42A01SE2001 OP93-270 OTTO



# REPORT ON THE OTTO TOWNSHIP PROPERTY
LARDER LAKE MINING DIVISION
FOR
FERNAND RIVARD

S.J. Carmichael Consultants
Kirkland Lake, Ontario
OPAP# OP93-270

Nov., 1993
NTS 42/SE

## *SUMMARY*

*This report on the Otto Township properties has been prepared by S.J. Carmichael, B.Sc., FGAC at the request of Fernand Rivard, 876 Government Rd. West, Kirkland Lake, Ontario. This report is a summary of work completed under OPAP grant OP93-270 during 1993.*

*The Otto Township property comprises ten contiguous staked claims with a total area of 400 acres. The claims are located in the north-central portion of Otto Township, District of Timiskaming, Larder Lake Mining Division, approximately six kilometres west of Kirkland Lake and two kilometres south of the town of Swastika.*

*Previous work on the claims includes that by Chavigny Gold Mines Limited (1948) who completed 3 diamond drill holes. Since then, the claims have been worked by Mr. Rivard who has completed two diamond drill holes and power stripping in 1989-1990, geological mapping, ground magnetometer and VLF-EM surveys in 1991. In 1992 Rivard completed a Maxi-Probe EM survey followed by three diamond drill holes, one of which was completed as a follow-up to a 1989 drill hole which intersected 0.107 oz/ton Au over 3.97m which appeared to have a corresponding weak Maxi-Probe anomaly.*

*This years program included two additional diamond drill holes totalling 238m. Although significant alteration and mineralization was intersected in one of the holes, no significant assays were returned. No further work is recommended on this property.*
*The total expenditures incurred during this phase of exploration including diamond drilling (238.30m) was $14,911.88.*

42A01SE2001 OP93-270 OTTO



## Table of Contents


| | Page |
|---|---|
| Summary | (i) |
| Introduction | 1 |
| Property Location, Access and Facilities | 1 |
| Topography | 1 |
| Land Tenure and Ownership | 2 |
| Property History | 2 |
| Regional Geology | 4 |
| Property Geology | 5 |
| 1993 Diamond Drilling | 5 |
| Conclusions and Recommendations | 6 |


## Figures and Plans


Figure 1 - General Location Plan, (following page 1)
Figure 2 - Claim Location Plan, Otto Twp. (following page 2)


## Appendices


Appendix A - Certificate of Qualifications
Appendix B - List of Expenditures
Appendix C - Diamond Drill Logs OT1-93, OT2-93,
Appendix D - Assay Certificates


## List of Plans and Sections


Map 1 - Otto Twp. Surface Geology With Drill Holes, 1:2500 Metric
Section 1 - Section 1+00S DDH OT1-93,
Section 2 - Section 4+60S DDH OT2-93

**Report on the Otto Township Properties**
**Larder Lake Mining Division**
**for**
**Fernand Rivard**

## INTRODUCTION

This report on Fernand Rivard's Otto Township mining exploration property has been prepared by S.J. Carmichael at the request of Mr. Rivard. It is an assessment of recent exploration completed on the properties and is intended to fulfil final OPAP reporting obligations.

Information on the properties are derived from the records of the Ministry of Northern Development and Mines and publications by the Ontario Geological Survey. The author of this report supervised the diamond drilling programs. All work on the claims was performed between June 6 and Aug. 16, 1993.

## PROPERTY LOCATION, ACCESS AND FACILITIES

The Rivard claim group is located in the north central portion of Otto Township (NTS 41A/SE), District of Timiskaming and within the Larder Lake Mining Division, approximately six kilometres west of Kirkland Lake. Access to the property is through Culver Park, located immediately west of the town of Swastika. A narrow trail, reconditioned by Mr. Rivard leads southeast a distance of two kilometres to the claims. The Blanche River flows through the south portion of the group and a beaver pond located in the middle of the property provides an ample water supply for diamond drilling.

## TOPOGRAPHY

The north section of the group is covered by rocky bedrock exposures with a 200' south-facing cliff located just north of the

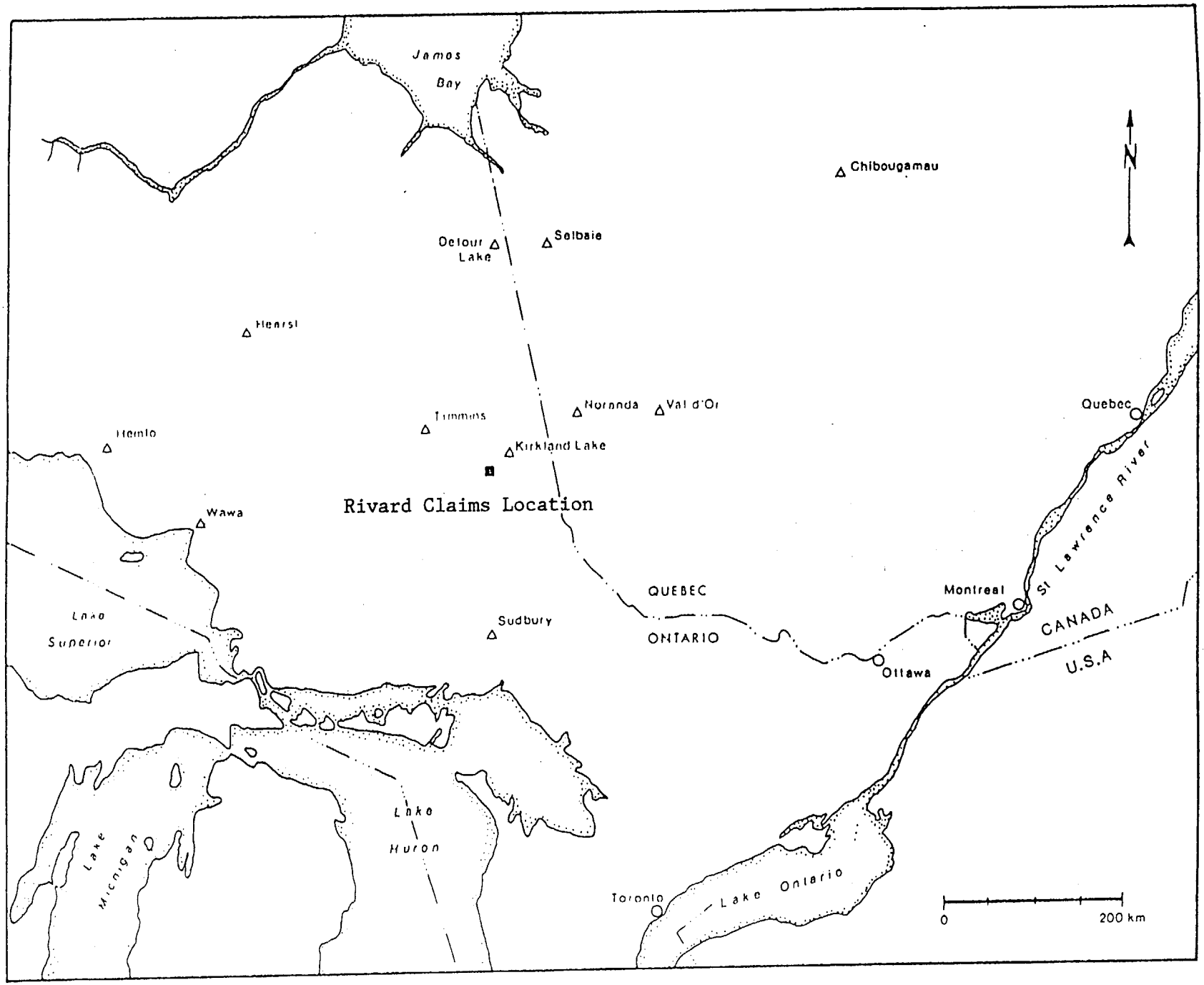



Figure 1 General Location Plan

baseline. The central portion is covered by lacustrine clay deposits cut by several deep ravines. These ravines were dry in the fall but may be active with running creeks during spring run off. Bedrock exposure occurs over the south portion towards the Blanche River. Murdock Creek empties into the Blanche River at the east boundary of the claims. The Maxi-Probe survey (1992) indicated that the overburden is generally less than thirty feet in depth over the entire property.

## LAND TENURE AND OWNERSHIP

The Otto Township property comprises 10 staked contiguous unsurveyed mining claims with a total area of approximately 400 acres. The claim numbers, recorded dates and applied assessment credits are listed in the following table:

| CLAIM NUMBER | RECORDED DATE | APPLIED CREDITS | COMMENTS |
|---|---|---|---|
| L-982689 | July 12, 1987 | N/A | In good standing until July 12, 2000 |
| L-982690 | July 21, 1987 | N/A | In good standing until July 21, 2000 |
| L-982691 | July 21, 1987 | N/A | In good standing until July 21, 2000 |
| L-982692 | July 21, 1987 | N/A | In good standing until July 21, 2000 |
| L-982693 | July 28, 1987 | N/A | In good standing until July 28, 2000 |
| L-982694 | July 22, 1987 | N/A | In good standing until July 22, 2000 |
| L-982695 | July 25, 1987 | N/A | In good standing until July 25, 2000 |
| L-982696 | July 25, 1987 | N/A | In good standing until July 25, 2000 |
| L-982697 | August 10, 1987 | N/A | In good standing until Aug. 10, 2000 |
| L-982698 | August 10, 1987 | N/A | In good standing until Aug. 10, 2000 |

Enough work has been applied to keep the claims in good standing until the year 2000.

## PROPERTY HISTORY

The first government map published covering the present Rivard group was by J. Thomson, 1948 titled Geology of Teck Township and the Kenogami Lake Area, map No. 1946-1. The area was mapped again in 1967-68 by H. Lovell (Map No. 2239 - Eby-Otto Area). Lovell reported the outcrops to be basalt to andesite in composition with two northeast tending faults passing through the present claims.

