Battle Mountain (Canada) Inc.

KIRKLAND LAKE PROJECT

REPORT ON GEOLOGICAL MAPPING,

MAGNETOMETER AND VLF-EM SURVEYS

CLAIM L-1111433

TECK TOWNSHIP, LARDER LAKE MINING DIVISION

ONTARIO, CANADA

Toronto, Ontario
April, 1991

W. Benham

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1.0 SUMMARY

Geological mapping, magnetic and VLF-EM surveys were carried out on claim L-111433 in Teck Township by Battle Mountain (Canada) Inc. during 1990.

The property is underlain by porphyritic syenitic phases of the Murdock Creek syenite stock. No significant alteration or mineralization was located.

The magnetic survey outlined three zones of lower magnetic susceptibilities. VLF-EM anomalies were found coincidental with two of the low magnetic anomalies.

Prospecting of the low magnetic anomalies is recommended to determine if they are due to significant alteration and/or sulphide mineralization.

2.0 INTRODUCTION

This report describes the results of geological mapping, magnetometer and very low frequency (VLF-EM) surveys completed by Battle Mountain (Canada) Inc. on claim L-1111433 during the period June 5th to August 8th, 1990.

The picket line grid was cut by Natives Exploration Services of Chibougamau, Quebec. The geophysical surveys were conducted by Joe Mihelcic of JVX Ltd. of Richmond Hill, Ontario. The geological mapping was carried out by Keith Barron of Battle Mountain (Canada) Inc. These surveys were completed in conjunction with surveys on the adjoining Teck "A" property to the east of claim L-1111433. The work was carried out under the supervision of W. Benham.

2.1 Property, Location and Access

Claim L-1111433 is currently held by Battle Mountain (Canada) Inc. as part of an option agreement with Queenston Mining Inc. dated June 15, 1989. Queenston Mining Inc. staked and recorded this claim on June 1, 1989. An airborne geophysical certificate was issued for this claim on May 7, 1990.

The claim is located in the southeastern quarter of Teck Township in the Larder Lake Mining Division, about five kilometres southwest of the Town of Kirkland Lake, as shown on Drawing PL-001.

Access is by a cut baseline from Highway 112, which lies 450 metres to the west of the claim.

3.0 PREVIOUS WORK

There is no record of previous work on the property which was patented ground prior to June 1, 1989. Some old trenches and pits were located during the mapping survey.

4.0 REGIONAL GEOLOGY

The Kirkland Lake mining district is situated within the Archean Abitibi greenston belt. From north to south the district is underlain by tholeiitic volcanics of the Kinojevis Group, alkalic volcanics and sediments of the Timiskaming Group and tholeiitic to komatiitic volcanics of the Larder Lake Group. The Timiskaming and Larder Lake Groups are separated by the Larder Lake Fault Zone. The Murdock Creek and Lebel syenitic stocks intrude the Larder Lake Group rocks.

5.0 SURVEYS

A base line, at 075° Azimuth, on the Teck "A" property was extended westward across patented claim 6817 and claim L1111433. Lines at 400 foot spacings were cut perpendicular to this baseline. Stations were established at 50 foot intervals. A total of 1.08 line miles was cut on claim L1111433 by Natives Exploration Services from June 5th to 8th, 1990.

5.1 Geological

The property was geologically mapped by Keith Barron of Battle Mountain (Canada) Inc. on August 8, 1990. The results of this mapping are shown on Drawing No. 2.

The claim is underlain by mela- to leuco-feldspar porphyritic phases of the Murdock Creek syenite stock. The syenite has fifteen to twenty percent tabular, euhedral, perthitic feldspar phenocrysts and a trachytoid texture. Mafic contents of the syenite are generally ten percent except near the northwestern corner of the claim where a pyroxene-rich, strongly magnetic phase with thirty percent mafic minerals was found.

The syenite is massive to weakly foliated at 075°. Alteration consists of minor epidote, chlorite and ankerite.

A weakly altered, ankerite syenite with traces of pyrite was noted in the southeastern corner of the claim. A sample from this outcrop assayed nil gold.

5.2 Magnetometer

The magnetic survey was conducted by Joe Mihelcic of JVX Ltd on June 12, 1990, using a Scintrex IGS-21MP-2 proton magnetometer reading the total magnetic field with a sensitivity of 1.0 nT. A digital Scintrex MP-2 basestation magnetometer was used to record diurnal variations. The total field magnetic data were processed to remove the diurnal variations. Readings were taken at 50 foot intervals. The contoured magnetic results are plotted on Drawing No. 3.

