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O P A P

Project Report

OP 95 - 273

Rat - Tail Lake \Grassy Lake
&
Upper Winding Lake

Properties

submitted by Walter Hanych

January 24th, 1996

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Located in back pocket

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Geological Compilation Map Upper Winding Lake Property

INTRODUCTION

The following report covers two separate properties located in the Shining Tree area of Northeastern Ontario. Previous to the application of an OPAP grant, a study was undertaken to identify target areas for their VMS potential. As a result of this study, a 2x7 claim, referred to as the Upper Winding Lake property was staked at the intersection of Midlothian, Halliday, Mond and Raymond townships, and a group of claims totalling 27 units, referred to as the Rat-Tail Lake \Grassy Lake property was staked within Kelvin and Kemp townships.

During the month of November 1995, the author of this report along with the assisstance of consulting geologist Robert Komarechka, spent approximately three weeks in the field, mapping, prospecting, sampling and collecting data. As well, as an integral component of this program a petrographic report was commissioned. The report was prepared by Dominic Babin of Laurentian University.

The data accumulated as a result of the work are presented in the following report under OPAP Grant file number OP 95-273.

It is with great appreciation that the Ministry of Northern Development and Mines is acknowledged for funding the program.

Rat - Tail Lake -Grassy Lake Property

Location

The property consists of a contiguous group of claims totaling 31 units located in the Grassy Lake area, in the northeast quadrant of Kelvin township, claim sheet G983, and the southeast quadrant of Kemp township, claim sheet G084. The property lies within the Larder Lake Mining Division and within the jurisdiction of the Cobalt Resident Geologist's office. The NTS coordinate for the property is 41P14 and it is situated between latitude 47° 45' to 47° 47'north latitude, and 81° 13' to 81° 15' east longitude.

Access

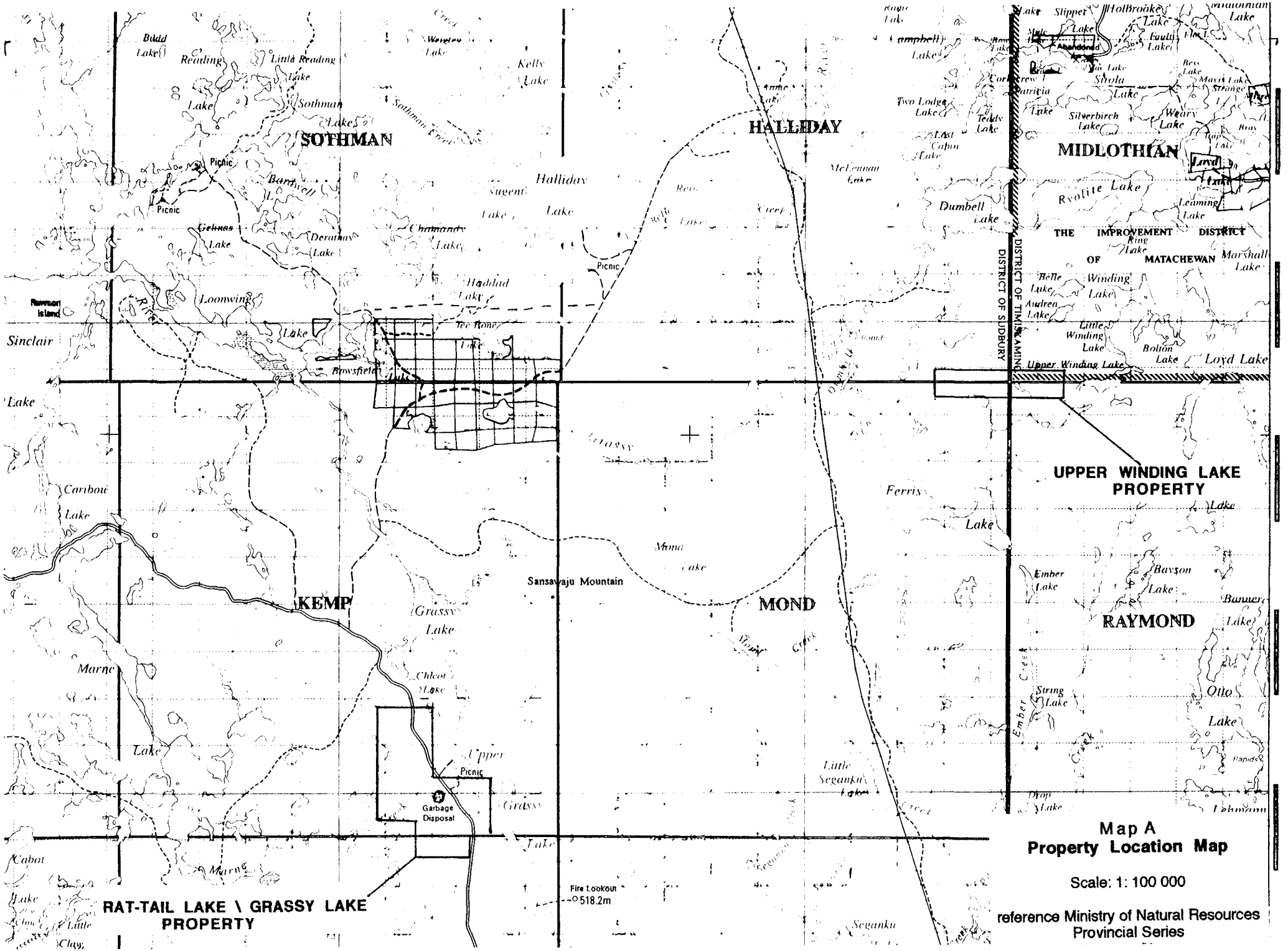
Access to the property is via Hwy. 560 to the Grassy Lake road, which is located 11km east of the hamlet of Shining Tree, then northward on the Grassy Lake road for 14 km to the southern claim boundary (see Map A)..

Work Performed

Prior to field investigations, an air photo study was undertaken to determine outcrop distribution and the claim boundaries were accurately plotted on an air photo base. Field work was carried out between November 8th and 14th. During this period the claim boundaries were mapped, compass and topo-line traverses were run, an existing base line was refurbished, and thirty one chip samples were collected.

The samples were sent to Accuassay Laboratories in Thunder Bay. and were analysed by the ICP technique for gold and multi element. As well, in order to better understand the geological environment of the area, nine thin sections were cut and a petrographic report was commissioned.

All the data was compiled and plotted on a map at a scale of 1:5000, the map is included in this report.


SOTHMAN
HALLEDAY
MIDLOTHIAN
KEMP
MOND
RAYMOND
THE IMPROVEMENT DISTRICT OF MATACHEWAN
DISTRICT OF TIMISKAMING
DISTRICT OF SUDBURY
UPPER WINDING LAKE PROPERTY
RAT-TAIL LAKE \ GRASSY LAKE PROPERTY
Sansaraju Mountain
Garbage Disposal
Fire Lookout
518.2m
Picnic
Sothman
Halliday
Dumbell Lake
Rvolite Lake
Loonwing
Sinclair
Caribou
Grassy Lake
Marne
Cabot
Ferris
Mona
Bavson
Ember
Otto
Shola
Silverbirch
Weary
Loyd Lake
Upper Winding Lake
Map A
Property Location Map
Scale: 1: 100 000
reference Ministry of Natural Resources
Provincial Series

Work Summary

Field work	7 days mapping by consultant 6 days mapping and prospecting by applicant 18 kilometers of traverse in total
Claim staking	1 day performed by grant applicant and not included as part of the grant programe
Sample prep and analysis	one day sample description and preparation by consultant and applicant
	31 chip samples collected and analysed by ICP for gold and multi elements
Petrographic report	nine thin sections analysed by Dominic Babin at Laurentian University
Air photo study	one day air photo study and compilation by applicant
Project report	project maps and report prepared by grant applicant

Regional Geology

The Rat-Tail \ Grassy Lake property is situated in Kemp and Kelvin Townships, which lie in the southern part of the Abitibi Greenstone Belt. Metavolcanics and metasediments occur throughout the area, an upper volcanic sequence comprising of calc-alkaline mafic to intermediate to felsic flows and pyroclastics underlie Kemp Tp,while the lower part of the sequence occurs to the west of the township and consists mainly of mafic tholeiitic and calc-alkaline flows. These sequences are separated by a northwest trending fault, the Kelvin Lake Fault. Locally mafic and ultramafic intrusives occur in the area (see map B).

Property Geology

The Rat-Tail \ Grassy Lake property is underlayed by a sequence of northeast striking, steeply dipping intermediate to felsic metavolcanics and lesser metasediments and minor mafic intrusive bodies. Several north northeast trending faults bisect the volcanic - sedimentary package.

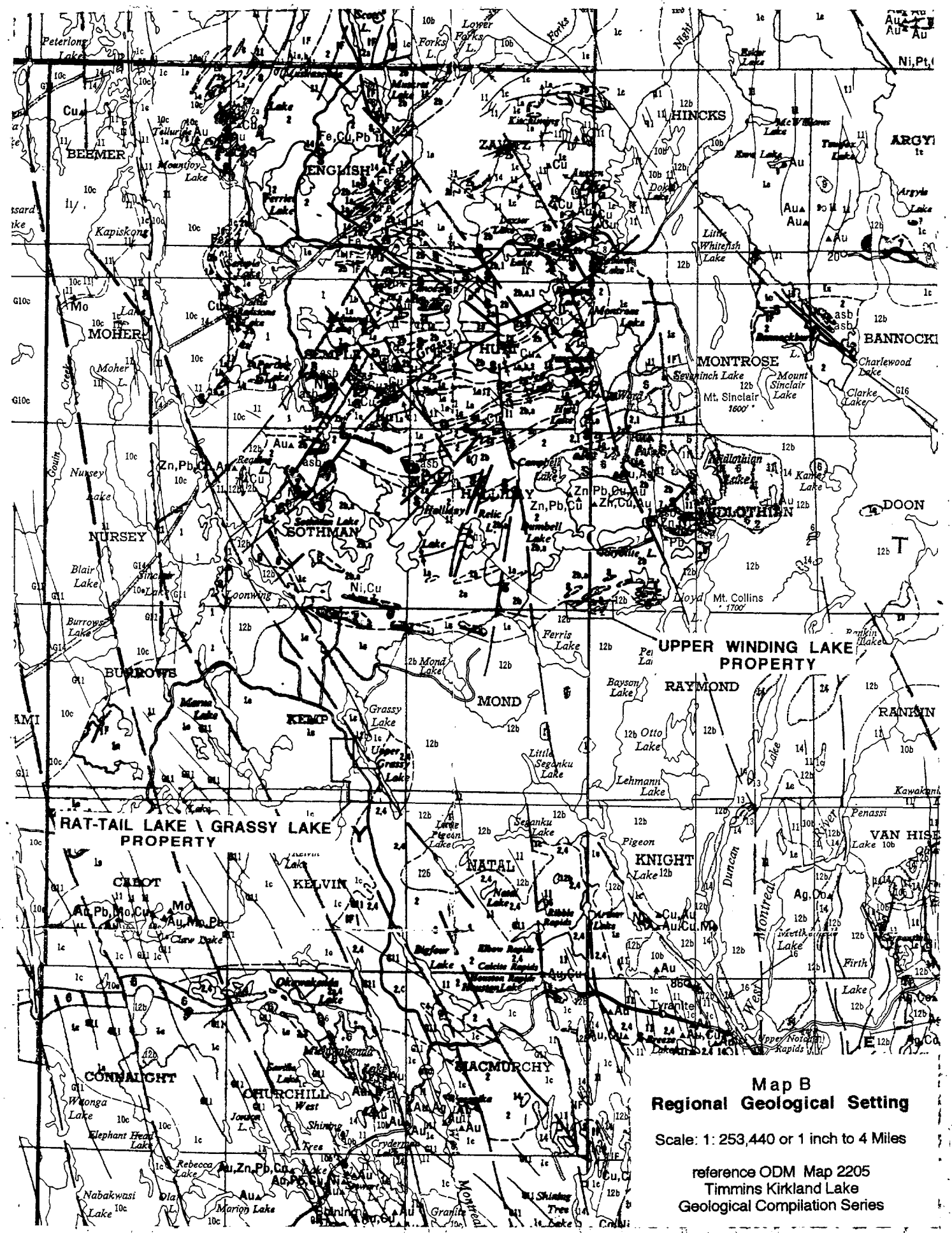
Intermediate pyroclastics predominate. Typically they are matrix supported, poorly sorted lapilli-tuff with the fragments generally being andesitic.

Intermediate flows occur to a lesser extent and may contain up to 10% pyrite.

Felsic volcanic rocks occur as flows and fragmentals and have been reported in drill holes to host massive pyrite sections up to 14.3 meters thick.

A volcanoclastic coarse lapilli tuff, the product of a debris flow event occurs in the east central portion of the property.

Metasediments occur as argillite and greywacke,the former typically dark black and fissile, the latter typically grey and well bedded.



Map B
Regional Geological Setting

Scale: 1: 253,440 or 1 inch to 4 Miles

reference ODM Map 2205
Timmins Kirkland Lake
Geological Compilation Series

Results and Recommendations

Initially the areas drilled in 1965 and 1975 were the target areas of interest, however, a lack of outcrop in these areas and the inability to locate the drillsites required a reconsideration of methadology. In the meantime, during the course of field mapping two areas of interest were identified, for the purposes of this report they are referred to as the Kelvin Creek showing and Target A.

Kelvin Creek Showing

Upon discovery of a pit in an outcrop along Kelvin Creek and subsequent field investigation, an area approximately 200 meters by 100 meters was discovered to contain numerous trenches and pits. A day was spent plotting and sampling the workings.

Although only weakly anomalous zinc values were obtained from the sampling program (see map for results), the rocks in this area have been interpreted to be partially the result of a hydromagmatic eruption with subsequent pyritization via a hydrothermal process in a VMS setting, (personal opinion and see Babin report TS-1).

Pyrite occurs as massive fragments in a matrix supported, poorly sorted lapilli-tuff and also as disseminated grains in the andesitic fragments, up to 15% pyrite has been observed in chip samples. VMS style activity may have been responsible for the mineralization and this environment may be preserved in a porphyritic andesite flow (see BOG 10 &11). Samples from this area contain up to 278 ppm Zn.

The Rat-Tail Lake occurrence which was drilled by Hudson Bay Oil and Gas in 1975 is situated approximately 650 meters north of the Kelvin Creek showing a 14.3 meter section of massive pyrite with anomalous Zn values was intersected. The two mineralized areas may represent a single VMS setting occuring on the limbs of a folded volcanic pile.

The above area is a favourable target for hosting a VMS deposit. A program of detailed mapping and sampling is warranted to enhance the model for drill target selection.

Target A

This target area occurs at the east end of claim 1198160 (see map). The area is underlayed by an intensely altered fragmental volcanic. The alteration appears to have brecciated the original rock resulting in a complex fragmentation of original textures.

The rocks have been intensely silicified and carbonatized and contain 1-2% disseminated pyrite. Silicification and carbonitization appear to be the result of a stockworks veining with the former occurring prior to the latter. Although the rocks appeared to be favourable for containing gold, the results of the analyses indicated otherwise.

Neverthless, the area merits further investigation. Detailed mapping and sampling would assisst in determining the relationship between the gabbro body to the south, futhermore the area is fault bounded to the east and west, such a program would be useful in estabishing whether a genetic relationship exists between the faults and the alteration.

UPPER WINDING LAKE

Location

The Upper Winding Lake property is located approximately thirty two kilometers southwest of the town of Matachewan. The property consists of a 2x7 unit claim (1205588), that is situated at the intersection of Midlothian, Halliday, Mond and Raymond townships.

Midlothian, Mond and Raymond townships are located in the Larder Lake Mining Division, while Halliday township is located in the Porcupine Mining Division.

Midlothian township is located on claim sheet G-3684, Mond township is located on claim sheet G-997, Halliday township is located on claim sheet G-976 and Raymond township is located on map sheet G-3706.

The NTS co-ordinate for the property is located on the Sinclair Lake map sheet at 41P/14, and at a longitude of 81° 05', and a latitude of 47° 50'.

Access

There are several access routes to the property, but being fairly remote, non of the overland routes are easy, nevertheless, two routes are outlined below.

One route is by travelling west from Matachewan on a gravel road for approximately 32 km to the former United Asbestos Mine site, then travelling by canoe south on Loyd Lake for approximately 5km. Portaging along a trail and canoeing via Bolton, Winding and Little Winding Lakes to Upper Winding Lake. The east property line is located about 250 meters west of the shore of Upper Winding Lake.

The other route, which was the access used for this program is via the Grassy Lake Road. The route is as follows, from the intersection of the Grassy Lake Road and Hwy 560 northward for a distance of 73km to an intersection of a northeastward bearing logging road. Along this road in a general eastward direction for 12.4km to the intersection of the pole line road. Southward along the pole line for about 5.5km to Dumbell Creek. At this point, by water transportation for 1300 meters to the bay at the north end of Ferris Lake. A flagged trail for 1394 meters provides access to the west property boundary.

When all is said and done, the easiest way is to fly into Upper Winding Lake and set up a camp there (see Map A).

Work Performed

Prior to field investigations, an air photo study was undertaken to determine outcrop distribution in areas of interest, and to accurately locate the property boundary. Field work was carried out between November 2nd and 7th. During this period compass and topoline traverses were run, a 1394 meter access trial was flagged, an existing base line was reflagged and 27 chip samples were collected.

The samples were sent to Accuassay Laboratories in Thunder Bay and were analysed by the ICP method for gold and multi element. Five thin sections were cut and a petrographic report was commissioned. All the data was compiled and plotted on map at a scale of 1:5000, the map is included in this report.

W O R K S U M M A R Y

Field work	6 mapping by consultant, prospecting and sampling by applicant 10 kilometers of traverse
Sample prep and analysis	one day sample description and preparation by consultant and applicant
	27 chip samples collected and analysed for gold and multi element
Petrographic report	five thin sections analysed by Dominic Babin at Laurentian University
Air photo study	one day air photo study and compilation by applicant
Project report	project maps and report by applicant

Regional Geology

The Upper Winding Lake property is situated in the southwestern portion of the Abitibi Greenstone Belt, at the southeastern edge of the Halliday rhyolite dome. East-west striking felsic metavolcanic flows and pyroclastic units predominate this area with mafic to ultramafic sills occurring at the margins of the Halliday dome. To the south, sediments of the Huronian Cobalt Group predominate.

Major faults in the area strike north northwest while minor faults trend in a general north northeast direction (see Map B).

Property Geology

The property is underlayed by east-west striking intermediate volcanics ranging in composition from andesite to rhyodacite. Minor ultramafic sills or flows occur as small uncorrelatable bodies.

In the field the intermediate volcanics were divided into mapable units largely distinguished by relative colour and hardness. This criteria proved somewhat successful in identifying rock types that distinguished essentially two mapable units. These units were labelled as intermediate

and felsic volcanics and they seem to correlate with the andesites and rhyodacites respectively.

The rhyodacite unit was observed to contain amygdular and disseminated pyrite as well as exhibiting chlorite alteration. These field observations were subsequently confirmed by petrographic analysis.

The rhyodacite is somewhat anomalous in zinc with values ranging from 77 to 203 ppm. At the west end of the property the unit was traced for 900 meters along strike and varied in thickness from 50 to 170 meters. At the east end of the property the unit was traced for 350 meters and is approximately 100 meters thick. Appropriately, these areas have been labelled the west and east zone. Between these two zones a lack of outcrop makes it difficult to tie them together, this may also be somewhat complicated by a strong north northwest trending fault that appears to truncate the west end of the east zone.

The amygdaloidal porphyritic rhyodacite in the west zone exhibits chloritic alteration and pyrite filled amygdules considered to be a favourable indicator of VMS activity. In view of the fact that a diamond drill hole in this vicinity intersected a brecciated rhyodacite with sporadic chlorite patches and 10% py and po, the zone becomes an excellent target for future work.

The east zone also hosts an intermedite volcanic that exhibits sulphide filled amygdules that may have been the result of VMS activity.

Two ultramafic bodies 1800 meters apart occur at the west end and the east end of the property. The western ultramafic (see TS12 petrographic report), is a massive fine grained rock that may have had sufficient time and mass to have formed a layered sill. The eastern ultramafic appears to be too thin to offer any potential.

Results and Recommendations

West Zone

The west zone contains numerous outcrops over an area approximately 700metres by 150 metres that exhibit an alteration and style of mineralization condusive to that associated with VMS activity. Samples from the area are weakly anomalous in Zn and Cu. One hole drilled into a

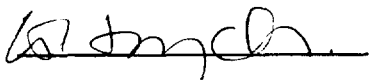
HEM conductor also intersected favourable lithology, mineralization and alteration. A detailed mapping program may assist in the selection drill targets.

East Zone

A chip sample from this area returned a Zn value of 203 ppm and contained 7% very finely disseminated py with associated chloritization (see map for location). Although this zone appears not to have the same spatial extent as the west zone, this may largely be the result of insufficient mapping. In this context a detailed mapping program would greatly assist in the evaluation of this zone.

In general it seems that the property is very favourable for hosting a VMS deposit. The west and east zones are obvious targets, but the area inbetween and along strike of these zones also offers potential. The ultramafics that occur on the property should also be investigated.

Dated this 24th day of January, 1996.....Walter Hanych



Summary Table of Chip Samples

SAMPLE	DESCRIPTION	RESULT
WG1\TS3 \TS4	matrix supported, polymictic lapilli tuff	not assayed
WG2\TS7	intensely silicified and carbonitzed intermediate fragmental, tr py	79ppm Zn
WG3\TS6	intensely silicified and carbonitized amygdaloidal flow	no significant results
WG4	gabbro, 1% py	198ppm Cu
WG5	intermediate to felsic brecciated flow 3% py	no significant results
WOG1	brecciated felsic flow, 15-20% py	109ppm Cu
WOG2	matrix supported lapilli tuff, 5% py in matrix, tr in fragments	no significant results
WOG3	lapilli tuff containing py fragments, 10-15% py overall	78ppm Zn
WOG4	lapilli tuff-agglomerate, 3% py	no significant results
WOG5\TS8	massive felsic flow, 5% py	no significant results
WOG6	massive felsic flow, 10% py	no significant results
WOG7	massive felsic flow, 5% py	no significant results
WOG8	matrix supported lapilli tuff, 10% py	no significant results
WOG9	clast supported lapilli tuff, 10% py	no significant results
WOG10	clast supported lapilli tuff, 5% py	no significant results
WOG11	matrix supported lapilli tuff, 15% py	not assayed
WOG12\TS1	matrix supported lapilli tuff, 5% py	155ppm Zn 54 ppm Cu
BG1	felsic lapilli tuff, 3% py	no significant results
BG2	lapilli tuff-agglomerate, 3% py	97ppm Zn
BG3	carbonitized felsic flow, tr py	no significant results
BG4	amygdaloidal felic flow, carbonitzed	no significant results
BG5 \TS5	carbonitized felsic flow, tr py	no significant results
BOG1	carbonitized felsic flow	96ppm Zn 90ppm Cu
BOG2	felsic flow, 3% py	56ppm Cu
BOG3	lapilli tuff -agglomerate, tr py	93ppm Zn
BOG4	brecciated felsic flow,3% py	59ppm Cu
BOG5	intermediate tuff, 3% py	100ppm Zn 64ppm Cu
BOG6	felsic flow, 5% py	no significant results
BOG7	matrix supported lapilli tuff, 3% py	83ppm Zn
BOG8	lapilli tuff-agglomerate, 20% py	171ppm Zn
BOG10	matrix supported lapilli tuff, 5% py	278ppm Zn
BOG11\TS2	intermediate porphyritic flow, 1% py	210 ppm Zn 54ppm Cu
HYALBOG1	carbonitized-silicified fragmental	78ppm Zn 71ppm Cu
WW1\TS12	ultramafic, tr py	not assayed
WW2	felsic lapilli tuff, 3% py	no significant results
WW2A	felsic lapilli tuff, 3% py	no significant results

Summary Table of Chip Samples

SAMPLE	DESCRIPTION	RESULTS
WW3	chloritzed felsic flow, 5% py	85ppm Zn
WW4	oxidized material from gossan	101ppm Zn 83ppm Cu
WW4B	oxidized material from gossan	88ppm Zn
WW5	amygdaloidal felsic flow, 5% py	144ppm Cu
WW6	amygdaloidal felsic flow, 5% py	129ppm Cu
WW7	amygdaloidal felsic flow, 1% py	no significant results
WW8	felsic flow, 5% py, tr po	no significant results
WW9	amygdaloidal felsic flow, tr py	no significant results
WW10\TS13	ultramafic	not assayed
WW11	chloritized felsic flow, &5 py	203ppm Zn 109ppm Cu
WW12\TS11	intermediate amygdaloidal flow 5% py, tr po	99ppm Zn
WW13	intermediate to fesic amygd flow 3-5% py	no significant results
WW14\TS14	inter amygd porphyritic flow, 5% py	77ppmZn
WW15	chloritized felsic flow, 5% py	80ppm Zn
WW16	felsic flow, 5% py	77ppm Zn 86ppm Cu
WW17\TS10	inter amygd porphyritic flow, 20% py massive and nodular py	91ppm Zn 86ppm Cu
WW18	inter porphyritic flow, 5% py nodular and fracture filling py	77ppm Zn 63ppm Cu
WW19	felsic fragmental, 20% py	82ppm Zn
WW20	inter-felsic pyroclastic, 15% py nodular and disseminated py	78ppm Zn 85ppm Cu
WW21	amygdaloidal felsic flow, 7% py	93ppm Zn
WW22	chloritized felsic flow, 7% py	93ppm Zn
WW23	chloritized felsic flow, 5% py	no significant results
WW24	amygdaloidal felsic flow, 7% py	86 ppm Zn
WB1	intermediate flow, 3% po	86ppm Zn 109ppm Cu
WB2	chloritized amygd felsic flow, 1% py	79ppm Zn

NOTE: Refer to report maps for sample location.