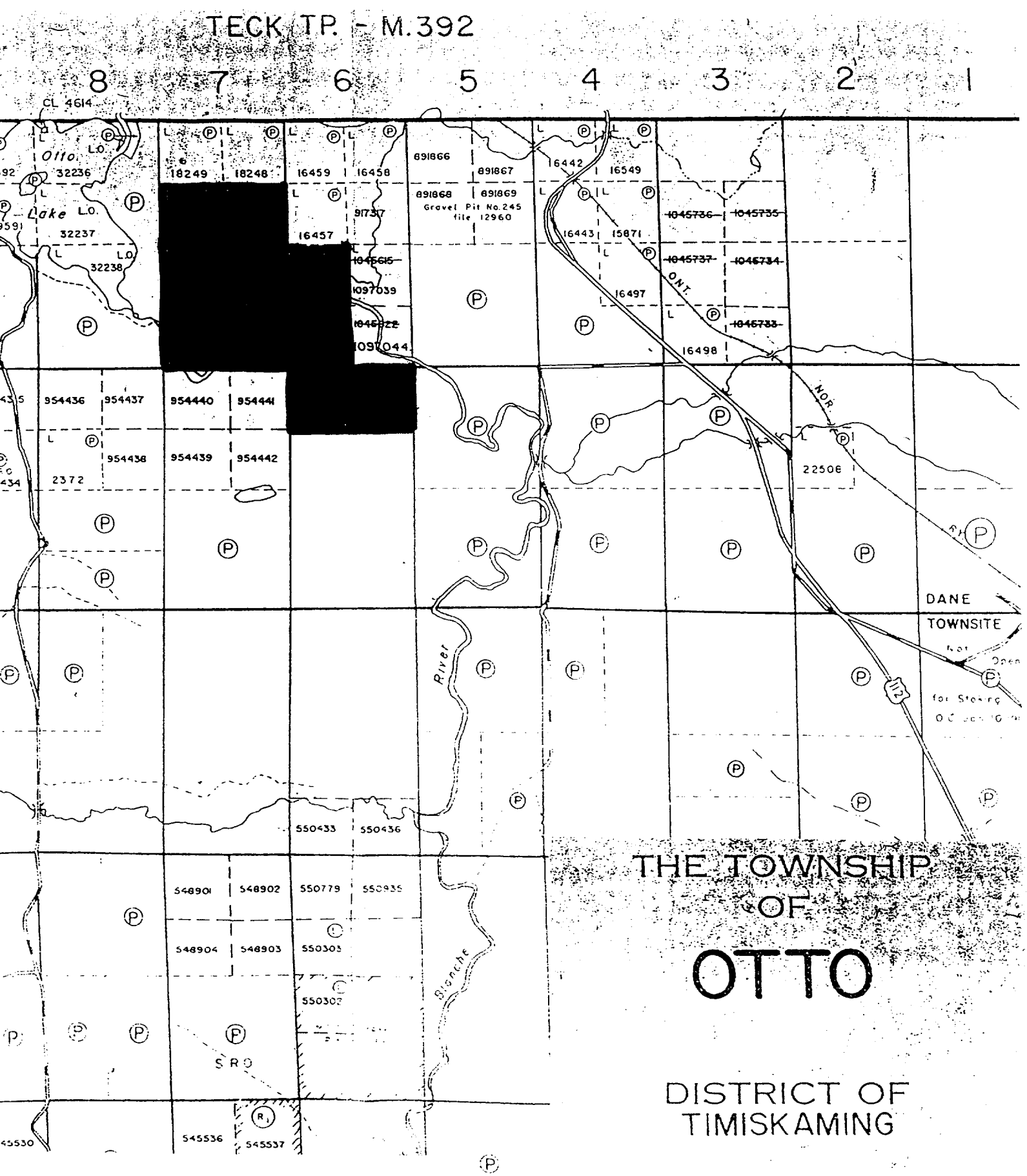



Figure 2

Claim Location Plan 1"=1/2 Mile

Further mapping by L.S. Jenson was completed in the late 1980's but never published.

Exploration on the claims has been limited in the past. The only recorded work was by Chavigny Gold Mines Limited which completed three diamond drill holes. The first two were completed on present claim 982690 in July of 1948. The first hole was drilled at a dip of -80 deg. and a southwest azimuth. Altered greenstone was intersected throughout with alteration and shearing intersected from 403.8 to 407.0'. A fault was also intersected at 638.0' and widespread narrow carbonate stringers were intersected to the end of the hole which was drilled to a depth of 1043 feet. An assay of 0.04 oz/ton Au was reported from this hole in rusty altered greenstone from 202.0 to 202.5'. The second hole, drilled at a -70 deg. dip and an azimuth of 250 deg. reached a depth of 945' with negligible results. A third hole was drilled on present claim 982694 intersected a major fault with a sludge assay of 0.02 oz/ton Au from 230.0 to 237.5'. Details from this hole are lacking. All collars from the Chavigny drilling were located during the 1991 geological mapping program. The property remained dormant until being staked by Rivard in 1987. Rivard completed one drill hole (EX) in 1989 (OT-89-1) at 0+75E, 0+50S, close to the first two Chavigny holes. The Rivard hole intersected mixed komatiitic to tholeiitic flows and returned an assay on 0.107 oz/ton Au over 13.0'. Core recovery from this section was poor and the sample was from a composite chip sample. This assay could not be reproduced from the remaining core leading to some question to its validity.

Rivard also completed some stripping and washing in the area of 0+00, 4+00S which uncovered a series of faults, shears and interflow graphitic/carbonaceous sediments. No significant gold assays were found. In 1990, Rivard completed an additional drill hole located at 7+50W, 3+75S. No significant gold assays were reported from this hole.

In 1992, Rivard completed a total of 3.5 km of Maxi-Probe EM surveying followed by diamond drilling. Two Maxi-Probe anomalies were tested with three holes; two of which were completed for a total of 212m with one hole abandoned due to blocky ground at 13.7m. Both holes were located on line 7+00W on the west section of the property. One additional hole was drilled on the east portion of the property in an attempt to verify the gold intersection (0.107 oz/ton/13.0 ft.). No significant assays were intersected during this drilling program.

Other projects active in the immediate area include those by Golden Crescent Resources, HSK Minerals, Jomi Minerals and Cyprus Canada. Previous producers in the area include the Golden Gate and Swastika Mines.

**REGIONAL GEOLOGY**

The Rivard claims are underlain by Archean meta-volcanics and sediments of the Larder Lake Group and close to, and perhaps part of the Skead Group. The prominent cliffs and ridges over the north half of the property are comprised of basaltic komatiite flows of the Larder Lake Group. To the south the volcanic chemistry changes to a tholeiitic to calk-alkalic, representing a possible transition

from the Larder Lake to Skead Group.

The Larder Lake Fault zone passes within 2 kilometres north of the Rivard claims.

**PROPERTY GEOLOGY**

Geological mapping of the Rivard claims was completed at a scale of 1:2500 Metric on grid lines cut at 100 m centres. The grid was cut on claims north of the Blanche River as the airborne INPUT survey indicated anomalies in this area. The mapping was completed in 1991.

Three distinct lithologies were mapped during the program. This include a massive to spinifex textured basaltic komatiite flows of the Larder Lake Group, transitional tholeiitic to calc-alkaline basalt, possibly part of the Skead Group and an intermediate diorite intrusive plug. Late diabase dikes cut all of the above lithologies. Stratigraphic indicators such as pillow tops and sedimentary bedding were poorly developed or absent from the property, however the volcanic stratigraphy appears to strike 100-120 deg. with a steep north dip.

**1993 DIAMOND DRILLING**

Two diamond drill holes were completed totalling 238.3m. The first hole (OT1-93) tested a possible north-east trending structure thought to have possibly caused the gold mineralization intersected in OT89-1. The orientation of this fault would have been such that the 1992 drilling could have missed the mineralization.

Drill hole OT1-93 failed to intersect any mineralization indicating a possible error (contamination) at the assay lab.

The second drill hole (OT2-93) tested a moderate strength Maxi-probe anomaly located at 1+00E, 4+25S. This hole intersected an upper tholeiitic basalt unit moderately to strongly carbonatized with local albite+-silicifcation. Silicified/albitized sections were mineralized with up to 15% pyrite. Assays throughout were low, the best being 79 ppb. A narrow graphitic shale horizon was intersected followed by talc-chlorite schist after komatiite. The cause of the Maxi-probe anomaly appears to be faulting within the talc chlorite schist. The graphitic horizon represents a break between komatiitic and tholeiitic volcanics, usually a potential location for deformation and subsequent gold mineralization. However, the assays returned are insignificant and no further work on this section of the property is recommended.

**CONCLUSIONS AND RECOMMENDATIONS**

No further work on the Rivard property is recommended at this time. The assays in OT1-89 appears to have been a problem with contamination.