High magnetic susceptibilities, up to 61,930 nT, which are interupted by three areas of lower magnetic susceptibilities (less than 60,400 nT) designated as A, B and C, were detected. The lower magnetic susceptibilities may be due to alteration or shear zones where the magnetite has been replaced by pyrite.

5.3 Electromagnetics

The VLF-EM survey was carried out with a Scintrex IGS-2/VLF-4 by Joe Mikelic of JVX Ltd. on June 12, 1990. This instrument measures the horizontal field strength and the in-phase and quadrature components of the vertical field. The transmitter used was Cutler, Maine which operates at a frequency of 24.0 kHz. Readings were taken at 50 foot intervals. The results are profiled on Drawing No. 4 and the Fraser filtered in-phase data is contoured on Drawing No. 5.

Four weak VLF-EM anomalies were located. Two of the anomalies are coincident with zones of lower magnetic susceptibility. These anomalies may be due to sulphide mineralization in alteration and/or shear zones.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Claim L1111433 is underlain by syenite with high magnetic susceptibilities which are locally interupted by areas of lower susceptibilities. No significant mineralization or alteration were located.

The areas of lower magnetic susceptibilities may be due to overburden covered shear zones. Prospecting along these low magnetic anomalies is recommended.

Wayne Benham,
Kirkland Lake, Ontario

Qual 2.143

FL: KL\L1111433.RPT

REFERENCES

- Thomson, J.E., 1950 - Geology of Teck Township and the Kenogami Lake area, Kirkland Lake Gold Belt: Ontario Department of Mines, Annual Report for 1948, Vol. 57, Part 5, p. 1-53. Reprinted 1989.

The following are all internal company reports of Battle Mountain (Canada) Inc.

- Airborne magnetic and VLF-EM survey, Kirkland Lake area; Terraquest, Grid Data North and Stratagex Ltd.; December, 1989.
- Report on geological mapping, overburden stripping and channel sampling, in July 1989 to August 1990, Teck "A" property; September, 1990.
- Report on magnetic survey, 1990, Teck "A" property, by Stratagex Ltd.; October 1990.

APPENDIX I

TECHNICAL DATA STATEMENT

M.L

Ministry of Northern Development and Mines

Ontario

WORK

DOCUMENT NO. W9180.00200

June 03 July 02

Instructions
- Please type or print.
- Refer to Section 77, the Mining Act for assessment work requirements and maximum credits allowed per survey type.
- If number of mining claims traversed exceeds space on this form attach a list.
- Technical Reports and maps in duplicate should be submitted to Mining Lands Section, Mineral Development and Lands Branch

Mining Act

Report of Work
(Geophysical, Geological and Geochemical Surveys)

2.14155

Type of Survey(s): Electromagnetic, Magnetometer, Geological	Mining Division: Larder Lake	Township or Area: Teck Township
Recorded Holder(s): BATTLE MOUNTAIN (CANADA) INC.		Prospector's Licence No.: T 5179
Address: Suite 2910, 390 Bay Street, Toronto, Ontario M5H 2Y2		Telephone No.: (416) 867-9815
Survey Company: JVX Ltd. and Battle Mountain (Canada) Inc.		
Name and Address of Author (of Geo-Technical Report): Wayne Benham, Suite 2910, 390 Bay Street, Toronto, Ont. M5H 2Y2		Date of Survey (from & to): 05 06 90 (Day, Mo, Yr) — 22 04 91 (Day, Mo, Yr)

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	40
	Geophysical - Magnetometer	20
	Geophysical - Other	
	Geological	20
	Geochemical	
Man Days Complete reverse side and enter total(s) here	Geophysical - Electromagnetic	
	Geophysical - Magnetometer	
	Geophysical - Other	
	Geological	
	Geochemical	
Airborne Credits Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	
	Magnetometer	
	Other	

Total miles flown over claim(s).