DAILY LOG
OPAP 1995 PROJECT

Day	Date	Description of Activities
1	Oct 30	- drive from Collingwood to Sudbury
2	Oct 31	- supply and equipment preparation in Sudbury
3	Nov 1	- leave Sudbury early morning and drive to MNR district office in Gogama, obtain air photos and inquire about conditions and accessibility to Ferris Lk via pole line, advised to speak with Timmins office, arrive Timmins late morning obtain necessary information and drive to Ferris Lk via Grassy Lk road and pole line - set up camp
4	Nov 2	- complete camp set up - reconoiter Ferris Lk, record shoreline geology and establish a traverse line to intersect southwest corner of claim
5	Nov 3	- canoed to travrese start and ran line at 050° , flagged line and intesected west boundary of claim at 1394 meters - mapped and prospected west claim line
6	Nov 4	- mapped and prospected baseline to 800 ME , ran cross lines 200, 400, 600 and 800 E to old east-west claim line, mapped and prospected cross lines and old east-west claim line
7	Nov 5	-mapped and prospected north of baseline from west claim boundary to 800ME, located drillhole
8	Nov 6	- mapped and prospected baseline to east claim boundary 2800ME then prospected and mapped northeast sector of claim
9	Nov 7	- prospected and sampled west claim area , zones of interest
10	Nov 8	- broke camp early morning, drove 85km to Grassy Lk property arrived at noon, restablished base line and attempted to locate old drill holes , investigated outcrops at Prov. camp site - end of day drove to Shining Tree and registered at Country Store Lodge

DAILY LOG
OPAP 1995 PROJECT

Day	Date	Descripton of Activities
1	Nov 9	- prospected and mapped traverse north boundary clm 1198163 from Grassy Lk road to cp#1, then south to cp#2, total traverse 2020 meters
12	Nov 10	- prospected and mapped traverse north boundary clm 1198160 cp #1 to cp#4, then south boundary cp#2 to cp#3, from cp#3 to cp# 1 clm 1210813, discovered numerous pits and trenches west of cp#4 clm 1198161, then ran taverse north boundary clm 1198161 from cp#4 to Grassy Lk road, total traverse 4900 meters
13	Nov 11	- prospected and mapped traverse north boundary clm 1198163 from road west to cp#4, then south to lake, northeast along west lake shore and then east back to Grassy Lk road, ,total traverse 3100 meters
14	Nov 12	- mapped existing grid, baseline, line 1N, 3N, 5N, 10N, 11N, and 12N, approximately traversed 3800 meters
15	Nov 13	- ran travrese in a southwest direction along creek to showing discovered Nov 10th, mapped, sampled and prospected numerous pits and trenches
16	Nov 14	- claim 1210813 staked by grant applicant; geological consultant mapped and prospested claim boundary , total traverse 3200 meters - last day in field, drive back to Sudbury in evening
17	Nov 15	- megascopic description report ,sample preparation, washing of samples and packiging for shipment to assay lab, sample selection and prep for petrographic analysis

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APPENDIX

A

Assay Results

ACCURASSAY LABORATORIES
A DIVISION OF ASSAY LABORATORY SERVICES INC.

1070 LITHIUM DRIVE, UNIT 2
THUNDER BAY, ONTARIO P7B 6G3
PHONE (807) 623-6448
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WALTER HANYCH
P.O. BOX 688
COLLINGWOOD, ONTARIO
L9Y 4E8

December 21, 1995

Job #9541937

SAMPLE # Accurassay	Customer	Gold ppb	Gold Oz/t
30	WOG5	<5	<0.001
31	Check WOG5	<5	<0.001
32	WOG7	<5	<0.001
33	WOG8	<5	<0.001
34	WOG9	<5	<0.001
35	WOG10	<5	<0.001
36	WOG12	<5	<0.001
37	WW2	<5	<0.001
38	WW2	<5	<0.001
39	WW3	<5	<0.001
40	WW4	<5	<0.001
41	Check WW4	<5	<0.001
42	WW4b	<5	<0.001
43	WW5	<5	<0.001
44	WW6	<5	<0.001
45	WW7	<5	<0.001
46	WW8	<5	<0.001
47	WW9	<5	<0.001
48	WW11	<5	<0.001
49	WW12	<5	<0.001
50	WW13	<5	<0.001
51	Check WW13	<5	<0.001
52	WW14	<5	<0.001
53	WW15	<5	<0.001
54	WW16	<5	<0.001
55	WW16	Sample	Missing
56	WW17	14	<0.001
57	WW18	9	<0.001
58	WW19	7	<0.001
59	WW20	7	<0.001

Certified By: D.G. Beer

ACCURASSAY LABORATORIES
A DIVISION OF ASSAY LABORATORY SERVICES INC.

1070 LITHIUM DRIVE, UNIT 2
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COLLINGWOOD, ONTARIO
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December 21, 1995

Job #9541937

SAMPLE # Accurassay	Customer	Gold ppb	Gold Oz/t
1	BG1	<5	<0.001
2	BG2	<5	<0.001
3	BG3	<5	<0.001
4	BG4	<5	<0.001
5	BG5	<5	<0.001
6	BOG1	<5	<0.001
7	BOG2	<5	<0.001
8	BOG3	<5	<0.001
9	BOG4	<5	<0.001
10	BOG5	<5	<0.001
11	Check BOG5	<5	<0.001
12	BOG6	<5	<0.001
13	BOG7	<5	<0.001
14	BOG8	<5	<0.001
15	BOG10	<5	<0.001
16	BOG11	<5	<0.001
17	HYALBOG1	<5	<0.001
18	WB1	<5	<0.001
19	WB2	<5	<0.001
20	WG2	<5	<0.001
21	Check WG2	<5	<0.001
22	WG3	<5	<0.001
23	WG4	<5	<0.001
24	WG5	<5	<0.001
25	WG6	Sample	Missing
26	WOG1	<5	<0.001
27	WOG2	<5	<0.001
28	WOG3	<5	<0.001
29	WOG4	<5	<0.001

Certified By: _____

A2

ACCURASSAY LABORATORIES
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1070 LITHIUM DRIVE, UNIT 2
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WALTER HANYCH
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COLLINGWOOD, ONTARIO
L9Y 4E8

December 21, 1995

Job #9541937

SAMPLE # Accurassay	Customer	Gold ppb	Gold Oz/t
60	WW21	<5	<0.001
61	Check WW21	<5	<0.001
62	WW22	<5	<0.001
63	WW23	<5	<0.001
64	WW24	<5	<0.001

Certified By: A. Beer.

ACCURASSAY LABORATORIES
A DIVISION OF ASSAY LABORATORY SERVICES INC.

1070 LITHIUM DRIVE, UNIT 2
THUNDER BAY, ONTARIO P7B 6G3
PHONE (807) 623-6448
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WALTER HANYCH
P.O. BOX 688
COLLINGWOOD, ONTARIO
L9Y 4E8

January 15, 1996

Job #9541937

SAMPLE #	La ppm	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Si %	Sr ppm	Ti %	V ppm	W ppm	Zn ppm
BG1	6	0.91	461	2	0.03	22	1131	15	<2	0.01	8	0.31	40	<2	60
BG2	6	0.83	532	2	0.05	39	571	15	<2	0.01	63	0.01	38	4	97
BG3	5	0.34	849	2	0.03	15	709	12	<2	0.01	42	<0.01	4	8	29
BG4	4	0.41	1213	<1	0.05	12	767	4	<2	0.01	50	<0.01	10	2	37
BG5	3	0.47	820	1	0.04	31	382	7	<2	0.01	38	<0.01	5	<2	67
BOG1	5	1.44	1521	<1	0.08	91	1142	9	<2	0.02	105	<0.01	37	2	96
BOG2	5	1.25	1202	1	0.05	43	623	15	<2	0.02	34	<0.01	50	7	72
BOG3	5	1.68	1659	1	0.04	45	776	2	<2	0.02	63	<0.01	48	<2	93
BOG4	4	1.51	1524	1	0.03	39	882	4	<2	0.02	48	<0.01	27	<2	63
BOG5	7	1.87	820	3	0.07	49	792	13	<2	0.03	27	0.27	78	4	100
BOG6	6	0.25	289	2	0.02	18	587	6	<2	0.01	5	<0.01	11	<2	43
BOG7	2	0.74	376	1	0.02	16	633	2	<2	0.01	4	0.02	37	<2	83
BOG8	5	1.08	777	3	0.02	36	724	4	<2	0.01	4	0.01	36	<2	171
BOG10	3	0.52	341	2	0.01	31	785	4	<2	0.01	3	<0.01	19	<2	278
BOG11	8	0.87	446	1	0.02	39	819	6	<2	0.01	6	<0.01	30	<2	210
HYALBOG1	4	1.29	1774	1	0.05	86	1557	5	<2	0.03	95	<0.01	38	<2	78
WB1	3	1.94	1180	2	0.04	49	788	6	<2	0.02	13	0.16	85	<2	86
WB2	2	1.31	1079	1	0.05	55	405	<2	<2	0.01	8	0.09	37	<2	79
WG2	4	0.31	760	1	0.04	37	404	<2	6	0.01	35	<0.01	9	<2	33
WG3	3	0.16	615	1	0.05	19	628	<2	<2	0.01	43	<0.01	11	<2	34
WG4	8	2.03	698	2	0.12	46	1677	6	12	0.01	26	0.33	119	<2	65
WG5	10	0.64	536	2	0.08	19	1206	5	<2	0.01	10	0.22	40	<2	20
WG6	sample missing														
WOG1	10	0.54	303	6	0.06	47	952	3	<2	0.01	6	0.08	29	<2	26
WOG2	6	0.45	259	7	0.04	40	881	8	<2	0.01	4	0.01	28	<2	30
WOG3	3	0.42	238	3	0.05	36	799	10	<2	0.01	4	0.01	30	<2	78
WOG4	4	0.43	176	3	0.06	37	693	10	<2	0.01	6	<0.01	29	<2	45
WOG5	9	0.77	371	5	0.04	30	980	5	3	0.01	5	0.07	38	<2	27
WOG6	7	0.60	316	6	0.04	36	906	2	<2	0.01	5	0.05	27	<2	24
WOG7	7	0.60	324	2	0.04	31	871	5	<2	0.01	4	0.06	34	<2	33
WOG8	4	0.60	333	4	0.03	31	898	14	4	0.01	3	0.01	30	<2	39
WOG9	4	0.43	248	2	0.03	27	764	11	<2	0.01	4	0.01	27	<2	26
WOG10	5	0.61	329	1	0.03	27	953	7	<2	0.01	3	0.01	30	<2	28
WOG12	8	1.19	660	2	0.06	38	1144	9	<2	0.01	10	0.14	58	<2	155

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COLLINGWOOD, ONTARIO
L9Y 4E8

January 15, 1996

Job #9541937

SAMPLE #	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Hg ppm
BG1	0.2	1.69	34	42	<1	<3	0.25	<1	<1	56	35	5.84	<3
BG2	<0.1	1.4	41	34	<1	<3	1.45	<1	19	212	43	3.22	<3
BG3	<0.1	0.27	37	37	<1	<3	2.08	<1	8	18	35	3.65	<3
BG4	<0.1	0.44	8	29	<1	<3	4.17	<1	12	244	37	3.06	<3
BG5	0.2	0.22	37	27	<1	<3	2.60	<1	12	19	49	3.34	<3
BOG1	0.5	0.89	30	62	1	<3	4.63	<1	29	111	90	4.47	<3
BOG2	0.1	1.72	46	22	<1	<3	2.01	<1	11	90	56	5.07	<3
BOG3	0.1	2.74	7	33	1	<3	3.55	<1	9	136	44	5.41	<3
BOG4	0.2	1.39	15	45	1	<3	4.07	<1	6	56	59	5.01	<3
BOG5	0.7	2.65	34	23	1	<3	2.12	<1	19	185	64	5.76	<3
BOG6	<0.1	0.59	16	24	<1	<3	0.43	<1	9	22	32	3.40	<3
BOG7	<0.1	1.59	24	29	<1	<3	0.12	<1	8	220	16	5.33	<3
BOG8	0.2	2.05	62	27	<1	<3	0.44	1	11	55	48	10.25	<3
BOG10	<0.1	1.14	26	27	<1	<3	0.10	<1	18	31	47	5.98	<3
BOG11	<0.1	1.8	37	36	<1	<3	0.46	<1	27	214	54	6.20	<3
HYALBOG1	0.2	1.1	18	51	1	<3	4.32	<1	24	54	71	5.79	<3
WB1	0.3	3.12	49	25	<1	<3	1.11	1	18	41	109	7.63	<3
WB2	<0.1	2.05	28	37	<1	<3	0.48	<1	12	75	47	5.14	<3
WG2	<0.1	0.34	18	34	<1	<3	2.95	<1	23	270	14	2.10	<3
WG3	<0.1	0.34	5	39	<1	<3	2.84	<1	16	380	26	1.27	<3
WG4	<0.1	2.44	76	53	1	<3	0.88	<1	24	152	198	6.02	<3
WG5	<0.1	1.32	29	30	<1	<3	0.44	<1	26	322	37	4.01	<3
WG6	sample missing												
WOG1	<0.1	1.1	41	32	<1	<3	0.21	<1	41	352	109	6.53	<3
WOG2	<0.1	0.93	48	29	<1	<3	0.14	<1	34	411	44	4.92	<3
WOG3	0.2	0.95	40	33	<1	<3	0.08	<1	32	467	51	6.10	<3
WOG4	<0.1	0.84	33	27	<1	<3	0.14	<1	32	567	37	4.92	<3
WOG5	<0.1	1.31	26	16	<1	<3	0.18	<1	18	293	23	3.92	<3
WOG6	<0.1	1.08	34	18	<1	<3	0.16	<1	32	281	52	5.73	<3
WOG7	<0.1	1.04	25	15	<1	<3	0.20	<1	23	386	31	2.95	<3
WOG8	0.2	1.07	34	18	<1	<3	0.14	<1	25	326	33	4.93	<3
WOG9	0.1	0.79	24	16	<1	<3	0.11	<1	21	305	26	4.10	<3
WOG10	<0.1	1.12	23	18	<1	<3	0.14	<1	22	320	28	4.06	<3
WOG12	0.1	2.1	28	27	<1	<3	0.97	<1	25	325	54	4.79	<3

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COLLINGWOOD, ONTARIO
L9Y 4E8

January 15, 1996

Job #9541937

SAMPLE #	La ppm	Mg %	Mn ppm	Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Si %	Sr ppm	Ti %	V ppm	W ppm	Zn ppm
WW2A	5	1.27	808	<1	0.08	47	484	7	<2	0.01	10	0.14	55	3	59
WW2	4	1.32	758	1	0.11	40	439	7	<2	0.01	16	0.13	57	<2	48
WW3	1	1.27	586	1	0.06	92	254	12	<2	0.01	5	0.13	68	<2	85
WW4	2	0.10	189	5	0.03	16	510	28	4	0.08	1	0.09	40	<2	101
WW4B	3	0.36	733	1	0.03	49	569	16	<2	0.01	9	0.15	17	<2	88
WW5	4	1.59	705	2	0.04	66	589	14	<2	0.01	10	0.14	47	<2	30
WW6	5	1.96	930	2	0.08	65	639	12	<2	0.01	10	0.15	59	<2	39
WW7	5	1.43	805	1	0.10	55	604	11	<2	0.01	14	0.11	62	<2	47
WW8	3	1.25	562	2	0.06	53	475	6	2	0.02	9	0.14	52	<2	50
WW9	2	2.02	755	2	0.07	84	453	7	<2	0.01	8	0.15	48	<2	67
WW11	2	2.19	1694	1	0.08	65	660	6	<2	0.01	8	0.35	178	<2	203
WW12	8	2.31	1113	2	0.13	80	1562	<2	<2	0.02	18	0.33	96	<2	99
WW13	3	1.00	573	1	0.05	53	361	12	<2	0.01	11	0.12	50	<2	45
WW14	4	1.36	635	1	0.04	41	470	6	<2	0.01	6	0.26	38	<2	77
WW15	4	1.35	652	2	0.04	47	473	8	<2	0.01	6	0.26	37	<2	80
WW16	4	1.18	594	1	0.04	46	450	6	<2	0.01	7	0.23	37	<2	77
WW16	sample missing														
WW17	3	1.46	698	3	0.04	64	355	27	10	0.01	6	0.19	37	<2	91
WW18	2	1.63	732	3	0.03	47	372	21	<2	0.01	4	0.19	39	<2	77
WW19	3	2.15	955	2	0.04	56	497	21	<2	0.01	5	0.23	46	<2	82
WW20	3	1.25	818	3	0.03	61	536	17	2	0.02	11	0.2	32	<2	78
WW21	3	1.31	926	2	0.04	51	523	9	<2	0.01	11	0.17	42	<2	93
WW22	3	1.18	1116	1	0.04	65	434	11	<2	0.01	9	0.18	39	3	93
WW23	2	1.37	751	1	0.06	49	377	10	<2	0.01	11	0.19	42	2	52
WW24	2	1.46	1185	2	0.02	49	441	11	<2	0.01	7	0.2	44	<2	86

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SAMPLE #	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Hg ppm
WW2A	<0.1	2.05	25	64	<1	<3	0.59	<1	26	382	32	3.60	<3
WW2	<0.1	2.23	23	194	<1	<3	0.48	<1	24	347	38	3.44	<3
WW3	0.1	2.02	31	23	<1	<3	1.71	<1	47	361	119	4.32	<3
WW4	3.3	0.37	158	43	<1	<3	0.05	1	29	102	83	22.88	<3
WW4B	<0.1	0.91	32	47	<1	<3	1.07	<1	18	172	53	4.93	<3
WW5	<0.1	2.52	30	45	<1	<3	0.94	<1	23	236	144	6.71	<3
WW6	0.6	3.14	41	29	<1	<3	1.36	<1	12	187	129	6.95	<3
WW7	0.2	2.63	34	26	<1	<3	1.36	<1	18	358	47	4.18	<3
WW8	<0.1	2.24	31	31	<1	<3	0.88	<1	25	362	31	6.22	<3
WW9	0.1	2.90	39	43	<1	<3	0.67	<1	16	229	30	5.20	<3
WW11	0.2	3.28	66	33	1	<3	0.92	<1	29	172	109	6.46	<3
WW12	0.1	3.29	52	37	1	<3	1.21	<1	19	285	48	5.01	<3
WW13	<0.1	1.93	48	22	<1	<3	0.90	<1	46	492	57	6.82	<3
WW14	0.2	1.80	25	46	<1	<3	0.24	<1	14	194	30	5.10	<3
WW15	<0.1	1.80	38	46	<1	<3	0.40	<1	18	178	36	5.16	<3
WW16	<0.1	1.60	36	49	<1	<3	0.36	<1	21	203	37	5.54	<3
WW16							sample missing						
WW17	1.9	2.30	113	37	<1	<3	0.50	1	34	263	86	14.65	<3
WW18	1.2	2.43	90	32	<1	<3	0.42	<1	19	203	63	10.29	<3
WW19	0.6	3.05	80	34	<1	<3	0.51	<1	17	203	54	10.00	<3
WW20	1.8	2.09	89	43	<1	7	0.76	1	52	264	85	14.24	<3
WW21	0.6	2.22	36	46	<1	<3	0.82	<1	20	298	54	6.42	<3
WW22	<0.1	1.97	31	33	<1	<3	1.21	<1	30	327	54	5.08	<3
WW23	<0.1	1.96	24	25	<1	<3	0.59	<1	17	249	30	4.86	<3
WW24	<0.1	2.65	43	29	<1	<3	1.09	<1	18	267	40	5.99	<3

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APPENDIX

B

Petrographic Report

THIN SECTIONS PETROGRAPHY

SAMPLES TS-1 TROUGH TS-14

for

WALTER HANYCH

by

DOMINIC BABIN - Geologist

Sudbury, January 19th, 1996

SAMPLE TS-1

Name: Lapilli-tuff

Megascopic description:

The hand sample is Matrix-supported, poorly sorted lapilli-tuff with a rusty-brown weathered surface and a dark grey fresh surface. The sample is slightly polymictic being composed of 40-50% grey, angular andesitic fragments ranging from 0.1 to 6cm in diameter, of 25% <1mm to 5mm lithic shards, of 1% massive pyrite fragments (which are similar to the andesitic fragments) and of 24-34% chlorite-rich, clay-sized ash. The andesitic fragments are composed of microporphyritic feldspar and disseminated pyrite in an aphanitic matrix. Several fragments show a jigsaw texture (the fragment is fractured, but the pieces stay together).

Modal composition:

Andesitic fragments		**40%**
plagioclase phenocrysts	10%	
plagioclase lathes	40-60%	
opaque (pyrite)	5-50%	
chlorite-filled amygdules	2-3%	
cryptocrystalline matrix	30-40%	
Amygdular porphyritic fragments		**5%**
chlorite-filled amygdules	15-30%	
plagioclase lathes	20%	
cryptocrystalline matrix	50-65%	
Porphyritic shards		**30%**
plagioclase lathes	20-50%	
cryptocrystalline matrix	50-80%	
Clay-size ash matrix		**25%**

Microscopic description:

The porphyritic andesite fragments have irregular edges and commonly have moderately sericitized, hypidiomorphic, zoned plagioclase phenocrysts ranging from 0.1 to 2mm (average of 1-1.5mm). The plagioclase lathes are also slightly sericitized, but they are usually <0.05mm in length and show preferential alignment in some areas. The amygdules are very irregular in nature and are <0.2mm in diameter. The matrix is mainly composed of chlorite, albite (and/or quartz) and iron carbonate. The pyrite is xenomorphic in nature and forms irregular blebs which replace the andesitic clasts.

The amygdaloidal fragments vary in size from 2 to 5mm with edges defined by amygdules 0.05-0.2mm in diameter. Plagioclase lathes in those fragments show a preferential alignment within a matrix composed of chlorite, iron carbonate and cryptocrystalline albite.

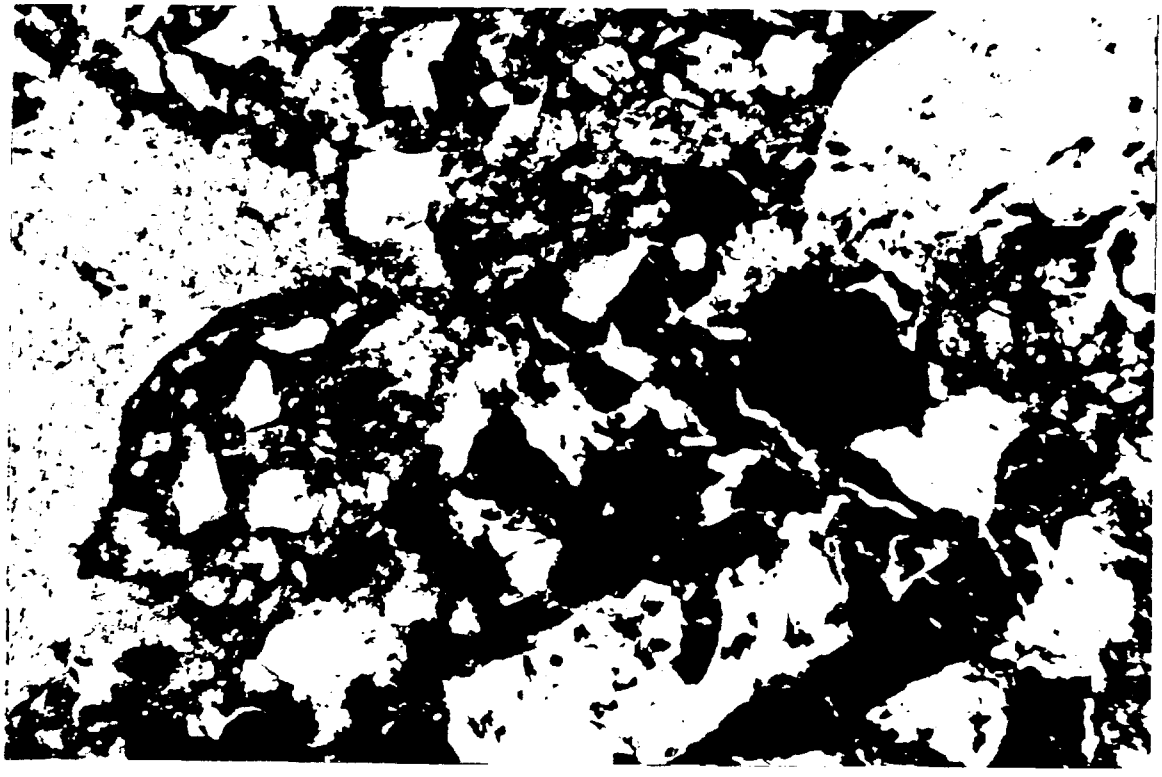
Shards have edges defined by amygdule boundaries and are interpreted to represent juvenile fragments. Their size varies from <0.05mm to 2mm. Plagioclase lathes typically exhibit a preferential alignment within a chloritic matrix. The shards are supported by a very dark, clay-sized matrix, possibly chloritic in composition.