Respectfully Submitted

S.J. Carmichael, B.Sc., FGAC

*Appendix A*

*CERTIFICATE OF QUALIFICATIONS*

*I, Stewart J. Carmichael, of the Town of Kirkland Lake, in the District of Timiskaming, in the Province of Ontario, Canada, do hereby certify that:*

*1) I am a consulting geologist with address 42 Rand Avenue East Kirkland Lake, Ontario, P2N 1X1.*

*2) I am a graduate of McMaster University, Hamilton, Ontario, having received the degree of Bachelor of Science, Geology from the Faculty of Science in 1982. I have since practised in the field of mineral exploration continuously since graduation.*

*3) I am a Fellow of the Geological Association of Canada.*

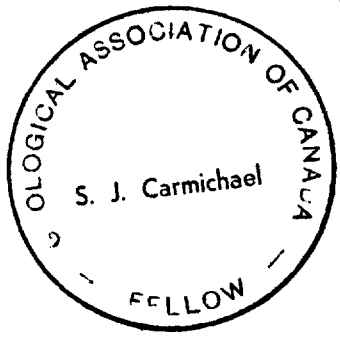
*4) I have no direct interest, nor do I expect to receive any interest in the Rivard claims.*

*5) In addition to my personal knowledge of the area, I have made use of the records of the Ministry of Natural Resources of Ontario, and of Mr. Rivard's records in the preparation of this report.*

*Dated this 30 day of November, 1993*

*Stewart J. Carmichael*

*Stewart J. Carmichael, B.Sc., FGAC*



*Appendix B*

*LIST OF EXPENDITURES*

*A) DIRECT COSTS*

| | |
|---|---|
| *1) Labour, Fern, 47 days @ $100/00/day* | *$4,700.00* |
| *2) Assistant* | *1,200.00* |
| *3) Meals* | *335.00* |
| *2) Geological Consultant* | *1,400.00* |
| *3) Assays* | *526.18* |
| *4) Fuel* | *1,737.59* |
| *5) Drilling Supplies* | *3,648.75* |
| *6) Repairs A] Drill Shaft* | *408.25* |
| *B] Gas Tank* | *20.00* |
| *C] Flat Tires* | *38.98* |
| *D] Welding* | *262.43* |
| *E] Windows (vandalized)* | *200.00* |
| *TOTAL* | *14,447.18* |

*B) INDIRECT COSTS*

| | |
|---|---|
| *1) Float* | *$434.70* |

| | |
|---|---|
| *TOTAL DIRECT AND INDIRECT COSTS* | *14,911.88* |
| *($19.00/ft)* | |

*Appendix C*

*DIAMOND DRILL LOGS*

FERN RIVARD OPAP

DIAMOND DRILL RECORD

Co-ords -100.0 N 100.0 E

Azimuth: 90.0

Dip: -46.0

Elevation 1000.0

Length: 106.3

HOLE NO.: OTI-93

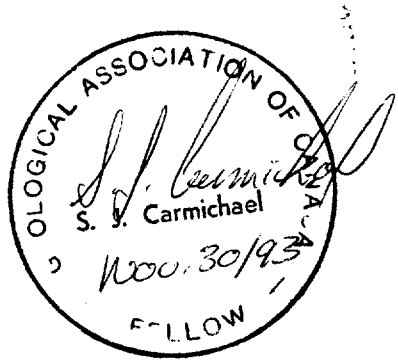
Property: OTTO RIVARD
Purpose: Test Possible Fault
Drilled by: Fern Rivard
Date Started: June 6, 1993
Date Completed: July 7, 1993
Logged by: S.J. Carmichael, Aug. 26, 1993
Core Size: IEX
Claim Number: L-982690

## Dip Tests

| from (m) | to (m) | Description | Sample No. | from (m) | to (m) | Length (m) | AU PPB | Au-2 oz/ton |
|---|---|---|---|---|---|---|---|---|
| .00 | 10.98 | CASING | | | | | | |
| 10.98 | 91.95 | BASALT<br>Dark green fine-grained basalt, possibly a Fe-tholeiite. Basalt is magnetic from from 67.38-71.04 m. Generally massive with minor (1%) quartz +- calcite stringers and epidote stringers. Core is moderately blocky and broken.<br>66.46 66.77 Ground core.<br>67.38 71.04 Magnetic phase of basalt. Sharp magnetic contact at 221.0 ft. With no indication of a flow contact. Slight color change to lighter grey/green.<br>82.62 86.28 Increase in hematite stringers. | | | | | | |
| 91.95 | 95.88 | MAFIC SYENITE<br>Dark purple/green fine-grained mafic augite syenite. Massive, equigranular. Highly carbonated and reactive to HCl. Nil sulfide mineralization. Irregular upper and lower contacts. | | | | | | |
| 95.88 | 106.25 | BASALT<br>Continuation of volcanics above dike.<br>106.25 End of Hole.<br>Casing Pulled.<br>Core Stored At Rivard Residence.<br>SLUDGE ASSAYS.<br>36.59-42.68 Nil.<br>42.68-48.78 Nil.<br>48.78-54.88 Nil.<br>54.88-60.98 Nil.<br>60.98-67.07 Nil.<br>67.07-73.17 3 PPB. | | | | | | |

| from (m) | to (m) | Description | Sample No. | from (m) | to (m) | Length (m) | AU PPB | Au-2 oz/ton |
|---|---|---|---|---|---|---|---|---|

73.17-79.27 Nil.
79.27-85.37 Nil.
85.37-91.46 <5 PPB.
91.46-94.51 <5 PPB.
94.51-97.56 8 PPB.
No core assays taken.



FERN RIVARD OPAP

DIAMOND DRILL RECORD

Co-ords -460.0 N 26.0 E

HOLE NO.: OT2-93

Azimuth: 90.0

Dip: -40.0

Elevation 1000.0

Length: 132.0

Property: OTTO RIVARD

Purpose: Test Structure

Drilled by: Fern Rivard

Date Started: July 16, 1993

Date Completed: Aug. 6, 1993

Logged by: S.J. Carmichael, Aug. 26, 1992

Core Size: IEX

Claim Number: L-982689

Dip Tests

| from (m) | to (m) | Description | Sample No. | from (m) | to (m) | Length (m) | AU PPB | Au-2 oz/ton |
|---|---|---|---|---|---|---|---|---|
| .00 | 3.35 | CASING | | | | | | |
| 3.35 | 59.91 | BASALT<br>Dark green fine-grained non-magnetic basalt. Moderately to highly fractured with quartz stringers, veins and flooding. 4-5% quartz stringers +- carbonate throughout. Basalt is moderately altered throughout with carbonatization. This unit represents a brittle deformation zone. | | | | | | |
| 3.69 | 4.51 | Highly silicified and quartz-flooded from 3.87-4.51m. Quartz veining is irregular with no distinct contacts. 0.5% finely disseminated pyrite throughout up to a maximum of 1%. | 224563 | 3.69 | 4.51 | .82 | 27.0 | nil |
| 4.51 | 5.34 | Moderately fractured with 5% quartz stringer. 75% core rcovery. | 224564 | 4.51 | 5.34 | .83 | 79.0 | tr |
| 5.34 | 6.10 | Quartz flooded with albite alteration from 5.34-5.49m. 1% finely disseminated pyrite throughout. | 224565 | 5.34 | 6.10 | .76 | 14.0 | nil |
| 6.10 | 7.62 | Weakly fractured basalt, 2% quartz/calcite stringers. Trace-0.5% disseminated pyrite throughout. | | | | | | |
| 7.74 | 7.93 | Quartz vein, dip 30 deg. To C.A. 1% pyrite. | 224566 | 7.74 | 7.93 | .19 | 17.0 | nil |
| 8.54 | 9.27 | Quartz breccia flooding, dip along C.A. Trace pyrite throughout, | 224567 | 8.54 | 9.27 | .73 | 14.0 | nil |
| 11.10 | 12.20 | 20% quartz veining with irregular dips. Trace to 1% disseminated pyrite throughout. | 224568 | 11.10 | 12.20 | 1.10 | 38.0 | nil |
| 13.38 | | 1.5 inch quartz vein, dip 22 deg. To C.A. Barren. | | | | | | |
| 14.33 | 14.63 | Ground core, 50% recovery. | | | | | | |
| 19.15 | 20.43 | Highly brecciated and carbonated. 20% quartz flooding and quartz brecciation. 1% finely disseminated pyrite throughout. | 224569 | 19.15 | 20.43 | 1.28 | 27.0 | nil |
| 20.43 | 21.95 | As above, quartz vein from 20.52-20.79m | 224570 | 20.43 | 21.95 | 1.52 | 24.0 | nil |

| from (m) | to (m) | Description | Sample No. | from (m) | to (m) | Length (m) | AU PPB | Au-2 oz/ton |
|---|---|---|---|---|---|---|---|---|
| | | with irregular contacts. | | | | | | |
| | 21.95 22.56 | Highly silicified from 22.26-22.50m., 2% quartz stringers remainder of section. 1-2% fine pyrite with seams of up to 10% pyrite at vein contacts. | 224571 | 21.95 | 22.56 | .61 | 79.0 | tr |
| | 22.56 23.78 | Moderately fractured basalt, 8-10% quartz stringers and flooding. Trace pyrite. | 224572 | 22.56 | 23.78 | 1.22 | 7.0 | nil |
| | 25.30 26.22 | Basalt, 2-4% quartz stringers, trace pyrite. | 224573 | 25.30 | 26.22 | .92 | 17.0 | nil |
| | 26.22 26.83 | Quartz vein, dip 13 deg. To C.A. Trace pyrite. | 224574 | 26.22 | 26.83 | .61 | 24.0 | nil |
| | 26.83 27.35 | Highly silicifed with albite/carbonate alteration. 10-15% disseminated pyrite. | 224575 | 26.83 | 27.35 | .52 | 67.0 | tr |
| | 27.35 28.38 | Weakly silicified with 4-5% quartz stringers, 1-2% disseminated pyrite. | 224576 | 27.35 | 28.38 | 1.03 | 51.0 | tr |
| | 28.38 29.12 | Moderately silicified with 4-5% disseminated pyrite. | 224577 | 28.38 | 29.12 | .74 | 41.0 | nil |
| | 30.40 31.86 | Weakly fractured basalt, 1-2% quartz stringers, trace pyrite. | 224578 | 30.40 | 31.86 | 1.46 | 14.0 | nil |
| | 31.86 33.23 | As above. | 224579 | 31.86 | 33.23 | 1.37 | 31.0 | nil |
| | 33.23 34.76 | As above, 80% core recovery. | 224580 | 33.23 | 34.76 | 1.53 | 27.0 | nil |
| | 35.37 36.89 | Moderately silicified, 10-15% quartz flooding and veins. Trace-0.5% pyrite. | 224581 | 35.37 | 36.89 | 1.52 | 21.0 | nil |
| | 37.65 39.18 | 4-5% quartz stringers, 1% disseminated pyrite throughout. | 224582 | 37.65 | 39.18 | 1.53 | 17.0 | nil |
| | 41.16 42.84 | 25% quartz stringers and flooding, 1-2% disseminated pyrite throughout. | 224583 | 41.31 | 42.84 | 1.53 | 21.0 | nil |
| | 42.84 43.90 | As above, trace-0.5% pyrite. | 224584 | 42.84 | 43.90 | 1.06 | 17.0 | nil |
| | 43.90 45.27 | Moderately brecciated and silicified with 10% albite/carbonate alteration. Trace pyrite. | 224585 | 43.90 | 45.27 | 1.37 | 33.0 | nil |
| | 45.27 46.65 | Decrease in silicifcation, 4-5% quartz stringers. Trace pyrite. | 224586 | 45.27 | 46.65 | 1.38 | 17.0 | nil |
| | 46.65 48.17 | As above, moderately silicified from 46.65-46.95m. Trace-0.5% pyrite throughout. | 224587 | 46.65 | 48.17 | 1.52 | 14.0 | nil |
| | 48.17 | Basalt becoming less fractured, still moderately brecciated with trace pyrite. | | | | | | |
| | 58.38 59.91 | As above, trace pyrite. | 224588 | 58.38 | 59.91 | 1.53 | 14.0 | nil |
| 59.91 | 61.43 | GRAPHITIC SHALE | | | | | | |
| | | Black silicious carbonaceous/graphitic shale. Highly fractured and brecciated with 20% quartz stringers and flooding. 10-15% fine disseminated pyrite and minor marcasite nodules. | | | | | | |
| | 59.91 61.43 | As above. | 224589 | 59.91 | 61.43 | 1.52 | 31.0 | nil |
| 61.43 | 132.01 | TALC CHLORITE SCHIST | | | | | | |
| | | Dark green to black talcose komatiite moderately altered to talc chlorite schist. Moderately fractured with up to 20% quartz/carbonate stringers and veinlets. | | | | | | |
| | 86.95 | Fault 1 inch of gouge, dip 66 deg. To C.A. | | | | | | |