Date: April 26/91

Recorded Holder or Agent (Signature): David E. Lloyd

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Mining Claim Prefix	Mining Claim Number	Mining Claim Prefix	Mining Claim Number
L	1111433				

RECEIVED
MAY 23 1991
MINING LANDS SECTION

Total number of mining claims covered by this report of work: 1

Certification Verifying Report of Work

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

Name and Address of Person Certifying: Wayne Benham c/o Battle Mountain (Canada) Inc., Suite 2910, 390 Bay Street

Toronto, Ontario M5H 2Y2	Telephone No.: (416) 867-9815	Date: April 26, 1991	Certified By (Signature): W Benham

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
80	May 3/91	D. Bennett
	Date Approved as Recorded: June 05, 1991	Provincial Manager, Mining Lands: Tom C Gadsden

Received Stamp
RECEIVED
LARDER LAKE
MINING DIVISION
MAY 3 1991
TIME

1362 (89/06)

BATTLE MOUNTAIN (CANADA) INC.

2.14155

BATTLE MOUNTAIN GOLD COMPANY

May 22, 1991

Mining Lands Section
Mineral Development
and Lands Branch
4th Floor
159 Cedar Street
Sudbury, Ontario
P3E 6A5

RECEIVED

MAY 30 1991

MINING LANDS SECTION

Dear Sir:

Re: Technical Report Geophysical and Geological
Claim L-1111433, Teck Township
Larder Lake Mining Division

Please find enclosed, in duplicate, a technical report describing the results of VLF-EM, magnetometer and geological mapping surveys which were completed on claim L-1111433 by Battle Mountain (Canada) Inc. A completed Report of Work form has been forwarded to the mining Recorder in Kirkland Lake.

If there are any questions regarding these reports, please contact W. Benham at (705) 567-4840.

Yours very truly,

BATTLE MOUNTAIN (CANADA) INC.

W. Benham,
Project Geologist

WB/jac
Encl.
c.c. - Mining Recorder,
Kirkland Lake, Ont.

FL: KL\TKGPGLRP.LET

File _____

Ontario

Ministry of Natural Resources

GEOPHYSICAL – GEOLOGICAL – GEOCHEMICAL TECHNICAL DATA STATEMENT

2.14155

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) Electromagnetic, Magnetometer, Geological

Township or Area Teck Township

Claim Holder(s) Battle Mountain (Canada) Inc.

Survey Company JVX Ltd. & Battle Mountain (Canada) Inc.

Author of Report Wayne Benham

Address of Author Ste. 2910, 390 Bay St. Toronto, Ont. M5H 2Y2

Covering Dates of Survey June 5, 1990 - April 22, 1991 (linecutting to office)

Total Miles of Line Cut 1.08

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	20
Geochemical	

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

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

DATE: April 22/91 SIGNATURE: W. Benham
Author of Report or Agent

Res. Geol. _____ Qualifications 2.143

Previous Surveys

File No.	Type	Date	Claim Holder

MINING CLAIMS TRAVERSED
List numerically

(prefix)	(number)
L	1111433

RECEIVED
MAY 30 1991
MINING LANDS SECTION

If space insufficient, attach list

TOTAL CLAIMS 1

OFFICE USE ONLY

837 (5/79)

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 _____

_____

_____

_____

_____

_____

_____

_____

_____

GEOPHYSICAL TECHNICAL DATA

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

Number of Stations 69 Number of Readings VLF-EM 69, Mag 69

Station interval VLF-EM 50 Ft., Mag 50 ft. Line spacing 400 ft.

Profile scale VLF 1 cm = 5.0% vertical field, 1 cm = 50% horizontal field

Contour interval Mag 50 gammas

MAGNETIC

Instrument Scintrex IGS-2/MP2

Accuracy – Scale constant 1.0 nT

Diurnal correction method Base station

Base Station check-in interval (hours) 20 seconds

Base Station location and value Teck A, 30 metres northeast of post #3 claim 495722
60,560 gammas

ELECTROMAGNETIC

Instrument Scintrex IGS-2/VLF-4

Coil configuration Vertical

Coil separation Infinite

Accuracy 1 degree

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

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

Parameters measured Horizontal field strength, in-phase and quadrature components of the vertical field.