Interpretation:

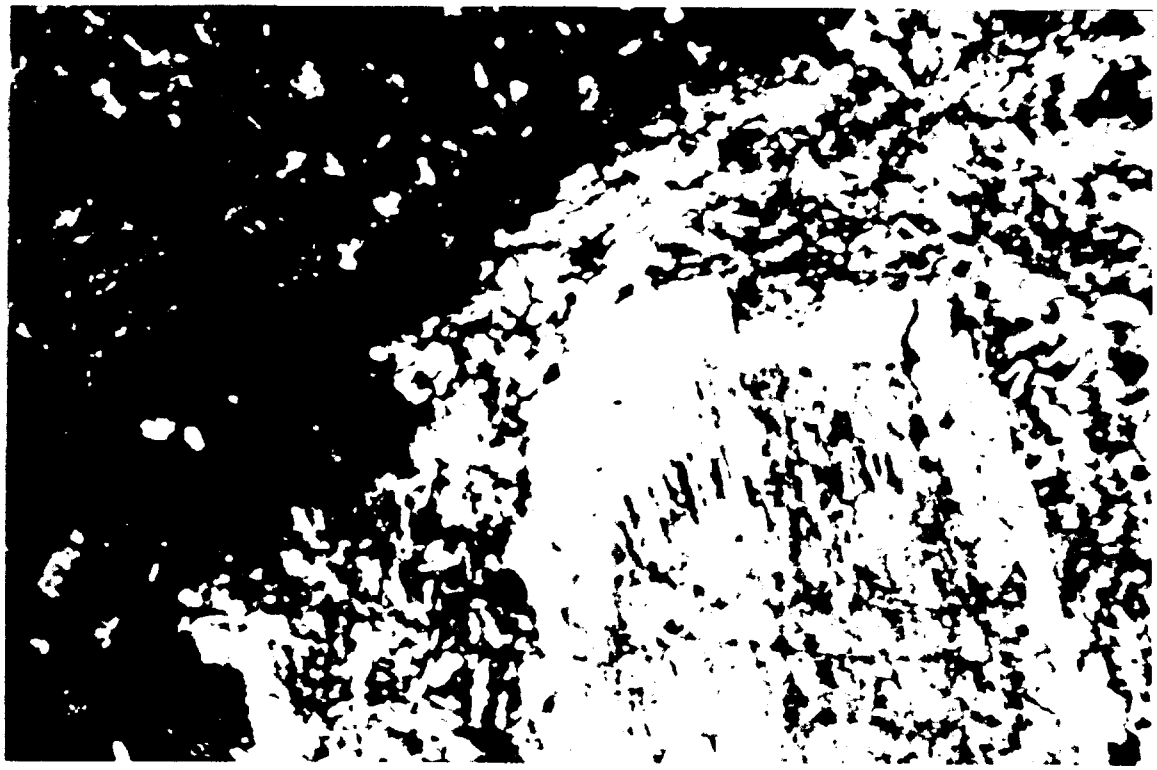
Fragments show evidence of flow banding as indicated by the alignment of plagioclase, suggesting they were emplaced either as part of a flow on surface, or formed during theascent of the magma in the vent during eruption. The fact that the sample contains amygdule-delimited shards indicates this unit is a product of hydro-

magmatic eruption or a short distance re-deposition of such product in a debris flow type of process (shards are not very resistant to transportation). Andesitic fragments were initially deposited as a flow, and were gradually replaced by pyrite via a hydrothermal process (VMS type of setting). Subsequent eruptions or debris flows incorporated fragments of this pre-existing unit, transporting them away from the vent. Subsequent greenschist facies metamorphism is responsible for chloritization, sericitization and carbonatization of the original volcanic rock.

Observations indicate an early stage of VMS style activity in the volcanic pile. It is however difficult to asses the distance involved or the economic value (dimension and base metal content) of such a deposit. If the massive sulfide lens was preserved, it would be contained within the porphyritic andesitic flow which was the source of the fragments.



Photomicrograph 1. Part of an andesitic fragments being replaced by pyrite (lower-right corner), within a matrix compsed of shards and dark, clay-sized ash. 5.0 x magnification, PPL, f.o.v = 2.6mm.



Photomicrograph 2. Irregular edge of an andesitic fragment showing the two family of sericitized plagioclase phenocrysts, within a chlorite-rich matrix. 5.0 x magnification, XPOL, f.o.v. = 2.6mm.

SAMPLE TS-2

Name: Altered mafic to intermediate porphyritic flow.

Megascopic description:

Fine-grained intermediate volcanic rock with a grey, rusty weathered surface and medium grey fresh surface. The sample is composed of 10% 0.1-2mm long altered feldspar phenocrysts and 3-4% of dissiminated pyrite, all within an aphanitic matrix. The sample has a texture defined by irregular zones of leucocratic, feldspar-rich material and darker more chloritic area.

Modal composition:

Plagioclase phenocrysts	**10%**
faint amygdules	**2%**
cryptocrystalline matrix	**55-60%**
veinlets	**30%**

Microscopic description:

Intense alteration masks primary volcanic features. Hypidiomorphic plagioclase phenocrysts are heavily sericitized and display minor carbonate alteration. Grains size range in from <0.1mm to 2mm with an average of 0.8-1mm. Amygdules are filled with fine-grained plagioclase (oriented sub-parallely), cryptocrystalline sericite, opaques (pyrite?) and quartz with minor very fine-grained chlorite and carbonate. Although the matrix is cryptocrystalline, the mineral assemblage appears to be composed of

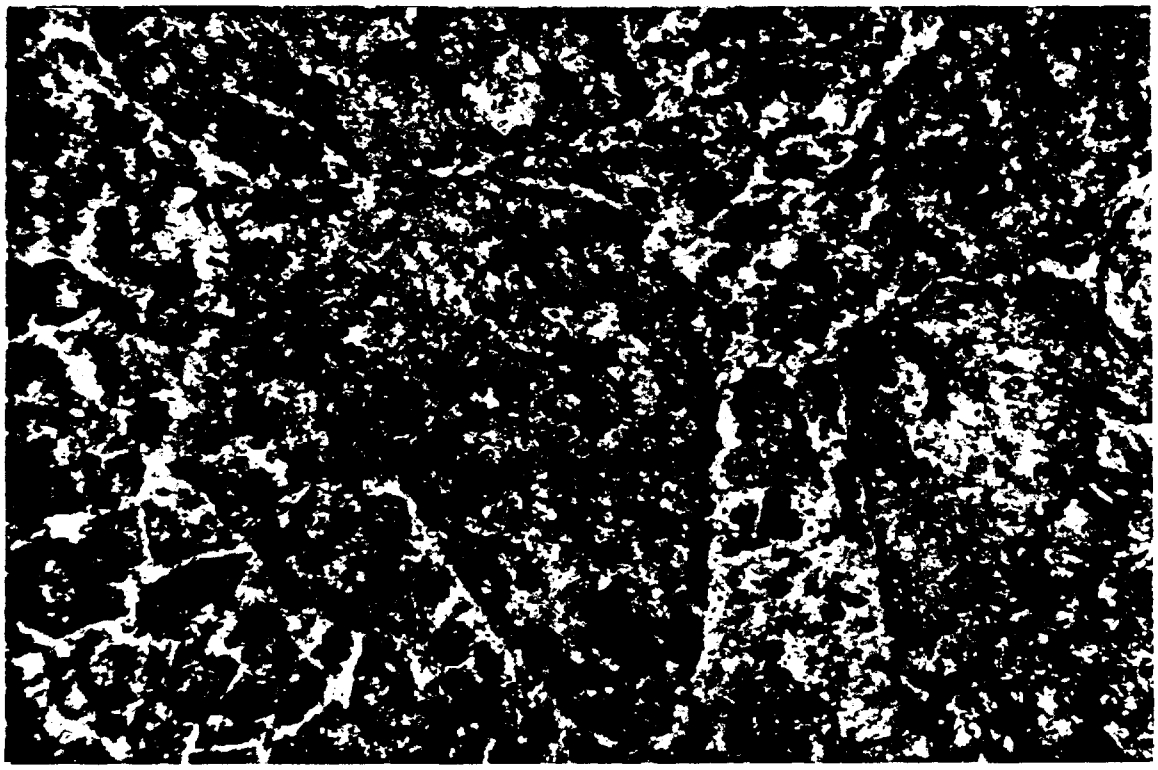
10%chlorite, 30% sericite, 10% carbonates, <1% apatite and with minor albite and/or quartz. There is also 5% dissiminated xenomorphic opaque (pyrite) which is observed in close spatial association with the veinlets as well replacing matrix material. The veinlets are dominated by cryptocrystalline xenomorphic albite and/or quartz with approximatly 10-40% of chlorite, carbonate, sericite and pyrite. More rarely, veinlets are composed of chlorite, pyrite and sericite. They form a "pseudo-stockwork texture", with <0.1mm randomly oriented veinlets that fragment the rock in 0.1 to 2mm pseudo-clasts. The edges of the pseudo-fragments display a more intense chloritic lateration.

Interpretation:

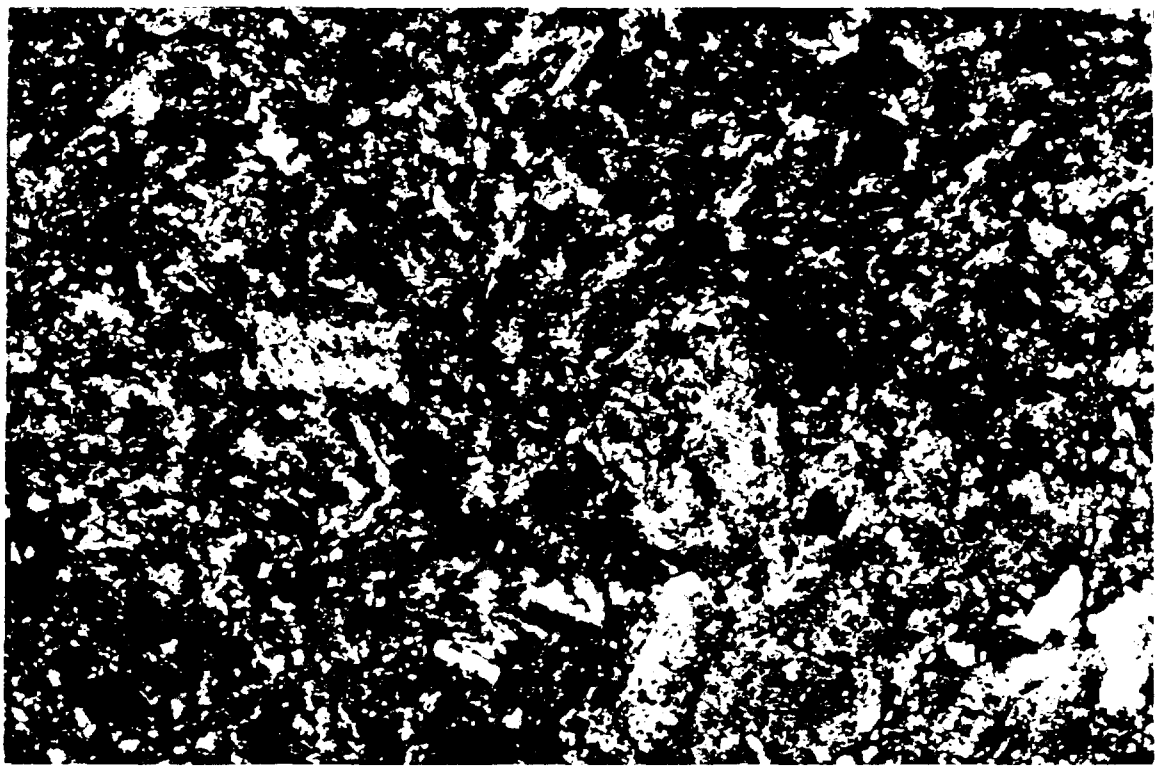
This sample represents an intensely altered intermediate to mafic porphyritic flow. This alteration, albitisation and/or silicification, is perhaps responsible for the presence of sulfide. It is difficult to determine the time and the true effect of the alteration due to an overprinting by regional metamorphism. The presence of chlorite and sericite in the veinlets suggests a "pre-metamorphism" alteration event, but it is possible that the fluids just incorporated the metamorphic minerals (chlorite, sericite, carbonate) after their formation (post-metamorphism). This kind of alteration could be related to a VMS style of mineralization but may also be derived from a shear zone, an intrusive body... Important elements that would favour a specific model would require particular attention to alteration during field mapping (localized around a fault or an intrusion, going through different volcanic units, etc.).

Sample TS-1 and TS-2 are not similar, even if they were collected in the same area. Their only similarity is that they are both a part of an intermediate volcanic

sequece (andesitic most likely). However, it is possible that the alteration in sample TS-2 is related to the emplacement of the masive sulfide in some fragments of sample TS-1, but a more detailed understanding of the field relationships is required to go further in the interpretation.



Photomicrograph 3. Picture showing the fragmented nature of the sample. A more intense alteration of the edges of the fragments is observed. 5.0 x magnification, PPL, f.o.v. = 2.6mm.



Photomicrograph 4. Sericitized plagioclase phenocrysts (lower-right corner) and plagioclase lathes in an amygdule. 10 x magnification, XPOL, f.o.v. = 1.3mm.

SAMPLE TS-3

Name: Polymict lapilli-tuff

Megascopic description:

Poorly-sorted, quasi-oligomict, matrix-supported lapilli-tuff with a light grey to rusty weathered surface. The rock is composed of medium grey, microporphyritic angular clasts (65%) within a dark grey clay-sized matrix. The fragments range in size from <0.1mm to >5cm. The clasts are composed of approximately 10-60% sericitized plagioclase feldspar phenocryst 0.05-4mm in length. The matrix appears somewhat heterogenous, with minor ash to lapilli size fragments within a dark clay-sized material.

Modal composition:

Lapilli-size volcanic fragments		**60-70%**
dacitic to rhyodacitic clasts	50%	
andesitic clasts	45%	
other	5%	
Ash-size components		**30-40%**
sericitized plagioclase fragments	55%	
quartz fragments	3%	
opaque (sulfide) fragments	2%	
clay-size matrix	40%	

Microscopic description:

The dacitic to rhyodacitic clasts comprise the bulk of the clast population and are composed of 60% of 0.05mm to 4mm intensely sericitized and carbonatised hypidiomorphic plagioclase phenocrysts. They also contain 3% carbonatized and

chloritized 0.1 to 1mm in size (average of 0.2mm) ferro-magnesian hypidiomorphic phenocrysts (probably amphibole originally). The matrix of those clasts with irregular edges is composed of xenomorphic quartz (60%) up to 0.5mm in size, cryptocrystalline (<0.01mm) plagioclase (33%), opaques (5%) and apatite(2%). It also contains sericite and carbonate.

The andesitic fragments are up to several centimetres in length and have irregular edges. They are composed of 30% sericitized, hypidiomorphic plagioclase phenocrysts (1.5 to 2mm in length) and 10% plagioclase lathes (<0.01mm in length). The fragments also contain 2-3% chloritized and carbonatized mafic phenocrysts (amphibole?) approximately 0.25mm in length, 2% idiomorphic apatite up to 0.1-0.2mm (phenocryst) and 55% cryptocrystalline matrix composed of chlorite and sericite. About 5% of the andesitic fragments do not contain apatite and show flow banding. Those clasts have less plagioclase phenocrysts (10-50%) and contain more carbonates (0-50% sparitic carbonate).

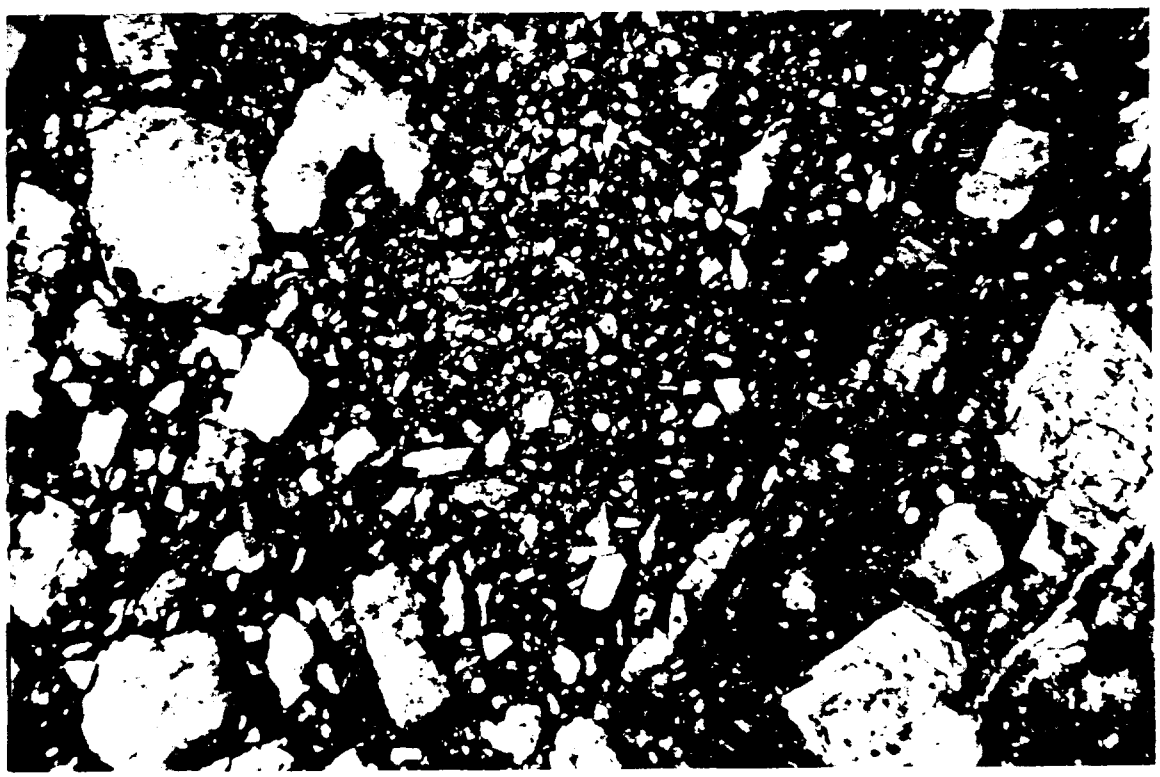
The other fragments can be described as a diffuse, tightly packed, moderately sorted, volcanic "sandstone" composed of very angular grains (0.1-0.3mm). It is similar to the ash component of the sample but with only 9-10% clay-sized matrix (see photo 5).

The ash-size component of the sample is composed of 55% andesitic clasts and plagioclase fragments. They are angular and blocky in nature (no amydaloidal margins) and average 0.1mm in size. There is also 2% opaque (sulfide) fragments which are up to 0.2mm in size and 2% angular quartz fragments up to 2mm in size. Approximately 1% of the ash-size matrix is composed of a low temperature feldspar

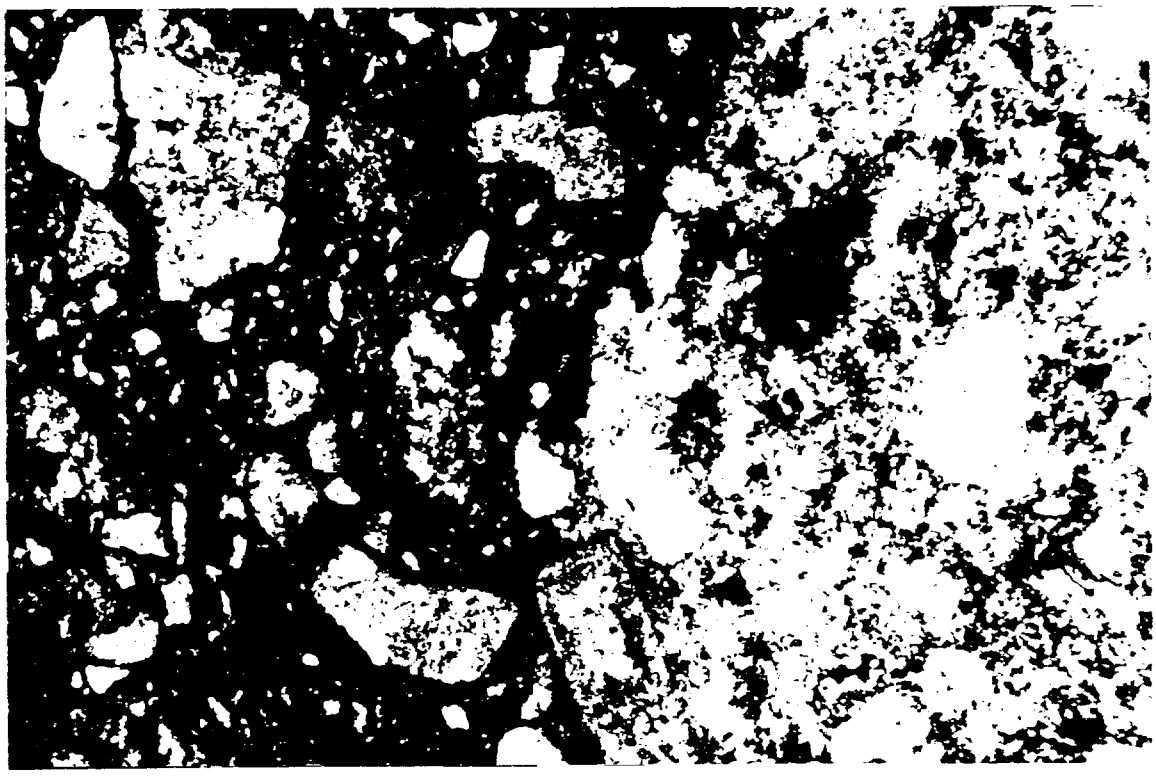
(adularia or albite) which appears similar to the quartz fragments. All those fragments are supported by a dark, chloritic clay-sized matrix.

Interpretation:

This sligthly polymict coarse lapilli-tuff is the product of reworking of pre-existing andesitic and dacitic flows which were transported a short distance by debris flow mechanism. It may also represent a clastic dyke. The high apatite content of some fragments is a good indicator used to detect the source area. This kind of high phosphorous magma indicates an Island type of volcanism or a high alkali products from a back-arc volcanic setting. This sample is not significant in term of exploration purposes, despite the presence of sulfide fragments in the ash matrix. These fragments may have originated from a synvolcanic deposit in the source area of they may represent erosion of dissiminated pyrite in a volcanic flow.



Photomicrograph 5. Photo showing part of an apatite-rich, andesitic fragment to the right and a volcanic sandstone fragment in the center, within a lithic-rich ash matrix. The two white fragments in the matrix are low temperature feldspar resulting from late potassic alteration. 2.5 x magnification, PPL, f.o.v. = 5.2mm.



Photomicrograph 6. Part of a dacitic fragment (to the right) within a lithic-rich ash-size matrix. 5.0 x magnification, XPOL, f.o.v. = 2.6mm.

SAMPLE TS-4

Name: Polymict lapilli-tuff

Megascopic description:

Matrix-supported, poorly sorted lapilli-tuff with a rusty-brown weathered surface, looking very similar to sample TS-3. The angular blocky fragments are similar in composition (mostly dacitic and andesitic) and contain a similar micro-porphyritic flow banded texture. The fragments range in size from <1mm to >6cm and are supported by an ash-sized matrix which is very dark in color. There is a 1.5 cm darker clast which probably represents one of the other andesitic fragments (finer grained). This sample is part of the same unit (lithology) as sample TS-3.

Modal composition:

Andesitic fragments		**80%**
sericitized, zoned plagioclase	58%	
apatite (phenocryst?)	1%	
opaque(sulfide)	1%	
mafic phenocryst	10%	
cryptocrystalline matrix	30%	
Ash-size matrix		**20%**
volcanic and plagioclase fragments	75%	
sulfide clasts	<1%	
quartz fragments	1%	
volcanic "sandstone" clasts	<1%	
clay-size chlorite rich matrix`	20-25%	

Microscopic description:

The thin section was made mostly on one andesitic clast which affects the modal composition of this sample compared to TS-3, but the constituant of each sample is similar in both cases. As a consequence, it is not necessary to describe in detail this sample, and one should refer to TS-3 for further details

Interpretation:

Sample TS-3 and TS-4 belong to the same unit and where emplaced by the same mechanism. See sample TS-3 for a more complete interpretation.

Photomicrograph 7. Part of an apatite-rich, andesitic fragment, containing plagioclase phenocrysts (light-grey crystals), mafic phenocrysts (black crystals) and apatite phenocryst (white crystal), within in a chorite-rich, cryptocrystalline matrix (brown component). 5.0 x magnification, PPL, f.o.v. = 2.6mm.

SAMPLE TS-5

Name: Altered lapilli-tuff

Megascopic description:

Intensely altered intermediate fragmental volcanic rock with a light grey to rusty weathered surface. The sample is composed of 60% light grey, angular porphyritic fragments up to 4mm in diameter within an iron carbonate-quartz rich matrix. The sericitized plagioclase phenocrysts in the fragments are <0.5mm in length.