| from (m) | to (m) | Description | Sample No. | from (m) | to (m) | Length (m) | AU PPB | Au-Z oz/ton |
|---|---|---|---|---|---|---|---|---|
| | | 95.18 95.64 Lamprophyre dike, dip 60 deg. To C.A. | | | | | | |
| | | 127.93 Fault Narrow seam of gouge, dip 90 deg. To C.A. | | | | | | |
| | | 132.01 End of Hole. | | | | | | |
| | | Casing Pulled. | | | | | | |
| | | Core Stored At Rivard Residence. | | | | | | |
| | | NOTE-Core axis angles of veins in upper portion of hole indicates an oblique intersection to alteration and veining. | | | | | | |



*Appendix D*

*ASSAY CERTIFICATES*

Established 1928

# Swastika Laboratories

A Division of TSL / ASSAYERS INC.

Assaying - Consulting - Representation

## *Geochemical Analysis Certificate*

3W-2345-RG1

Company: **F. RIVARD**

Date: AUG-31-93

Project:

Attn:

*We hereby certify* the following Geochemical Analysis of 27 CORE samples submitted AUG-27-93 by .

| Sample Number | Au PPB | Au check PPB |
|---|---|---|
| 224563 | 24 | 31 |
| 224564 | 79 | |
| 224565 | 14 | |
| 224566 | 17 | |
| 224567 | 14 | |
| 224568 | 38 | |
| 224569 | 27 | |
| 224570 | 24 | |
| 224571 | 79 | |
| 224572 | 7 | |
| 224573 | 17 | |
| 224574 | 24 | |
| 224575 | 72 | 62 |
| 224576 | 51 | |
| 224577 | 41 | |
| 224578 | 14 | |
| 224579 | 31 | |
| 224580 | 27 | |
| 224581 | 21 | |
| 224582 | 17 | |
| 224583 | 21 | |
| 224584 | 17 | |
| 224585 | 31 | 34 |
| 224586 | 17 | |
| 224587 | 14 | |
| 224588 | 14 | |
| 224589 | 31 | |

*Certified by* G. Leboy

P.O. Box 10, Swastika, Ontario P0K 1T0

Telephone (705) 642-3244 FAX (705)642-3300

Swastika Laboratories
P.O. Box 10
Swastika, Ontario
P0K 1T0

# INVOICE

NO.: 28690

DATE: 08-31-93

PAGE: 1 of 1

SOLD TO:

F Rivard
Box 1091
Kirkland Lake, Ontario
P2N 3J7

SHIP TO:

Same

GST Number: R132862640

| ITEM NO. | QUANTITY | UNIT | DESCRIPTION | G | P | UNIT PRICE | AMOUNT |
|---|---|---|---|---|---|---|---|
| | 27 | | Au Assays | 3 | | 8.000 | 216.00 |
| | 27 | | Sample Prep | 3 | | 3.000 | 81.00 |
| | | | Cert #3W-2345-RG1 | | | | |
| | | | 3-GST @ 7 % | | | | 20.79 |

SWASTIKA LABORATORIES
PAID
SEP 8
THANKS
PER

4027
8/93

COMMENTS:

Net 30 Days

TOTAL 317.79

FERN RIVARD, L. RAITANEN,
PHIL RIVARD
BOX 1091 567-7344
KIRKLAND LAKE, ONT P2N 2C9

ACCT. NO. 290001

262

May 28 1993

PAY TO THE ORDER OF Paul Mazzola $ 100.00

One Hundred 00/100 DOLLARS

TIMISKAMING CREDIT UNION LTD.
22 PROSPECT AVE. PH. (705) 567-3254
KIRKLAND LAKE, ONT. P2N 3L1

MEMO OTTO PROJECT

Phil Rivard

⑈262⑈ ⑆106628⑆ 029000⑆712⑈

FERN RIVARD, L. RAITANEN,
PHIL RIVARD
BOX 1091 567-7344
KIRKLAND LAKE, ONT P2N 2C9

ACCT. NO. 290001

267

June 10 1993

PAY TO THE ORDER OF Paul Mazzola $ 100.00

One Hundred 00/100 DOLLARS

TIMISKAMING CREDIT UNION LTD.
22 PROSPECT AVE. PH. (705) 567-3254
KIRKLAND LAKE, ONT. P2N 3L1

MEMO

Phil Rivard

⑈267⑈ ⑆106628⑆ 029000⑆712⑈

FERN RIVARD, L. RAITANEN,
PHIL RIVARD
BOX 1091 567-7344
KIRKLAND LAKE, ONT P2N 2C9

ACCT. NO. 290001

276

June 18 1993

PAY TO THE ORDER OF John Mazza $ 100.00

One Hundred 00/100 DOLLARS

TIMISKAMING CREDIT UNION LTD.
22 PROSPECT AVE. PH. (705) 567-3254
KIRKLAND LAKE, ONT. P2N 3L1

MEMO

Phil Rivard

⑈276⑈ ⑆106628⑆ 029000⑆712⑈

FERN RIVARD, L. RAITANEN,
PHIL RIVARD
BOX 1091 567-7344
KIRKLAND LAKE, ONT P2N 2C9

ACCT. NO. 290001

278

June 24 1993

PAY TO THE ORDER OF JOHN MAZZA $ 100.00

One Hundred 00/100 DOLLARS

TIMISKAMING CREDIT UNION LTD.
22 PROSPECT AVE. PH. (705) 567-3254
KIRKLAND LAKE, ONT. P2N 3L1

MEMO OTTO

Phil Rivard

⑈278⑈ ⑆106628⑆ 029000⑆712⑈

Paul Mazoda 251398

2/10 4/20

10662-828 TIMISKAMING CREDIT UNION LTD. 13
JUN 24 1993
22 PROSPECT AVE. – BOX 972 KIRKLAND LAKE, ONT. P2N 3L1
13 10662-828

10662-828 14
JUN 18 1993
22 PROSPECT AVE. – BOX 972 KIRKLAND LAKE, ONT. P2N 3L1
14 10662-828

2/5 2/10 4/20

Paul Mazoda 251398

2/20 1 Rod .10 3/10 5/20

10662-828 TIMISKAMING CREDIT UNION LTD. 13
JUN 10 1993
22 PROSPECT AVE. – BOX 972 KIRKLAND LAKE, ONT. P2N 3L1
13 10662-828

Paul Mazoda 251398

Tyre Mazoda

10662-828 TIMISKAMING CREDIT UNION LIMITED 15
MAY 20 1993
22 Prospect Ave., Box 972 Kirkland Lake, Ont. P2N 3L1
15 10662-828

Paul Mazda 251398

2/20

FERN RIVARD, L. RAITANEN,
PHIL RIVARD
BOX 1091 567-7344
KIRKLAND LAKE, ONT P2N 2C9

ACCT. NO. 290001

282

Jun 30 1993

PAY TO THE ORDER OF John Mazza $100.00

One Hundred 00/100 DOLLARS

TIMISKAMING CREDIT UNION LTD.
22 PROSPECT AVE. PH. (705) 567-3254
KIRKLAND LAKE, ONT. P2N 3L1

MEMO

Phil Rivard

⑈282⑈ ⑆106628⑆ 029000⑈712⑈

FERN RIVARD, L. RAITANEN,
PHIL RIVARD
BOX 1091 567-7344
KIRKLAND LAKE, ONT P2N 2C9

ACCT. NO. 290001

287

Jul 8 1993

PAY TO THE ORDER OF John Mazza $100.00

One Hundred 00/100 DOLLARS

TIMISKAMING CREDIT UNION LTD.
22 PROSPECT AVE. PH. (705) 567-3254
KIRKLAND LAKE, ONT. P2N 3L1

MEMO

Phil Rivard

⑈287⑈ ⑆106628⑆ 029000⑈712⑈

FERN RIVARD, L. RAITANEN,
PHIL RIVARD
BOX 1091 567-7344
KIRKLAND LAKE, ONT P2N 2C9

ACCT. NO. 290001

291

~~July~~ Jul 16 1993

PAY TO THE ORDER OF John Mazza $100.00

One Hundred 00/100 DOLLARS

TIMISKAMING CREDIT UNION LTD.
22 PROSPECT AVE. PH. (705) 567-3254
KIRKLAND LAKE, ONT. P2N 3L1

MEMO

Phil Rivard

⑈291⑈ ⑆106628⑆ 029000⑈712⑈

FERN RIVARD, L. RAITANEN,
PHIL RIVARD
BOX 1091 567-7344
KIRKLAND LAKE, ONT P2N 2C9

ACCT. NO. 290001

296

Jul 22 1993

PAY TO THE ORDER OF John Mazza $100.00

One Hundred 00/100 DOLLARS

TIMISKAMING CREDIT UNION LTD.
22 PROSPECT AVE. PH. (705) 567-3254
KIRKLAND LAKE, ONT. P2N 3L1

MEMO

Phil Rivard

⑈296⑈ ⑆106628⑆ 029000⑈712⑈

John Magee
251398
Lot 20 Con VI

10662-828
TIMISKAMING CREDIT UNION
LIMITED
15
JUL 8 1993
22 Prospect Ave., Box 972
Kirkland Lake, Ont. P2N 3L1
15
10662-828

John Magee
251398
Lot 20 Con VI

10662-828
TIMISKAMING CREDIT UNION
LIMITED
15
JUL 8 1993
22 Prospect Ave., Box 972
Kirkland Lake, Ont. P2N 3L1
15
10662-828

John Magee
251398.