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

Bernhardt Twp. M 327

Otto Twp M379

Lebel Twp

M 330

NOTES

Areas shown thus for slime disposal

Mining claim L 5779 - Mining Rights subject to Sec 36 of the Mining Act RSO 1950)

AREAS WITHDRAWN FROM STAKING

(R1) SURFACE RIGHTS WITHDRAWN FROM STAKING SECTION 43/70 ORDER NO W76/80

(R2) SURFACE AND MINING RIGHTS WITHDRAWN FROM STAKING SECTION 36/80 ORDER NO W108/82

(R3) ~~SURFACE AND MINING RIGHTS WITHDRAWN FROM STAKING SECTION 36/80 ORDER NO. W8/86~~ ORDER NO. O-20/88 OPENS PART W-08/86

(R4) SURFACE AND MINING RIGHTS WITHDRAWN FROM STAKING SECTION 36/80 ORDER NO. W9/86 ORDER NO. O-22/88 OPENS PART OF W9/86

(R5) ~~SURFACE AND MINING RIGHTS WITHDRAWN FROM STAKING SECTION 36/80 ORDER NO. W18/86~~ ORDER NO O-L19-90 NR OPENS W18/86 NOV 15/90

(R6) ~~MINING RIGHTS WITHDRAWN FROM STAKING SECTION 36/80 ORDER NO. W90/87 NR~~ ORDER NO O-33/88 OPENS W-90/87

(R7) MINING RIGHTS WITHDRAWN FROM STAKING SECTION 36/80 ORDER NO W-22/88

(R8) MINING RIGHTS WITHDRAWN FROM STAKING SECTION 36/80 ORDER NO ~~W-1195~~ W-L 2/89 NR ORDER NO O-L11/90 NER OPENS W-L2/89NR

~~MINING RIGHTS WITHDRAWN FROM STAKING SECTION 36/80 ORDER NO. W-L 3789 NR~~ ORDER NO O-L11/90 OPENS W-L3/89NR

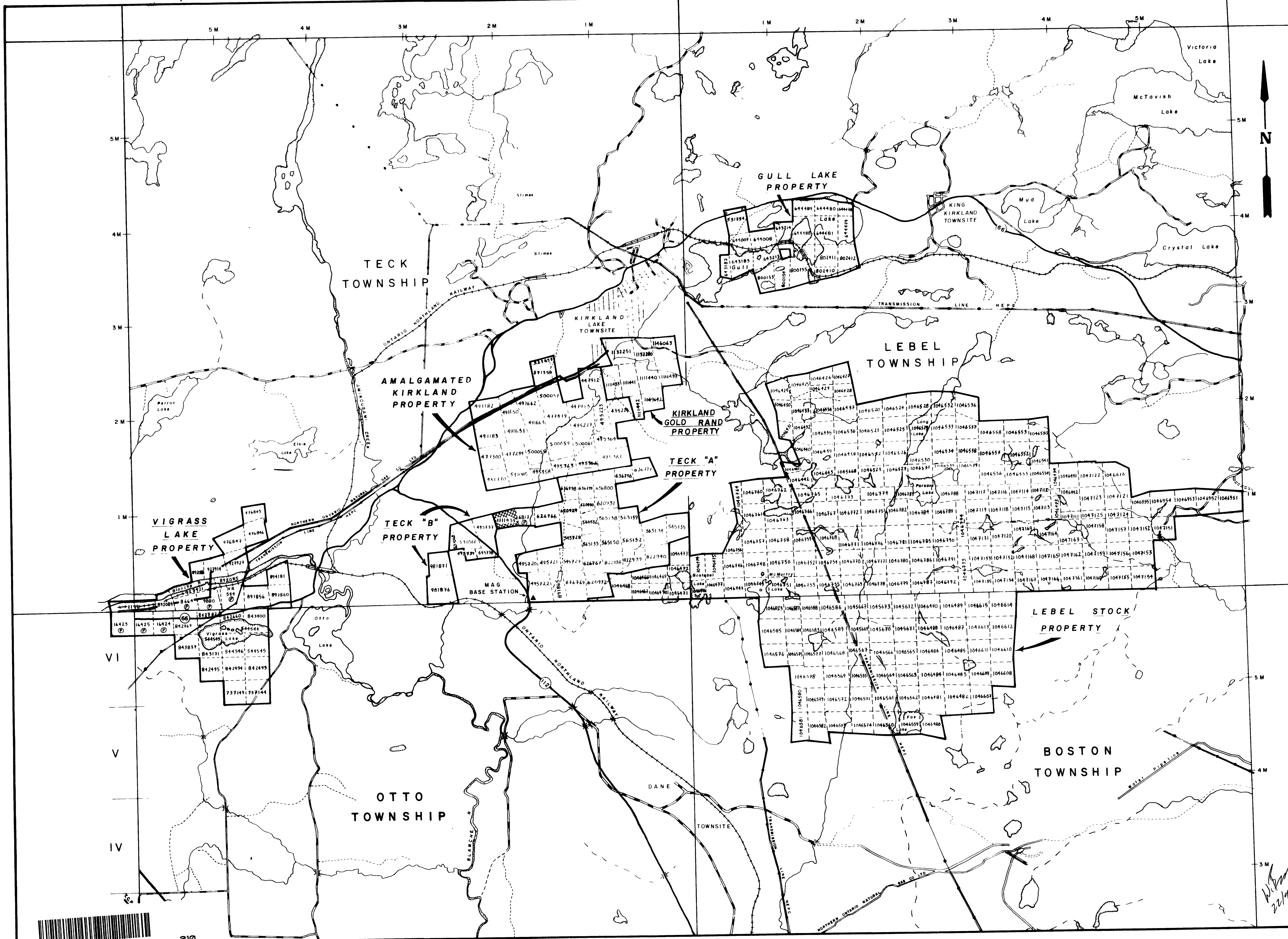
THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES, AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER, MINISTRY OF NORTHERN DEVELOPMENT AND MINES, FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON.