Modal composition:

Porphyritic fragments		**45%**
pseudomorph of plagioclase phenocryst	0-5%	
cryptocrystalline matrix	95-100%	
Pseudo-amygdaloidal clasts		**2%**
pseudo-amygdules	40-70%	
cryptocrystalline matrix	30-60%	
Quartz-rich fragments		**5%**
quartz	5-20%	
cryptocrystalline matrix	80-95%	
Matrix (or veinlets)		**38%**
sericite	10-15%	
quartz	30%	
iron carbonate and other carbonates	50%	
chlorite	5-10%	
apatite	<1%	
opaque (sulfide?)	1-2%	

Microscopic description:

The porphyritic clasts have an average dimension of 2mm and are very blocky and angular. The pseudomorphic phenocrysts are often composed of sericite+carbonate. They can also be completly transformed to quartz with a very fine-grained mineral (possibly epidote or even scheelite). Xenomorphic pyrite is often associated with the replacement minerals. The matrix is entirely cryptocrystalline and composed of chlorite, sericite, plagioclase and some opaque (1%). There is also minor carbonate.

Pseudo-amydaloidal clasts are weakly deformed (oval) and are composed of oval forms (0.05mm) which closely resemble amygdules. However, there is no difference in composition between the amygdules and the matrix, both of which are composed of cryptocrystalline chlorite, sericite and carbonate. The amygdules are delimited by a concentration of very, very fine-grained opaques (see photo 10). These clasts range in size from <0.5mm to 2mm (average of 1mm).

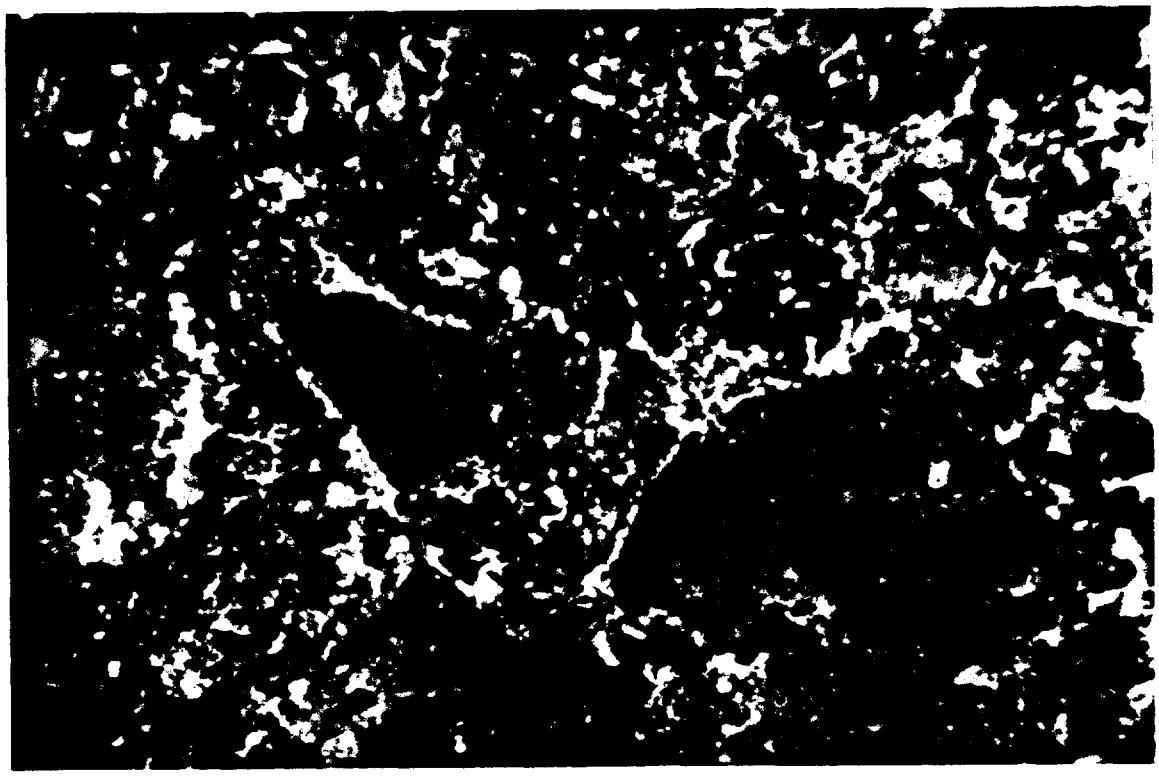
The quartz-rich fragments are similar to the porphyritic ones, except they do not contains phenocryst and their matrix is coarser grained (still <0.1mm). The matrix also contains 20-50% carbonate and iron-carbonate. Some fragments do not contain quartz, but are still coarser grained and rich in carbonate.

The matrix of the sample is composed of cryptocrystalline sericite, carbonate and iron carbonate (which are often in clusters about 0.5mm in diameter), chlorite and opaques. The quartz is xenomorphic and up to 0.1mm in size. This matrix is very chaotic and ressemble a veinlet system that replaced the previous ash matrix. Some of the fragments are fractured, but it is confined within each clast (no single fracture

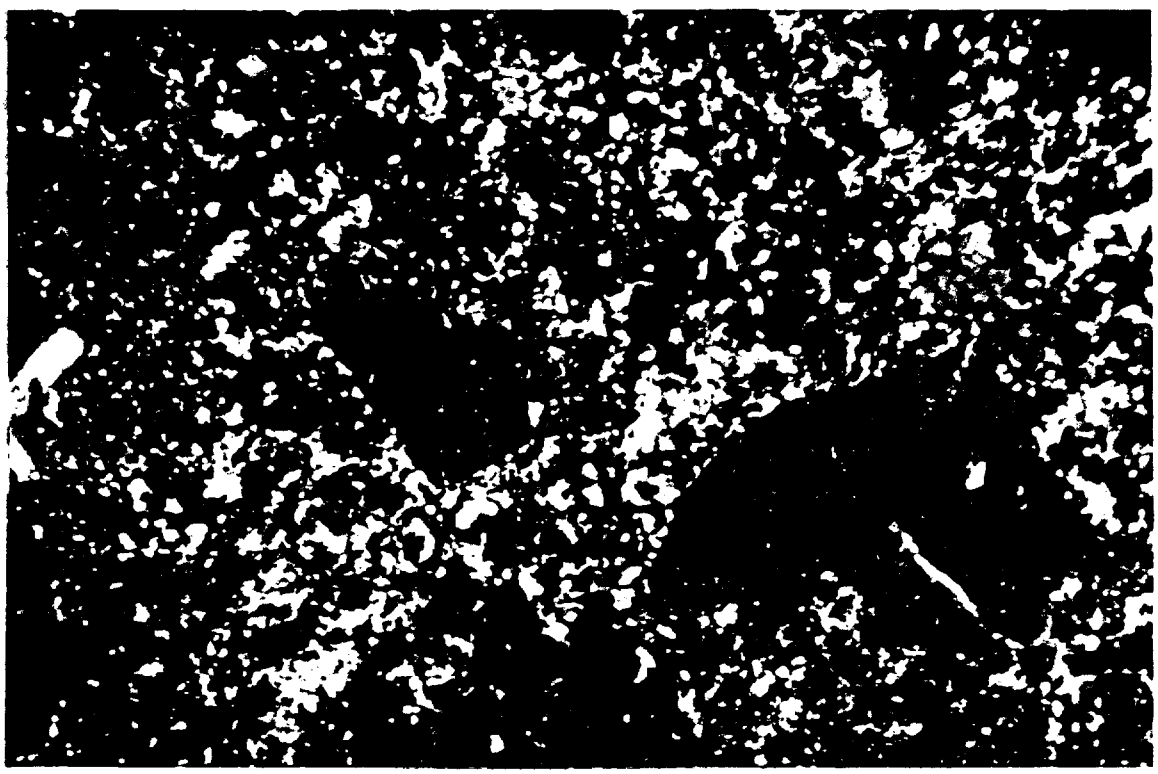
penetrates 2 adjacent clasts).

Interpretation:

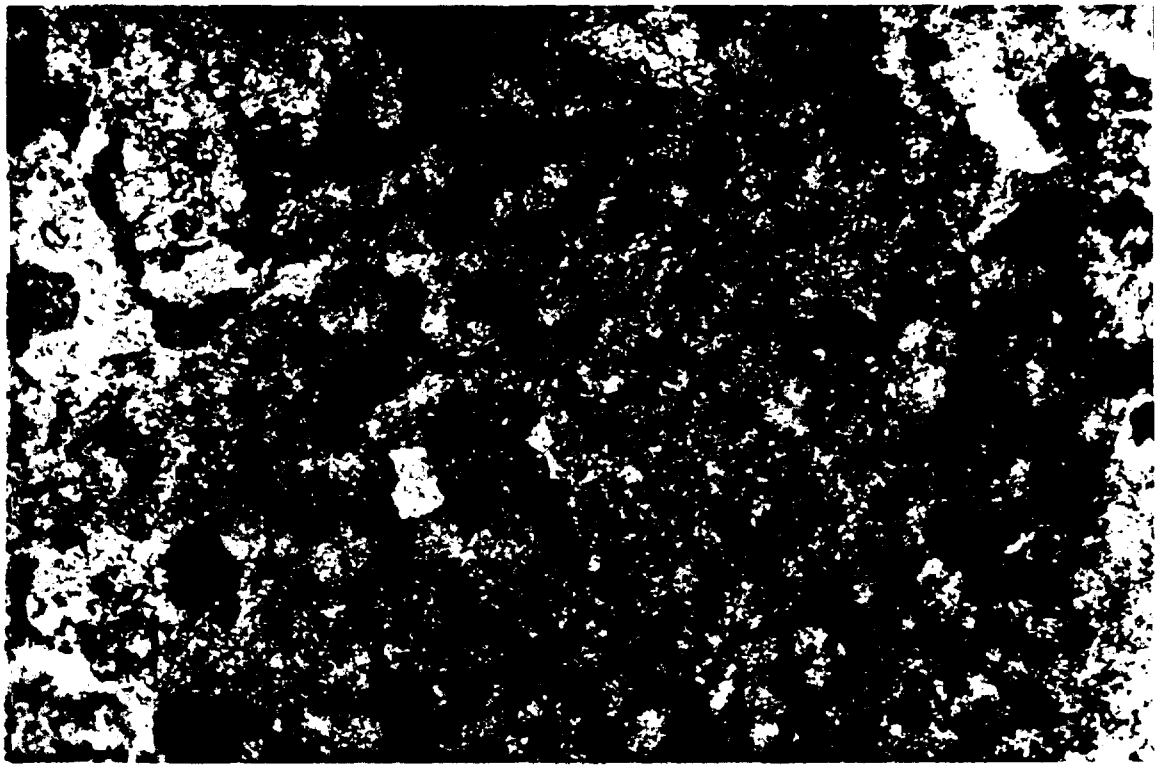
The fact that the sample seem to contains several different clast types is an indicator that the rock was already fragmental before the onset of alteration. Due to the intensity of the alteration, it is possible that the clasts moved sligtly to accomodate the passage of the fluid. The composition of the fragments was probably andesite to dacite for some fragments as observed in all other samples. The intense silicification and carbonatization may have originated from different sources, perhaps from a nearby fault, an intrusion (there is a gabroic body just south of the sample and a fault just east of it) or even synvolcanic hydrothermal activity. The field relationships between this alteration and the different geologic structures around it are important elements to look for. However, the possible presence of scheelite and the location of the gabbroic body to the south, favor the skarn theory. Samples TS-6 and TS-7 are similar than TS-5 and so, they are interpreted to be part of the same unit.



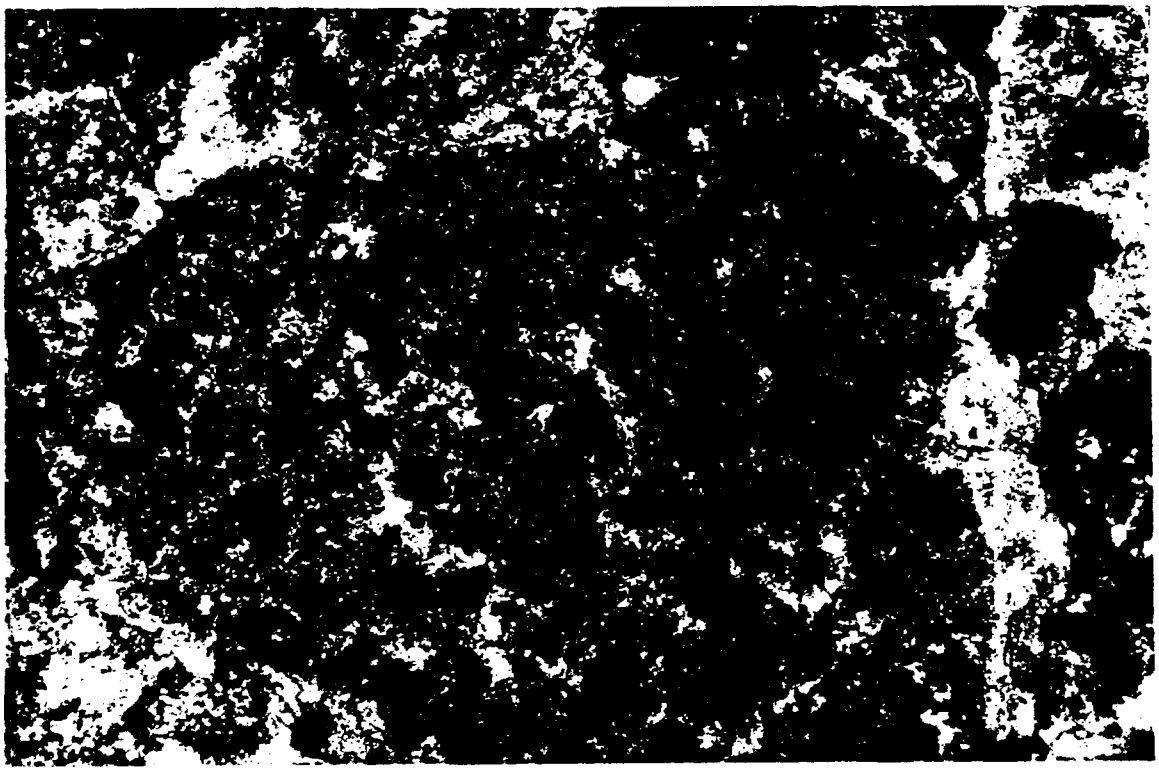
Photomicrograph 8. General view of the fragmented nature of the sample. 2.5 x magnification, PPL, f.o.v. = 5.2mm.



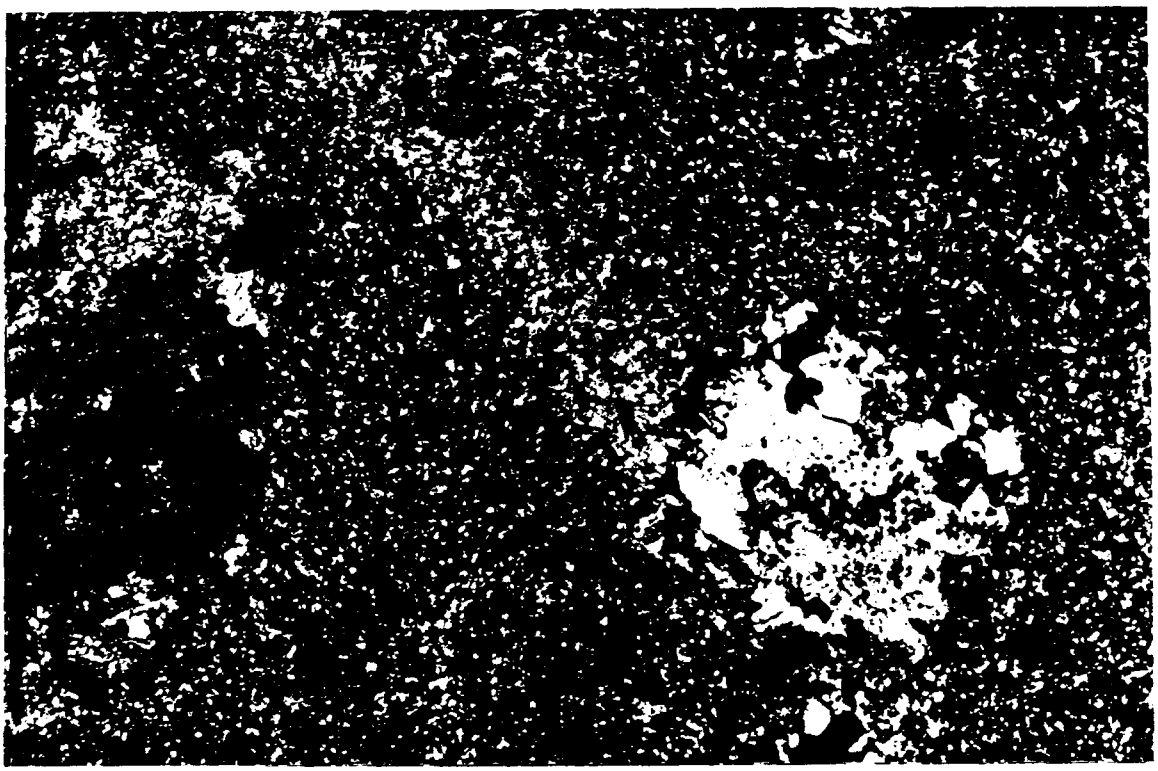
Photomicrograph 9. General view of the fragmented nature of the sample. 2.5 x magnification, XPOL, f.o.v. = 5.2mm.



Photomicrograph 10. Part of a pseudo-amygdaloidal clast showing numerous circular to oval shape. 10 x magnification, PPL, f.o.v. = 1.3mm.



Photomicrograph 11. View of a quartz-rich clast. The dark brown clusters represent the iron carbonate alteration. 10 x magnification, PPL, f.o.v. = 1.3mm.



Photomicrograph 12. Part of a porhyritic fragment showing plagioclase phenocryts being altered to quartz + scheelite (to the right) and to carbonate + sericite (to the left). The cryptocrystalline matrix is composed of chlorite, sericite, plagioclase and minor opaque. 10 x magnification, XPOL, f.o.v. = 1.3mm.

SAMPLE TS-6

Name: Porphyritic, amygdaloidal, intermediate flow.

Megascopic description:

Porphyritic brecciated volcanic rock, similar in nature, color and composition to sample TS-5. However, the fragments in sample TS-6 seem to be slightly bigger (0.1mm to >1cm with an average of 4-5mm).

modal composition:

Porphyritic fragments		**70%**
sericitized plagioclase phenocrysts	2-4%	
amygdules	1%	
cryptocrystalline matrix	95%	
matrix or veinlets		**30%**
quartz+carbonate veinlets	75%	
carbonate and iron carbonate veinlets	5%	
qz+feldspar+carbonate+sericite veinlets		20%

Microscopic description:

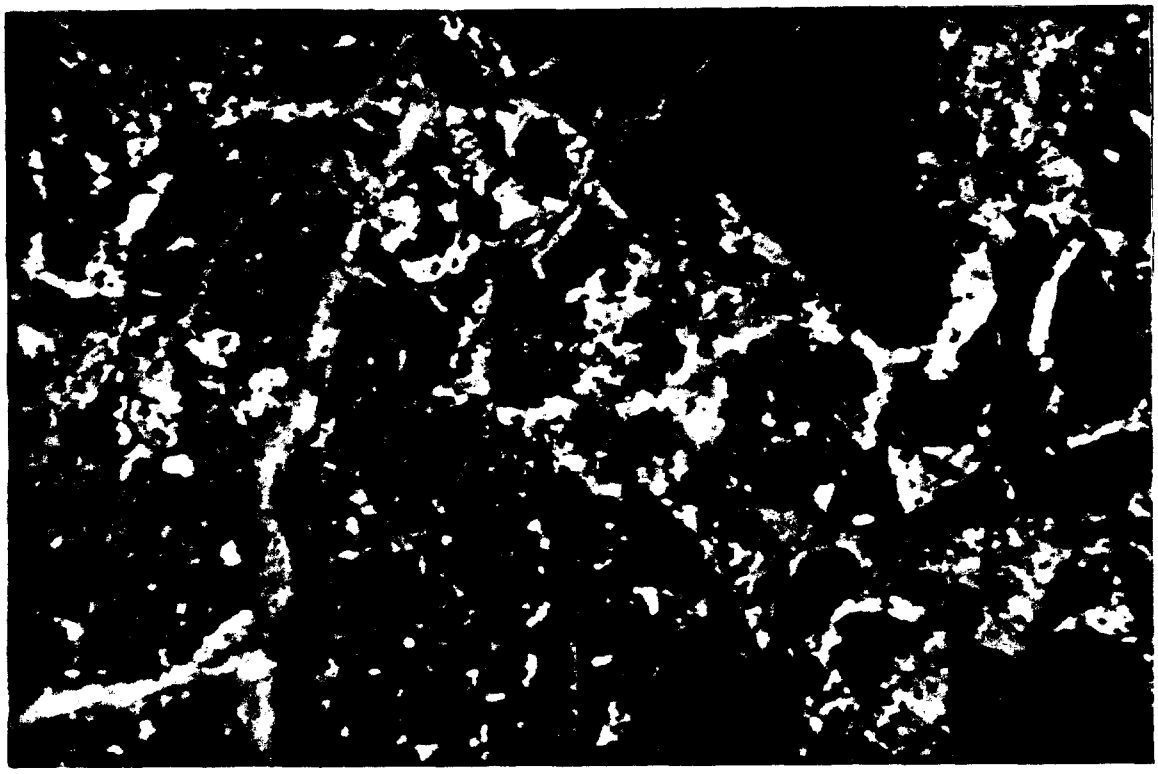
This sample is similar to TS-5 and TS-7, with the exception of its oligomic character within fragments of a porphyritic and amygdudar nature. Hypidiomorphic plagioclase phenocrysts are intensely sericitized but are not recrystalised to quartz. Contrary to the other samples, this unit contains diffuse amygdules of about 1mm in diameter that are filled with 10-40% of quartz (often radiately oriented), 0-40% sericite, 5-25% carbonates (iron and calcite), 10% idiomorphic opaque (hematite) and 5%

apatite. The cryptocrystalline matrix of these fragments is composed of sericitized feldspar (80%), quartz (10%), iron carbonate (5-10%) and opaques (1%).

The veinlets are more defined than in the other sample and usually range from <0.1mm to 1mm wide. The oldest set of veinlets contain the quartz and carbonate, with the quartz being preferentially located along vein walls. No preferential alteration appears to be associated with these veinlets. The carbonate veinlets cross-cut all the other sets, indicating that they were the last one to be emplaced. They often offset other veinlets (micro-fault) and contain minor opaques. The last type of veinlet (qz-feldspar-carb.-ser.) is less defined and appears to have caused a concentration of iron carbonates on the edges of the fragments in contact with this type of veinlets. They represent a kind of diffuse stockwork pattern and include abundant fragments.

Interpretation:

This sample was probably an intermediate flow (not a volcaniclastic rock like the two other sample) which was brecciated by the circulation of fluids. Here also, the timing and origin of the alteration is difficult to determine, but it is related to the same episode as sample TS-5 and TS-7.



Photomiograph 13. View of the fragmented texture of sample TS-6 in PPL. Some fragments present an iron carbonate alteration along their edge. 2.5 x magnification, f.o.v. = 5.2mm.

SAMPLE TS-7

Name: Lapilli-tuff

Macroscopic description:

Sample TS-7 is very similar to sample TS-5; however the fragments are more tightly packed (only 20-30% matrix) and are larger in size (3mm in average and up to 6mm).

Modal composition:

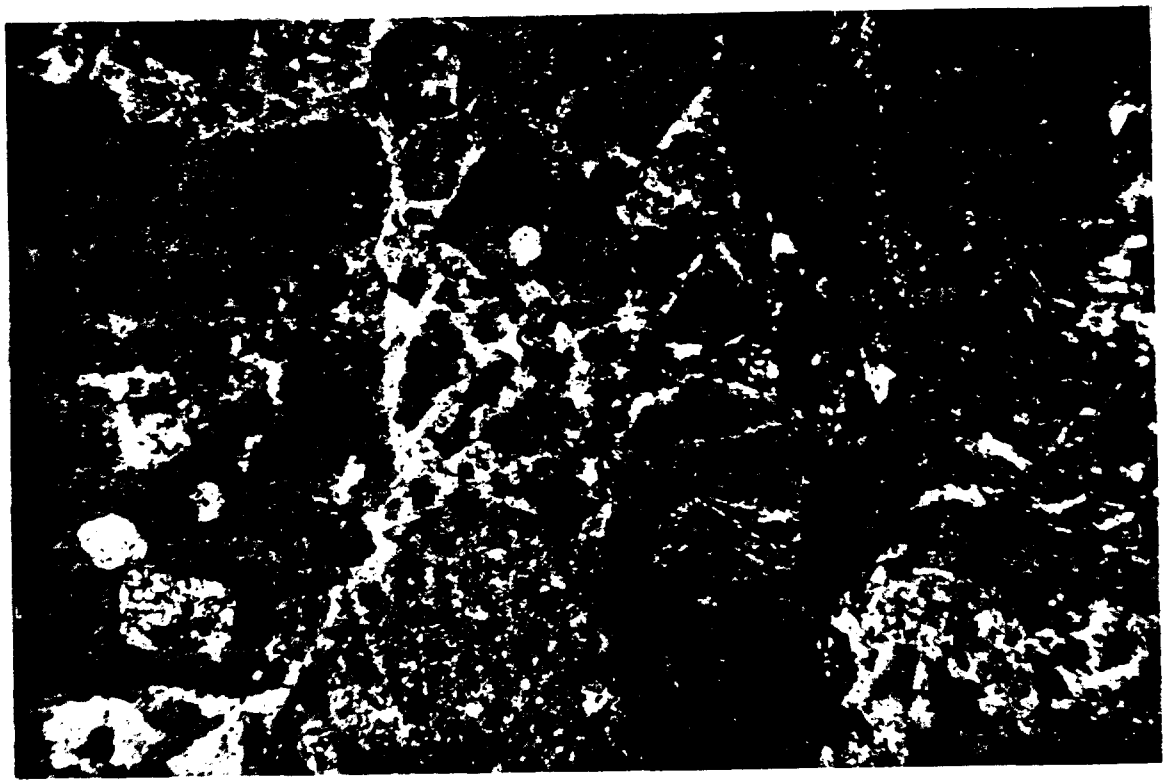
Porphyritic fragments		**60%**
Pseudo-amygdaloidal fragments		**1%**
Quartz-rich and carbonate-rich fragments		**15%**
Matrix		**25-30%**
carbonate	50%	
sericite	10%	
quartz and/or albite	35%	
chlorite	4%	
opaque	1%	
apatite	<1%	

Microscopic description:

The fragments and matrix are similar to those of sample TS-5 except that the plagioclase and the matrix of sample TS-7 are highly carbonatized compare to sample TS-5.