13
10662-828
22 PROSPECT AVE., BOX 972
KIRKLAND LAKE, ONT. P2N 3L1
JUL 17 1993
13
10662-828

John Magee
251398.

10662-828
14
JUL 23 1993
22 PROSPECT AVE. — BOX 972
KIRKLAND LAKE, ONT. P2N 3L1
14
10662-828

John Magee
251398.

FERN RIVARD
PHIL RIVARD
BOX 1091 PH. 567-7344
KIRKLAND LAKE, ONT P2N 2C9

290001

001

Aug 19 1993

PAY TO THE ORDER OF John Mazza $ 100 00

One Hundred 00/100 DOLLARS

TIMISKAMING CREDIT UNION LTD.
22 PROSPECT AVE. PH. (705) 567-3254
KIRKLAND LAKE, ONT. P2N 3L1

MEMO

Phil Rivard

⑈001⑈ ⑆1066 2⑈8 28⑆ 029000 1⑈ 71 2⑈

---

FERN RIVARD, L. RAITANEN,
PHIL RIVARD
BOX 1091 567-7344
KIRKLAND LAKE, ONT P2N 2C9

ACCT. NO. 290001

274

Aug 10 1993

PAY TO THE ORDER OF John Mazza $ 100 00

One Hundred 00/100 DOLLARS

TIMISKAMING CREDIT UNION LTD.
22 PROSPECT AVE. PH. (705) 567-3254
KIRKLAND LAKE, ONT. P2N 3L1

MEMO

Phil Rivard

⑈274⑈ ⑆1066 2⑈8 28⑆ 029000 1⑈ 71 2⑈

---

FERN RIVARD, L. RAITANEN,
PHIL RIVARD
BOX 1091 567-7344
KIRKLAND LAKE, ONT P2N 2C9

ACCT. NO. 290001

273

Aug 9 1993

PAY TO THE ORDER OF John Mazza $ 100 00

One Hundred 00/100 DOLLARS

TIMISKAMING CREDIT UNION LTD.
22 PROSPECT AVE. PH. (705) 567-3254
KIRKLAND LAKE, ONT. P2N 3L1

MEMO

Phil Rivard

⑈273⑈ ⑆1066 2⑈8 28⑆ 029000 1⑈ 71 2⑈

---

FERN RIVARD, L. RAITANEN,
PHIL RIVARD
BOX 1091 567-7344
KIRKLAND LAKE, ONT P2N 2C9

ACCT. NO. 290001

299

July 30 1993

PAY TO THE ORDER OF John Mazza $ 100 00

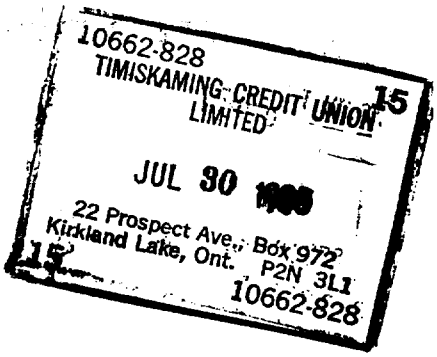
One Hundred 00/100 DOLLARS

TIMISKAMING CREDIT UNION LTD.
22 PROSPECT AVE. PH. (705) 567-3254
KIRKLAND LAKE, ONT. P2N 3L1

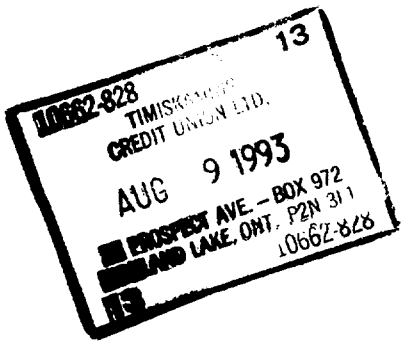
MEMO

Phil Rivard

⑈299⑈ ⑆1066 2⑈8 28⑆ 029000 1⑈ 71 2⑈



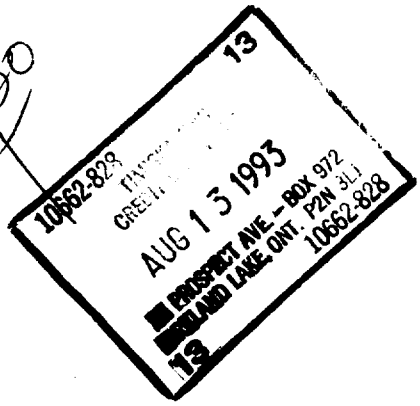

Mayor
25 1398




2/10
4/20

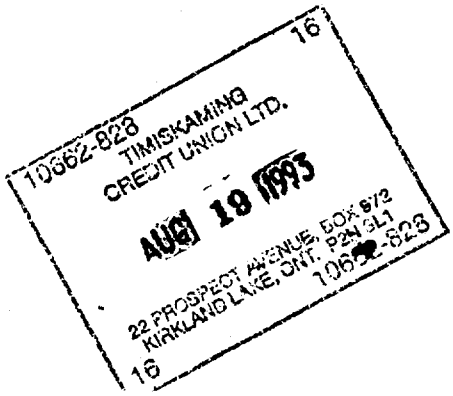
25 1398

Mayor




Mayor
25 1398

2/10
4/20




25 1398

Mayor

2/10
4/20

TRIM LINE

M.357

BEN NEVIS TP. M.325

THE TOWNSHIP
OF

# KATRINE

DISTRICT OF
TIMISKAMING

LARDER LAKE
MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

LEGEND

PATENTED LAND
CROWN LAND SALE
LEASES
LOCATED LAND
LICENCE OF OCCUPATION
MINING RIGHTS ONLY
SURFACE RIGHTS ONLY
ROADS
IMPROVED ROADS
KING'S HIGHWAYS
RAILWAYS
POWER LINES
MARSH OR MUSKEG
MINES

PATENTED LAND

1 M John E Jackson O.L.S. 2 M 3 M 1911 4 M 5 M 6 M

Sullivan Lake
Daughter Lake
Sylvia Lake
Wicklan Lake
Bourassa Lake
Geodetic Station
Dunbrack Lake
Forsyth Lake
Row L.
Jones Lake
River
Northern Misema Lake
Misema Lake
Kinobik Lake
Gem Lake
Gol Lake
Misema R.

1186412
1186231
1186243
1186232
1186244
1186245
1186736
1180480
1180460
1180465
1180464
1180513
1186260
1186261
1186222
1186223

REG PLAN M320

ARNOLD TP. M.321

NIPISSING TWP.

3RD MERIDIAN TP. M.378

3RD BASE LINE J. Newman O.L.S. 1907

McVITTIE TP. M.370

M+5.25ch.

Order no.
$R_1$ NR.W 83/80
$R_2$ NR.W 88/80
$R_3$ ~~Doc 36/80~~ ~~W 86/86~~
PT of W-8/86 and W
PT of W-8/86 (S.R. + I
W LI/89 NR MR AND
W LI/89 OPENED ORDER

INFORMATION THAT ON THIS MAP BEEN COMPILED VARIOUS SOURCES, ACCURACY IS NOT RANTEED. THOSE TO STAKE MIN- IMS SHOULD CON- TH THE MINING ER, MINISTRY OF RN DEVELOP- D MINES, FOR AD- INFORMATION STATUS OF THE HOWN HEREON.

CIRCULATED MARCH 29, 1966

PLAN NO. M. 357

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

COPY OF THIS MYLAR
ARCHIVED APR.15/92

42A01SE2001 OP93-270 OTTO

200

TRIM LINE

1

TECK TP. - M.392

# THE TOWNSHIP OF OTTO

DISTRICT OF TIMISKAMING

LARDER LAKE MINING DIVISION

SCALE: 1-INCH=40 CHAINS

EBY TP. - M.345

BOSTON TP. - M.332

MARQUIS TP. - M.362

## LEGEND

| | |
|---|---|
| PATENTED LAND | ● or (P) |
| CROWN LAND SALE | C.S. |
| LEASES | (L) |
| LOCATED LAND | Loc. |
| LICENSE OF OCCUPATION | L.O. |
| MINING RIGHTS ONLY | M.R.O. |
| SURFACE RIGHTS ONLY | S.R.O. |
| ROADS | |
| IMPROVED ROADS | |
| KING'S HIGHWAYS | (P) |
| RAILWAYS | |
| POWER LINES | |
| MARSH OR MUSKEG | |
| MINES | |
| CANCELLED | |
| PATENTED S.R.O. | |

## NOTES

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

(R) SURFACE AND MINING RIGHTS WITHDRAWN FROM STAKING SEC. 36/80, W.9/86, JAN. 24, 1986 O-L26-90 NR OPENS W9/86 DEC. 14, 1990

✳ APPLICATION UNDER THE PUBLIC LANDS ACT SEC. 31 (b) OF THE MINING ACT

CL.5029 DISPOSITION OF CROWN LAND
Surface Rights Withdrawn under Sec. 36, The Mining Act R.S.O. 1980, ORDER NO. W-01/91/ONT (Trans Canada Pipeline Right of Way and Buffer Zone particularly 40.25 meters or 132 ft. on either side of centre line of right of way)

## NOTICE OF FORESTRY ACTIVITY

THIS TOWNSHIP / AREA FALLS WITHIN THE TIMISKAMING MANAGEMENT UNIT

AND MAY BE SUBJECT TO FORESTRY OPERATIONS. THE MNR UNIT FORESTER FOR THIS AREA CAN BE CONTACTED AT: P.O. BOX 129
SWASTIKA, ONT.
P0K 1T0
705-642-3222

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.

