52M01SE8108 2.12571 FAIRLIE

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2.12571

# GEOPHYSICAL ASSESSMENT REPORT ON

# WOLF BAY PROPERTY

# RED LAKE AREA

NTS: 52 M/1

RECEIVED
JUN 20 1989
MINING LANDS SECTION

Submitted by:

Peter A. Diorio
Senior Geophysicist
BHP-Utah Mines Ltd.
Toronto, Ontario

June 1989

52M01SE8108 2.12571 FAIRLIE

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## 1.0 SUMMARY

Approximately 123 line kilometers of magnetic and VLF surveys were completed by BHP-Utah Mines Ltd. over the Wolf bay Property, located in Todd, Fairlie and Baird Townships near Red Lake, Ontario. These surveys are part of an ongoing gold exploration program.

The surveys were performed on two cut line grids (East and West), much of which were emplaced on the lake ice and removed immediately after completion of the survey.

The magnetic response is dominated by an oxide iron formation which transects the West grid. Most of the iron formation bands have coincident VLF anomalies. Elsewhere the magnetics show erratic, moderately intense anomalies typical of mafic volcanics and intrusives.

Four areas are identified which require closer attention.

1. A band of iron formation which is conductive but not magnetic along part of its length. This may have been altered by sulphidation.
2. A portion of the iron formation which may have been tectonically thickened.
3. Coincident VLF-IP anomalies north of the iron formation.
4. A strong linear VLF anomaly on the East grid may be related to a proposed deformation zone.

## 2.0 LOCATION AND ACCESS

The Wolf Bay Property consisting of two groups of contiguous claims as shown on Figure 1. The west grid also contains claims held by R. Soltermann under option to BHP-Utah Mines Ltd.

The property may be reached from Red Lake by boat or snowmobile or, as in the case of the surveys here, via the Suffel Lake Road. A camp two miles south of the West grid served as a base of operations.

The topography is rugged, typically with 30 meters of relief. The short of Red Lake is often marked by a cliff. Outcrop exposure is extensive.

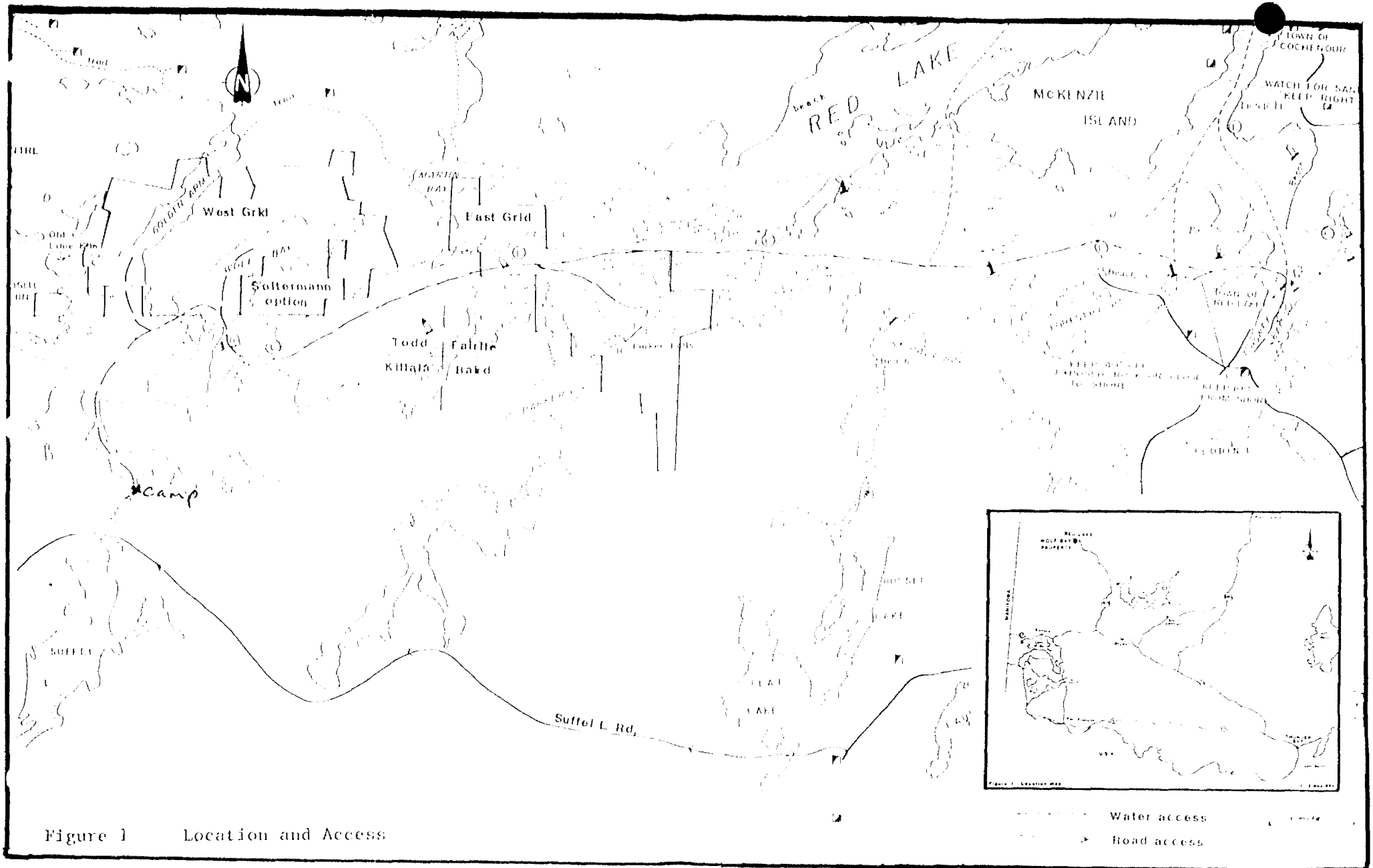


Figure 1 Location and Access

## 3.0 CLAIMS COVERED BY THE SURVEY

Table 1 lists claims covered by the geophysical surveys. In addition the 13 Soltermann claims were covered, however only two of these KRL 903833-903834 are to be considered for assessment credits. KRL 368771 is patented and KRL 502556-561, KRL 502839-842 each have the maximum 200 days assessment.

Figure 2 shows the extent of the grid covered by the mag and VLF surveys.

Magnetometer data on lines 32N - 34N on the East grid was unacceptably noisy hence was removed from the contoured data set.

## 4.0 GEOLOGY

The following sections on geology are taken verbatim from Allen 1989.

### 4.1 Regional Geology

The Red Lake greenstone belt is located in the west half of the Uchi Subprovince in the Superior Province of the Canadian Shield. The simplified geology of the belt is shown in Figure 3. All rocks are of Archean age and have been metamorphosed.

The belt is dominated by volcanic rocks, with subordinate clastic sediments. It is bounded on all sides by large granitic batholiths. The volcanic rocks have been subdivided in to two major groups; an older tholeiitic-komatiitic sequence and a younger calc-alkaline sequence (Andrews, et al., 1986). The Wolf Bay property lies within the tholeiitic-komatiitic sequence.

The older sequence is primarily tholeiitic basalts and basaltic komatiites. Minor interbeds of felsic volcanics, mainly pyroclastics, are present as thin units interspersed through the mafic-ultramafic

Table 1

| EAST GRID | WEST GRID |
|---|---|
| 1038993 | 1038994 |
| 1039281 | 1038995 |
| 1039283 | 1039003 |
| 1039284 | 1039004 |
| 1039285 | 1039005 |
| 1039286 | 1039006 |
| 1039287 | 1039013 |
| 1039288 | 1039014 |
| 1039289 | 1039016 |
| 1039290 | 1039023 |
| 1039291 | 1039024 |
| 1039292 | 1039025 |
| 1039293 | 1039026 |
| 1039294 | 1039027 |
| 1039295 | 1039028 |
| 1039304 | 1039029 |
| 1039333 | 1039031 |
| 1039334 | 1039296 |
| 1039335 | 1039297 |
| 1039336 | 1039300 |
| 1039337 | 1039301 |
| 1039341 | 1039308 |
| 1039344 | 1039309 |
| 1039345 | 1039310 |
| 1039346 | 1039311 |
| 1039352 | 1039312 |
| 1039353 | 1039327 |
| 1045820 | |
| 1045821 | |
| 1045822 | |
| 1045823 | |
| 1045824 | |
| 1045825 | |
| 1045826 | |
| 1045827 | |
| 1045828 | |
| 1045829 | |
| 1045830 | |
| 1056670 | |
| 1056671 | |
| 1056672 | |
| 1056673 | |
| 1056674 | |
| 1056675 | |
| 1056680 | |
| 1056681 | |
| 1056682 | |
| 1056683 | |
| 1056684 | |
| 1056685 | |
| 1056686 | |
| 1056687 | |

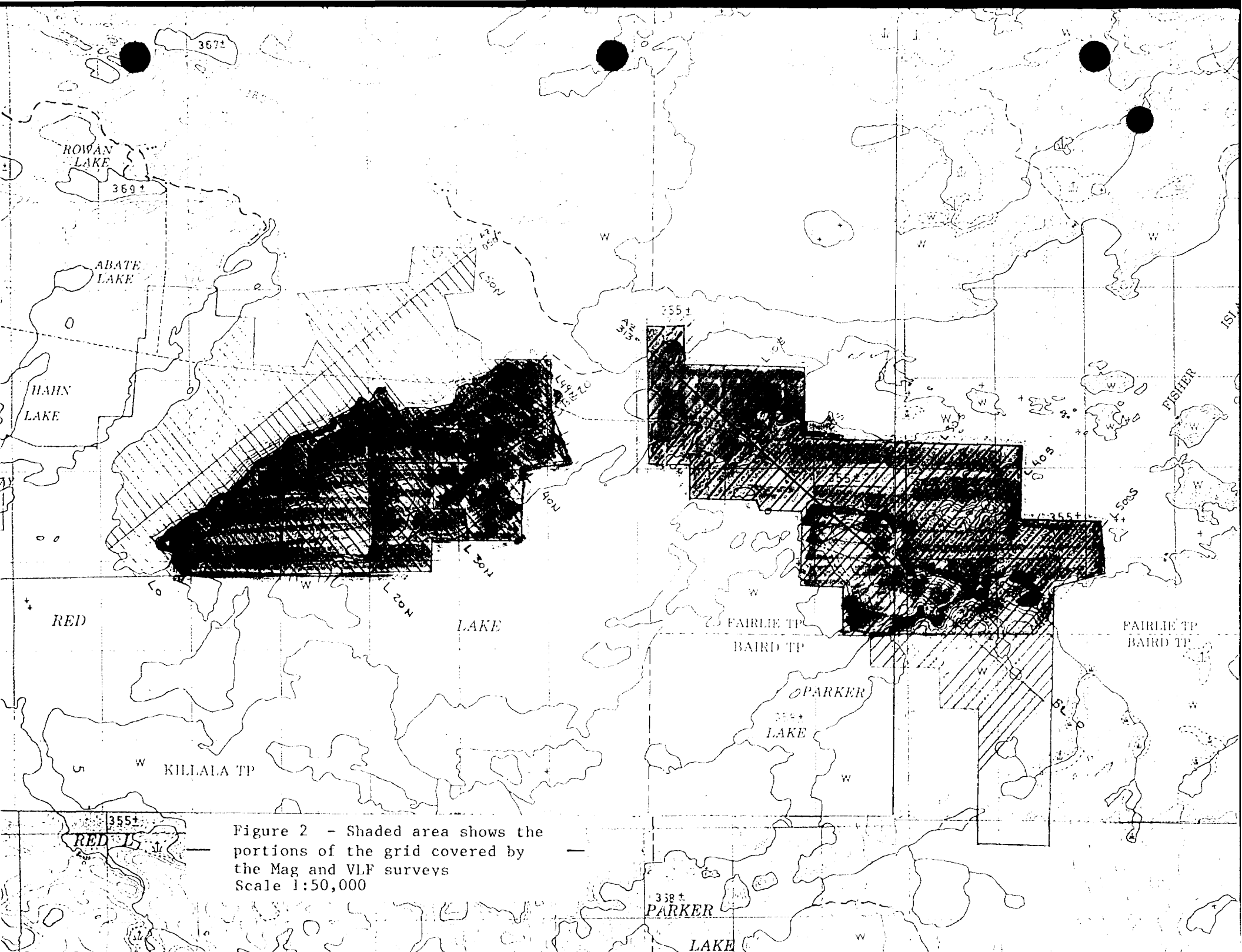


Figure 2 - Shaded area shows the portions of the grid covered by the Mag and VLF surveys
Scale 1:50,000