Interpretation:

This sample is similar in nature to TS-5 but shows a more intense alteration of carbonates and less sulfide involvement. Also, the fragments are more tightly packed. The different alteration and volcanic facies should be studied more closely to determine the source and the timing of this alteration.



Photomicrograph 14. General view of sample TS-7 in PPL. Presence of a pseudo-amygdaloidal clast to the right and a plagioclase porphyritic clast to the left. 2.5 x magnification, f.o.v. = 5,2mm.

SAMPLE TS-8

Name: Andesitic to dacitic flow

Megascopic description:

Massive, aphanitic intermediate volcanic rock with a rusty weathered surface and a greenish grey fresh surface. The sample is heterogenous with feldspar-rich zones intermingled with chloritic patches. The sample contains 5-10% of disseminated pyrite which may be associated with a late fracture filling.

Modal composition:

Plagioclase phenocrysts	**8-10%**
Ferro-magnesian phenocrysts	**1%**
Matrix	**75-80%**
plagioclase lathes	35%
cryptocrystalline albite/quartz	35%
chlorite	10-15%
iron carbonate+hematite	10%
apatite	<1%
sericite	5-10%
opaque (sulfide?)	1%
Veinlets	**10-15%**
qz+chlorite	80%
chlorite+pyrite?	10-15%
late iron carbonate+opaque	5-10%

Microscopic description:

The hypidiomorphic plagioclase phenocrysts are oligoclase in composition. They are moderately sericitized and the crystals are up to 3mm in length with an

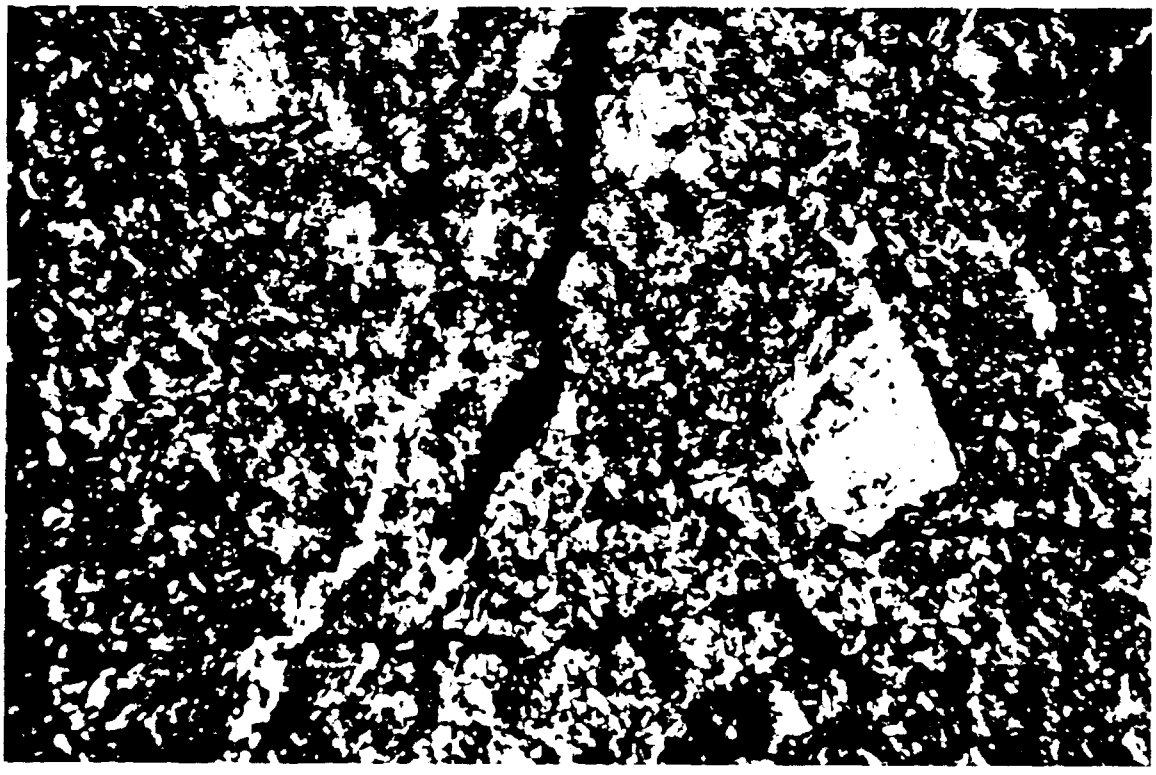
average of 0.5-1mm. The ferro-magnesian phenocrysts are completely altered to chlorite. They are hypidiomorphic to xenomorphic with rare pyramidal terminations. The pseudomorphic crystals are up to 2mm in length with an average length of 0.5mm. Hematite is often associated with the presence of chlorite.

The matrix is cryptocrystalline thereby rendering exact modal mineralogy difficult to assess. The plagioclase lathes are flow banded in some section, <0.1mm long and slightly sericitized. The albite/quartz is often observed in cluster or agglomerations approximately 0.1mm in size. The iron carbonate is intimately associated with hematite and is evident in disseminated granules that are <0.05mm in grain size. The apatite is idiomorphic and the crystals can be up to 0.2mm long, but the average size is 0.05 to 0.1mm. The opaque mineral (pyrite?) is distributed as blebs up to 0.3mm in size. This phase is not in equilibrium with the rock (replacing or being replace).

Veinlets of quartz and chlorite are 0.1-0.4mm wide and are composed of 90% quartz and 10% chlorite. Chlorite-opaque veinlets were emplaced after the previous veinlets. They present separate streches of chlorite and sulfide filling. The late iron carbonate-opaque veinlets are <0.1mm wide and represent remobilization in micro-faults.

Interpretation:

This sample was derived from an intermediate flow, possibly andesite or dacite. The sericitization and carbonatization are related to the regional metamorphism. Emplacement of sulfide may be related to late fracturing events.



Photomicrograph 15. Andestic to dacitic flow composed of sericitized plagioclase phenocrysts, plagioclase lathes showing flow banding and cryptocrystalline matrix. The photo also show a quartz-filled veinlet, two chlorite-filled veinlets (dark, thin veinlet) and a opaque-filled veinlet (black and thickest veinlet in the center of the picture). 2.5 x magnification, XPOL, f.o.v. = 5.2mm.

SAMPLE TS-9

Name: Polymicyct volcanic litharudite

Megascopic description:

Schistose, bedded, polymict, clast-supported volcanic litharudite showing a rusty weathered surface and a medium to dark grey fresh surface. The rock is composed of 10-20% bedded clay-size ash fragments which are concentrated in 1cm-thick horizon highlighting the presence of beds of about 2cm in thickness. These fragments range from 0.1mm to 1.5cm, with an average of 2-3mm. They are elongated in the same orientation as the bedding. The sample is also composed of 2-3% felsic volcanic fragments 1-4mm in length. The rest of the sample is composed of intermediate to mafic medium grey volcanic fragments of 1-2mm and <5% matrix. The clasts appear angular to sub-rounded.

Modal composition:

Mafic ash-tuff fragments	**15-20%**
Plagioclase-porphyritic fragments	**70-75%**
Felsic fragments	**1%**
Granitic fragments (+quartz fragments)	**6%**
Plagioclases fragments	**2%**
Sulfide fragments	**2%**
Metamorphic cement	**2%**

Microscopic description:

The mafic ash-tuff fragments are composed of very fine ash (clay-sized) with minor quartz and feldspar fragments. The ash is agglomerated in dissiminated granular clusters and present evidence of bedding.

There are several different types of plagioclase-porphyritic fragments. They range in size from 0.1mm to 5mm (average being about 1.7mm) and are elongate in the direction of bedding. Several of them display flow banding, others contains 2 different sizes of plagioclase with lathes < 0.05mm long and phenocrysts up to 0.2-0.3mm (some fragments show a glomeroporphyritic texture). The matrix of these clasts is generally cryptocrystalline and rich in chlorite. There is less than 1% fragments that contains amygdules and about 5% of that display a strange fracturation pattern filled with cryptocrystalline opaques and ash (cooling fractures?).

The felsic fragments have a cherty texture and are composed dominantly of cryptocrystalline quartz and felsdspar (albite?) with minor chlorite and sulfide. The fragments are rounded to sub-angular and they range in size from 1 to 4mm, averaging 2-3mm in length.

The granitic fragments are composed of quartz, plagioclase and rare alkali-feldspar (tonalite to granodiorite composition) in a hypidiomorphic granular texture. The quartz is often find as separate angular fragments which are <2mm in size with an average of 0.1mm.

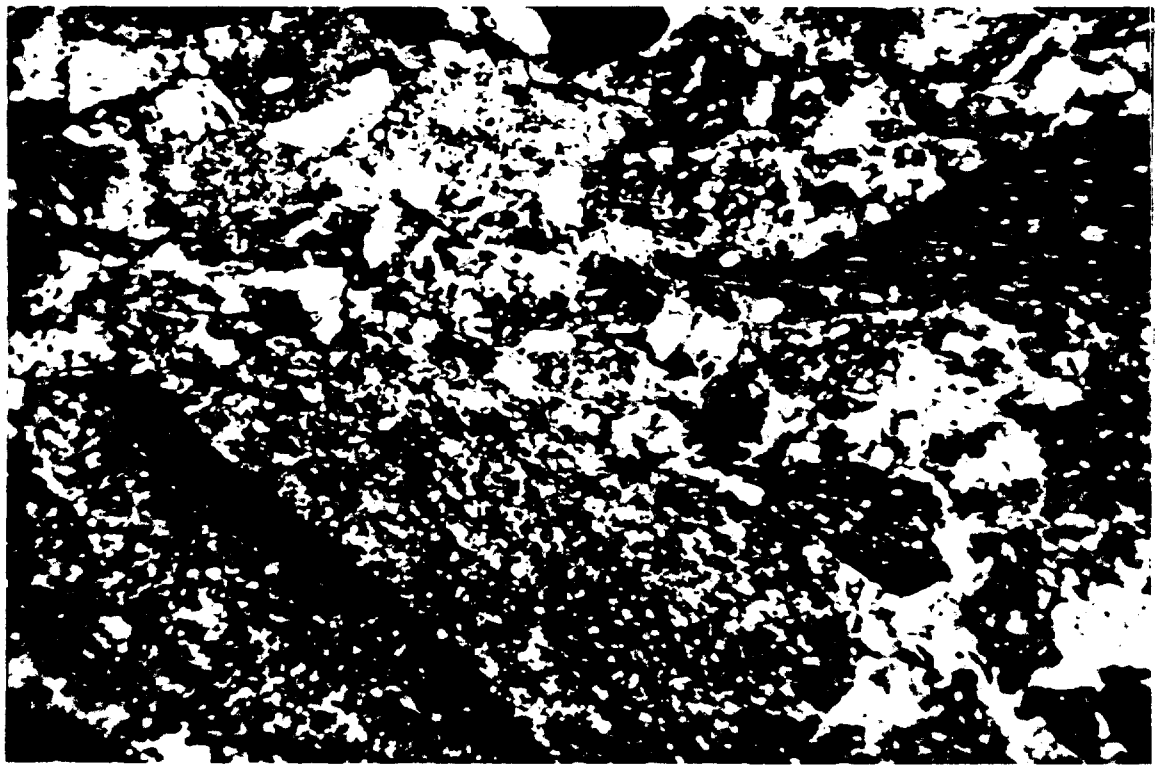
The plagioclase fragments are sericitized and have an average size of 1mm. They represent part of volcanic fragments. The sulfide fragments are sub-rounded to irregular and range in size from 0.5 to 1.5mm (average of 1mm).

The original matrix, which was composed of volcanic ash, was recrystallised during metamorphism into very small inter-fragmental veinlet composed of chlorite (75%) and carbonate (up to 25%).

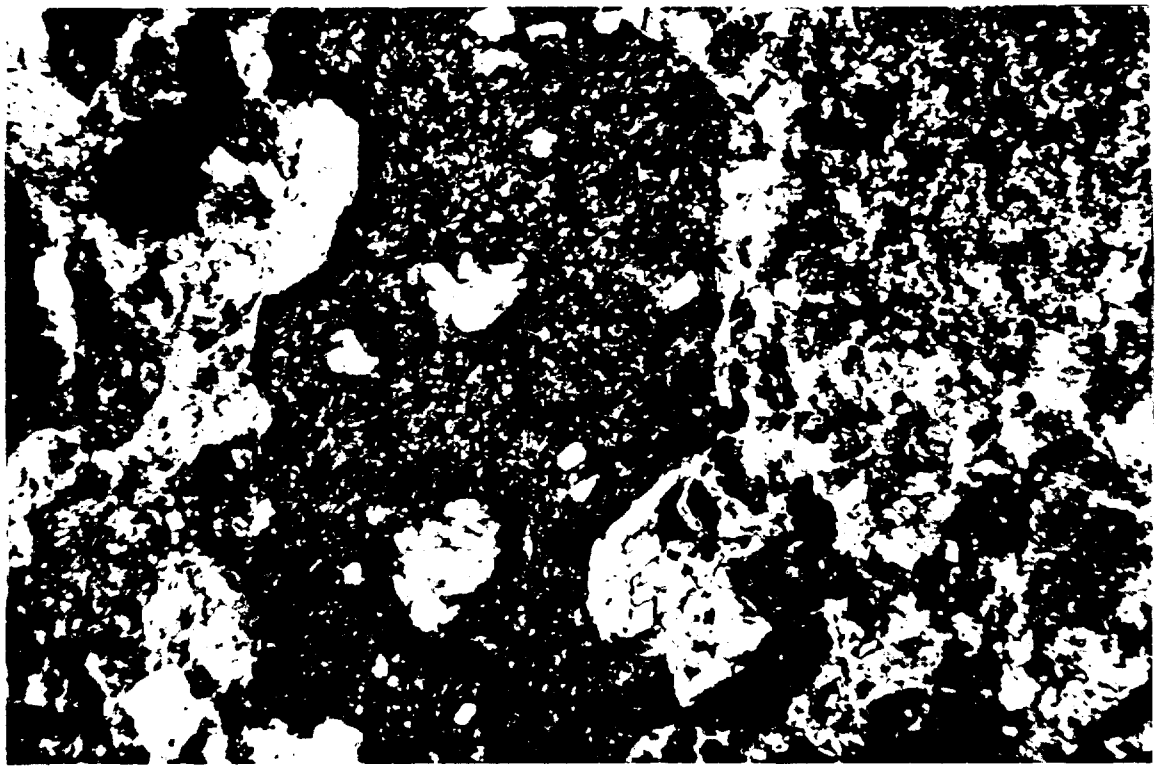
Interpretation:

The grain size and the packing of the volcanic sediments indicate that this unit was deposited either in a sub-marine fan (proximal facies) or from fluvial facies on the side of a volcano. The fact that the ash fragments show a clustering (hydromagmatic eruption) indicate some kind of water-magma interaction during eruption (sub-aqueous eruption). More detailed mapping could give a better idea of the appropriate facies model. Most of the fragments are andesitic (with minor felsic and minor intrusive) which indicate the dominant volcanic product of this volcanic center or field was andesite.

The presence of this sediment clearly indicate a break in the volcanic sequence, but the absence of evaporites or other sign of hydrothermal activity during that erosive period, tend to eliminate this unit as a potential target for VMS exploration. The presence of sulfide fragments, could, however indicate some kind of VMS style of mineralization in the source area (but it is a very weak indicator).



Photomicrograph 16. View of a bedded volcanic ash fragment (lower left corner) and an andesitic, flow banded fragment (upper right corner), in a clast-supported volcanic litharudite. 2.5 x magnification, PPL, f.o.v. = 5.2mm.



Photomicrograph 17. View of a glomeroporphyritic andesite fragment (center of the picture) presenting cooling fractures filled with fine ash and opaques. 2.5 x magnification, PPL, f.o.v. = 5.2mm.

SAMPLE TS-10

Name: Intermediate, amygdaloidal, porphyritic flow.

Megascopic description:

The hand specimen is a intermediate to mafic amygdaloidal flow with a rusty weathered surface and a dark greenish-gray fresh surface. Amygdules represent 15-20% of the sample. They are <1mm to 5mm in size and are filled with pyrite and quartz. A 1-3mm wide, irregular chlorite-rich veinlet crosses the sample and brecciates the specimen in places.

Modal composition:

Plagioclase phenocrysts	**25%**
Amygdules	**15%**
Cryptocrystalline matrix	**55%**
Chloritic veinlet	**5%**

Microscopic description:

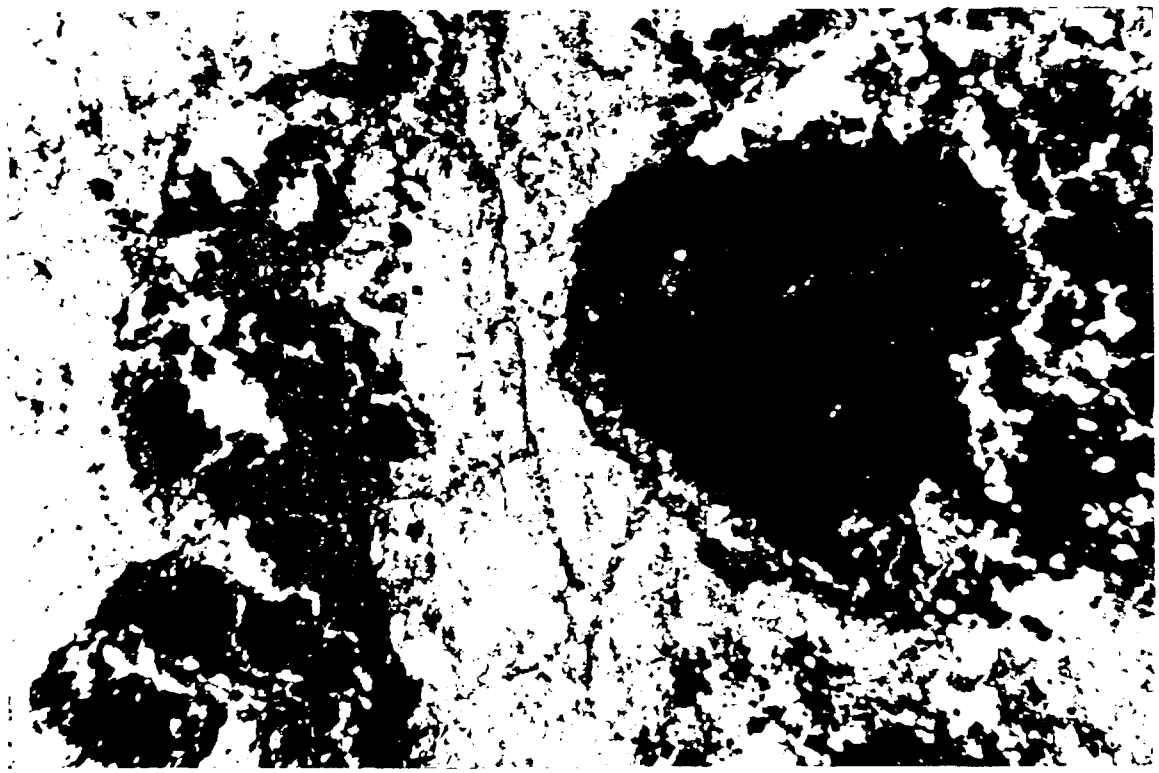
The plagioclase phenocrysts are completely sericitized and have diffuse grain boundaries. They range in size from 0.05mm to 0.25mm. Rounded amygdules are filled with varying amounts of quartz and pyrite. Although very fine grained (<0.05mm) epidote, chlorite and sericite may also be present. The matrix is composed of cryptocrystalline chlorite, sericite, feldspar (albite most likely) and opaques (pyrite).

The chloritic veinlet consists of heavily chloritized zones with disseminated

sulfides concentrated along margins. It appears that the sulfide in the amygdules originate from this veinlet. There is also some late quartz-filled veinlet in the sample.

Interpretation:

This unit represents an intermediate to mafic porphyritic flow which was affected by an early chloritic alteration that was laso responsible for filling the amygdules with sulfide (mainly pyrite). This filling of the amygdules with sulfide is usually a very good indicator for early VMS activity in a volcanic deposit. Even though the lack of base metal minerals in association with the pyrite (chalcopyrite, galena, sphalerite, etcl) tends to indicate non-economic hydrothermal activity, the Zn and Cu showing in the vicinity tends to demonstrate the opposite. The fact that sample TS-14 also displays this early sulfide-filling of amygdules proves that the area has potential for VMS mineralisation.



Photomicrograph 18. Pyrite-filled amygdules (to the right) associated with a chlorite-opaque veinlet (to the left) in a intermediate porphyritic flow. 2.5 x magnification, XPOL, f.o.v. = 5.2mm.

SAMPLE TS-11

Name: Intermediate (andesitic), microporhyritc and amydaloidal flow.

Megascopic description:

Massive, microporphyritic and amygdaloidal andesitic rock with a rusty orange weathered surface and a greenish grey fresh surface. The sample contains approximately 10% amygdules up to 4-5mm in diameter (but average <1mm) which are often filled with chlorite and pyrite. The feldspar phenocrysts are difficult to distinguish due to the intensity of alteration. The sample is cross-cut by late-stage, fine veinlets of fine-grained feldspar.

Modal composition:

Plagioclase phenocrysts		**25-30%**
Plagioclase lathes		**10%**
Amygdules		**20%**
Cryptocrystalline matrix		**40-45%**
iron carbonate	45%	
albite?	45-47%	
sericite	5%	
chlorite	2-5%	

Microscopic description:

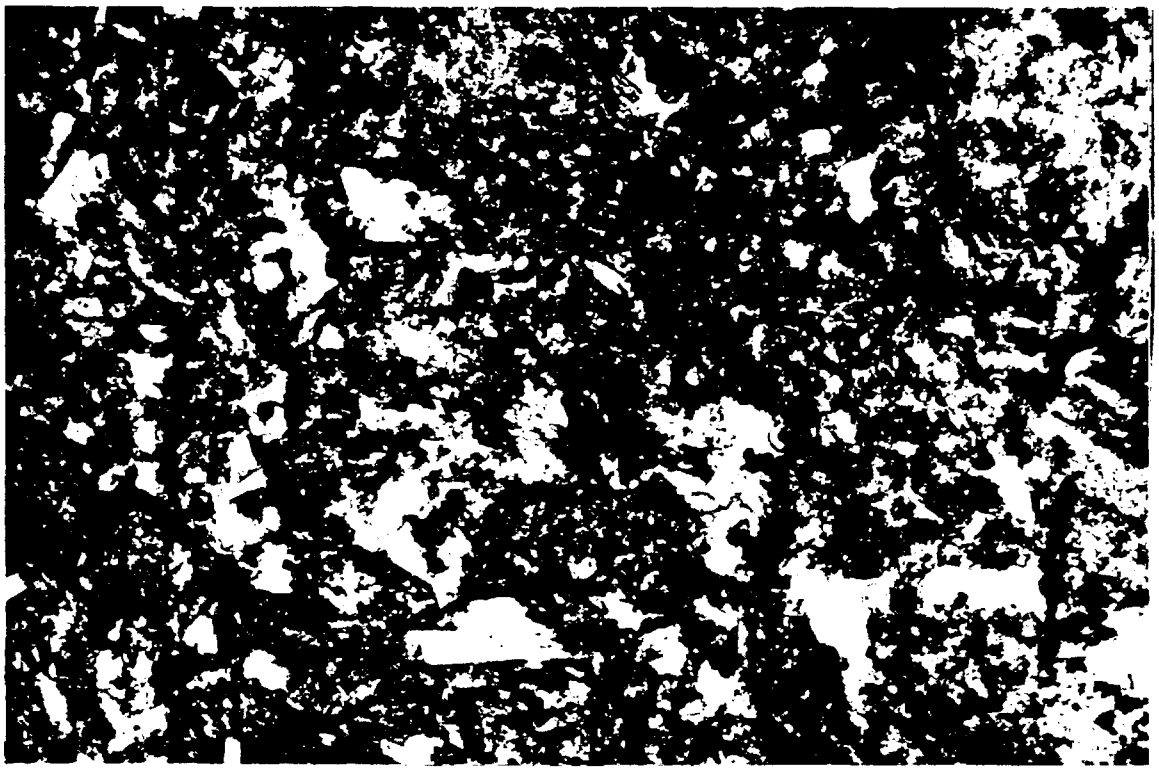
Hypidiomorphic plagioclase phenocrysts are intensely sericitized and contain minor chlorite. Crystals attain a maximum of 2mm in length but average 0.3-0.5mm. The plagioclase lathes are generally 0.1mm long and are recrystallized to

cryptocrystalline albite or quartz (clear in thin section).