DATE OF ISSUE
JUN 09 1998
PROVINCIAL RECORDING OFFICE - SUDBURY

PLAN NO. M-379

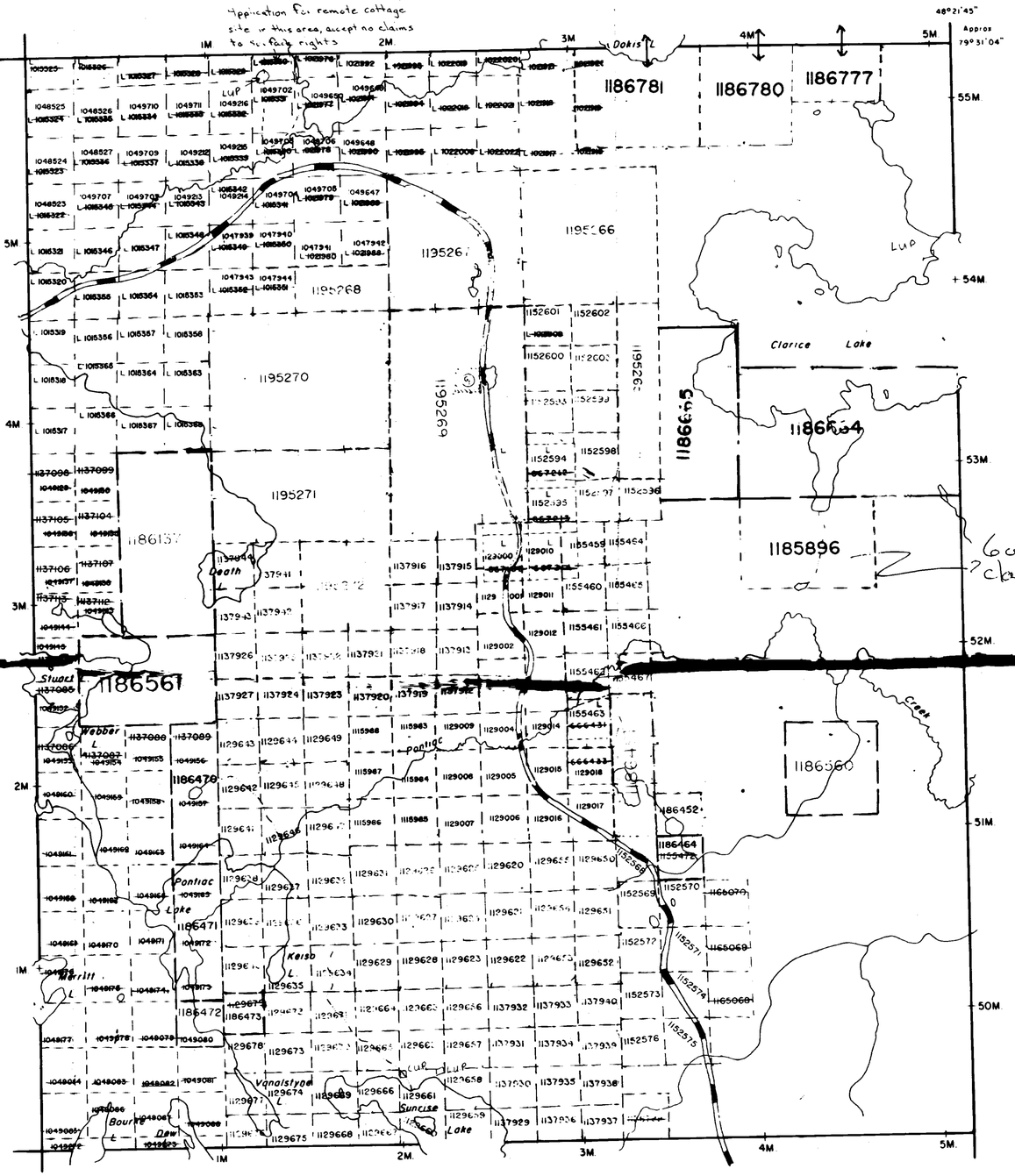
MINISTRY OF NORTHERN DEVELOPMENT AND MINES

CIRCULATED NOV.3/88
ARCHIVED ON JUNE 01/95

42A01SE2001 OP93-270 OTTO 210

N-385

# DOKIS TWP. M-342




## NOTES

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

## SAND and GRAVEL

(G) M.N.R. GRAVEL PIT

## NOTICE OF FORESTRY ACTIVITY

THIS TOWNSHIP / AREA FALLS WITHIN THE ------
TIMISKAMING MANAGEMENT UNIT
AND MAY BE SUBJECT TO FORESTRY OPERATIONS.
THE MNR UNIT FORESTER FOR THIS AREA CAN BE CONTACTED AT: P.O. BOX 129
SWASTIKA, ONT.
POK 1TO
705-642-3222

## 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. |
| | 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

# PONTIAC

DISTRICT OF
COCHRANE

LARDER LAKE
MINING DIVISION

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

DR. RW Noble
DATE Feb 10, 72
PLAN NO. M-382

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING 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

COPY OF THIS MYLAR ARCHIVED CT JAN 28/92

M-385

42A01SE2001 0P93-270 OTTO

# LEGEND

FELSIC TO INTERMEDIATE INTRUSIVE ROCKS

7 — 7 Undivided; 7a Granite; 7b Syenite; 7c Feldspar Porphyry; 7d Granodiorite; 7e Diorite; 7f Monzonite

MAFIC TO ULTRAMAFIC INTRUSIVE ROCKS

6 — 6 Undivided; 6a Gabbro; 6b Gabbro Anorthosite; 6c Anorthosite; 6d Pyroxenite; 6e Peridotite; 6f Diabase; 6g Lamprophyre

SEDIMENTS

5 — 5 Undivided; 5a Greywacke; 5b Chert; 5c Graphitic shale; 5d Conglomerate; 5e Sandstone; 5f Shale

FELSIC METAVOLCANICS

4 — 4 Undivided; 4a Rhyolite; 4b Rhyolite breccia; 4c Dacite; 4d Dacite breccia

MAFIC METAVOLCANICS

2 2' Fe Mg — 2 Undivided; 2a Massive flows; 2b Pillowed flows; 2c Massive to well foliated coarse-grained flows; 2d Variolitic flows; 2e Py,f and lapilli-tuff; 2f Flow-top breccia

ULTRAMAFIC METAVOLCANICS

1 — 1 Undivided; 1a Massive, polysutured serpentinized flows; 1b Spinifex textured flows; 1c Ultramafic pyroclastics; 1d Talc-carbonate alteration

# SYMBOLS

- Claim Post
- Claim Line
- Trail
- Creek
- Outcrop Boundary
- Small Outcrop or Station
- WR 192388 — Whole Rock or Assay Sample Location
- Strike and Dip of Foliation
- Strike and Dip of Bedding
- Geological Contact
- Fault
- q.s. — Quartz Stringers
- Q.V. 12" — Quartz Vein With Width and Dip
- cal. — Calcite Stringers
- mag. — Magnetic Attraction
- py. — Pyrite
- cpy. — Chalcopyrite
- mal. — Malachite
- carb. — Carbonate Alteration
- spar. — Sparry Calcite
- Drill Hole
- Pit or Trench
- VLF-EM Anomaly
- MAXI PROBE ANOMALY — RED – GOOD TO EXCELLENT; YELLOW – MEDIUM TO GOOD; BLACK – MINOR TO WEAK

SCALE 1:2500

50 0 50 100 150 200 METRES

ASTRONOMIC NORTH

# OTTO TWP. PROPERTY

## SURFACE GEOLOGY PLAN

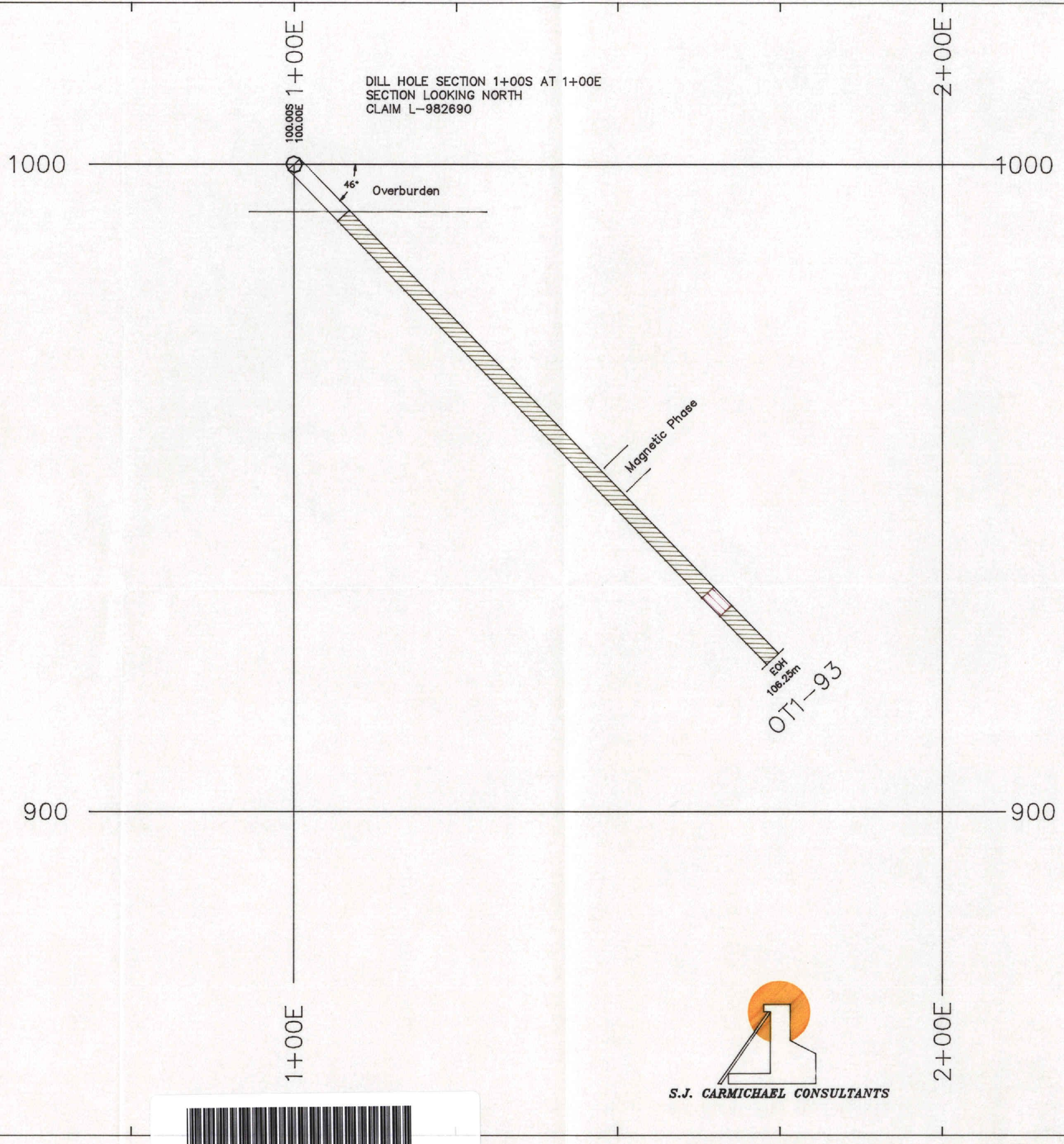
OTTO TOWNSHIP
LARDER LAKE MINING DIVISION
DISTRICT OF TIMISKAMING, ONT.