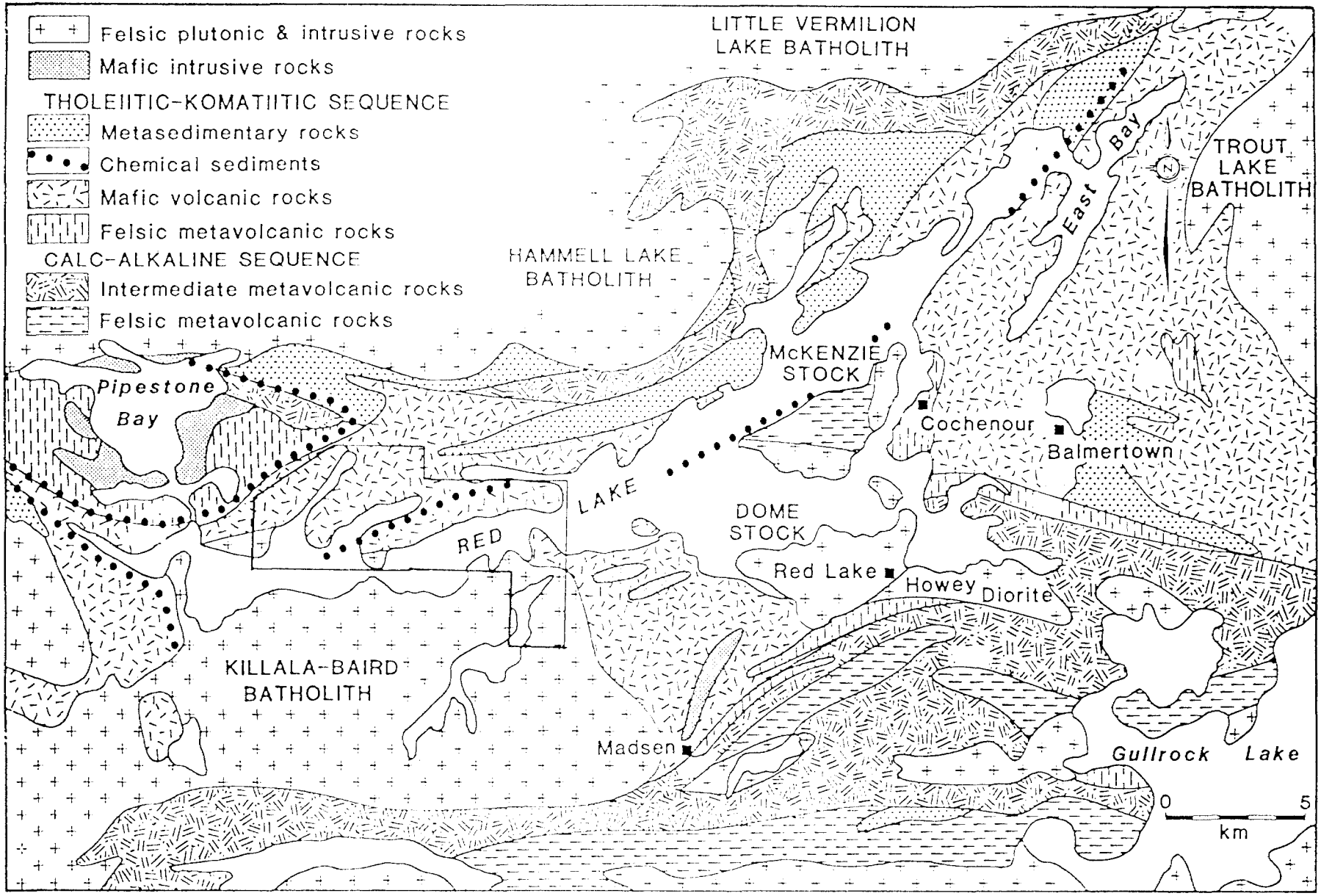




**Figure 3 Regional geology.**

(modified after Andrews, et. al., 1986)

sequence. Thin interflow units of greywacke, argillite, chert, ironstone, and ferruginous marble comprise the sediments. Graded wacke-mudstones and polymictic conglomerates are commonly present at the top of the tholeiitic-komatiitic sequence. (Andrews, et. al., 1986).

The younger calc-alkaline sequence is primarily rhyolitic to dacitic pyroclastic lithologies and basaltic to andesitic flows. A variety of igneous rocks intrudes the supracrustals, ranging from serpentinized periodotites to minor felsic dikes. The Dome stock is the largest of the internal intrusions. It is a biotite and hornblende granodiorite and trondhjemite. The bounding batholiths of the belt are composite intermediate to felsic bodies (Andrews, et. al., 1986).

## 4.2 Property Geology

Figure 4 shows the simplified geology of the Wolf Bay property.

Most of the property is underlain by mafic volcanics, primarily massive, foliated and pillowed flows. Ultramafic flows and/or intrusive rocks are found along the southwest edge of the peninsula between Wolf Bay and Martin Bay.

Intermediate volcanics, primarily pillowed flows, outcrop in the northwest portion of the West grid. Felsic volcanic rocks are confined to a band of crystal tuff that outcrops along the western part of the peninsula south of Wolf Bay on the West grid. This unit continues northeast onto the peninsula between Middle Narrows and Martin Bay on the East grid.

South and east of the tuff is an exhalite unit composed of intermixed chert, magnetite ironstone

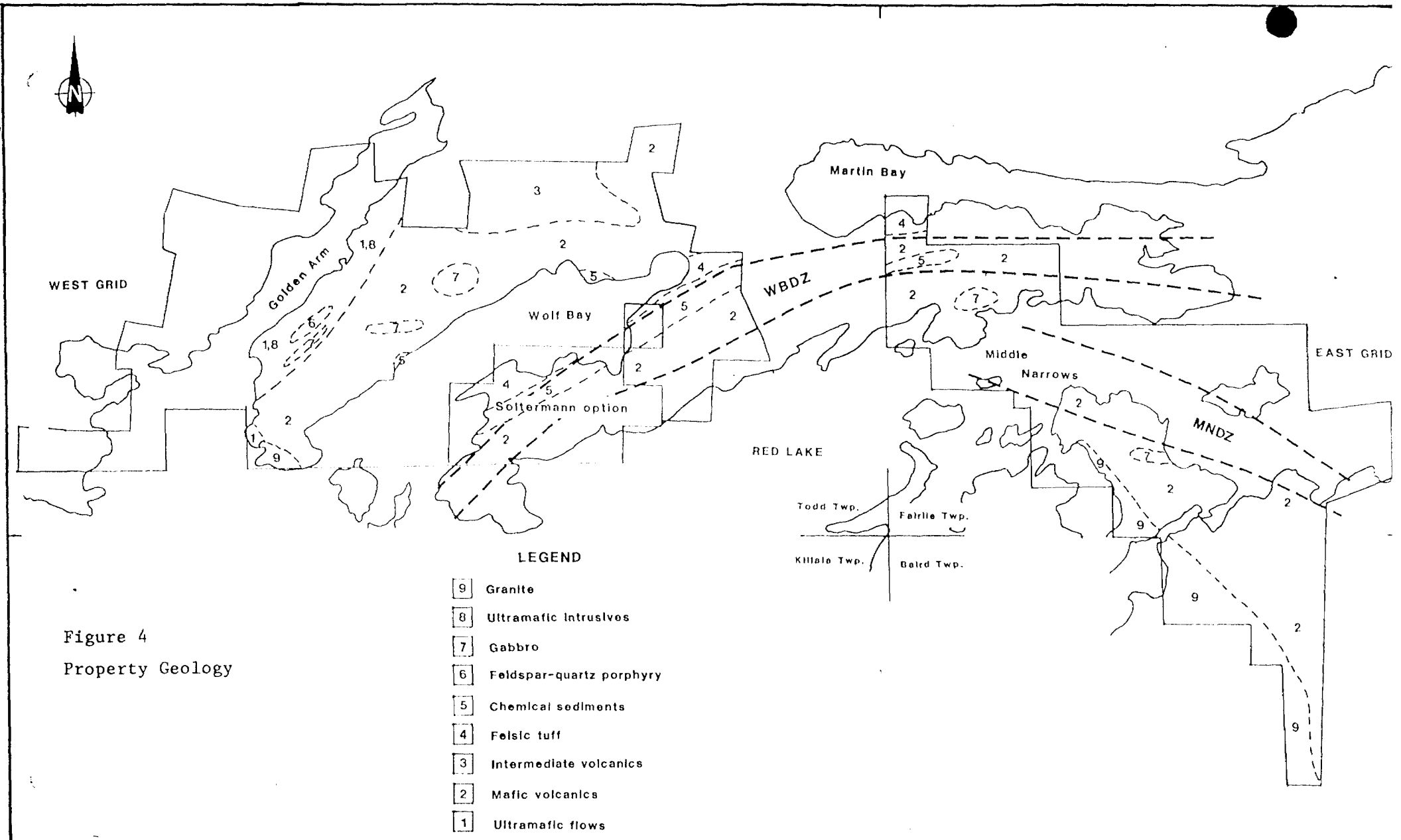


Figure 4
Property Geology

(MIS), and chert/ironstone breccia. This exhalite unit trends northeast from the Soltermann option until it appears to pinch out on the east grid.

Scattered, irregular gabbro bodies intrude the mafic metavolcanics. In some cases these may be simply coarser phases of the flow, but were mapped as a separate unit. Granitic basement rocks outcrop along the southwest edge of both grids.

Two deformation zones, the Wolf Bay deformation zone (WBDZ) and the Middle Narrows deformation zone (MNDZ) have recently been identified and provide a focus for the exploration effort.

## 5.0 PREVIOUS EXPLORATION HISTORY

Government mapping of the Red Lake area began with E.L. Bruce in 1924. H.C. Horwood mapped the area in 1940, followed by R. Riley in 1971. Mapping by Moe Lavigne in the summer and fall of 1987 identified the WBDZ and MNDZ.

Horwood, 1940, reports claim staking in the Red Lake area as early as 1897. Sustained activity began in 1924. most of the work in this area was aimed at gold, with some base metal exploration in the 1960's and 1970's.

Durocher, et. al., in the 1987 compilation "Gold Occurrences, Prospects and Deposits of the Red Lake Area", provide a summary of most of the work done in the past in the Red Lake gold camp. Little work and no gold values greater than 0.01 opt, are reported on the Wolf Bay claims.

Redaurum Red Lake Mines Ltd. holds patented ground southeast of the east grid. Values of 0.4 opt over 60 cm from drilling and 30 m of 0.38 opt from a series of 58 cm channel samples are reported. The best results from previous work in the vicinity of the West grid are from the recently optioned

Soltermann property. Values of 0.16 opt over 81 cm and 0.81 over 56 cm are reported from surface sampling by Perma Gold Mines in the 1950's.

In 1988 BHP-Utah Mines mapped the property using a 100 meter cut line grid.

## 6.0 METHOD OF GEOPHYSICAL SURVEYS

### 6.1 Magnetic Survey

The magnetic survey was carried out using a Scintrex MP-4 hand-held Proton Precession magnetometer. Magnetometers of this type make use of the phenomena called Nuclear Magnetic Resonance. The phenomena is observable when the nuclei of certain materials are first aligned to some direction by an intense magnetic field and then allowed to precess about a "weak" magnetic field. In the case of this survey the "weak" field is dominated by the earth's magnetic field. The intense magnetic field is provided by a D.C. current through a coil surrounding a proton rich fluid (kerosene). When the current is switched off, the protons precess about the earth's field with a frequency directly proportional to that field. The proportionality appears to be fundamental property of the nuclei and is not influenced by temperature or chemical variations. The frequency is measured by observing the current induced in a coil surrounding the fluid. A magnetometer based on this principle is effectively free from drift. The output is in the form of a 6 digit display yielding the total field measurement in gammas (nanoteslas). The resolution and accuracy of this unit is $\pm$ 0.1 gamma.

### 6.2 VLF-EM Survey

The electromagnetic survey was carried out using a Scintrex VLF-4 electromagnetic system. The VLF-4 is a

receiver that measures the VLF magnetic field component from transmitter stations normally used for navigation and military submarine communications. The survey made use of the VLF transmitter in Cutler Maine operating at a frequency of 24.0 kHz.