Most of the amygdules (80%) are very irregular in shape and approximately 0.1mm in diameter. These amygdules are filled with chlorite and more rarely with pyrite and/or cryptocrystalline albite or quartz, idiomorphic epidote and minor carbonate. The bigger amygdules (20%) are more spherical and can reach 5mm in size, but average approximately 1.5mm. They are filled with minerals similar to those observed within the small ones. The matrix of the sample is composed of the cryptocrystalline assemblage cited in the modal composition table above.

Interpretation:

This sample, even though it was not collected in the same area as TS-10, is very similar in nature to TS-10. It is also an andesitic to basaltic flow with sulfide-filled amygdules providing the evidence for an early VMS activity in the volcanic succession. However, the amygdules are generally smaller and do not contain as much sulfide as TS-10. Also, this sample does not show any evidence of synvolcanic alteration aside from sericitization, chloritization and carbonitization associated with regional metamorphic events.



Photomicrograph 19. Porphyritic, amygdaloidal, andesitic flow. The amygdules are represented by the clear irregular forms, sometimes filled with opaques (irregular black shapes). Some of the plagioclase phenocrysts are sericitized (cloudy-grey crystals) and few of them are altered to quarz and/or albite (clear tabular crystals). 10 x magnification, PPL, f.o.v. = 1.3mm.

SAMPLE TS-12

Name: Lherzolite

Megascopic description:

Massive, fine grained ultramafic rock with a yellowish-brown weathered surface and a very dark grey fresh surface. The rock contains serpentinised olivine and pyroxene with minor magnetite. The crystals average 1-2mm in size.

Modal composition:

Serpentinized olivine	**50%**
Serpentinized orthopyroxene	**20%**
Augite	**15%**
Brown hornblende	**10%**
Magnetite	**5%**

Microscopic description:

The olivine is idiomorphic and is being replaced by radiating, fibrous actinolite (80%) and veinlets of crysotile (20%). The grains are surrounded by fine grained xenomorphic magnetite that was exolved from the olivine during metamorphism. The size of the olivine varies from 0.1mm to 1.8mm, with an average of 0.8mm. The crystals display a cumulate texture.

The interstitial space is occupied by the rest of the phases. The most abundant phase is composed of antigorite (serpentine) which was probably an orthopyroxene

before metamorphism occured. There is also augite, which is often altered to talc. Augite is found occupying 3-4mm wide space between olivine crystals. Clinopyroxene (also augite?) has been altered to brown hornblende. In some interstitial areas, there is an association between chlorite-muscovite-opaque flakes which are no longer than 0.5mm. Finally, there is approximately 1-2% dissiminated idiomorphic grains of magnetite which are 0.1mm in size.

Interpretation:

This ultramafic rock is very well preserved and relatively undeformed. The original cumulate texture is very evident. This texture indicates an accumulation of crystals at the bottom of a magmatic body thick enough to permit an adequate crystallization and accumulation of olivine crystals. Whether the section represents a sill, a layered intrusion or a thick flow is unknown. This kind of ultramafic body could be a potential reservoir for Cu, Ni and Cr type of mineralization.

Photomicrograph 20. View of the cumulate texture in sample TS-12. The olivine crystals are middle-grey in color, the serpentinized ortho-pyroxene are very dark grey and the augite + brown horblende are represented by the yellow to orange minerals. 2.5 x magnification, XPOL, f.o.v. = 5.2mm.

SAMPLE TS-13

Name: Ultramafic flow (websterite)

Megascopic description:

Massive, ultramafic rock of medium brown weathered surface with about 30-40% of light beige, rounded and zoned "granules". The fresh surface is dark grey and composed of 1-2mm crystals of pyroxenes (20%) and zoned rounded "varioles" (40%) in a dark greenish gray matrix (40%).

Modal composition:

Varioles?		**40%**
cryptocrystalline feldspar (albite)	75%	
acicular actinolite	15%	
epidote	10%	
Augite		**25%**
Antophyllite and epidote		**15%**
Matrix		**20%**
chlorite	75%	
epidote	15%	
actinolite	10%	

Microscopic description:

The texture of the thin section is quite unusual. It contains approximately 40% rounded and zoned masses which have an average diameter of 1.8mm. They are composed of a cryptocrystalline felspathic interior with dissiminated actinolite needle

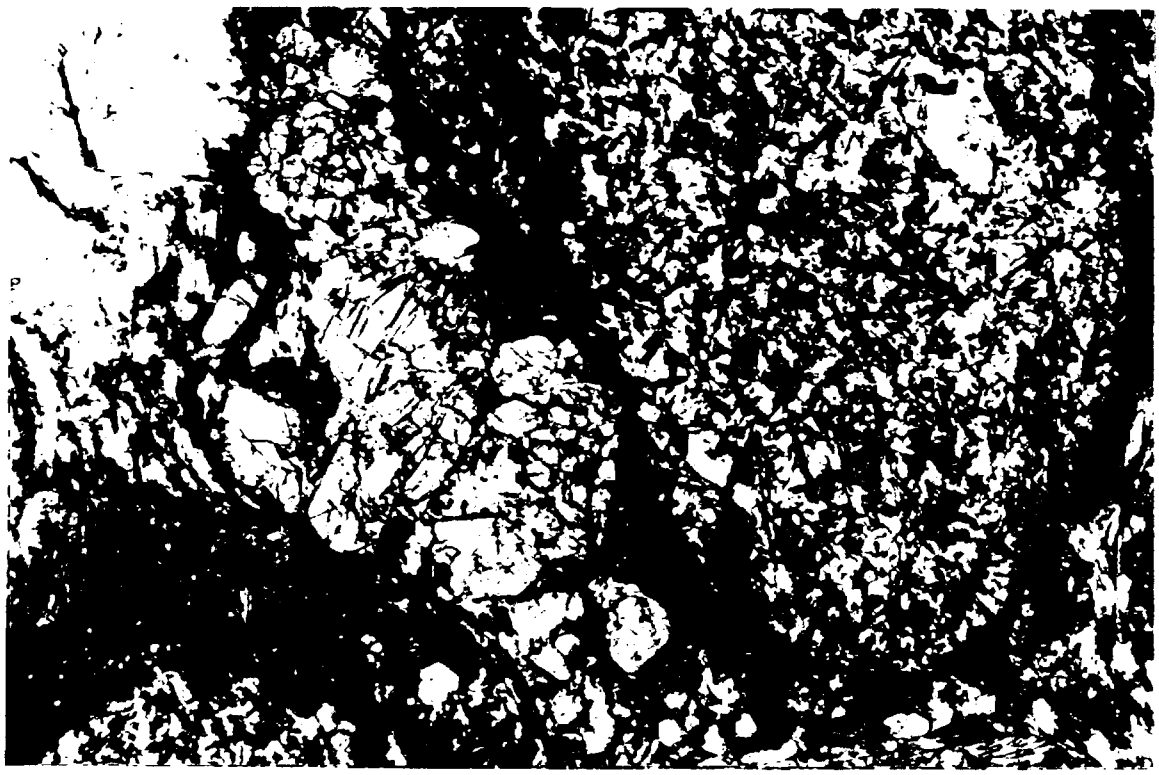
and idiomorphic epidote. The exterior is composed of a irresolvable chloritic cloud(75%) with some actinolite needles(15%) and epidote(10%) similar to the matrix, except that the mineral assemblage is more opaque (darker in thin section).

The augite is idiomorphic to hypidiomorphic, non-altered, with crystals (sometimes broken) ranging from 0.1mm to 6mm long with an average dimension of 1.5mm. The anthophyllite is associated with epidote in a radial to mica-like texture and are probably the metamorphic result of the alteration of an orthopyroxene. The texture is similar to a cumulate, but if the varioles are the alteration product of a volcanic glass, the texture would become porphyritic.

Interpretation:

The rock is clearly ultramafic in compositin. The nature of the circular zoned agglomeration is somewhat obscure. Indeed, this phenomenon could be the result of several processes such as the alteration of olivine, an orbicular plagioclase metamorphic product, a variolitic or even an amygdaloidal structure. According to the composition of the structure and the way that they combine together, a variolitic nature would be more probable. In that case, this sample would be part of some kind of thin dike emplaced near the surface (fast cooling) or a ultramafic flow.

For exploration purpose, this unit could be the host of Cu,Ni and Cr mineralization and be part of the same mapping unit than sample TS-12.



Photomicrograph 21. Parts of variole-like structures (to the right and lower-left corner) associated with augite phenocrysts in between. 5.0 x magnification, PPL, f.o.v. = 2.6mm.

Photomicrograph 22. Part of a variole-like sructure (in XPOL), associated with an anthophyllite-epidote pseudomorph (upper-right corner). The variole is composed of actinolite needles within a cryptocrystalline feldspar groundmass. 10 x magnification, XPOL, f.o.v. = 1.3mm.

SAMPLE TS-14

Name: intermediate, amygdaloidal, porphyritic flow

Megascopic description

Massive, intermediate volcanic rock with a rusty weathered surface and a greenish-grey fresh surface. The rock is composed of 1-2% disseminated pyrite and 1-2% amygdules 1-2mm in diameter, within an aphanitic matrix. The sample is cross-cut by 1-3mm wide, irregular chloritic veinlets. Several brittle fractures, oriented in every directions, are also observed.

Modal composition:

Sericitized plagioclase phenocrysts		**45%**
Amygdules		**5%**
Cryptocrystalline matrix		**43%**
chlorite	30%	
sericite	10-20%	
feldspar and/or quartz	35-40%	
iron carbonate	10-20%	
Pyrite		**5%**
Veinlets		**2%**
sericite	45%	
chlorite	40%	
cryptocrystalline feldspar and/or quartz	10%	
opaques (pyrite)	5%	

Microscopic description:

The hypidiomorphic plagioclase phenocrysts average 0.2mm in size. Amygdules are elongated according to a ratio length/wideness < 2:1. They average 1mm in length, with the biggest amygdules being 5mm long. They are filled with chlorite, cryptocrystalline feldspar (and/or quartz) and minor sericite, iron carbonate, quartz and xenomorphic pyrite.

The cryptocrystalline matrix contains agglomerations or clusters of feldspar and/or quartz ranging in size from 0.3mm to 1mm. They may represent small amygdules filling or alteration of a tabular mineral (plagioclase or mafic mineral).

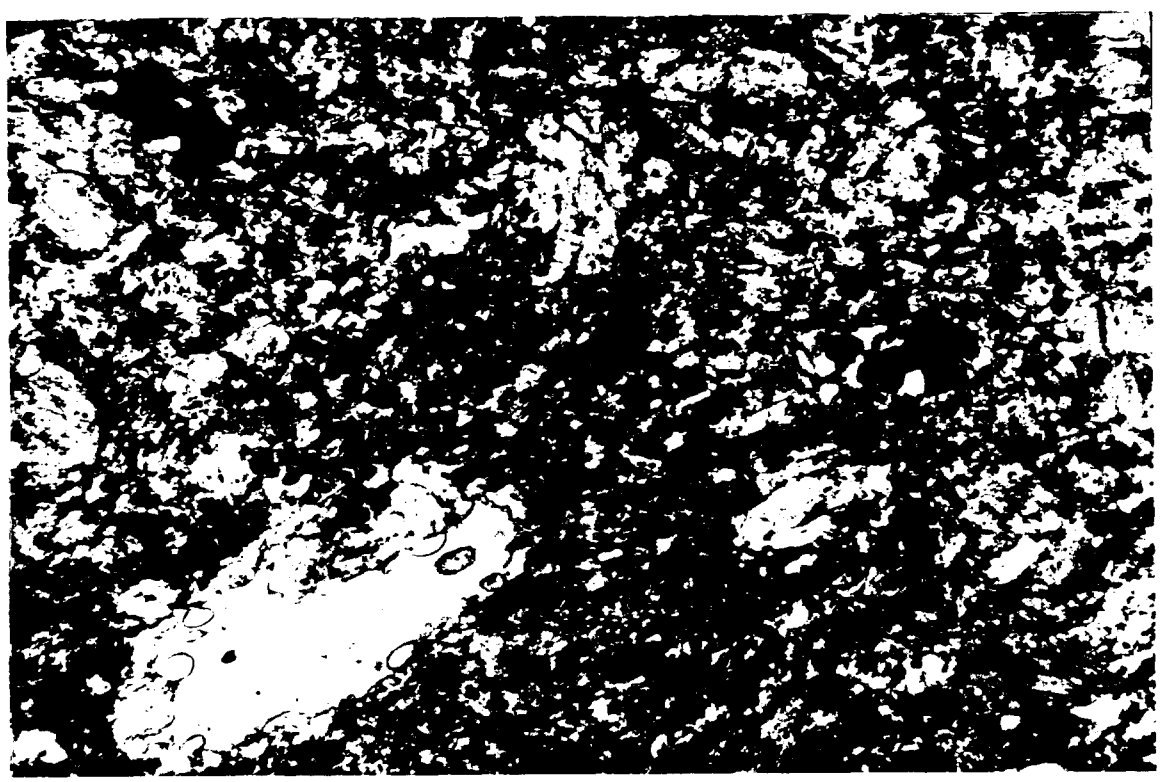
Pyrite is found in small xenomorpic blebs averaging 0.2mm in size, with a maximum diameter of 0.5mm. It is often associated with amygdules and cryptocrystalline plagioclase and/or quartz clusters. It appears to have been emplaced at the same time than the chlorite-sericite veinlets (syn-genetic).

The veinlets present an alignment of chlorite and sericite in the same direction than the amygdules, which indicates that they were emplaced before the deformation occurred. Fine-grained sulfides are concentrated along the margins of the veinlets. Later phase of plagioclase-rich veinlets are also present and are associated with this chlorite-sericite alteration. Late-stage, iron carbonate-rich veinlets cross-cut the two previous type of veinlets.

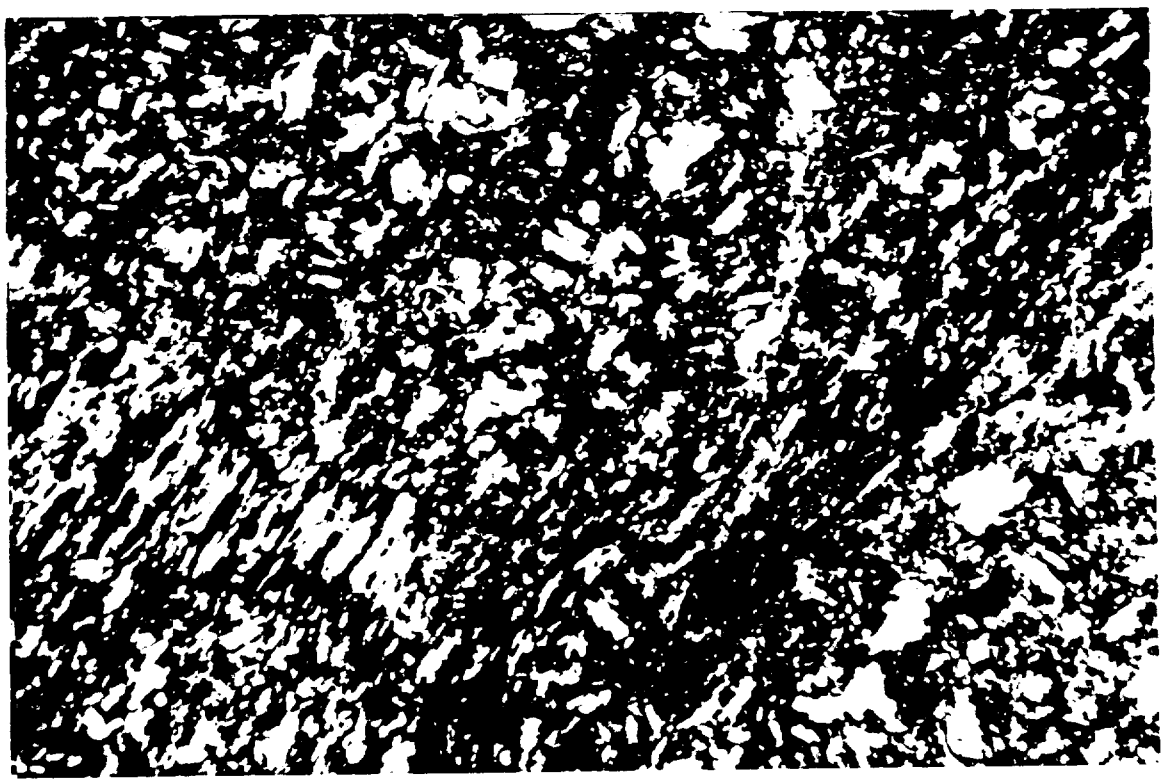
Interpretation:

The sample is a porphyritic flow, intermediate in composition. The rock was altered by early-stage chlorite-sericite veinlets, followed by albite veinlets. These

alterations appears to be responsible for the presence of early-stage sulfides in the sample. Subsequent deformation and metamorphism caused an alignment of chlorite and sericite in the veinlets as well as elongation of amygdules. This sample represent a similar setting than sample TS-10 and TS-11.



Photomicrograph 23. View of a chlorite-filled amygdule (lower-left corner) and two, smaller, opaques-filled amygdules represented by irregular black forms. 5.0 x magnification, PPL, f.o.v. = 2.6mm.



Photomicrograph 24. View of a chlorite-sericite veinlet showing alignment of the micas. The host rock is a porphyritic, amygdaloidal flow (the white crystals represent sericitized plagioclase). 2.5 x magnification, XPOL, f.o.v. = 5.2mm.

This thin section petrography report was performed by Dominic Babin (geologist) and completed in Sudbury, January 19th, 1996.

Dominic Babin, B.Sc.

Addendum to OPAP Project Report OP95-273
Additional Assessment Data

The attached report contains work on two performed on two discreet groups of claims as shown below:

1) Rat-Tail Lake \ Grassy Lake Area

Claim #	# Units	Recorded Holder	Holder's Address
1197769	4	Walter Hanych	P. O. Box 688
1198160	2	" "	Collingwood, Ont.
1198161	4	" "	L9Y 4E8
1198162	4	" "	
1198163	12	" "	
1210813	4	" "	

2) Upper Winding Lake Area

Claim #	# Units	Recorded Holder	Holder's Address
1205588	14	Robert G. Komarechka	Apt. 1 537 Haig St. Sudbury, Ontario P3C 1E2

The field work for this report was conducted by two geologists namely:

Walter Hanych P.O. Box 688 Collingwood, Ontario L9y 4E8	and	Robert G. Komarechka #1 537 Haig Street Sudbury, Ontario P3C 1E2

Work was performed by the above geologists, in the field, on the Upper Winding Lake Property from November 1-8 and on the Grassy Lake Property, from November 9-14, 1996.

Previous recorded work in the Grassy Lake area consisted of:

Year	Company or Group	Work Done
1909,14,26	GSC - Collins 1909 &14, Gledhill 1926	Geological Mapping
1957	GSC map 286G	Aeromagnetic Survey
1965	Consolidated Mining and Smelting	diamond drilling 1 ddh H.G. 1A -10.67m 1 ddh H.G. 1B -73.17
1975	Hudson Bay Oil and Gas	Linecutting Mag & HLEM survey diamond drilling 1 ddh SS-75-1
1990	Ontario Geological Survey	Aeromagnetic Survey
1991	Noranda Exploration	Linecutting Mag & HLEM surveys
?	Asarco	Linecutting Mag & HLEM surveys Geological Mapping Whole Rock Analysis

Previous recorded work in the Upper Winding Lake area consisted of:

Year	Company or Group	Work Done
1957	GSC	Aeromagnetic Survey
1990	Ontario Geological Survey	Aeromagnetic Survey
?	Asarco	Linecutting Geological Mapping Soil geochem Survey Diamond drilling

CERTIFICATE of QUALIFICATION

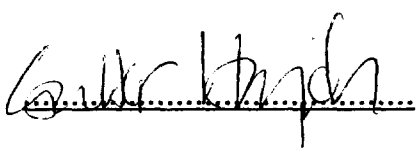
I Walter Hanych of the town of Collingwood, Province of Ontario, do hereby certify that:

1. I am a geologist and reside at RR # 3 Collingwood, Ontario, L9Y•3Z3.

2. I graduated from Laurentian University in 1979, with an Honours Degree of Bachelor of Science in Geology.

3. I have been practising my profession since graduation.

4. That I am familiar with the contents of this report, having done the field work and report writing.



Walter Hanych

Collingwood, Ontario

January 15, 1997

Ontario

Ministry of Northern Development and Mines

Declaration of Assessment Work Performed on Mining Land

Mining Act, Subsection 65(2) and 66(3), R.S.O. 1990

Transaction Number (office use)
W9780.0
Assessment Files Research

41P14SE0007 2.17111 MIDLOTHIAN

900

sections 65(2) and 66(3) of the Mining Act. Under sec... the assessment work and correspond with the mining ...der, Ministry of Northern Development and Mines

...rding a claim, use form 0240.

2.17111

1. Recorded holder(s) (Attach a list if necessary)

Name	WALTER HANYCH	Client Number 300751
Address	P.O BOX 688	Telephone Number (705) 445-6440
	COLLINGWOOD ONTARIO L9Y 4E8	Fax Number (705) 445-6440
Name		Client Number
Address		Telephone Number
		Fax Number

2. Type of work performed: Check (✓) and report on only ONE of the following groups for this declara...

☐ Geotechnical: prospecting, surveys, assays and work under section 18 (regs) ☐ Physical: drilling, stripping, trenching and associated assays ☐ Reh...

Work Type: RECONNAISSANCE MAPPING, SAMPLE COLLECTION THIN SECTION STUDIES & ASSAYS (Geol) ~~(ASSAYS)~~

Office Use

Commodity

Total $ Value of Work Claimed 8,856.0

Dates Work Performed: From 13 10 95 To 27 01 96 (Day / Month / Year)

NTS Reference

Township/Area: KEMP & KELVIN

Mining Division Larder Lake

M or G-Plan Number: G-0984 & G-983

Resident Geologist District Cobalt

Please remember to:
- obtain a work permit from the Ministry of Natural Resources as required;
- provide proper notice to surface rights holders before starting work;
- complete and attach a Statement of Costs, form 0212;
- provide a map showing contiguous mining lands that are linked for assigning work;
- include two copies of your technical report.

3. Person or companies who prepared the technical report (Attach a list if necessary)

Name	WALTER HANYCH	Telephone Number (705) 445-6440
Address	P.O BOX 688	Fax Number (705) 445-6440
Name		Telephone Number
Address		Fax Number
Name		Telephone Number
Address		Fax Number

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MAR - 3 1997
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MINING DIVISION
FEB 18 1997
8:15 Z.

4. Certification by Recorded Holder or Agent

I, Robert G KUMARECHKA (Print Name), do hereby certify that I have personal knowledge of th... in this Declaration of Assessment Work having caused the work to be performed or witnessed the sam... during and/or after its completion and, to the best of my knowledge, the annexed report is true.

Signature of Recorded Holder or Agent	Robert G Kumarechka Robert G Kumarechka	Date ~~FEB~~ FEB 12
Agent's Address	APT #1 537 HAIG ST. SUDBURY ONT.	Telephone Number (705) 673-0873 Fax Number (705) 673-08...

PAGE 2

Deemed - May 19/97

FEB [illegible] (WED) 10:57 KLK MINING RECORDER TEL:5675621

Work to be recorded and distributed. Work can only be assigned to claims that are contiguous (adjoin... the mining land where work was performed, at the time work was performed. A map showing the contiguous... must accompany this form.

Mining Claim Number. Or if work was done on other eligible mining land, show in this column the location number indicated on the claim map.	Number of Claim Units. For other mining land, list hectares.	Value of work performed on this claim or other mining land.	Value of work applied to this claim.	Value of work assigned to other mining claims.	Bank. Va... to be distr... at a future...
TB 7827	16 ha	$26, 825	N/A	$24,000	$2...
1234567	12	0	$2...00		
1234568	2	$ 8, 892	$ 4,000		$4...
1197769 ✓	4	521.00	1600.00	0	
1198160 ✓	3	2084.00	856.00	1228.00	
1198161 ✓	4	1042.00 BK	1600.00	0	
1198162 ✓	4	1042.00	0	1042.00	
1198163 ✓	12	2084.00	4800.00	0	
1210813 ✓	4	2083.00	0	2083.00	
	31 Units 6 Claims				
Column Totals		8856.00	8856.00	4353.00	

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MAR - 3 1997
MINING LANDS BRANCH

Robert G. Komarechka (Print Full Name), do hereby certify that the above work credits are eligib... subsection 7 (1) of the Assessment Work Regulation 6/96 for assignment to contiguous claims or for applicat... this mining land where the work was done.

Signature of Recorded Holder or Agent Authorized in Writing: Robert G. Komarechka — Date: FEB 12/9...

Instructions for cutting back credits that are not approved.