| | | |
|---|---|---|
| NTS 42 A/SE | SCALE: 1:2500 | PROJECT: OP93-270 |
| DATE: JAN. 1992 | DRAWN BY: S.J.C. | REVISED: OCTOBER, 1993 |
| | | DRAWING NO. 1 |

GEOLOGICAL ASSOCIATION OF CANADA — S. J. Carmichael — 1300 30/9/93 — FELLOW

42A01SE2001 OP93-270 OTTO
230

DILL HOLE SECTION 1+00S AT 1+00E
SECTION LOOKING NORTH
CLAIM L-982690




LEGEND

- CASE — CASING

ROCK CODES

SEDIMENTARY UNITS

- GRAPHITIC SHALE
- BRECCIATED GRAPHITIC SHALE
- SILTSTONE

VOLCANIC UNITS

- BASALTIC KOMATIITE
- CARBONATED ULTRAMAFIC
- TALC CHLORITE SCHIST
- BASALT
- BRECCIATED BASALT
- MINERALIZED ZONE
- MAFIC INTRUSIVE
- MAFIC SYENITE

SCALE 1:500

10 0 20 40

METRES

GEOLOGICAL ASSOCIATION OF CANADA
S. J. Carmichael
Nov. 30/93
FELLOW

# OTTO TOWNSHIP PROPERTY

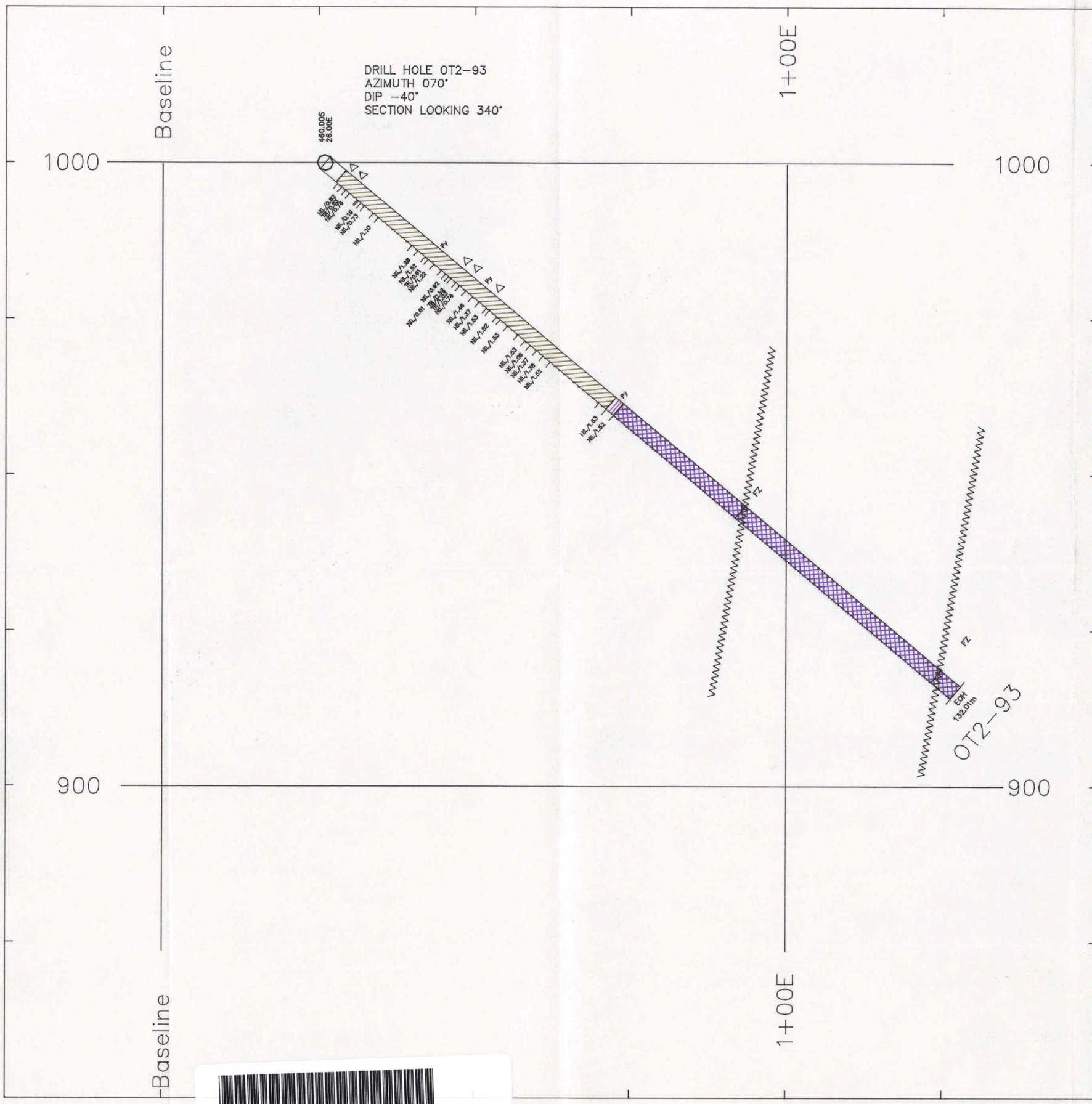
## DRILL HOLE SECTION 1+00S
## DRILL HOLE OT1-93
## SECTION LOOKING NORTH

OTTO TOWNSHIP
DISTRICT OF TIMISKAMING, ONT.
LARDER LAKE MINING DIVISION

| | | |
|---|---|---|
| NTS: 42 A/SE | Scale: 1:500 Metric | Revised: Date: Sept, 1993 |
| PROJECT: OP93-270 | Drawn by: S.J.C. | Drawing No. 2 |