DATE OF ISSUE
JUN 7 1991
LARDER LAKE
MINING RECORDER'S OFFICE

2.14155

42A81NE0114 2.14155 TECK

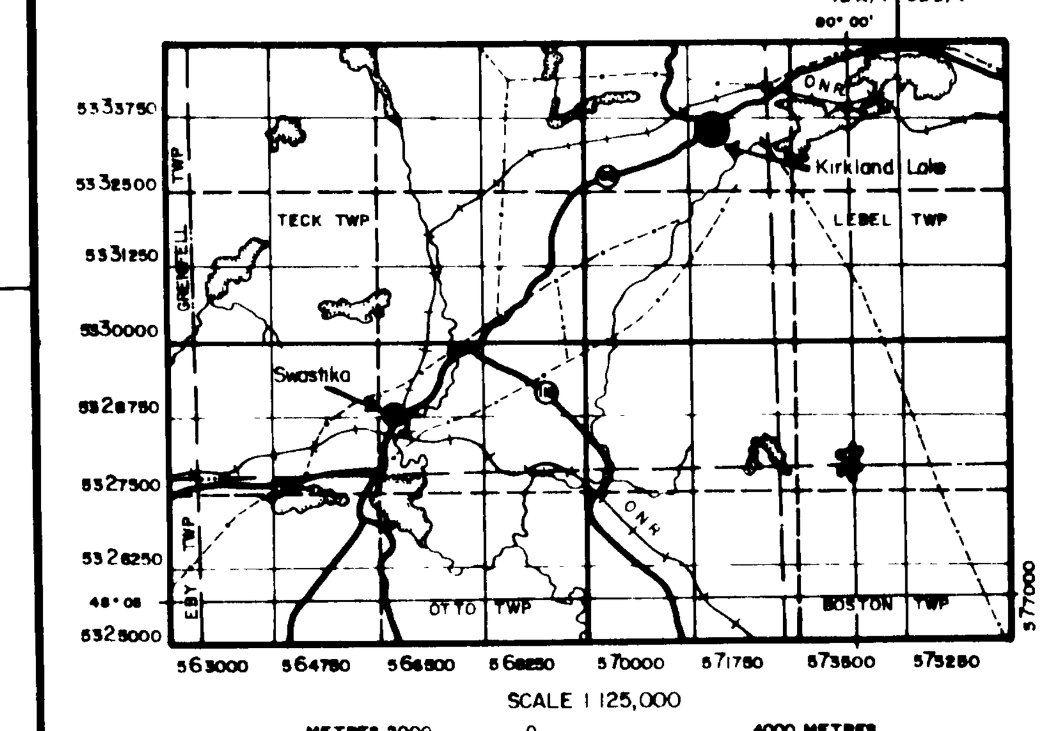
200



LEGEND

HIGHWAY and ROUTE No (66)
OTHER ROADS
TRAILS
SURVEYED LINES
TOWNSHIP BASE LINE, etc
UNSURVEYED LINES
PARCEL BOUNDARY
MINING CLAIMS

NOTE: The information that appears on this map has been compiled from various sources, therefore accuracy cannot be guaranteed



SCALE 1:125,000

METRES 2000 0 4000 METRES

1:2,500 SHEET 1:5,000 SHEET 1:10,000 SHEET 1:20,000 SHEET

BATTLE MOUNTAIN (CANADA) INC.