Some of the credits claimed in this declaration may be cut back. Please check (✓) in the boxes below to sh... you wish to prioritize the deletion of credits:

- ☐ 1. Credits are to be cut back from the Bank first, followed by option 2 or 3 or 4 as indicated.
- ☐ 2. Credits are to be cut back starting with the claims listed last, working backwards; or
- ☐ 3. Credits are to be cut back equally over all claims listed in this declaration; or
- ☒ 4. Credits are to be cut back as prioritized on the attached appendix or as follows (describe):

FIRST 1198160, 1198161, 1198163, 1197769 LAST.

Note: If you have not indicated how your credits are to be deleted, credits will be cut back from the Bank firs... followed by option number 2 if necessary.

For Office Use Only

Received Stamp: MINING DIVISION FEB 18 1997 9:15

Deemed Approved Date: May 19/97 — Date Notification Sent:

Date Approved: — Total Value of Credit ...

Approved for Recording by Mining Recorder (Signature):

FEB [illegible] (WED) 10:57 KLK MINING RECORDER TEL:5675621

Ontario Ministry of Northern Development and Mines
Ministère du Développement du Nord et des mines

Statement of Costs for Assessment Credit

État des coûts aux fins du crédit d'évaluation

Transaction No./N° de tran[illegible]

Mining Act/Loi sur les mines **2.17111**

Personal information collected on this form is obtained under the authority of the Mining Act. This information will be used to maintain a record and ongoing status of the mining claim(s). Questions about this collection should be directed to the Provincial Manager, Minings Lands, Ministry of Northern Development and Mines, 4th Floor, 159 Cedar Street, Sudbury, Ontario P3E 6A5, telephone (705) 670-7264.

Les renseignements personnels contenus dans la présen[illegible] recueillis en vertu de la Loi sur les mines et serviront à tenir à [illegible] des concessions minières. Adresser toute question sur la [illegible] renseignements au chef provincial des terrains minier[illegible] Développement du Nord et des Mines, 159, rue Cedar, 4e [illegible] (Ontario) P3E 6A5, téléphone (705) 670-7264.

1. Direct Costs/Coûts directs

	Description	Amount Montant	Totals Total global
Wages Salaires	Labour Main-d'oeuvre		
	Field Supervision Supervision sur le terrain		
Contractor's and Consultant's Fees Droits de l'entrepreneur et de l'expert-conseil	Type GEOLOGICAL MAPPING	5,850.00	
	PETROGRAPHIC REPORT	352.00	
	THIN SECT - BLDG. TYANG. ASSAYS - 77@ 100.00	951.00	7153.00
Supplies Used Fournitures utilisées	Type ELASTOMER, TOPO TL GAS SAMPLE BAGS GRANSAMOS	42.00	
	STATIONARY PHOTOCOPIES BLUEPRINTS, PHOTO DEV	126.00	PSK
	AIR PHOTOS	153.00	
	SHIPPING PSK	~~186~~	321.00 PSK
Equipment Rental Location matériel	Type		
	920 Total Direct Costs Total des coûts directs		7,473.00

PSK

2. Indirect Costs/Coûts indirects

** Note: When claiming Rehabilitation work indirect costs allowable as assessment work.
Pour le remboursement des travaux de réhabilit[illegible] coûts indirects ne sont pas admissibles en tant que d'évaluation.

Type	Description	Amount Montant
Transportation Transport	Type 4WD TRUCK	711.00
	SHIPPING	17.00
Food and Lodging Nourriture et hébergement		654.00
Mobilization and Demobilization Mobilisation et démobilisation		

Sub Total of Indirect Costs
Total partiel des coûts indirects

Amount Allowable (not greater than 20% of Direct Costs)
Montant admissible (n'excédant pas 20 % des coûts direct[illegible]

Total Value of Assessment Credit (Total of Direct and Allowable Indirect costs)

Valeur totale du crédit d'évaluation (Total des coûts directs et indirects admissibles)

RECEIVED
MAR - 3 2007
MINING LANDS BRANCH

Note: The recorded holder will be required to verify expenditures claimed in this statement of costs within 30 days of a request for verification. If verification is not made, the Ministry may reject for assessment work all or part of the assessment work submitted.

Note : Le titulaire enregistré sera tenu de vérifier les dépenses [illegible] le présent état des coûts dans les 30 jours suivant une [illegible] effet. Si la vérification n'est pas effectuée, le ministre [illegible] ou une partie des travaux d'évaluation présentés.

Filing Discounts

Work credited within two years of completion is claimed at 100% of the above Total Value of Assessment Credit.

Work credited three, four or five years after completion is claimed at 50% of the above Total Value of Assessment Credit. See calculations below:

Total Value of Assessment Credit	Total Assessment Claimed
x 0.50 =	

Remises pour dépôt

1. Les travaux déposés dans les deux ans suivant leur ac[illegible] remboursés à 100 % de la valeur totale susmentionnée du c[illegible]

2. Les travaux déposés trois, quatre ou cinq ans après l[illegible] sont remboursés à 50 % de la valeur totale du cré[illegible] susmentionné. Voir les calculs ci-dessous.

Valeur totale du crédit d'évaluation	Evaluation to[illegible]
x 0,50 =	

Certification Verifying Statement of Costs

I hereby certify that the amounts shown are as accurate as possible and these costs were incurred while conducting assessment work on the lands shown on the accompanying Report of Work form.

I, Agent, am authorized
(Recorded Holder, Agent, Position in Company)

to make this certification

Attestation de l'état des coûts

J'atteste par la présente :
que les montants indiqués sont le plus exact possi[illegible]
dépenses ont été engagées pour effectuer les travau[illegible]
sur les terrains indiqués dans la formule de rapport d[illegible]

Et qu'à titre de _____, j[illegible]
(titulaire enregistré, représentant, poste occupé dans la co[illegible])

à faire cette attestation.

Signature	Date
	FEB 1

Note : Dans cette formule, lorsqu'il désigne des personnes, le masculin est utilisé [illegible]

Ontario

Ministry of Northern Development and Mines

Declaration of Assessment Work Performed on Mining Land

Mining Act, Subsection 65(2) and 66(3), R.S.O. 1990

Transaction Number (of
W9780.0
Assessment Files Reso

Personal information collected on this form is obtained under the authority of subsections 65(2) and 66(3) of the Mining Act. Under sec
Mining Act, the information is a public record. This information will be used to review the assessment work and correspond with the mining
Questions about this collection should be directed to the Chief Mining Recorder, Ministry of Northern Development and Mines
933 Ramsey Lake Road, Sudbury, Ontario, P3E 6B5.

Instructions: - For work performed on Crown Lands before recording a claim, use form 0240.
- Please type or print in ink.

2.17111

Recorded holder(s) (Attach a list if necessary)

Name	ROBERT G. KOMARECHKA	Client Number 153168
Address	#1 537 HAIG ST	Telephone Number (705) ~~695~~ 673-0
	SUDBURY, ONTARIO P3C 1E2	Fax Number (705) 673-0873
Name		Client Number
Address		Telephone Number
		Fax Number

Type of work performed: Check (✓) and report on only ONE of the following groups for this declara

☑ Geotechnical: prospecting, surveys, assays and work under section 18 (regs) ☐ Physical: drilling, stripping, trenching and associated assays ☐ Reha

		Office Use
Work Type	RECONNAISSANCE MAPPING, SAMPLE COLLECTION THIN SECTION STUDIES, ASSAYS (Geol)	Commodity
		Total $ Value of Work Claimed 8,294.00
Dates Work Performed	From 13 10 95 To 27 01 96 (Day / Month / Year)	NTS Reference
Global Positioning System Data (if available)	Township/Area HALLIDAY, MCNAUGHTON & MIDLOTHIAN & RAYMOND.	Mining Division Larder Lake
	M or G-Plan Number M910, G497, M235, M244	Resident Geologist District Cobalt

Please remember to: - obtain a work permit from the Ministry of Natural Resources as required;
- provide proper notice to surface rights holders before starting work;
- complete and attach a Statement of Costs, form 0212;
- provide a map showing contiguous mining lands that are linked for assigning work;
- include two copies of your technical report.

Person or companies who prepared the technical report (Attach a list if necessary)

Name WALTER HANYCH	Telephone Number (705) 445-6440
Address P.O. BOX 688 COLLINGWOOD ON L9Y 4E8	Fax Number (705) 445-6440
Name	Telephone Number
Address	Fax Number
Name	Telephone Number
Address	Fax Number

LARDER LAKE MINING DIVISION
FEB 18 1997
9:15A

RECEIVED
MAR - 3 1997
MINING LANDS BRANCH

Certification by Recorded Holder or Agent

I, Robert G Komarechka (Print Name), do hereby certify that I have personal knowledge of th
forth in this Declaration of Assessment Work having caused the work to be performed or witnessed the sa
or after its completion and, to the best of my knowledge, the annexed report is true.

Signature of Recorded Holder or Agent	Robert G Komarechka		Date FEB 12, 1
Agent's Address	APT #1 537 HAIG ST SUDBURY, ONTARIO P3C 1E2	Telephone Number (705) 673-0873	Fax Number (705) 673-0

Deemed - May 19/97

Work to be recorded and distributed. Work can only be assigned to claims that are contiguous (adjoin... the mining land where work was performed, at the time work was performed. A map showing the contiguous... must accompany this form.

Mining Claim Number. Or if work was done on other eligible mining land, show in this column the location number indicated on the claim map.	Number of Claim Units. For other mining land, list hectares.	Value of work performed on this claim or other mining land.	Value of work applied to this claim. 2.17111	Value of work assigned to other mining claims.	Bank. Va... to be dis... at a futur...
TB 7827	16 ha	$26, 825	N/A	$24,000	$2...
1234567	12	0	$24,000	0	
1234568	2	$ 8, 892	$ 4,000	0	$4...
1205588	16	8,294.00	8,294.00	0	0
Column Totals		8,294.00	8,294.00	0	0

RECEIVED
MAR - 3 1997
MINING LANDS BRANCH

I, ROBERT G. KOMARECHKA (Print Full Name), do hereby certify that the above work credits are eligib... subsection 7 (1) of the Assessment Work Regulation 6/96 for assignment to contiguous claims or for applicati... the claim where the work was done.

Signature of Recorded Holder or Agent Authorized in Writing: Robert G. Komarechka — Date: FEB 12 19...

6. Instructions for cutting back credits that are not approved.

Some of the credits claimed in this declaration may be cut back. Please check (✓) in the boxes below to sp... you wish to prioritize the deletion of credits:

- ☐ 1. Credits are to be cut back from the Bank first, followed by option 2 or 3 or 4 as indicated.
- ☐ 2. Credits are to be cut back starting with the claims listed last, working backwards; or
- ☐ 3. Credits are to be cut back equally over all claims listed in this declaration; or
- ☐ 4. Credits are to be cut back as prioritized on the attached appendix or as follows (describe):

Note: If you have not indicated how your credits are to be deleted, credits will be cut back from the Bank firs... followed by option number 2 if necessary.

For Office Use Only

Received Stamp: LARDER LAKE MINING DIVISION FEB 18 1997 8:15 A.

Deemed Approved Date	Date Notification Sent
May 19/97	
Date Approved	Total Value of Credit
Approved for Recording by Mining Recorder (Signature)	

FEB-05-97(WED) 10:57 KLK MINING RECORDER TEL:5675621

Ministry of Northern Development and Mines
Ontario
Ministère du Développement du Nord et des mines

Statement of Costs for Assessment Credit

État des coûts aux fins du crédit d'évaluation

Mining Act/Loi sur les mines

Transaction No./N° de tran

2.17111

Personal information collected on this form is obtained under the authority of the Mining Act. This information will be used to maintain a record and ongoing status of the mining claim(s). Questions about this collection should be directed to the Provincial Manager, Minings Lands, Ministry of Northern Development and Mines, 4th Floor, 159 Cedar Street, Sudbury, Ontario P3E 6A5, telephone (705) 670-7264.

Les renseignements personnels contenus dans la présent recueillis en vertu de la Loi sur les mines et serviront à tenir à des concessions minières. Adresser toute question sur le renseignements au chef provincial des terrains miniers Développement du Nord et des Mines, 159, rue Cedar, 4e (Ontario) P3E 6A5, téléphone (705) 670-7264.

1. Direct Costs/Coûts directs

Type	Description	Amount Montant	Totals Total global
Wages Salaires	Labour Main-d'oeuvre		
	Field Supervision Supervision sur le terrain		
Contractor's and Consultant's Fees Droits de l'entrepreneur et de l'expert conseil	Type GEOLOGICAL MAPPING/REPORT	5,250.00	
	PETROGRAPHIC RPT	352.00	
	CUT THIN SECTIONS - 81.00 ASSAYS - 770.00 TYPING 100.00	951.00	6553.00
Supplies Used Fournitures utilisées	Type EQUIPMENT, TOTAL, SAMPLE BAGS	66.00	
	AIRPHOTOS, STATIONARY, PHOTOGRAPHS, BLUEPRINTING	294.00	
			360.00
Equipment Rental Location de matériel	Type CHAIN SAW	100.00	
	TENT & STOVE	210.00	
			310.00
	Total Direct Costs Total des coûts directs		7223.00

2. Indirect Costs/Coûts indirects

** Note: When claiming Rehabilitation work indirect costs allowable as assessment work.
Pour le remboursement des travaux de réhabilita coûts indirects ne sont pas admissibles en tant que d'évaluation.

Type	Description	Amount Montant
Transportation Transport	Type 4WD TRUCK	111-00
	SHIPPING	17.00
	CANOE RENTAL	135-00
Food and Lodging Nourriture et hébergement		208.00
Mobilization and Demobilization Mobilisation et démobilisation		

Sub Total of Indirect Costs
Total partiel des coûts indirects

Amount Allowable (not greater than 20% of Direct Costs)
Montant admissible (n'excédant pas 20 % des coûts direct

Total Value of Assessment Credit (Total of Direct and Allowable Indirect costs)

Valeur totale du crédit d'évaluation (Total des coûts directs et indirects admissibles)

Note: The recorded holder will be required to verify expenditures claimed in this statement of costs within 30 days of [illegible] verification is not made, the Minister may reject [illegible] of the assessment work submitted.

Note : Le titulaire enregistré sera tenu de vérifier les dépenses le présent état des coûts dans les 30 jours suivant une effet. Si la vérification n'est pas effectuée, le ministre ou une partie des travaux d'évaluation présentés.

RECEIVED
MAR - 3 1997
MINING LANDS BRANCH

Filing Discounts

Work performed within two years of completion is claimed at 100% of the Total Value of Assessment Credit.

Work performed three, four or five years after completion is claimed at 50% of the above Total Value of Assessment Credit. See calculations below:

Total Value of Assessment Credit	Total Assessment Claimed
x 0.50 =	

Remises pour dépôt

1. Les travaux déposés dans les deux ans suivant leur ach remboursés à 100 % de la valeur totale susmentionnée du cr

2. Les travaux déposés trois, quatre ou cinq ans après le sont remboursés à 50 % de la valeur totale du créd susmentionné. Voir les calculs ci-dessous.

Valeur totale du crédit d'évaluation	Evaluation tot
x 0,50 =	

Certification Verifying Statement of Costs

I hereby certify that the amounts shown are as accurate as possible and these costs were incurred while conducting assessment work on the lands shown on the accompanying Report of Work form.

AGENT

I am authorized as a (Recorded Holder, Agent, Position in Company)

to make this certification

Attestation de l'état des coûts

J'atteste par la présente :
que les montants indiqués sont le plus exact possib dépenses ont été engagées pour effectuer les travau sur les terrains indiqués dans la formule de rapport de

Et qu'à titre de _____ je
(titulaire enregistré, représentant, poste occupé dans la co

à faire cette attestation.

Signature	Date
Robert L Komaniecki Jr	FEB

Nota : Dans cette formule, lorsqu'il désigne des personnes, le masculin est utilisé

Robert L Komaniecki

Ministry of
Northern Development
and Mines

Ministère du
Développement du Nord
et des Mines

Ontario

Geoscience Assessment Office
933 Ramsey Lake Road
6th Floor
Sudbury, Ontario
P3E 6B5

Telephone: (705) 670-5853
Fax: (705) 670-5863

April 21, 1997

Roy Spooner
Mining Recorder
4 Government Road East
Kirkland Lake, ON
P2N 1A2

Dear Sir or Madam:

Submission Number: 2.17111

Subject: Transaction Number(s):		Status
	W9780.00116	Approval
	W9780.00117	Approval

We have reviewed your Assessment Work submission with the above noted Transaction Number(s). The attached summary page(s) indicate the results of the review. WE RECOMMEND YOU READ THIS SUMMARY FOR THE DETAILS PERTAINING TO YOUR ASSESSMENT WORK.

If the status for a transaction is a 45 Day Notice, the summary will outline the reasons for the notice, and any steps you can take to remedy deficiencies. The 90-day deemed approval provision, subsection 6(7) of the Assessment Work Regulation, will no longer be in effect for assessment work which has received a 45 Day Notice.

Please note any revisions must be submitted in DUPLICATE to the Geoscience Assessment Office, by the response date on the summary.

NOTE: This correspondence may affect the status of your mining lands. Please contact the Mining Recorder to determine the available options and the status of your claims.

If you have any questions regarding this correspondence, please contact Lucille Jerome by e-mail at jerome_l@torv05.ndm.gov.on.ca or by telephone at (705) 670-5858.

Yours sincerely,

ORIGINAL SIGNED BY
Ron C. Gashinski
Senior Manager, Mining Lands Section
Mines and Minerals Division

Correspondence ID: 10734
Copy for: Assessment Library

Work Report Assessment Results

Submission Number: 2.17111

Date Correspondence Sent: April 21, 1997 **Assessor:** Lucille Jerome

Transaction Number	First Claim Number	Township(s) / Area(s)	Status	Approval Date
W9780.00116	1197769	KEMP, KELVIN	Approval	April 16, 1997

Section:
12 Geological GEOL

Transaction Number	First Claim Number	Township(s) / Area(s)	Status	Approval Date
W9780.00117	1205588	HALLIDAY, MOND, MIDLOTHIAN, RAYMOND	Approval	April 16, 1997

Section:
12 Geological GEOL

Correspondence to:

Mining Recorder
Kirkland Lake, ON

Resident Geologist
Cobalt, ON

Assessment Files Library
Sudbury, ON

Recorded Holder(s) and/or Agent(s):

Robert Gerald Komarechka
SUDBURY, ONTARIO, CANADA

WALTER HANYCH
COLLINGWOOD, ONTARIO

ROBERT GERALD KOMARECHKA
SUDBURY, Ontario

Correspondence ID: 10734

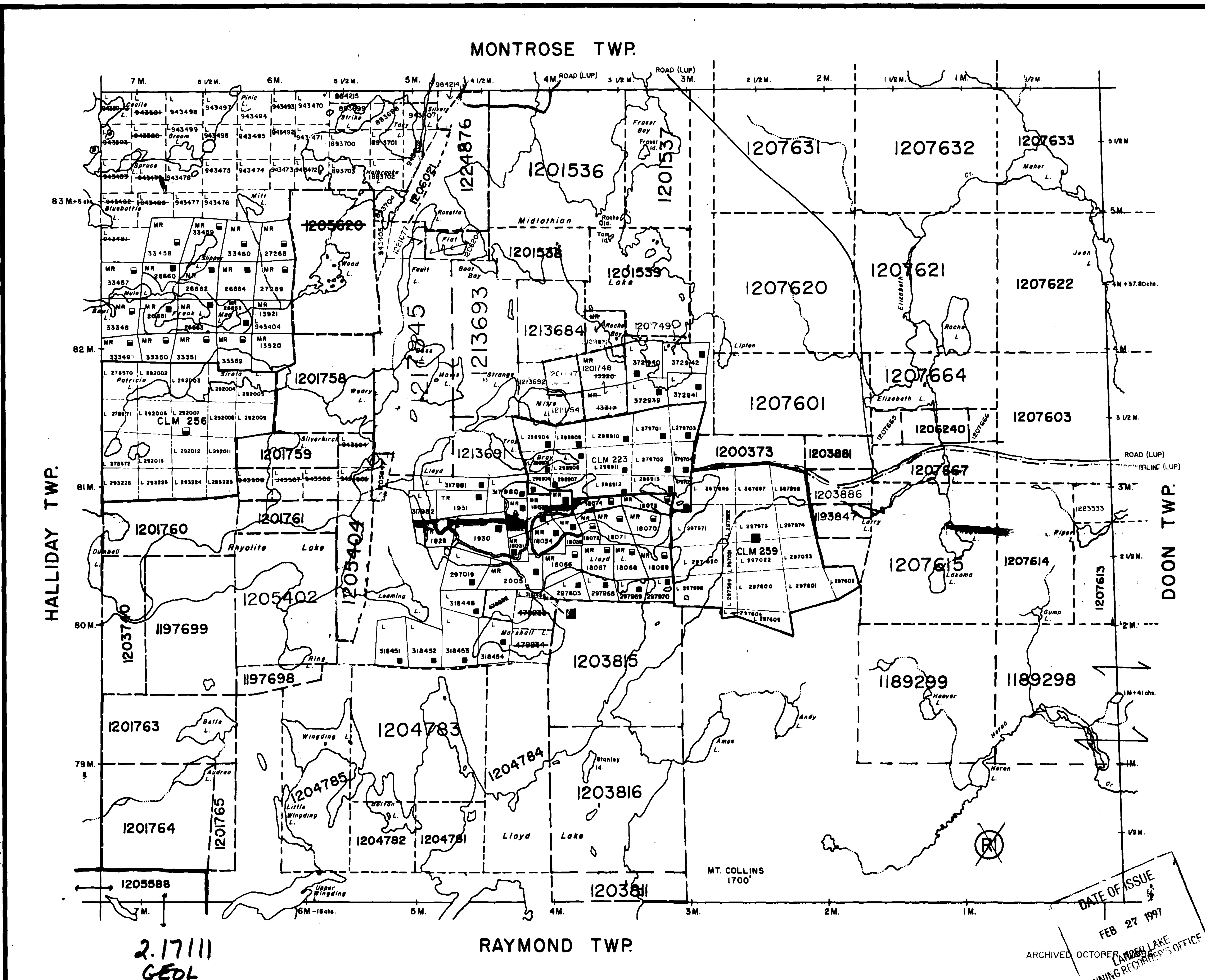
AREAS WITHDRAWN FROM DISPOSITION

M.R.O. – MINING RIGHTS ONLY
S.R.O. – SURFACE RIGHTS ONLY
M.+S. – MINING AND SURFACE RIGHTS

Description	Order No.	Date	Disposition	File
	NRW 65/83	18/11/83	M.+S.	
	W.L. 71/94 NER	07/06/94	M.+S.	

(RI) Mining & Surface Rights Reopened to prospecting, sale or lease. Order O – 10.95, previously withdrawn under Order W-65/83

THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES, AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER, MINISTRY OF NORTHERN DEVELOPMENT AND MINES, FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON.