S.J. CARMICHAEL CONSULTANTS

42A01SE2001 OP93-270 OTTO
240




LEGEND

CASE CASING

ROCK CODES

SEDIMENTARY UNITS

GRAPHITIC SHALE

BRECCIATED GRAPHITIC SHALE

SILTSTONE

VOLCANIC UNITS

BASALTIC KOMATIITE

CARBONATED ULTRAMAFIC

TALC CHLORITE SCHIST

BASALT

BRECCIATED BASALTIC

MINERALIZED ZONE

MAFIC INTRUSIVE

MAFIC SYENITE

Silicification

Fault

Py Pyrite

SCALE 1:500

10 0 20 40

METRES

GEOLOGICAL ASSOCIATION OF CANADA
S. J. Carmichael
1000. 30/93
FELLOW

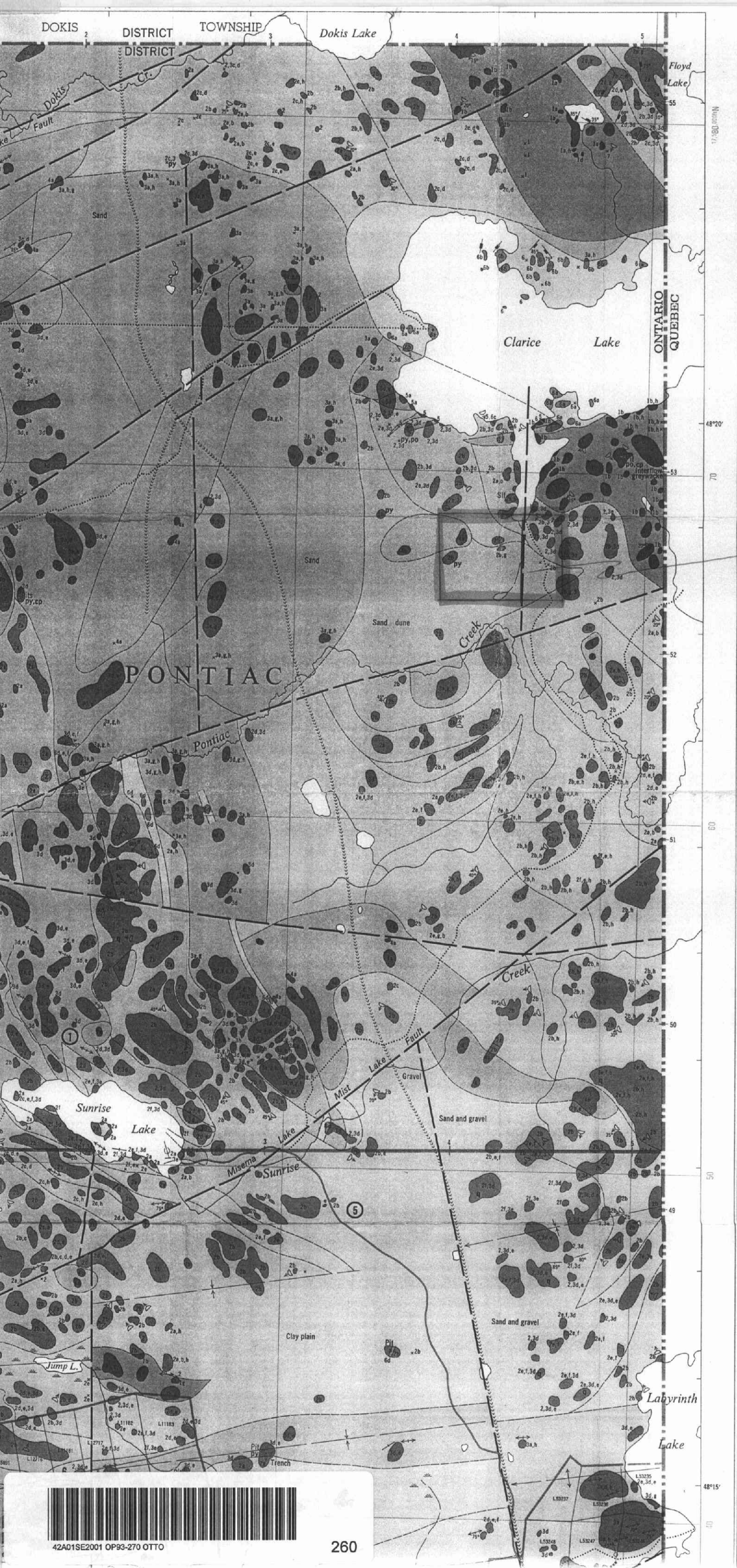
# OTTO TOWNSHIP PROPERTY

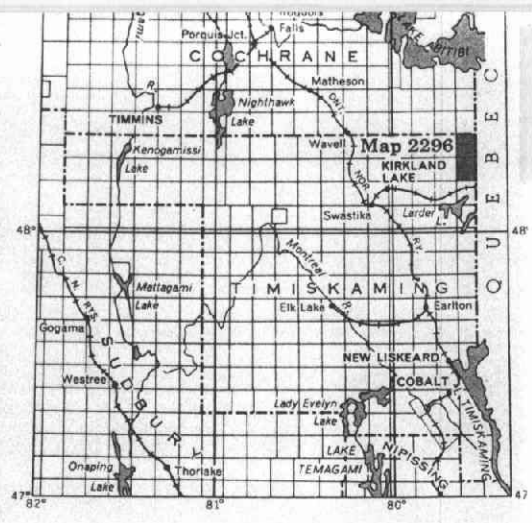
## DRILL HOLE SECTION 4+60S
## DRILL HOLE OT2-93
## SECTION LOOKING 340°

OTTO TOWNSHIP
DISTRICT OF TIMISKAMING, ONT.
LARDER LAKE MINING DIVISION

| | | |
|---|---|---|
| NTS: 42 A/SE | SCALE: 1:500 METRIC | REVISED: DATE: SEPT. 1993 |
| PROJECT: OP93-270 | DRAWN BY: S.J.C. | DRAWING NO: 3 |

42A01SE2001 OP93-270 OTTO
250




Scale, 1 inch to 50 miles

N.T.S. Reference 32D/4, 32D/5

Pontiac Twp
Claim

Proposed location of baseline for prospecting.

## LEGEND

**CENOZOIC**[a]

**QUATERNARY**

PLEISTOCENE AND RECENT

*Sand, gravel and clay.*

UNCONFORMITY

**PRECAMBRIAN**[b]

**MIDDLE TO LATE PRECAMBRIAN (PROTEROZOIC)**

**KEWEENAWAN**

*7 Diabase (dikes).*

INTRUSIVE CONTACT

**EARLY PRECAMBRIAN (ARCHEAN)**

**FELSIC INTRUSIVE ROCKS**

*6 Unsubdivided.*
*6a Quartz diorite.*
*6b Granodiorite.*
*6c Quartz monzonite.*
*6d Feldspar porphyry (dikes).*

INTRUSIVE CONTACT

**INTERMEDIATE INTRUSIVE ROCKS**

*5 Unsubdivided.*
*5a Microdiorite (magnetic).*

INTRUSIVE CONTACT

**MAFIC INTRUSIVE ROCKS**

*4 Unsubdivided.*
*4a Gabbro and quartz gabbro.*
*4b Diorite and quartz diorite.*
*4c Hornblende gabbro.*
*4d Magnetite-rich gabbro.*
*4e Mafic pegmatite.*

INTRUSIVE CONTACT

**VOLCANIC ROCKS**

FELSIC VOLCANIC ROCKS

*3 Unsubdivided.*
*3a Massive rhyodacite and rhyolite.*
*3b Leucophyre (dikes).*
*3c Rhyodacite or rhyolite agglomerate or flow breccia.*
*3d Rhyodacite or rhyolite tuff breccia or lapilli tuff.*
*3e Rhyodacite or rhyolite tuff and ash.*
*3f Amygdaloidal rhyodacite or rhyolite.*
*3g Rhyodacite or rhyolite feldspar porphyry.*
*3h Rhyodacite or rhyolite quartz porphyry.*

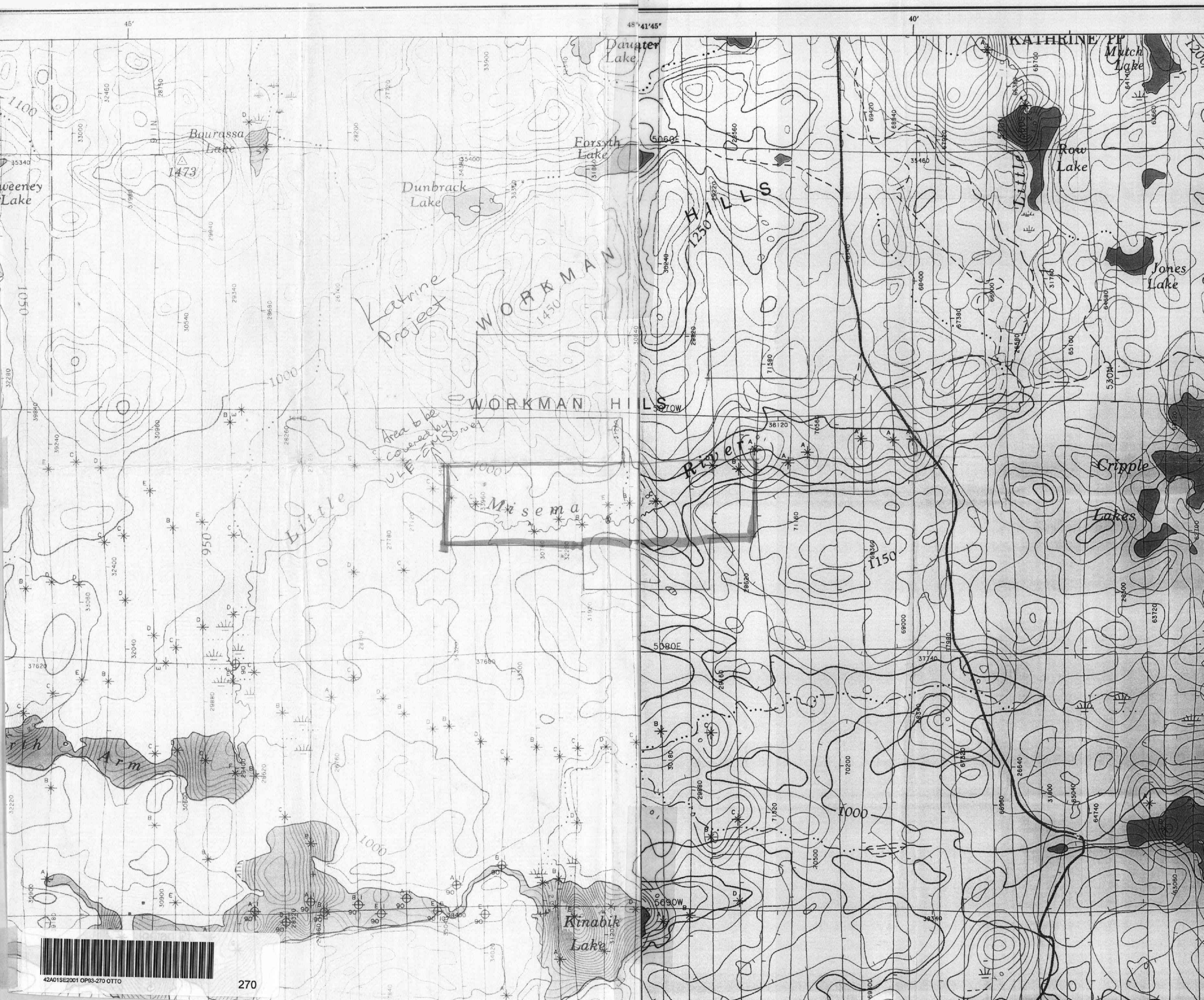
INTERMEDIATE VOLCANIC ROCKS

*2 Unsubdivided.*
*2a Massive andesite or dacite (includes some diorite).*
*2b Pillowed andesite or dacite lava flows.*
*2c Andesite or dacite block lava and flow breccia.*
*2d Andesite or dacite agglomerate.*
*2e Andesite or dacite tuff breccia or lapilli tuff.*
*2f Andesite or dacite tuff.*
*2g Amygdaloidal andesite or dacite.*
*2h Andesite or dacite feldspar porphyry.*
*2j Dacite quartz porphyry.*

MAFIC VOLCANIC ROCKS

*1 Unsubdivided.*
*1a Massive basalt or basaltic andesite (includes some gabbro).*
*1b Pillowed basalt or basaltic andesite.*
*1c Basalt or basaltic andesite block lava and flow breccia.*
*1d Basalt or basaltic andesite tuff breccia.*
*1e Variolitic basalt.*
*1g Amygdaloidal basalt.*
*1h Basaltic andesite feldspar porphyry.*

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