The VLF-4 measures three components of the VLF-magnetic field: the horizontal amplitude vector in a direction perpendicular to a line joining the operator to the station; vertical in-phase amplitude and; vertical quadrature amplitude.

These components are recorded simultaneously for a given station. The vertical components are expressed as a percentage of a horizontal field.

## 7.0 DATA PRESENTATION

Data is presented at a scale of 1:5000 on the following ten map sheets.

WOLF BAY WEST GRID

Fraser Filter VLF Contours
VLF In-Phase and Quadrature Profiles and Posted Data Values
Total Field Magnetic Contours
Total Field Magnetic Posted Data Values
Survey Grid with Claim Locations

WOLF BAY EAST GRID

Fraser Filtered VLF Contours
VLF In-Phase and Quadrature Profiles and Posted Data Values
Total Field Magnetics Contours
Total Field Magnetics Posted Data Values
Survey Grid with Claim Locations

## 8.0 INTERPRETATION

### 8.1 West Grid

The magnetic map is dominated by several zones of intense (5000-10000 nT) anomalies which undoubtedly arise from magnetite iron formations. Intimately associated with these are strong VLF anomalies directly correlated with peak magnetic responses. The degree of correlation suggests that the EM response is attributable to intrinsic conductivity of massive magnetite however, in some cases sulphide facies iron formation, interbedded graphitic sediments or possibly sulphidation of the iron formation may contribute to the conductivity. In each of these latter three cases we would expect a decrease in magnetic response with increased conductivity. In at least one case (L39N 1775E to 43N 1900E) a VLF conductor continues through a gap in the magnetic unit. Note that the intense mag lows within the iron formation (eg. L17N at 1500E) result from inability of the proton magnetometer to function in areas of very high gradient. Rather than magnetic lows they are probably extreme magnetic highs and should most properly be considered as areas of "no data".

Several VLF anomalies run parallel to and 100 to 300 meters north of the iron formation. Limited IP coverage suggests these are also strongly polarizable anomalies. They lack magnetic response and may be graphite or perhaps sulphide iron formation. These are proximal to and conformable with the interpreted deformation zone and hence warrant further alteration.

### 8.2 East Grid

The magnetic contours of the East grid exhibit a mixture of flat areas with moderate amplitude (<2000 nT) anomalies. This erratic anomaly pattern is typical of

Archean mafic volcanics and intrusives. Extensive iron formations are absent and even the relatively minor iron formations which were mapped do not have a significant magnetic expression. Unlike the West grid, there is no obvious correlation between magnetic and electromagnetic responses.

Two very intense VLF anomalies stand out. From L48S at 325E to L52S at 500E the response probably arises from a power line. From L18S at 400E to L6S at 400W a strong anomaly is noted. An abandoned power line is mapped in this general vicinity however the shape of the VLF response is not consistent with a power line source. The anomaly is located close to the southern edge of the Wolf Bay deformation zone and may be of interest on that basis.

## 9.0 RECOMMENDATIONS

Magnetics and VLF surveys, while useful as an aid to mapping (eg. iron formations, graphitic sediments, conductive faults), produce at best indirect guides to exploration in this type of environment. Recommendations tend to be notoriously subjective, particularly in the early stages of an exploration program. However, several features have emerged which, in the opinion of the author, warrant further attention. These areas are compiled for convenience on Figure 5a,b.

1) VLF anomaly L38N at 1775E to L43N at 1800E

This conductive zone lies within a "dead" spot along a magnetic unit and may result from an area where the iron formation has been sulphidized, hopefully with accompanying gold deposition. Strongly altered outcrop with anomalous gold was identified previously on line 45N approximately Station 2160E (Showing 2).

Follow-up - Prospecting, geochem and IP are recommended

follow-up area

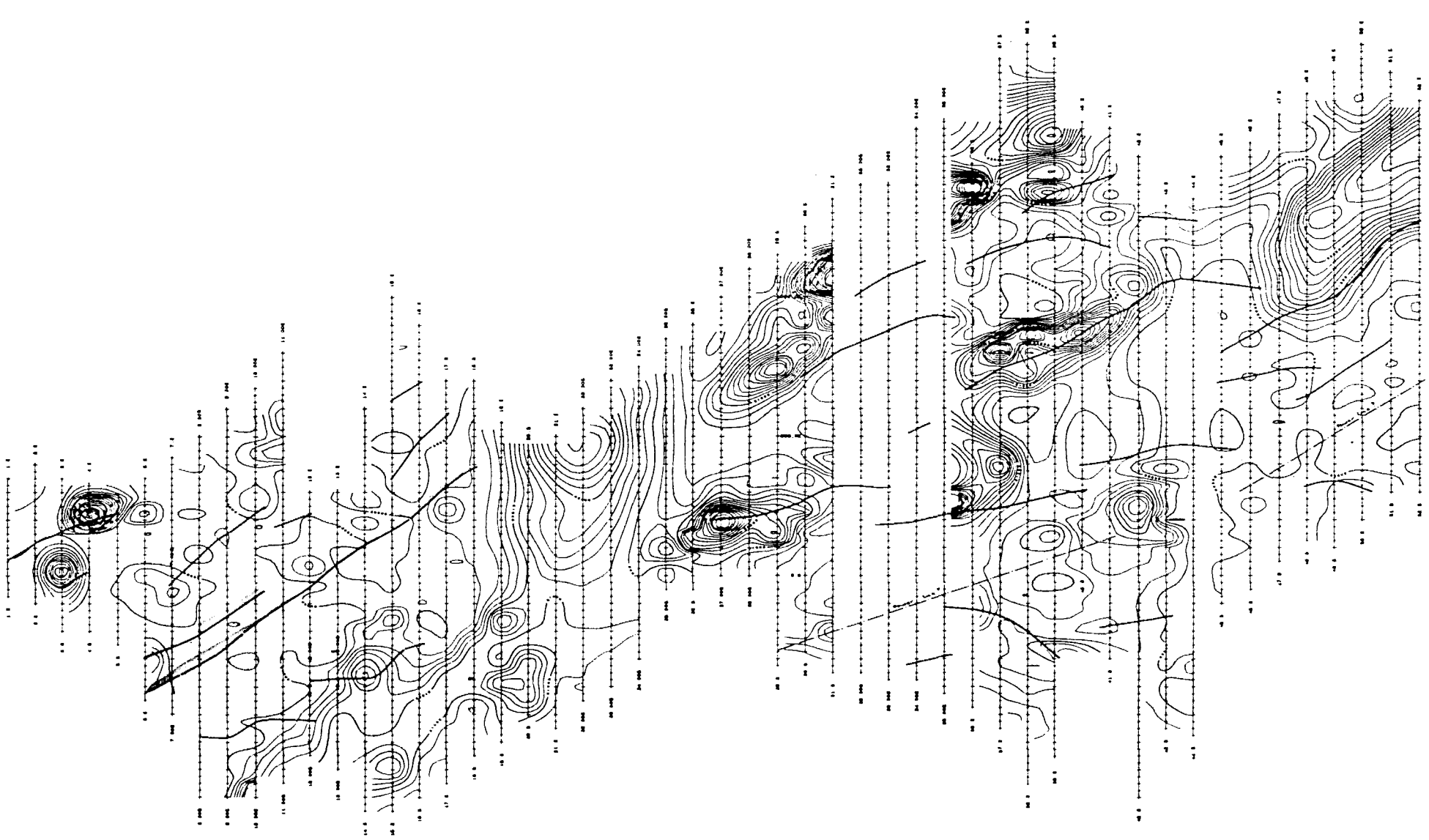

**FIGURE 5b WOLF BAY EAST GRID (1:20000)**
**MAG CONTOURS WITH VLF ANOMALIES**

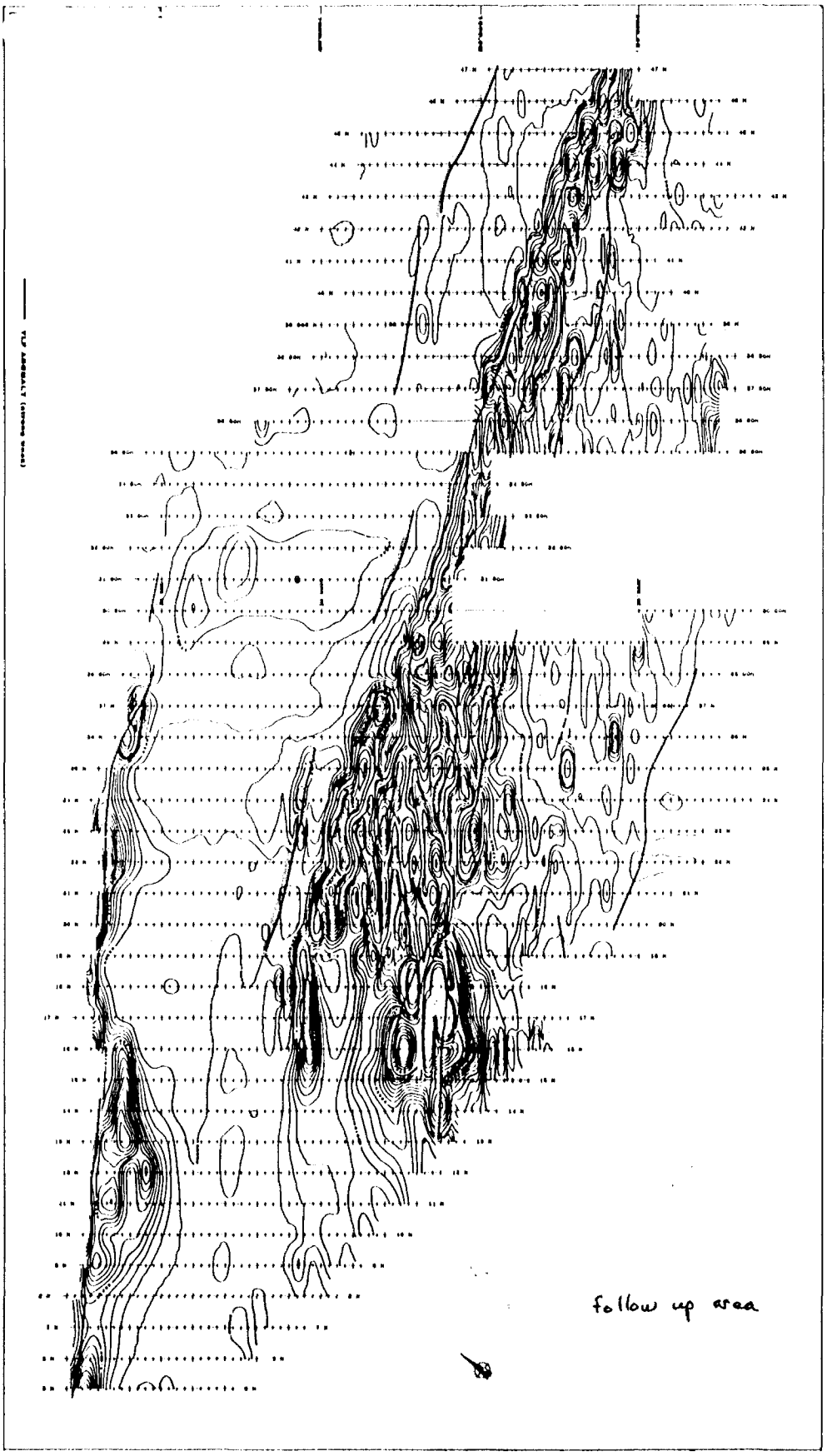


**FIGURE 5a WOLF BAY WEST GRID (1:20000)**
**MAG CONTOURS WITH VLF ANOMALIES**

along the length of this zone.

2) Mag and VLF Anomaly Complex L29N - L15N, Station 1100E-1600E

This area shows dramatic thickening of the iron formation, possibly due to folding. This evidence of structural deformation coupled with an inherently favourable host rock for gold deposition make this a prime target area.

3) VLF/IP Anomalies 100 to 300 Meters North of the Iron Formation on the West Grid

Follow-up - These areas should be prospected and sampled to attempt to identify the cause of the anomalies. With any sign of encouragement (alteration, anomalous gold or pathfinder element) the horizons should be systematically covered by IP.

4) VLF Anomaly L18S at 400E to L6S at 400W

This strong linear trend is close to mapped ironstone and within the Wolf Bay deformation zone.

Follow-up - Prospecting and geochem to evaluate these responses. IP could also be used to discriminate metallic (sulphide and graphite) from non-metallic (i.e. clay-filled valley) sources.