2.17111 GEOL

DATE OF ISSUE FEB 27 1997 LARDER LAKE MINING RECORDER'S OFFICE

ARCHIVED OCTOBER

LEGEND

HIGHWAY AND ROUTE No.
OTHER ROADS
TRAILS
SURVEYED LINES:
TOWNSHIPS, BASE LINES, LOTS, MINING CLAIMS, PA
UNSURVEYED LINES:
LOT LINES
PARCEL BOUNDARY
MINING CLAIMS ETC.
RAILWAY AND RIGHT OF WA
UTILITY LINES
NON PERENNIAL STREAM
FLOODING OR FLOODING RI
SUBDIVISION OR COMPOSITI
RESERVATIONS
ORIGINAL SHORELINE
MARSH OR MUSKEG
MINES
TRAVERSE MONUMENT

DISPOSITION OF

TYPE OF DOCUMENT
PATENT, SURFACE & MINING
" , SURFACE RIGHTS O
" , MINING RIGHTS ON
LEASE, SURFACE & MINING
" , SURFACE RIGHTS ON
" , MINING RIGHTS ONL
LICENCE OF OCCUPATION
ORDER IN-COUNCIL
RESERVATION
CANCELLED
SAND & GRAVEL

SCALE: 1 INCH = 40 CHAI

TOWNSHIP

MIDLOTH

M.N.R. ADMINISTRATIVE

KIRKLAND LA

MINING DIVISION

LARDER LAKE

LAND TITLES / REGISTR

TIMISKAMING

Ministry of Natural Resources
Ontario

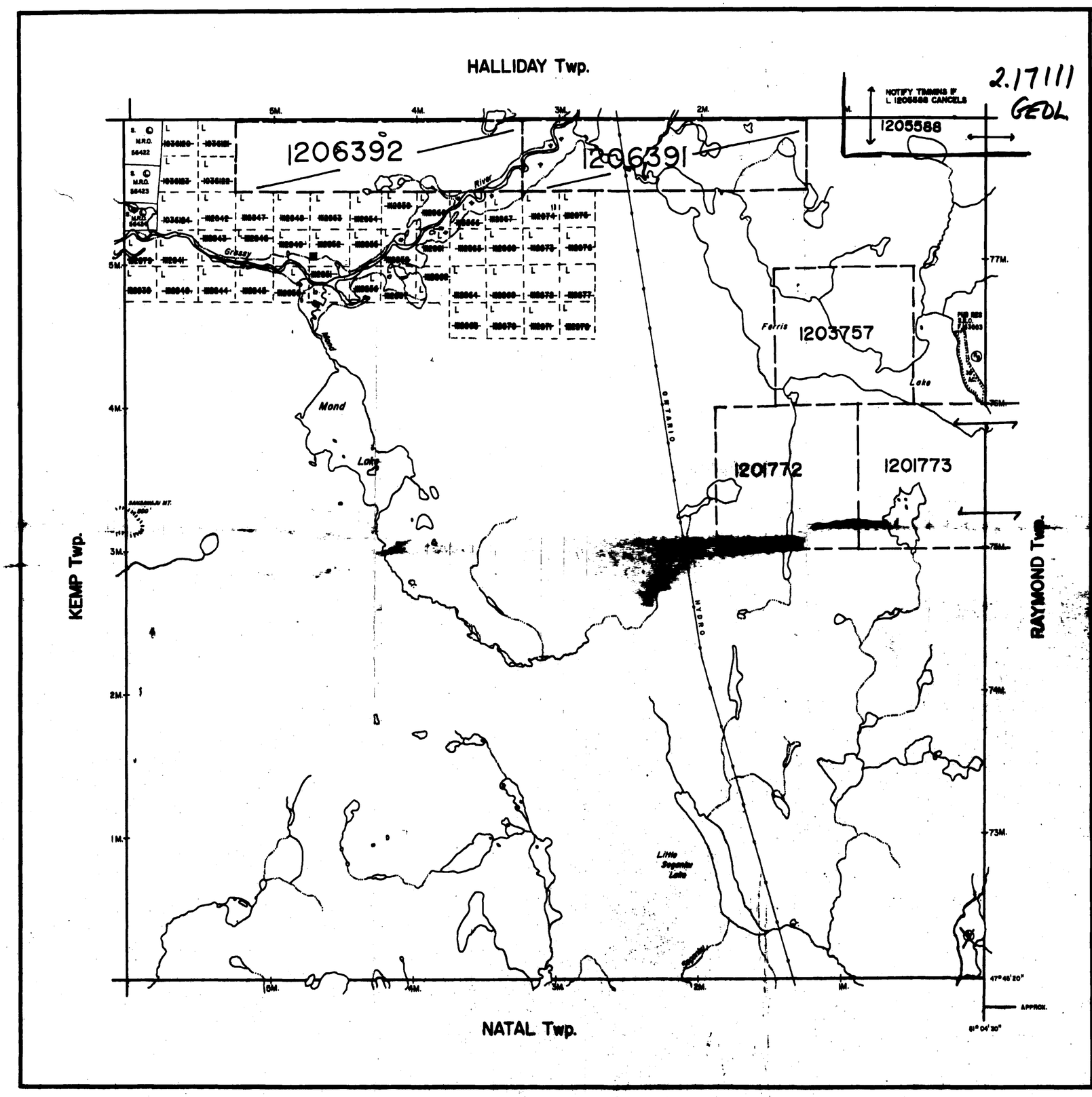
Date AUGUST, 1992

CIRCULATED OCTOBER 25, 1994

41P14SE0007 2.17111 MIDLOTHIAN

200

TRIM LINE



NOTES

400' surface rights reservation along the shores of all lakes and rivers.

■ TRAPLINE CABIN

THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES, AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER, MINISTRY OF NORTHERN DEVELOPMENT AND MINES, FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON.

AREAS WITHDRAWN FROM DISPOSITION

MRO - Mining Rights Only
SRO - Surface Rights Only
M&S - Mining & Surface Rights

Description	Order No.	Date	Disposition	File
~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~
(R) PUBLIC RESERVE			SRO	163005

(R) Mining & Surface Rights Reopened to prospecting, sale or lease. Order O-L-10/95, previously withdrawn under Order W-65/83.

LEGEND

PATENTED FOR SURFACE RIGHTS ONLY
LEASE
LICENSE OF OCCUPATION — L.O.
CROWN [illegible] — C.S.
[illegible] — Loc.
[illegible] — C.
[illegible] RIGHTS ONLY — M.R.O.
SURFACE RIGHTS ONLY — S.R.O.
HIGHWAY & ROUTE NO. — (17)
ROADS
TRAILS
RAILWAYS
POWER LINES
MARSH OR MUSKEG
MINES

*used only with summer resort locations or when space is limited

TOWNSHIP OF

MOND

DISTRICT OF
SUDBURY

LARDER LAKE
MINING DIVISION

SCALE : 1 INCH = 40 CHAINS (1/2 MILE)

DR.	R.W. NOBLE	PLAN NO.	G-997
DATE	NOV. 1989		

DATE OF ISSUE
FEB 27 1997
LARDER LAKE
MINING RECORDER'S OFFICE

2.17111

RECEIVED
MAR 3 - 1997
MINING LANDS BRANCH

CIRCULATED JANUARY 27, 1995 ML

210

G-997 MOND TWP.

G-997

TRIM LINE

Ministry of Natural Resources
Ontario

Ministry of Northern Development and Mines

41P14SE0007 2.17111 MIDLOTHIAN

220

INDEX TO LAND DISPOSITION

PLAN

G-3706

TOWNSHIP

RAYMOND

M.N.R. ADMINISTRATIVE DISTRICT
KIRKLAND LAKE
MINING DIVISION
LARDER LAKE
LAND TITLES/REGISTRY DIVISION
TIMISKAMING

Scale 1:20 000

1000 Metres 0 1000 2000 Metres

1000 Feet 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 Feet

Contour Interval 10 Metres

MIDLOTHIAN TOWNSHIP

MOND TOWNSHIP

RANKIN TOWNSHIP

KNIGHT TOWNSHIP

1205588

1204092

1204093

1203824

1207279

1201773

1203903

1203964

1203902

1203905

1203901

2.17111 GEOL.

Upper Winding Lake
Lloyd Lake
Perth Lake
Perth Creek
Bayson Lake
Ember Lake
Ember Creek
Beaver Dam
Banner Lake
Viipond Lake
String Lake
Otto Lake
Lehmann Creek
Lehmann Lake
Prop Lake

ZONE 17

494000mE 50 60 70 80 90 500000mE 10 20 30 40 50 506000mE

81°04' 81°02' 81°00' 80°58' 80°56'

NUMBERED SIDES

SYMBOLS

Boundary
Township, Meridian, Baseline
Road allowance; surveyed
shoreline
Lot/Concession; surveyed
unsurveyed
Parcel; surveyed
unsurveyed
Right-of-way; road
railway
utility
Reservation
Cliff, Pit, Pile
Contour 20
Interpolated
Approximate
Depression
Control point (horizontal) △
Flooded land
Mine head frame
Pipeline (above ground)
Railway; single track
double track
abandoned
Road; highway, county, township
access
trail, bush
Shoreline (original)
Transmission line
Wooded area

DISPOSITION OF CROWN LANDS

Patent
Surface & Mining Rights ●
Surface Rights Only ◒
Mining Rights Only ◒
Lease
Surface & Mining Rights ■
Surface Rights Only ■
Mining Rights Only ■
Licence of Occupation ▼
Order-in-Council OC
Cancelled ⊖
Reservation Ⓡ
Sand & Gravel Ⓢ

AREAS WITHDRAWN FROM DISPOSITION

MRO - Mining Rights Only
SRO - Surface Rights Only
M + S - Mining and Surface Rights

Description	Order No.	Date	Disposition
(RI)			

(RI) Mining & Surface Rights Reopened to prospecting, sale or lease, Order O-L-10/95, previously withdrawn under Order W-65/83.

RECEIVED
MAR 3 - 1997
MINING LANDS BRANCH

2.17111

DATE OF ISSUE
FEB 27 1997
LARDER LAKE
MINING RECORDER'S OFFICE

THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES, AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER, MINISTRY OF NORTHERN DEVELOPMENT AND MINES, FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON.

[redacted] THE BOUNDARIES [redacted] THE AREA WHICH IS THE SUBJECT OF SURVEY. THE SURVEY [redacted] LOCATION WILL BE SHOWN FOLLOWING [redacted]

ARCHIVED MARCH 7, 1995

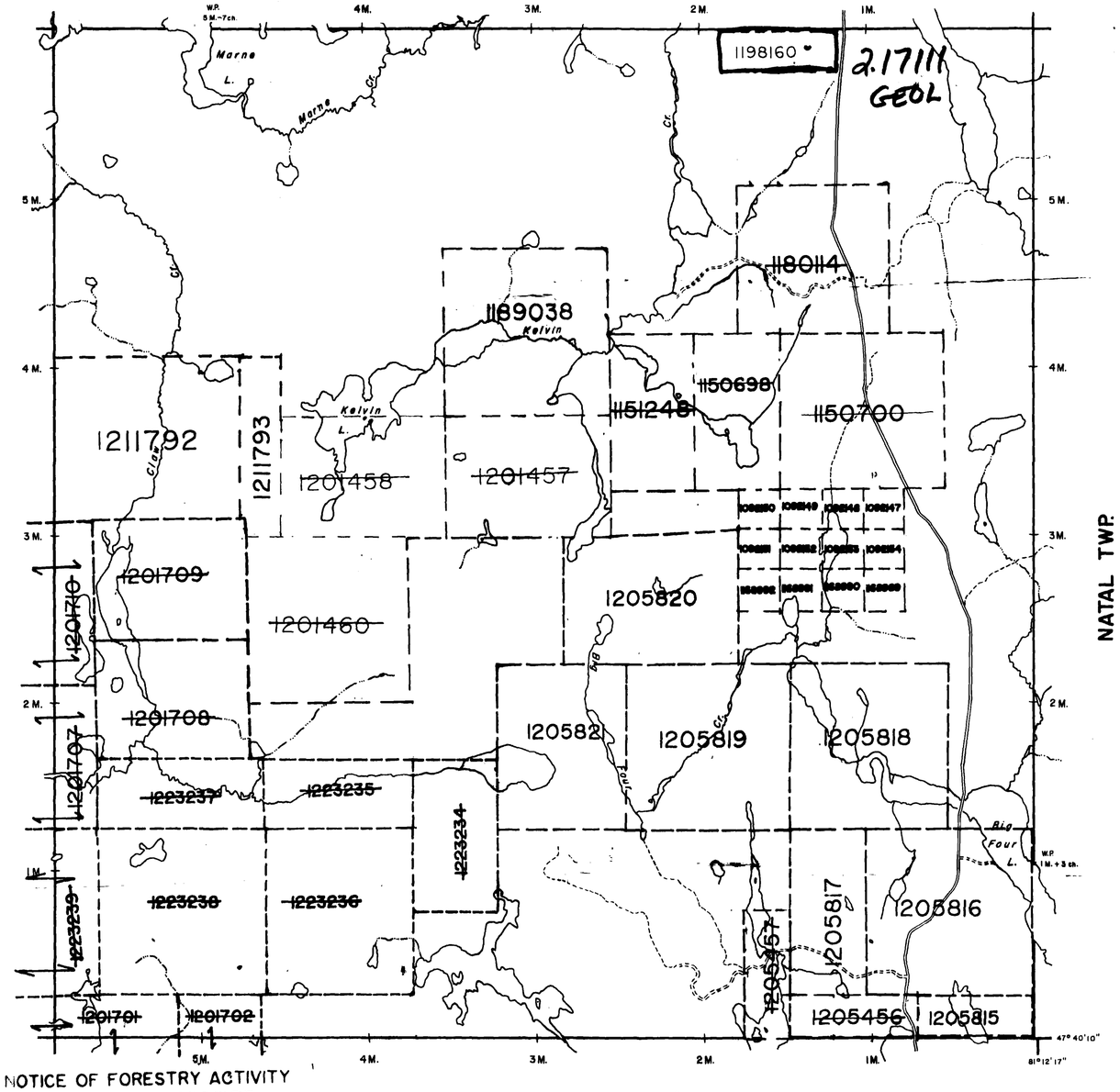
CIRCULATED AUG. 18, 1992 B.R.B.

Map base and land disposition drafting by Surveys and Mapping Branch, Ministry of Natural Resources.

The disposition of land, location of lot fabric and parcel [redacted] on this index was compiled for administrative purposes only.

TRIM LINE

KEMP TWP.



LEGEND

- HIGHWAY AND ROUTE No.
- OTHER ROADS
- TRAILS
- SURVEYED LINES:
  - TOWNSHIPS, BASE LINES, ETC.
  - LOTS, MINING CLAIMS, PARCELS, ETC.
- UNSURVEYED LINES:
  - LOT LINES
  - PARCEL BOUNDARY
  - MINING CLAIMS ETC.
- RAILWAY AND RIGHT OF WAY
- UTILITY LINES
- NON-PERENNIAL STREAM
- FLOODING OR FLOODING RIGHTS
- SUBDIVISION OR COMPOSITE PLAN
- RESERVATIONS
- ORIGINAL SHORELINE
- MARSH OR MUSKEG
- MINES
- TRAVERSE MONUMENT

DISPOSITION OF [redacted] LANDS

TYPE OF DOCUMENT	SYMBOL
PATENT, SURFACE & MINING RIGHTS	●
" , SURFACE RIGHTS ONLY	◓
" , MINING RIGHTS ONLY	◒
LEASE, SURFACE & MINING RIGHTS	■
" , SURFACE RIGHTS ONLY	◨
" , MINING RIGHTS ONLY	◧
LICENCE OF OCCUPATION	▼
ORDER-IN-COUNCIL	OC
RESERVATION	Ⓡ
CANCELLED	⊗
SAND & GRAVEL	Ⓢ

SCALE: 1 INCH = 40 CHAINS

FEET 0 1000 2000 4000 6000 8000
METRES 0 200 1000 2000 (1 KM) (2 KM)

TOWNSHIP

KELVIN

M.N.R. ADMINISTRATIVE DISTRICT

TIMMINS

MINING DIVISION

LARDER LAKE

LAND TITLES / REGISTRY DIVISION

TIMISKAMING

Ontario Ministry of Natural Resources | Ministry of Northern Development and Mines

Date	Number
MAY, 1992	G-983

NOTICE OF FORESTRY ACTIVITY

THIS TOWNSHIP / AREA FALLS WITHIN THE SHININGTREE MANAGEMENT UNIT AND MAY BE SUBJECT TO FORESTRY OPERATIONS. THE MNR UNIT FORESTER FOR THIS AREA CAN BE CONTACTED AT: P.O. BOX 129, LOW AVENUE, GOGAMA, ONT. POM 1WO, 705-894-2000

THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES, AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER, MINISTRY OF NORTHERN DEVELOPMENT AND MINES, FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON.

CIRCULATED AUG. 17, 1992 B.R.B.

ARCHIVED OCT. 31, 1994

DATE OF ISSUE FEB 27 1997 LARDER LAKE MINING DIVISION

RECEIVED MAR 3 - 1997 MINING LANDS BRANCH

230

41P14SE0007 2.17111 MIDLOTHIAN

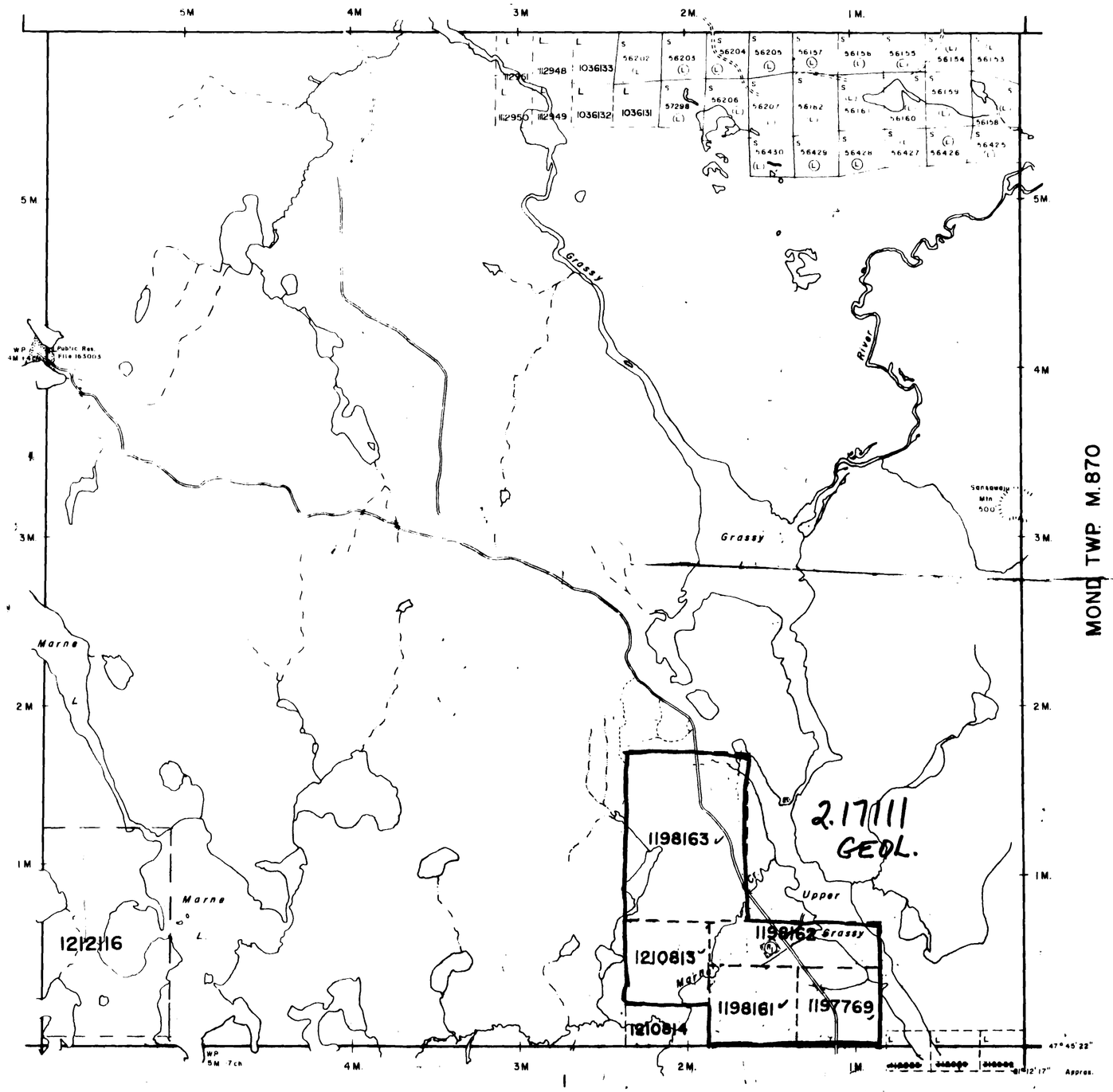
K&E 11-70

TRIM LINE

G-983
KELVIN TWP.
2.17111
G-983

KEMP TWP

SOTHMAN TWP. M.1121



COPY OF THIS MYLAR ARCHIVED MAY 15/92
ARCHIVED NOV 1/96

NOTES

400' surface rights reservation along the shores of all lakes and rivers

■ Trapline Cabin

2.17111

Areas withdrawn from staking under Section 43 of the Mining Act, R.S.O. 1970.

Order No.	File	Date	Disposition
(R) W 66/76	188517		

RECEIVED
MAR 3 - 1977
MINING LANDS BRANCH

THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES, AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER, MINISTRY OF NORTHERN DEVELOPMENT AND MINES, FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON.

LEGEND

PATENTED LAND	(P) or
PATENTED FOR SURFACE RIGHTS ONLY	
LEASE	(L)
LICENSE OF OCCUPATION	L.O.
CROWN LAND SALES	C.S.
LOCATED LAND	Loc.
CANCELLED	C.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
HIGHWAY & ROUTE NO.	17
ROADS	
TRAILS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
MINES	

*used only with summer resort locations or when space is limited

TOWNSHIP OF

KEMP

DISTRICT OF
SUDBURY

DATE OF ISSUE
FEB 27 1997
LARDER LAKE
MINING RECORDER'S OFFICE

LARDER LAKE
MINING DIVISION

SCALE : 1 INCH 40 CHAINS (1/2 MILE)

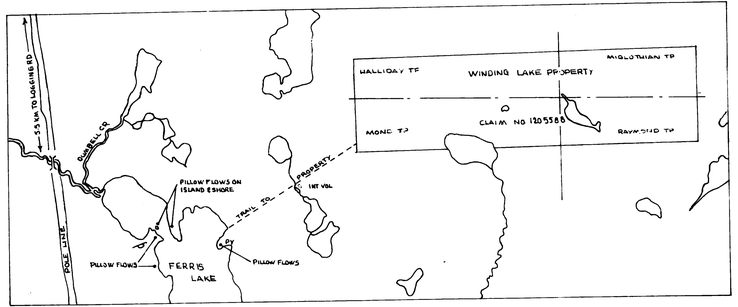
DR. K INAMOTO	PLAN NO. G 0981
DATE JUNE '71	

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

K&E 11-70

TRIM LINE

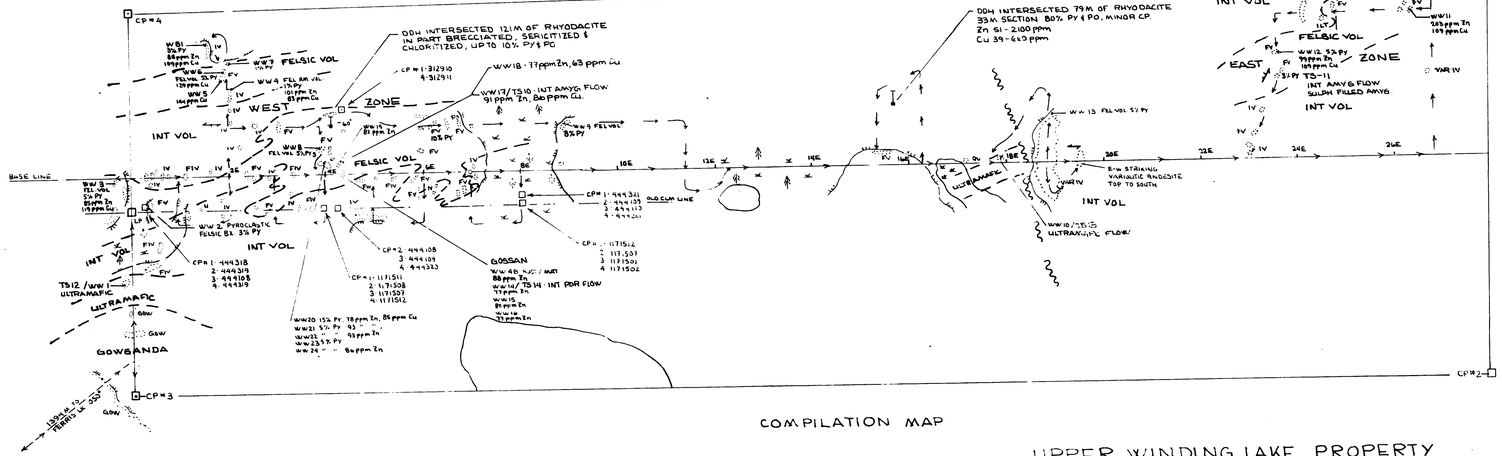
2.17111



LOCATION and ACCESS MAP

SCALE 1:20000

0 100 500 1000 1500 METERS



COMPILATION MAP

SCALE 1:5000

0 100 200 300 400 METERS

UPPER WINDING LAKE PROPERTY

LEGEND

- GOW GOWGANDA FORMATION
- U ULTRAMAFIC ROCKS
- FV FELSIC VOLCANIC ROCKS
- FIV FELSIC - INTERMEDIATE VOL.
- IV INTERMEDIATE VOLCANICS
- ILT INTERMEDIATE LAPILLI TUFF

SYMBOLS

- OUTCROP
- GEOLOGICAL CONTACT
- CLAIM POST
- SWAMP AND/OR SPRUCE BOG
- TRAVERSE LINE & DIRECTION
- SIGNIFICANT TOPOGRAPHIC CHANGE
- DIAMOND DRILL HOLE
- WW3 SAMPLE SITE
- TS-11 THIN SECTION OF CORRESPONDING ROCK SAMPLE

Map Prepared by:
Walter Hanych

astronomic

LEGEND

MAFIC INTRUSIVE ROCKS

- G — GABBRO

META SEDIMENTS

- ARG SLTST GWK — ARGILLITE/ SILTSTONE/GREYWACKE

METAVOLCANICS

- INT VOL — INTERMEDIATE VOLCANIC FLOW
- ILT — INTERMEDIATE LAPILLI TUFF
- FV — FELSIC VOLCANIC FLOW
- FBX — FELSIC PYROCLASTIC
- FIV — FELSIC- INTERMEDIATE VOLCANIC

- OUTCROP
- SWAMP AND/OR SPRUCE BOG
- SIGNIFICANT TOPOGRAPHIC CHANGE
- FAULT
- AEM/HEM CONDUCTOR AXIS
- GEOLOGICAL CONTACT
- CLAIM POST
- LINE OF TRAVERSE & DIRECTION
- PIT
- TRENCH
- C — CARBONATIZATION
- SIL — SILICIFICATION
- WG3 — SAMPLE SITE AND IDENTIFICATION; ROCK
- DIAMOND DRILL HOLE
- BEAVER DAM
- TS1 — THIN SECTION OF CORRESPONDING ROCK SAMPLE

2.17111

RAT-TAIL LAKE • GRASSY LAKE PROPERTY

SCALE 1:5000

0 100 200 300 400 METERS

Map Prepared by:
Walter Hanych