3 and rock underneath

Alto Ventures Soil Sample Sheet

Sample Number	S7	S8	S9	60
	1600N, 180E	1600N, 200E	1600N, 220E	1600N, 240E
Dry Protocol				
Medium	Dry	Dry	Dry	Dry
Moisture and Drainage	~~dry~~ flat area near trench by road to others	flat area	flat area	flat area
Type of Material (ex. sand, silt, alluvium)	silt	silt / fine sand	sand	sand / fine silt
Predominant Soil Horizon	B	B	B	E
Peat Protocol				
Medium				
Peat Thickness (up to length of auger)				
Clastic Material (ex. sand, silt, clay)				
Presence of Watercourses				

Alto Ventures Soil Sample Sheet

Sample Number	61	62	63	64
	100W, 80S	0S0S, 0	80S, 20E	80S, 40E
Dry Protocol				
Medium	Dry			
Moisture and Drainage	Flat area 50m from creek			
Type of Material (ex. sand, silt, alluvium)	fine sand / silt			
Predominant Soil Horizon	B			
Peat Protocol				
Medium		peat	peat	peat
Peat Thickness (up to length of auger)		60cm till rock	40cm ~~till~~ rock	60cm
Clastic Material (ex. sand, silt, clay)		none	none	none
Presence of Watercourses		cedar swamp	cedar swamp	cedar swamp

80S, 20W: ~~right~~ rock right under swamp

80S, 20W → 100W: rock ridge the cut area

Alto Ventures Soil Sample Sheet

Sample Number	65	66	67	68
	50S, 60E	50S, 100E	50S, 120E	50S, 140E
Dry Protocol				
Medium				
Moisture and Drainage				
Type of Material (ex. sand, silt, alluvium)				
Predominant Soil Horizon				
Peat Protocol				
Medium	peat	peat	peat	peat
Peat Thickness (up to length of auger)	60cm till rock	1.5m	80cm	60cm
Clastic Material (ex. sand, silt, clay)	none	none	none	none
Presence of Watercourses	cedar swamp	cedar swamp	edge of cedar swamp	edge of cedar swamp

50S, 80E: small creek area in cedar swamp and all slop up 2 1.5m (Lot auger)

Alto Ventures Soil Sample Sheet

Sample Number	BQ	20		
	S0S, 160E	S0S, 200E		
Dry Protocol				
Medium		Dry		
Moisture and Drainage		rock right slight slope West		
Type of Material (ex. sand, silt, alluvium)		sand		
Predominant Soil Horizon		B		
Peat Protocol				
Medium	peat			
Peat Thickness (up to length of auger)	1 m			
Clastic Material (ex. sand, silt, clay)	none			
Presence of Watercourses	very edge of cedar swamp by west facing slope			

S0S, 180E = organic covered rock or rock highland