Peter A. Diorio
Senior Geophysicist
BHP-Utah Mines Ltd.
June 7, 1989

# BIBLIOGRAPHY

Andrews, A.J., Hugon, H., Durocher, M., Corfu, F., and Lavigne, M.J.; The Anatomy of a Gold-Bearing Greenstone Belt: Red Lake, Northwestern Ontario, Canada, in Macdonald, A.J., Ed., Proceedings of Gold '86, an International Symposium on the Geology of Gold: Toronto, 1986, p. 3-22.

Allen, I.,; Geology of the Wolf Bay Property, BHP-Utah Internal Report, March 1989.

ophysical, Geological, eochemical and Expenditures)

W8902-072

– If number of mining claims traversed exceeds space on this form, attach a list.
Note: – Only days credits calculated in the "Expenditures" section may be entered

Jun 16

Mining

and VLF-EM 2.1

900

tah Mines

-25 Adelaide St.E., Toronto, Ontario M5C 1Y2

| Date of Survey (from & to) | | | | | | Total Miles of line Cut |
|---|---|---|---|---|---|---|
| 17 Day | 02 Mo. | 89 Yr. | 18 Day | 03 Mo. | 89 Yr. | 123 km |

BHP-Utah Mines Ltd.
(Author of Geo-Technical report)

rio, BHP-Utah Mines Ltd., 900 - 25 Adelaide St.E., Toronto, Ontario M5C 1Y2

sted per Each Claim in Columns at right

| ions | | Days per Claim |
|---|---|---|
| t survey: nter 40 days. (This ncludes line cutting) | Geophysical | |
| | - Electromagnetic | 20 |
| | - Magnetometer | 40 |
| For each additional survey: using the same grid: Enter 20 days (for each) | - Radiometric | |
| | - Other | |
| | Geological | |
| | Geochemical | |

| Man Days | | Days per Claim |
|---|---|---|
| Complete reverse side and enter total(s) here | Geophysical | |
| | - Electromagnetic | |
| | - Magnetometer | |
| | - Radiometric | |
| | - Other | |
| | Geological | |
| | Geochemical | |

| Airborne Credits | | Days per Claim |
|---|---|---|
| Note: Special provisions credits do not apply to Airborne Surveys. | Electromagnetic | |
| | Magnetometer | |
| | Radiometric | |

Mining Claims Traversed (List in numerical sequence)

| Mining Claim Prefix | Mining Claim Number | Expend. Days Cr. | Mining Claim Prefix | Mining Claim Number | Expend. Days Cr. |
|---|---|---|---|---|---|
| KRL | See attached list | | | | |

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MINING LANDS SECTION

Total number of mining claims covered by this report of work: 79

Expenditures (excludes power stripping)

Type of Work Performed

Performed on Claim(s)

Calculation of Expenditure Days Credits

Total Expenditures: S ÷ 15 = Total Days Credits

Instructions
Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

For Office Use Only

| Total Days Cr. Recorded | Date Recorded | Mining Recorder |
|---|---|---|
| 4740 | April 27/89 | Debbie Thompson |
| | Date Approved as Recorded | Branch Director |

| Date | Recorded Holder or Agent (Signature) |
|---|---|
| April 25, 1989 | |

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying

Peter Diorio, BHP-Utah Mines Ltd., 900 - 25 Adelaide St. E.

| Date Certified | Certified By (Signature) |
|---|---|
| | |

EAST GRID (151)

1038993 1/4
1039281
1039283 1/2
1039284 1/2
1039285
1039286 1/4
1039287
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1039289
1039290
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1039292 1/2
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1056674 1/4
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1056687

27 WEST GRID

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1038995 1/4
1039003 1/2
1039004
1039005
1039006 1/4
1039013 1/4
1039014
1039016
1039023
1039024
1039025
1039026 1/2
1039027 1/2
1039028
1039029
1039031 1/2
1039296
1039297
1039300
1039301 3/4
*1039308 1/4
1039309
1039310
1039311
*1039312 1/4
1039327 3/4

* all 1/4 deductions [illegible] Survey except 2 that are attributed -

APR 27 1981

DOCUMENT No. W8902.079

Mining Act

Township or Area: Killala Twp

# 2.12571

Prospector's Licence No.: P996!

Magnetic and VLF EM

Mr. Rene H. Soltermann

RR#6, Peterborough, Ontario

BHP-Utah Mines Ltd.

Date of Survey: from 17 02 89 to 18 02 89

Total Miles of Line Cut: 20.8 km

Peter Diorio, BHP-Utah Mines Ltd., 900 - 25 Adelaide St. E., Toronto, Ontario

Days Requested per Each Claim in Columns at right

| Special Provisions | | Days per Claim |
|---|---|---|
| For first survey: Enter 40 days. (This includes line cutting) | Geophysical - Electromagnetic | 20 |
| | - Magnetometer | 40 |
| For each additional survey: using the same grid: Enter 20 days (for each) | - Radiometric | |
| | - Other | |
| | Geological | |
| | Geochemical | |

| Man Days | | Days per Claim |
|---|---|---|
| Complete reverse side and enter total(s) here | Geophysical - Electromagnetic | |
| | - Magnetometer | |
| | - Radiometric | |
| | - Other | |
| | Geological | |
| | Geochemical | |

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| Airborne Credits | | Days per Claim |
|---|---|---|
| Note: Special provisions credits do not apply to Airborne Surveys. | Electromagnetic | |
| | Magnetometer | |
| | Radiometric | |

Expenditures (excludes power stripping)

Type of Work Performed

Performed on Claim(s)

Calculation of Expenditure Days Credits

Total Expenditures: $ ÷ 15 = Total Days Credits

Instructions: Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

Date: [illegible]

Recorded Holder or Agent (Signature)

Mining Claims Traversed (List in numerical sequence)

| Prefix | Mining Claim Number | Expend. Days Cr. |
|---|---|---|
| KRL | ~~368771~~ | |
| | ~~502556~~ | |
| | ~~502557~~ | |
| | ~~502558~~ | |
| | ~~502559~~ | |
| | ~~502560~~ | |
| | ~~502561~~ | |
| | ~~502839~~ | |
| | ~~502840~~ | |
| | ~~502841~~ | |
| | ~~502842~~ | |
| | 903833 | ✓ |
| | 903834 | ✓ |

| Prefix | Mining Claim Number | Expend. Days Cr. |
|---|---|---|
| | | |

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MINING LANDS SECTION

Total number of mining claims covered by this report of work: ~~14~~ 13

For Office Use Only

Total Days Cr. Recorded: 1[illegible]

Date Recorded: [illegible]

Mining Recorder (or his Typist)

Date Approved as Recorded: [illegible]

Branch Director

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying

Peter Diorio, BHP-Utah Mines Ltd., 900 - 25 Adelaide St. E., Toronto, Ontario M5C 1Y2

Date of Certification: April 25, 1989

Signature of Person Certifying

Ministry of Northern Development and Mines

Ontario

# Report of Work

(Geophysical, Geological, Geochemical and Expenditures)

Mining Act

W8902.072

Note:
- If number of mining claims traversed exceeds space on this form, attach a list.
- Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns.
- Do not use shaded areas below.

LANDS

Type of Survey(s): Magnetic and VLF-EM

Township or Area: BAIRD - HAMMELL Fairlie

Claim Holder(s): BHP-Utah Mines

Prospector's Licence No.: T793

Address: 900 -25 Adelaide St.E., Toronto, Ontario M5C 1Y2

Survey Company: BHP-Utah Mines Ltd.

Date of Survey (from & to): 17 02 89 (Day, Mo., Yr.) | 18 03 89

Total Miles of line Cut: 123 km

Name and Address of Author (of Geo-Technical report): Peter Diorio, BHP-Utah Mines Ltd., 900 - 25 Adelaide St.E., Toronto, Ontario M5C 1Y2

## Credits Requested per Each Claim in Columns at right

| | | Days per Claim |
|---|---|---|
| **Special Provisions** For first survey: Enter 40 days. (This includes line cutting) For each additional survey: using the same grid: Enter 20 days (for each) | Geophysical - Electromagnetic | 20 |
| | Geophysical - Magnetometer | 40 |
| | Geophysical - Radiometric | |
| | Geophysical - Other | |
| | Geological | |
| | Geochemical | |
| **Man Days** Complete reverse side and enter total(s) here | Geophysical - Electromagnetic | |
| | Geophysical - Magnetometer | |
| | Geophysical - Radiometric | |
| | Geophysical - Other | |
| | Geological | |
| | Geochemical | |
| **Airborne Credits** Note: Special provisions credits do not apply to Airborne Surveys. | Electromagnetic | |
| | Magnetometer | |
| | Radiometric | |

## Mining Claims Traversed (List in numerical sequence)

| Prefix | Number | Expend. Days Cr. | Prefix | Number | Expend. Days Cr. |
|---|---|---|---|---|---|
| KRL | See attached list. | | | | |

Total number of mining claims covered by this report of work: 79

## Expenditures (excludes power stripping)

Type of Work Performed:

Performed on Claim(s):

Calculation of Expenditure Days Credits

Total Expenditures: S ÷ 15 = Total Days Credits:

Instructions: Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

For Office Use Only

Total Days Cr. Recorded: 4740

Date Recorded: April 27/89

Mining Recorder: ACTING

Date Approved as Recorded:

Branch Director: Barbara Thompson

Date: April 25, 1989

Recorded Holder or Agent (Signature):

## Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying: Peter Diorio, BHP-Utah Mines Ltd., 900 - 25 Adelaide St. E.

Ont[redacted] Geochemical and Expenditures

Mining Act

Note: "Expenditures" section may be entered in the "Expend. Days Cr." columns. – Do not use shaded areas below.

Type of Survey(s): Magnetic and VLF EM

Township or Area: Killala Twp

Claim Holder(s): Mr. Rene H. Soltermann

Prospector's Licence No.:

Address: RR#6, Peterborough, Ontario

Survey Company: BHP-Utah Mines Ltd.

Date of Survey (from & to): 17 Day | 02 Mo. | 89 Yr. | 18 Day | 02 Mo. | 89 Yr.

Total Miles of line Cut: 3.2 ~~20~~ 8 km

Name and Address of Author (of Geo-Technical report): Peter Diorio, BHP-Utah Mines Ltd., 900 - 25 Adelaide St. E., Toronto, Ontario

Credits Requested per Each Claim in Columns at right

| | | Days per Claim |
|---|---|---|
| Special Provisions: For first survey: Enter 40 days. (This includes line cutting) | Geophysical | |
| | - Electromagnetic | 20 |
| | - Magnetometer | 40 |
| For each additional survey: using the same grid: Enter 20 days (for each) | - Radiometric | |
| | Other | |
| | Geological | |
| | Geochemical | |
| Man Days: Complete reverse side and enter total(s) here | Geophysical | Days per Claim |
| | - Electromagnetic | |
| | - Magnetometer | |
| | - Radiometric | |
| | Other | |
| | Geological | |
| | Geochemical | |
| Airborne Credits: Note: Special provisions credits do not apply to Airborne Surveys | | Days per Claim |
| | Electromagnetic | |
| | Magnetometer | |
| | Radiometric | |

Mining Claims Traversed (List in numerical sequence)

| Prefix | Number | Expend. Days Cr. |
|---|---|---|
| KRL | ~~368771~~ | |
| | ~~502556~~ | |
| | ~~502557~~ | |
| | ~~502558~~ | |
| | 502559 | |
| | ~~502560~~ | |
| | ~~502561~~ | |
| | ~~502839~~ | |
| | ~~502840~~ | |
| | ~~502841~~ | |
| | ~~502842~~ | |
| | 903833 | |
| | 903834 | |

| Prefix | Number | Expend. Days Cr. |
|---|---|---|
| | | |

Total number of mining claims covered by this report of work: 13

Expenditures (excludes power stripping)

Type of Work Performed:

Performed on Claim(s):

Calculation of Expenditure Days Credits

Total Expenditures: $ ÷ 15 = Total Days Credits:

Instructions: Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

| Date | Recorded Holder or Agent (Signature) |
|---|---|
| | |

For Office Use Only

| Total Days Cr. Recorded | Date Recorded | Mining Recorder |
|---|---|---|
| | Date Approved as Recorded | Branch Director |

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying: Peter Diorio, BHP-Utah Mines Ltd., 900 - 25 Adelaide St. E., Toronto, Ontario M5C 1Y2

| Date Certified | Certified by (Signature) |
|---|---|
| May 3 1989 ~~April 25, 1989~~ | |

Mining Lands Section
880 Bay Street, 3rd Floor
Toronto, Ontario
M5S 1Z8

Telephone: (416) 965-4888

September 21, 1989

Your File: W6902-072
Our File: 2.12571

Mining Recorder
Ministry of Northern Development and Mines
875 Queen Street East
Box 669
Sault Ste. Marie, Ontario
P6A 2B3

Dear Sir:

Re: Approval dated August 28, 1989 for Geological and Geophysical (Magnetometer) Survey submitted on Mining Claims KRL 1038993 et al in Fairlie and Baird-Hammell Townships.

---

This approval replaces the approval dated August 28, 1989.

Please inform the recorded holder of these mining claims and so indicate on your records.

Yours sincerely,

ONTARIO GEOLOGICAL SURVEY
ASSESSMENT FILES
OFFICE
SEP 26 1989
RECEIVED

W.R. Cowan
Provincial Manager, Mining Lands
Mines & Minerals Division

LJS:eb
Enclosure

cc: Mr. G.H. Ferguson
Mining and Lands Commissioner
Toronto, Ontario

BHP-Utah Mines Ltd.
900-25 Adelaide Street E.
Toronto, Ontario
M5C 1Y2

Resident Geologist
Kenora, Ontario

AMENDED

Ministry of Northern Development and Mines
Ontario

Technical Assessment Work Credits

File 2.12571

Date Sept21, 1989

Mining Recorder's Report of Work No. W8902-072



Recorded Holder
BHP-UTAH MINES LTD.

Township or Area
FAIRLIE, BAIRD HAMMELL TOWNSHIP.

| Type of survey and number of Assessment days credit per claim | Mining Claims Assessed |
|---|---|
| Geophysical<br>Electromagnetic 20 days<br>Magnetometer 40 days<br>Radiometric ____ days<br>Induced polarization ____ days<br>Other ____ days<br>Section 77 (19) See "Mining Claims Assessed" column<br>Geological ____ days<br>Geochemical ____ days<br>Man days ☐ Airborne ☐<br>Special provision ☒ Ground ☒<br>☐ Credits have been reduced because of partial coverage of claims.<br>☐ Credits have been reduced because of corrections to work dates and figures of applicant. | East Grid<br>KRL 1038993<br>1039281, 1039285 to 291 incl.<br>1039293, 1039294<br>1039335 to 337 incl.<br>1039344 to 346 incl.<br>1039352, 1039353<br>1045820 to 830 incl.<br>1056670 to 675 incl.<br>1056680 to 687 incl.<br><br>West Grid<br>KRL 1038994-995<br>1039004 to 006 incl.<br>1039013, 1039014, 1039016<br>1039023 to 025 incl.<br>1039028-29<br>1039296-97, 1039300<br>1039309 to 311 incl. |

Special credits under section 77 (16) for the following mining claims

East Grid

10 days Electromagnetic+ KRL 1039283, 1039284, 1039292, 1039334, 1039341
20 days Magnetometer

5 days electromagnetic+ KRL 1039295, 1039304
10 days Magnetometer

No credits have been allowed for the following mining claims

☒ not sufficiently covered by the survey ☐ insufficient technical data filed

East Grid

KRL 1039333

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77(19) - 60.

Ministry of Northern Development and Mines

Ontario

Technical Assessment Work Credits

File 2.12571

Date July 26, 1989

Mining Recorder's Report of Work No. W8902-072



Recorded Holder
BHP-UTAH MINES LTD.

Township or Area
FAIRLIE, BAIRD-HAMMELL TOWNSHIP

| Type of survey and number of Assessment days credit per claim | Mining Claims Assessed |
|---|---|
| Geophysical | |
| Electromagnetic _____ days | |
| Magnetometer _____ days | |
| Radiometric _____ days | |
| Induced polarization _____ days | |
| Other _____ days | |
| Section 77 (19) See "Mining Claims Assessed" column | |
| Geological _____ days | |
| Geochemical _____ days | |
| Man days ☐ Airborne ☐ | |
| Special provision ☐ Ground ☐ | |
| ☐ Credits have been reduced because of partial coverage of claims. | |
| ☐ Credits have been reduced because of corrections to work dates and figures of applicant. | |

Special credits under section 77 (16) for the following mining claims

West Grid

15 days Electromagnetic+ KRL 1039308, 1039312
30 days Magnetometer

10 days Electromagnetic+ KRL 1039003, 1039026,
20 days Magnetometer 1039027, 1039031

No credits have been allowed for the following mining claims

☐ not sufficiently covered by the survey ☐ insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geologocal - 40; Geochemical - 40; Section 77(19) - 60.

Ontario Ministry of Northern Development and Mines

Technical Assessment Work Credits

File 2.12571

Date July 26, 1989

Mining Recorder's Report of Work No. W8902-072



Recorded Holder
BHP-UTAH MINES LTD.

Township or Area
FAIRLIE, BAIRD-HAMMELL TOWNSHIP.

| Type of survey and number of Assessment days credit per claim | Mining Claims Assessed |
|---|---|
| Geophysical | |
| Electromagnetic _____ days | |
| Magnetometer _____ days | |
| Radiometric _____ days | |
| Induced polarization _____ days | |
| Other _____ days | |
| Section 77 (19) See "Mining Claims Assessed" column | |
| Geological _____ days | |
| Geochemical _____ days | |
| Man days ☐ Airborne ☐ | |
| Special provision ☐ Ground ☐ | |
| ☐ Credits have been reduced because of partial coverage of claims. | |
| ☐ Credits have been reduced because of corrections to work dates and figures of applicant. | |

Special credits under section 77 (16) for the following mining claims

West Grid

5 days Electromagnetic KRL 1039301
10 days Magnetometer 1039327

No credits have been allowed for the following mining claims

☐ not sufficiently covered by the survey ☐ insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geologocal - 40; Geochemical - 40; Section 77(19) - 60.

Ontario

Ministry of
Northern Development
and Mines

Ministère du
Développement du Nord
et des Mines

Mining Lands Section
880 Bay Street, 3rd Floor
Toronto, Ontario
M5S 1Z8

Telephone: (416) 965-4888

August 28, 1989

Your File: W8902-072
Our File: 2.12571

Mining Recorder
Ministry of Northern Development and Mines
808 Robertson Street
P.O. Box 5200
Kenora, Ontario
P8N 3X9

Dear Sir:

Re: Notice of Intent dated July 26, 1989 Geophysical (Electromagnetic and Magnetometer) Survey submitted on Mining Claims KRL 1038993 et al in Fairlie and Baird-Hammell Townships.

---

The assessment work credits, as listed with the above-mentioned Notice of Intent, have been approved as of the above date.

Please inform the recorded holder of these mining claims and so indicate on your records.

Yours sincerely,

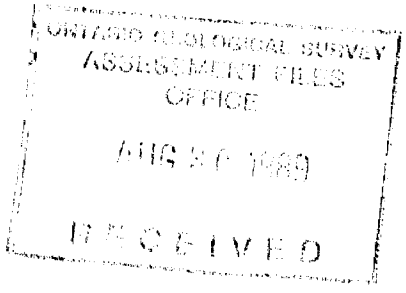
W.R. Cowan
Provincial Manager, Mining Lands
Mines & Minerals Division

LS:eb
Enclosure

cc: Mr. G.H. Ferguson
Mining and Lands Commissioner
Toronto, Ontario

BHP-Utah Mines Ltd.
900-25 Adelaide Street E.
Toronto, Ontario
M5C 1Y2

Resident Geologist
Kenora, Ontario



Ministry of Northern Development and Mines

Ontario

Technical Assessment Work Credits

File 2.12571

Date July 26 1989

Mining Recorder's Report of Work No. W8902-072



Recorded Holder
BHP-UTAH MINES LTD.

Township or Area
FAIRLIE, BAIRD HAMMELL TOWNSHIP.

| Type of survey and number of Assessment days credit per claim | Mining Claims Assessed |
|---|---|
| Geophysical | East Grid |
| Electromagnetic 20 days | KRL 1038993 |
| Magnetometer 40 days | 1039281, 1039285 to 291 incl. |
| Radiometric ____ days | 1039293, 1039294 |
| Induced polarization ____ days | 1039335 to 337 incl. |
| Other ____ days | 1039344 to 346 incl. |
| Section 77 (19) See "Mining Claims Assessed" column | 1039352, 1039353 |
| Geological ____ days | 1045820 to 830 incl. |
| Geochemical ____ days | 1056670 to 675 incl. |
| Man days ☐ Airborne ☐ | 1056680 to 687 incl. |
| Special provision ☒ Ground ☒ | West Grid |
| ☐ Credits have been reduced because of partial coverage of claims. | KRL 1038994-995 |
| ☐ Credits have been reduced because of corrections to work dates and figures of applicant. | 1039004 to 006 incl. |
| | 1039013, 1039014, 1049016 |
| | 1039023 to 025 incl. |
| | 1039028-29 |
| | 1039296-97, 1039300 |
| | 1039309 to 311 incl. |

Special credits under section 77 (16) for the following mining claims

East Grid

10 days Electromagnetic+ KRL 1039283, 1039284, 1039292, 1039334, 1039341
20 days Magnetometer

5 days electromagnetic+ KRL 1039295, 1039304
10 days Magnetometer

No credits have been allowed for the following mining claims

☒ not sufficiently covered by the survey ☐ insufficient technical data filed

East Grid

KRL 1039333

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geologocal - 40; Geochemical - 40; Section 77(19) - 60.

Ministry of Northern Development and Mines

Ontario

Technical Assessment Work Credits

File 2.12571

Date July 26, 1989

Mining Recorder's Report of Work No. W8902-072



Recorded Holder
BHP-UTAH MINES LTD.

Township or Area
FAIRLIE, BAIRD-HAMMELL TOWNSHIP

| Type of survey and number of Assessment days credit per claim | Mining Claims Assessed |
|---|---|
| Geophysical | |
| Electromagnetic _____ days | |
| Magnetometer _____ days | |
| Radiometric _____ days | |
| Induced polarization _____ days | |
| Other _____ days | |
| Section 77 (19) See "Mining Claims Assessed" column | |
| Geological _____ days | |
| Geochemical _____ days | |
| Man days ☐ Airborne ☐ | |
| Special provision ☐ Ground ☐ | |
| ☐ Credits have been reduced because of partial coverage of claims. | |
| ☐ Credits have been reduced because of corrections to work dates and figures of applicant. | |

Special credits under section 77 (16) for the following mining claims

West Grid

15 days Electromagnetic+ KRL 1039308, 1039312
30 days Magnetometer

10 days Electromagnetic+ KRL 1039003, 1039026,
20 days Magnetometer 1039027, 1039031

No credits have been allowed for the following mining claims

☐ not sufficiently covered by the survey ☐ insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geologocal - 40; Geochemical - 40; Section 77(19) - 60.

Ministry of Northern Development and Mines

Ontario

# Technical Assessment Work Credits

File 2.12571

Date July 26, 1989

Mining Recorder's Report of Work No. W8902-072



Recorded Holder
BHP-UTAH MINES LTD.

Township or Area
FAIRLIE, BAIRD-HAMMELL TOWNSHIP.

| Type of survey and number of Assessment days credit per claim | Mining Claims Assessed |
|---|---|
| Geophysical | |
| Electromagnetic _____ days | |
| Magnetometer _____ days | |
| Radiometric _____ days | |
| Induced polarization _____ days | |
| Other _____ days | |
| Section 77 (19) See "Mining Claims Assessed" column | |
| Geological _____ days | |
| Geochemical _____ days | |
| Man days ☐ Airborne ☐ | |
| Special provision ☐ Ground ☐ | |
| ☐ Credits have been reduced because of partial coverage of claims. | |
| ☐ Credits have been reduced because of corrections to work dates and figures of applicant. | |

Special credits under section 77 (16) for the following mining claims

West Grid

5 days Electromagnetic KRL 1039301
10 days Magnetometer 1039327

No credits have been allowed for the following mining claims

☐ not sufficiently covered by the survey ☐ insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77(19) - 60.

Ontario

Ministry of Natural Resources

File _____

# GEOPHYSICAL – GEOLOGICAL – GEOCHEMICAL TECHNICAL DATA STATEMENT

**TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT**
**FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT**
**TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.**

Type of Survey(s) Magnetic, VLF-EM

Township or Area Fairlie, Baird-Hammell

Claim Holder(s) BHP-Utah Mines Ltd.
900-25 Adelaide St.E., Toronto M5C 1Y2

Survey Company BHP-Utah Mines Ltd.

Author of Report Peter Diorio

Address of Author BHP-Utah Mines (as above)

Covering Dates of Survey 17/02/89 06/06/89
(linecutting to office)

Total Miles of Line Cut 123 km

**SPECIAL PROVISIONS CREDITS REQUESTED**

ENTER 40 days (includes line cutting) for first survey.

ENTER 20 days for each additional survey using same grid.

| | DAYS per claim |
|---|---|
| Geophysical | |
| --Electromagnetic | 40 |
| --Magnetometer | 20 |
| --Radiometric | |
| --Other | |
| Geological | |
| Geochemical | |

**AIRBORNE CREDITS** (Special provision credits do not apply to airborne surveys)

Magnetometer _____ Electromagnetic _____ Radiometric _____
(enter days per claim)

DATE: June 6/89 SIGNATURE: _____
Author of Report or Agent

Res. Geol. _____ Qualifications _____

Previous Surveys

| File No. | Type | Date | Claim Holder |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**MINING CLAIMS TRAVERSED**
**List numerically**

See Attached List
(prefix) (number)

If space insufficient, attach list

TOTAL CLAIMS _____

OFFICE USE ONLY

837 (5/79)

# GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS - If more than one survey, specify data for each type of survey

Number of Stations Mag = 9840, VLF = 4920 Number of Readings Mag = 9840, VLF = 4920

Station interval Mag = 125 meters VLF = 25 meters Line spacing 100 meters

Profile scale

Contour interval

## MAGNETIC

Instrument Scintrex IGS II

Accuracy - Scale constant ± .1 nT (nominal)

Diurnal correction method Digitally recording base station

Base Station check-in interval (hours)

Base Station location and value See Report

## ELECTROMAGNETIC

Instrument Scintrex VLF 4

Coil configuration Self orienting Vertical and Horizontal Coils

Coil separation

Accuracy

Method: ☒ Fixed transmitter ☐ Shoot back ☐ In line ☐ Parallel line

Frequency Cutler Maine 24.0 kHz (specify V.L.F. station)

Parameters measured Vertical Inphase, Vertical Out of Phase, Horizontal Field Strength

## GRAVITY

Instrument

Scale constant

Corrections made

Base station value and location

Elevation accuracy

## INDUCED POLARIZATION RESISTIVITY

Instrument

Method ☐ Time Domain ☐ Frequency Domain

Parameters - On time Frequency

- Off time Range

- Delay time

- Integration time

Power

Electrode array

Electrode spacing

Type of electrode

## SELF POTENTIAL

Instrument _____ Range _____

Survey Method _____

_____

Corrections made _____

_____

## RADIOMETRIC

Instrument _____

Values measured _____

Energy windows (levels) _____

Height of instrument _____ Background Count _____

Size of detector _____

Overburden _____

(type, depth – include outcrop map)

## OTHERS (SEISMIC, DRILL WELL LOGGING ETC.)

Type of survey _____

Instrument _____

Accuracy _____

Parameters measured _____

_____

Additional information (for understanding results) _____

_____

_____

## AIRBORNE SURVEYS

Type of survey(s) _____

Instrument(s) _____

(specify for each type of survey)

Accuracy _____

(specify for each type of survey)

Aircraft used _____

Sensor altitude _____

Navigation and flight path recovery method _____

_____

Aircraft altitude _____ Line Spacing _____

Miles flown over total area _____ Over claims only _____

# GEOCHEMICAL SURVEY – PROCEDURE RECORD

Numbers of claims from which samples taken_____

Total Number of Samples_____

Type of Sample_____
(Nature of Material)

Average Sample Weight_____

Method of Collection_____

Soil Horizon Sampled_____

Horizon Development_____

Sample Depth_____

Terrain_____

Drainage Development_____

Estimated Range of Overburden Thickness_____

## SAMPLE PREPARATION
(Includes drying, screening, crushing, ashing)

Mesh size of fraction used for analysis_____

General_____

## ANALYTICAL METHODS

Values expressed in: per cent ☐
p. p. m. ☐
p. p. b. ☐

Cu, Pb, Zn, Ni, Co, Ag, Mo, As,-(circle)

Others_____

Field Analysis (_____tests)

Extraction Method_____

Analytical Method_____

Reagents Used_____

Field Laboratory Analysis

No. (_____tests)

Extraction Method_____

Analytical Method_____

Reagents Used_____

Commercial Laboratory (_____tests)

Name of Laboratory_____

Extraction Method_____

Analytical Method_____

Reagents Used_____

General_____

EAST GRID

1038993
1039281
1039283
1039284
1039285
1039286
1039287
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1039290
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1056675
1056680
1056681
1056682
1056683
1056684
1056685
1056686
1056687

WEST GRID

1038994
1038995
1039003
1039004
1039005
1039006
1039013
1039014
1039016
1039023
1039024
1039025
1039026
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1039311
1039312
1039327

Ontario

Ministry of Natural Resources

File _____

# GEOPHYSICAL – GEOLOGICAL – GEOCHEMICAL TECHNICAL DATA STATEMENT

**TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT**
**FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT**
**TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.**

Type of Survey(s) Mag, VLF-EM

Township or Area Killala

Claim Holder(s) Rene Soltermann
RR#6, Peterborough, Ontario

Survey Company BHP-Utah Mines Ltd.

Author of Report Peter Diorio

Address of Author BHP-Utah Mines Ltd., 900-25 Adelaide St. E. Toronto

Covering Dates of Survey 17/02/89 6/6/89
(linecutting to office)

Total Miles of Line Cut 3.2 km

SPECIAL PROVISIONS CREDITS REQUESTED

ENTER 40 days (includes line cutting) for first survey.

ENTER 20 days for each additional survey using same grid.

DAYS per claim

Geophysical
--Electromagnetic _____
--Magnetometer _____
--Radiometric _____
--Other _____
Geological _____
Geochemical _____

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

Magnetometer _____ Electromagnetic _____ Radiometric _____
(enter days per claim)

DATE: June 6/89 SIGNATURE: _____
Author of Report or Agent

Res. Geol. _____ Qualifications _____

Previous Surveys

| File No. | Type | Date | Claim Holder |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**MINING CLAIMS TRAVERSED**
**List numerically**

| (prefix) | (number) |
|---|---|
| KRL | 903833 |
| KRL | 903834 |

If space insufficient, attach list

TOTAL CLAIMS _____

OFFICE USE ONLY

837 (5/79)

# GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS -- If more than one survey, specify data for each type of survey

Number of Stations Mag = 256, VLF = 128 Number of Readings Mag = 256, VLF = 128

Station interval Mag = 12.5 meter, VLF = 25 meter Line spacing 100 meters

Profile scale See Maps

Contour interval See Maps

## MAGNETIC

Instrument Scintrex IGS II MP4

Accuracy -- Scale constant ± 0.1 nT (nominal)

Diurnal correction method Digitally Recording Base Station

Base Station check-in interval (hours)

Base Station location and value See Report

## ELECTROMAGNETIC

Instrument Scintrex IGS II VLF4

Coil configuration Self Orienting Vertical and Horizontal Coils

Coil separation

Accuracy

Method: ☒ Fixed transmitter ☐ Shoot back ☐ In line ☐ Parallel line

Frequency 24.0 kHz Cutler, Maine
(specify V.L.F. station)

Parameters measured Vertical Inphase, Vertical Out of Phase, Horizontal Field Strength

## GRAVITY

Instrument

Scale constant

Corrections made

Base station value and location

Elevation accuracy

## INDUCED POLARIZATION RESISTIVITY

Instrument

Method ☐ Time Domain ☐ Frequency Domain

Parameters -- On time Frequency

-- Off time Range

-- Delay time

-- Integration time

Power

Electrode array

Electrode spacing

Type of electrode

## SELF POTENTIAL

Instrument _____ Range _____

Survey Method _____

_____

Corrections made _____

_____

## RADIOMETRIC

Instrument _____

Values measured _____

Energy windows (levels) _____

Height of instrument _____ Background Count _____

Size of detector _____

Overburden _____

(type, depth – include outcrop map)

## OTHERS (SEISMIC, DRILL WELL LOGGING ETC.)

Type of survey _____

Instrument _____

Accuracy _____

Parameters measured _____

_____

Additional information (for understanding results) _____

_____

_____

## AIRBORNE SURVEYS

Type of survey(s) _____

Instrument(s) _____

(specify for each type of survey)

Accuracy _____

(specify for each type of survey)

Aircraft used _____

Sensor altitude _____

Navigation and flight path recovery method _____

_____

Aircraft altitude _____ Line Spacing _____

Miles flown over total area _____ Over claims only _____

# GEOCHEMICAL SURVEY – PROCEDURE RECORD

Numbers of claims from which samples taken_____

_____

_____

Total Number of Samples_____

Type of Sample_____
(Nature of Material)

Average Sample Weight_____

Method of Collection_____

_____

Soil Horizon Sampled_____

Horizon Development_____

Sample Depth_____

Terrain_____

_____

Drainage Development_____

Estimated Range of Overburden Thickness_____

_____

_____

## SAMPLE PREPARATION
(Includes drying, screening, crushing, ashing)

Mesh size of fraction used for analysis_____

_____

_____

_____

General_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

## ANALYTICAL METHODS

Values expressed in: per cent ☐
p. p. m. ☐
p. p. b. ☐

Cu, Pb, Zn, Ni, Co, Ag, Mo, As,-(circle)

Others_____

Field Analysis (_____tests)

Extraction Method_____

Analytical Method_____

Reagents Used_____

Field Laboratory Analysis

No. (_____tests)

Extraction Method_____

Analytical Method_____

Reagents Used_____

Commercial Laboratory (_____tests)

Name of Laboratory_____

Extraction Method_____

Analytical Method_____

Reagents Used_____

General_____

_____

_____

_____

_____

_____

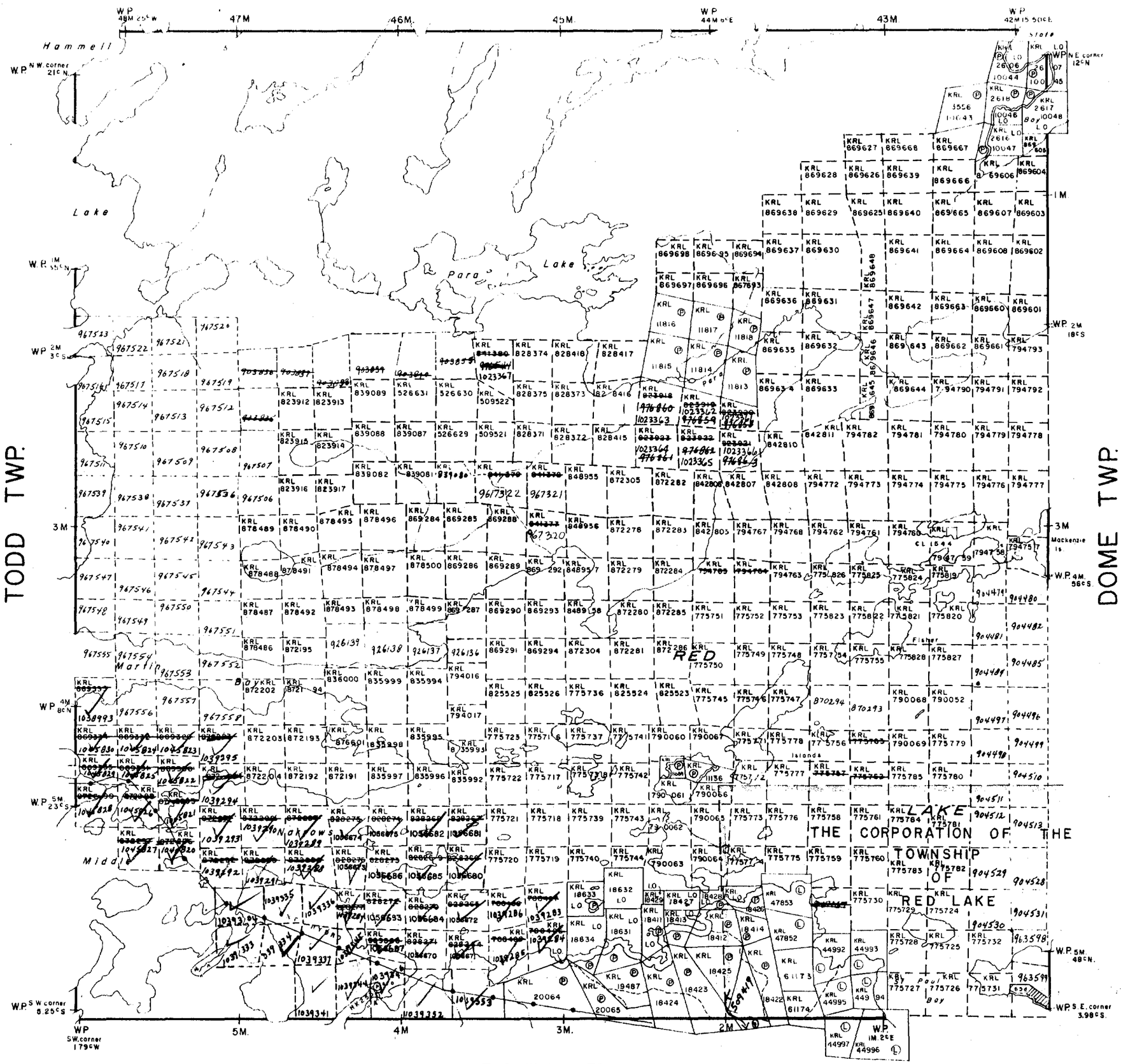
_____

_____

_____

_____

# GRAVES TWP.




# THE TOWNSHIP OF

# FAIRLIE

DISTRICT OF
KENORA
(PATRICIA PORTION)

RED LAKE
MINING DIVISION

SCALE: 1-INCH=40 CHAINS

## LEGEND

| | |
|---|---|
| PATENTED LAND | (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 | |
| RAILWAYS | |
| POWER LINES | |
| MARSH OR MUSKEG | |
| MINES | |
| CANCELLED | C. |

## 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 |
|---|---|---|---|---|

RED LAKE MINING DIVISION
OCT 20 1988
RED LAKE, ONTARIO

Ontario
Ministry of Natural Resources
Ministry of Northern Development and Mines

Date: AUGUST, 1986

Number
G-3731

52M01SE8108 2.12571 FAIRLIE

## REFERENCES

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 |
|---|---|---|---|---|---|
| (1) | SEC 36/80 | W.19/83 | 15/7/83 | S.R.O. | 188521 |
| (2) | Sec. 36 | W. 4/86 | 17/01/86 | M+ | 188555 1885 95 |
| (3) | Sec. 36 | W 58/87 | 12/02/87 | M. | |

RED LAKE MINING DIVISION
JUN - 7 1989
RED LAKE, ONTARIO

INDIAN HOUSE LAKE G-1796

94°15'
94°00'
51°07'30"
51°00'

GRAVES TP. M.2166
FOR STATUS REFER TO TOWNSHIP PLAN

PROJECTED LINE

56M 55M 54M 53M 52M 51M 50M 49M 48M 47M

1M

BALL TP. M.2136
FOR STATUS REFER TO TOWNSHIP PLAN

FAIRLIE TP. M.2158
FOR STATUS REFER TO TOWNSHIP PLAN

KILLALA TP. M.2176
FOR STATUS REFER TO TOWNSHIP PLAN

MULCAHY TP. M.2188
FOR STATUS REFER TO TOWNSHIP PLAN

BAIRD TP. M.2138
FOR STATUS REFER TO TOWNSHIP PLAN

Hammell Lake
Pipestone Bay
Red Lake
Scott Bay
Rowan Bay
Goodwin Bay
Trout Bay
West Narrows
Middle Narrows
North Narrows
Martin Bay
Reed Lake

14 13 12 11 10 9 8 7 6 5 4 3 2 1

MEDICINE STONE LAKE G-1823

## 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 CROWN 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 | R |
| CANCELLED | C |
| SAND & GRAVEL | S |

NOTE MINING RIGHTS IN PARCELS PATENTED PRIOR TO MAY 6 1913, VESTED IN ORIGINAL PATENTEE BY THE PUBLIC LANDS ACT, R.S.O. 1970 CHAP. 380, SEC. 67, SUBSEC. 1.

SCALE: 1 INCH = 40 CHAINS

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

AREA

# HAMMELL LAKE

M.N.R. ADMINISTRATIVE DISTRICT
RED LAKE
MINING DIVISION
RED LAKE
LAND TITLES / REGISTRY DIVISION
KENORA / PATRICIA

Ministry of Natural Resources — Land Management Branch
Ontario

Date FEBRUARY 14, 1983
Number G-1782

52N15SE188 2.12571 FAIRLIE

220

BHP-UTAH MINES LTD.
Toronto Ont

WOLF BAY PROPERTY EAST GRID

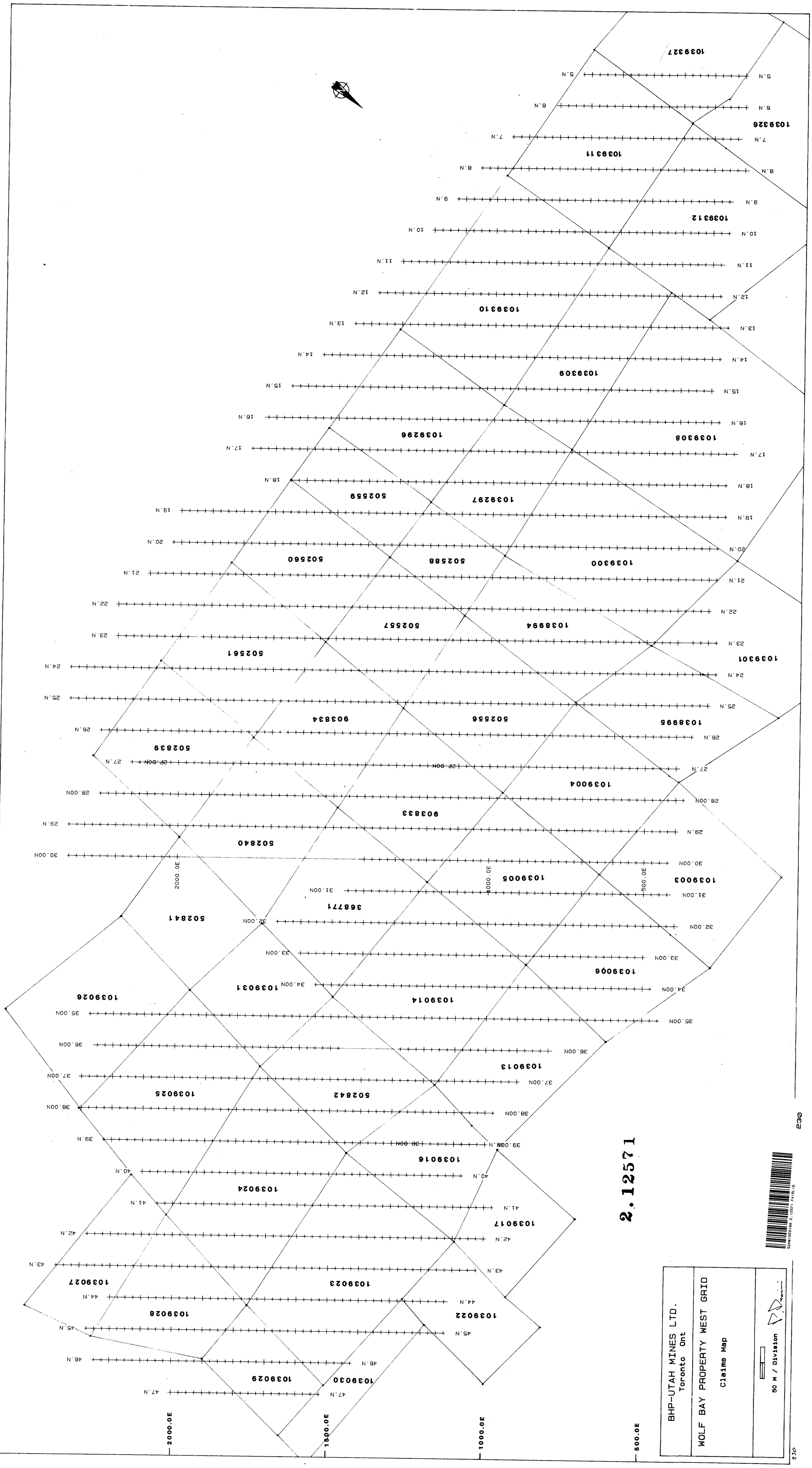
Claims Map

50 M / Division

2.12571

1500.0E
1000.0E
500.0E
0.0
500.0W

1038993 1045824 1045825 1045826 1045822 1039295 1039294 1039289 1039290 1039292 1039293 1045821 1045820 1039304 1039333 1039335 1039336 1039334 1039337 1039345 1039341 1039344 1039346 1039352 1039285 1039284 1039353 1039283 1039286 1056671 1056687 1056670 1056672 1056684 1056680 1056685 1056681 1056683 1056686 1056673 1056675 1056682 1039281 1039288 1056674 1039291 1045827 1045828 1045829 1045830 1045823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5.N
6.N
1039326
7.N
1039311
8.N
9.N
1039312
10.N
11.N
1039310
12.N
13.N
1039309
14.N
15.N
1039308
16.N
1039296
17.N
1039297
502559
18.N
19.N
1039300
502588
502560
20.N
21.N
1038994
502557
22.N
23.N
1039301
502561
24.N
25.N
1038995
502556
903834
26.N
502839
27.N
1039004
28.00N
903833
29.N
502840
30.00N
1039003
1000.0E
2000.0E
500.0E
1039005
31.00N
368771
502841
32.00N
33.00N
1039006
34.00N
1039031
1039014
1039026
35.00N
36.00N
1039013
37.00N
1039025
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38.00N
39.00N
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40.N
1039024
41.N
1039017
42.N
43.N
1039027
1039023
44.N
1039028
1039022
45.N
46.N
1039029
1039030
47.N
2000.0E
1500.0E
1000.0E
500.0E
BHP-UTAH MINES LTD.
Toronto Ont
WOLF BAY PROPERTY WEST GRID
Claims Map
50 M / Division
2.12571
52H015E0108 2.12571 FAIRLIE
230

BHP-UTAH MINES LTD.
Toronto Ont

WOLF BAY PROPERTY WEST GRID
TOTAL FIELD MAG SURVEY
Posted Data Values in nT

Scintrex IGS2 Magnetometer

50 M / Division

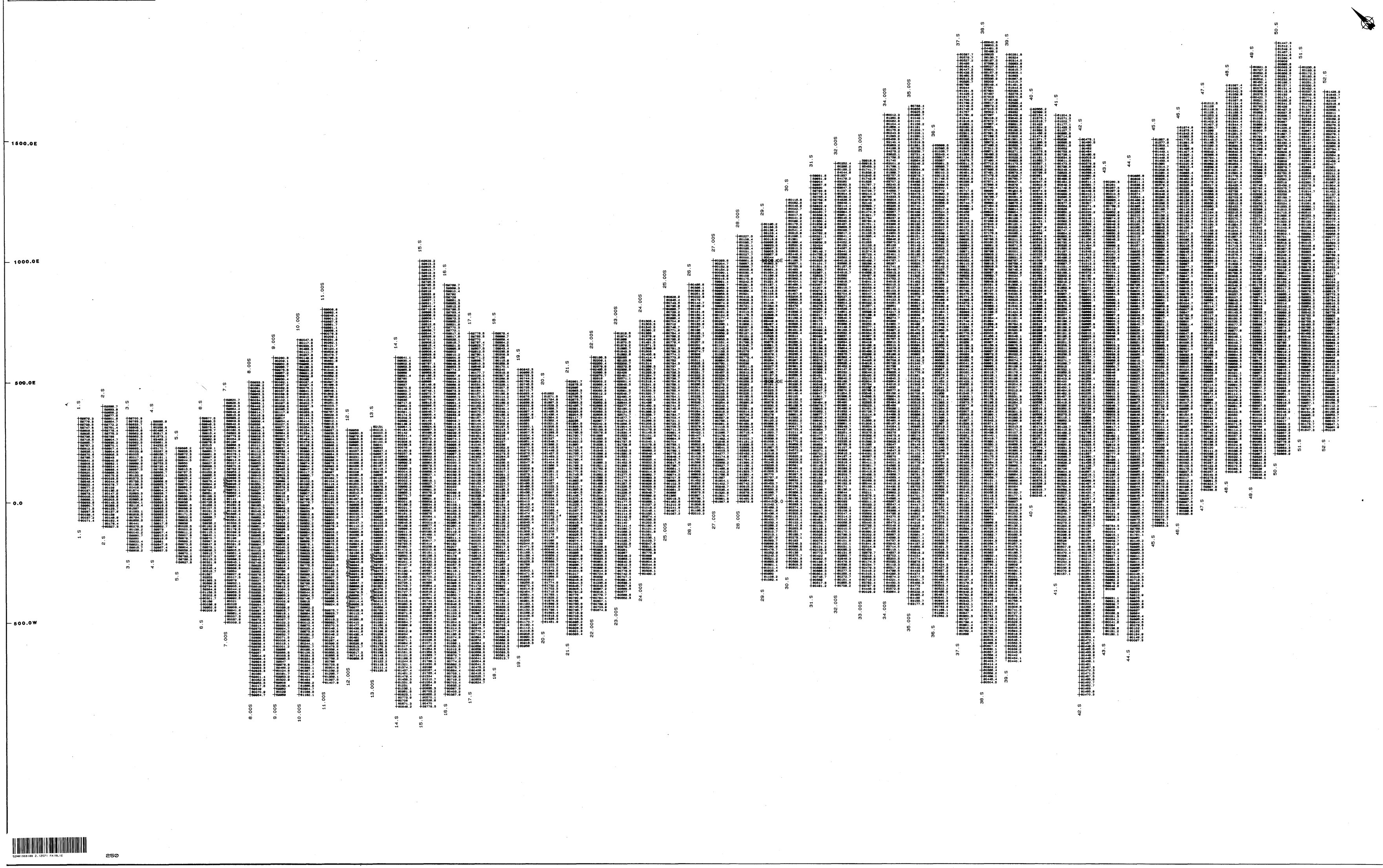
2.12571

BHP-UTAH MINES LTD.
Toronto Ont

WOLF BAY PROPERTY EAST GRID
TOTAL FIELD MAG SURVEY
Scintrex IGS2 Magnetometer
Posted Data Values (Gammas)

50 M / Division

2.12571




250

2000.0E

1500.0E

1000.0E

500.0E

2.12571

BHP-UTAH MINES LTD.
Toronto Ont

WOLF BAY PROPERTY WEST GRID
TOTAL FIELD MAG SURVEY
Contour Interval 200 gammas
Background 59000 gammas
Scintrex IGS2 Magnetometer

50 M / Division

S2M015E0108 2.12571 FAIRLIE

260

VLF ANOMALY (strong weak)

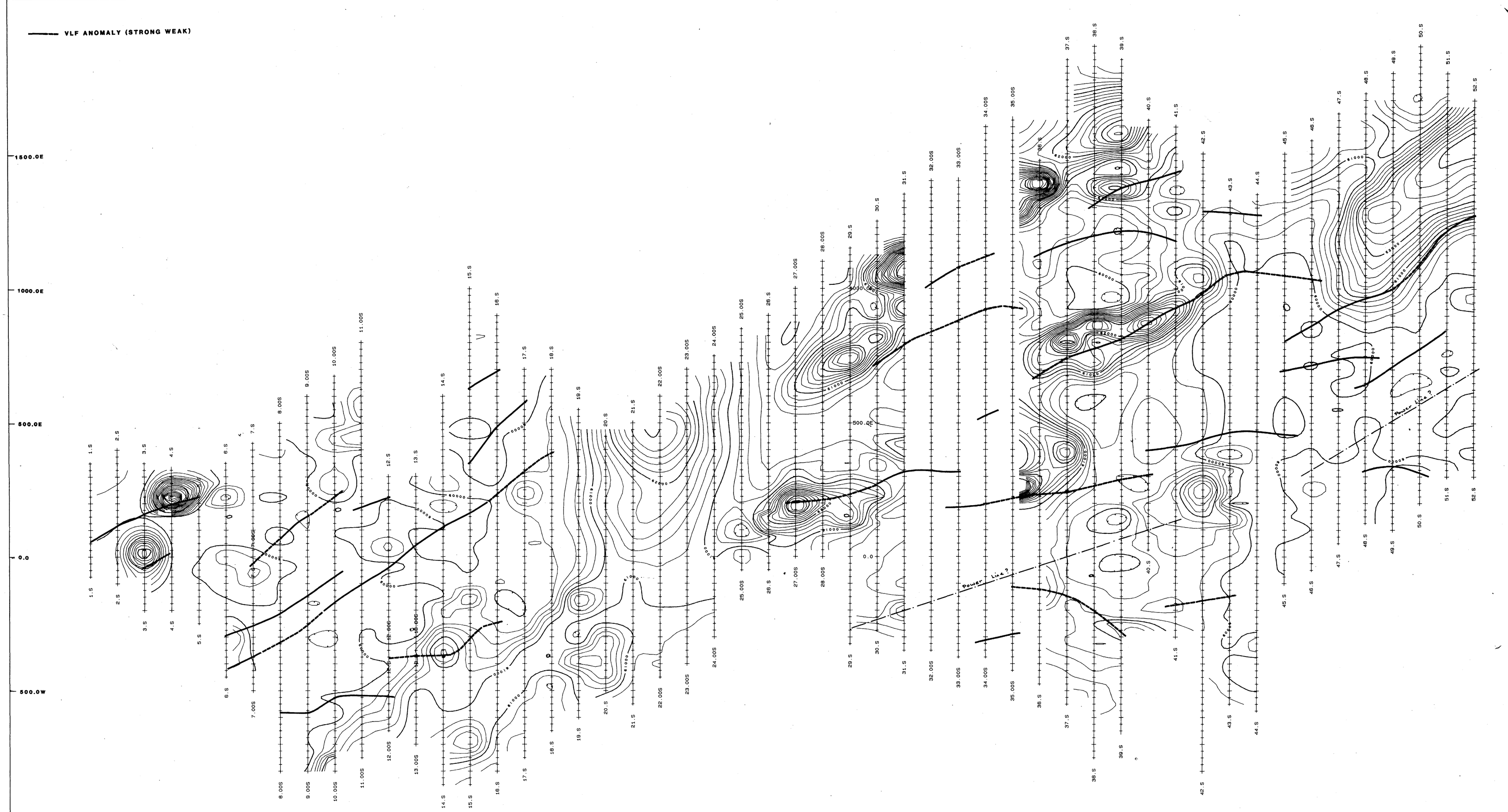
BHP-UTAH MINES LTD.
Toronto Ont

WOLF BAY PROPERTY EAST GRID
TOTAL FIELD MAG SURVEY
Scintrex IGS2 Magnetometer
Contour Interval 200 gammas
Background 59000 gammas

50 M / Division

2.12571

VLF ANOMALY (STRONG WEAK)



2000.0E

1500.0E

1000.0E

500.0E

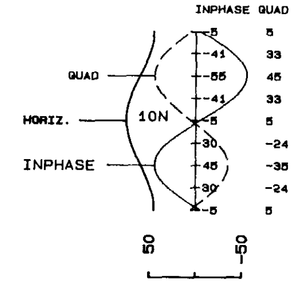
2.12571

BHP-UTAH MINES LTD.
Toronto Ont

WOLF BAY PROPERTY WEST GRID
VLF PROFILES
CUTLER, Maine 24.0Khz.
---- In Phase 50% /cm
- - - Quad 50% /cm

50 M / Division

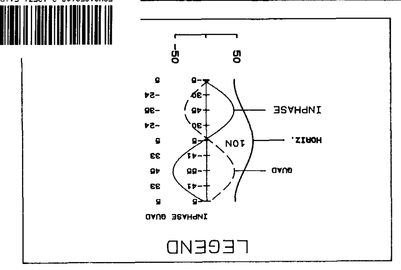
LEGEND




52N016E0108 2.12571 FAIRLIE

280

52M1028-68 2.1257/PAGE/E




500.0W

0.0

500.0E

1000.E

1500.E

BHP-UTAH MINES LTD.
Toronto Ont

WOLF BAY PROPERTY EAST GRID
VLF PROFILES
CUTLER Maine 24.0KHz
----- In Phase at 50% /cm
- - - Quad at 50% /cm

50 M / DIVISION

2.1257 1

2000.0E

1500.0E

1000.0E

500.0E

2000.0E

1000.0E

0000.0E

**2.12571**

BHP-UTAH MINES LTD.
Toronto Ont

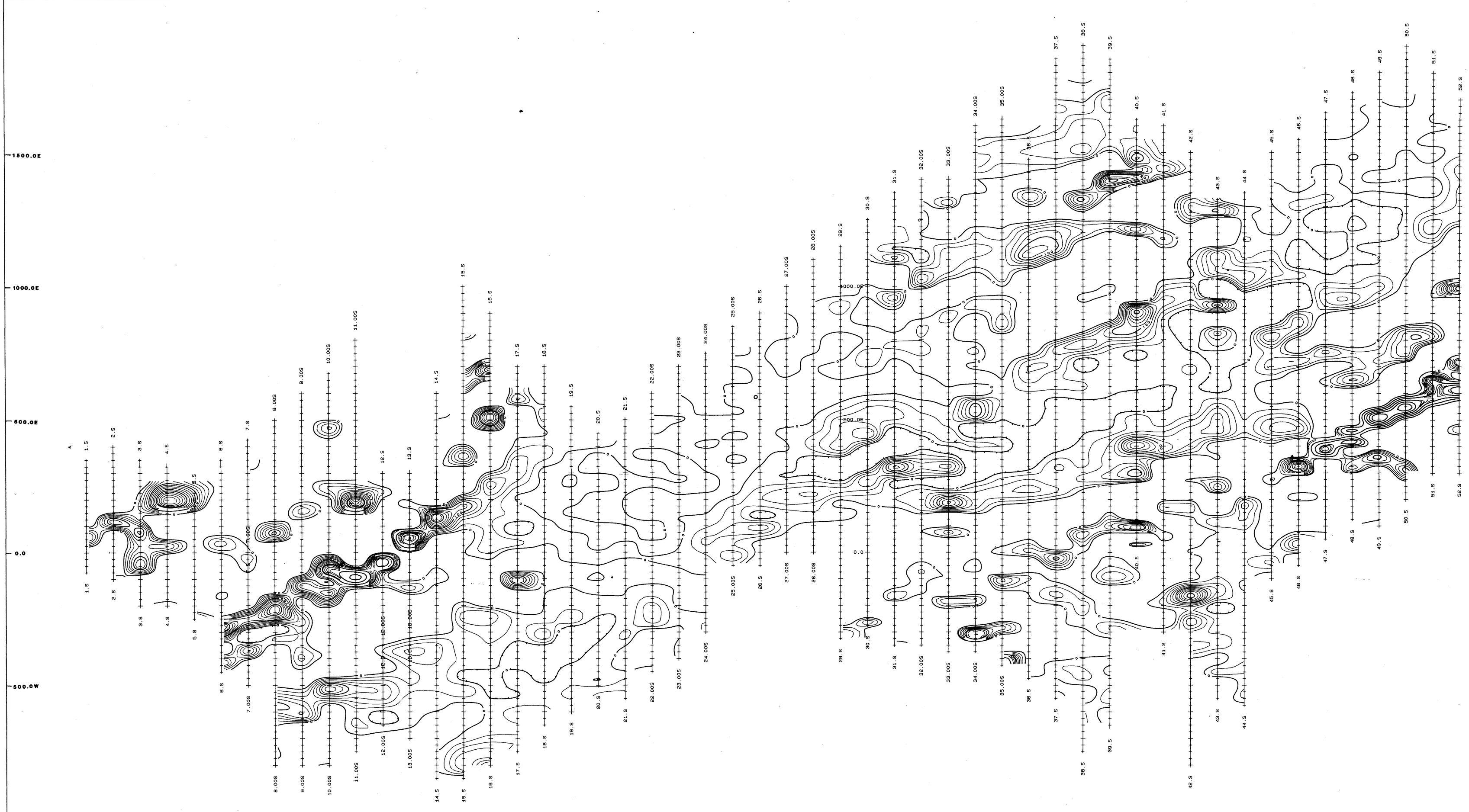
WOLF BAY PROPERTY WEST GRID
FRASER FILTERED VLF
Cutler Maine 24.0 Khz
Contour Interval =20units

50 M / Division

52W16SE0100 2.12571 FAIRLIE

BHP-UTAH MINES LTD.
Toronto Ont

WOLF BAY PROPERTY EAST GRID
FRASER FILTERED VLF
Cutler Maine 24.0Khz
Contour Interval =20units

50 M / Division

2.12571