2.14155

KIRKLAND LAKE PROJECT
Queenston Mining Inc.
ONTARIO

CLAIM MAP

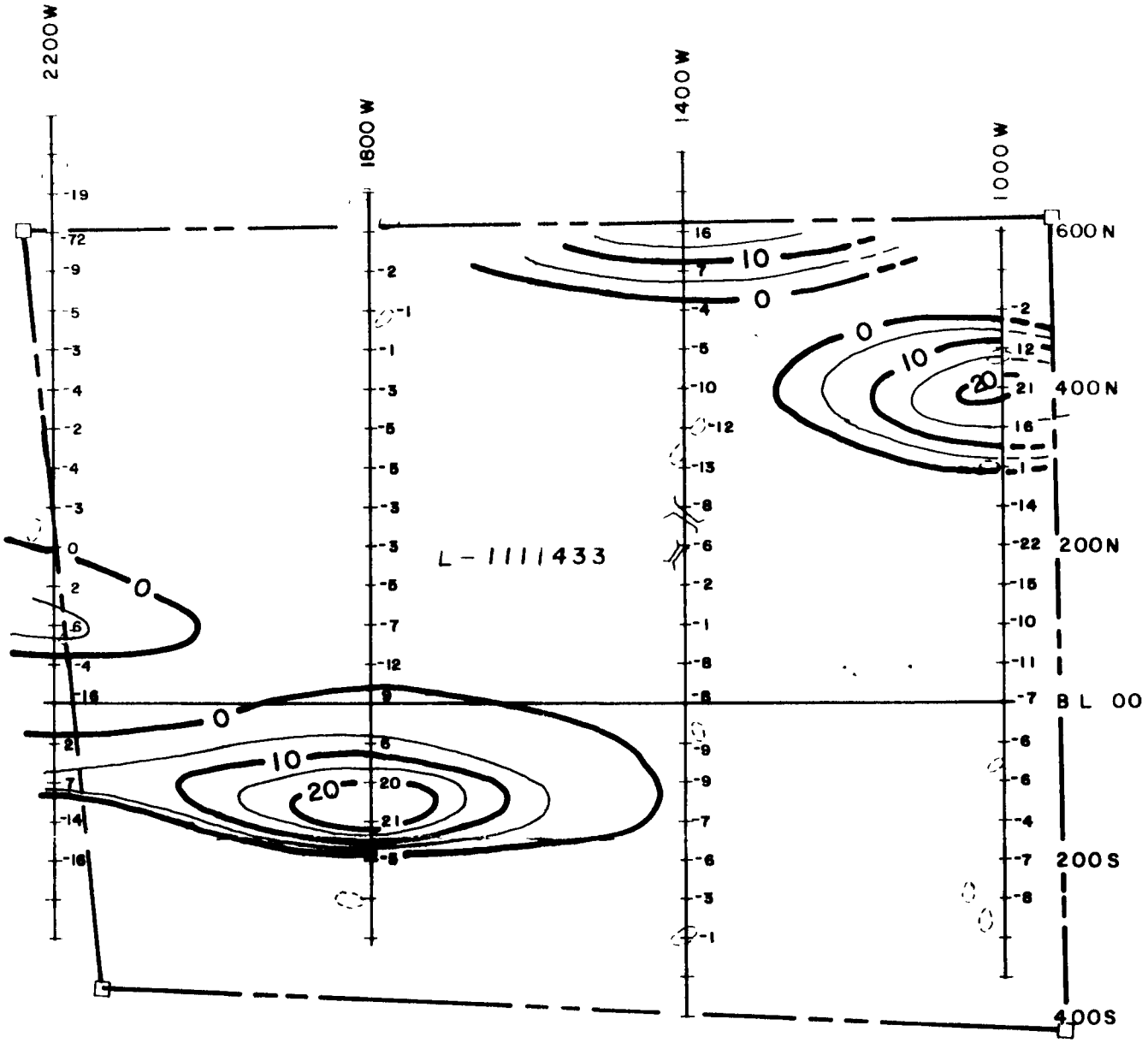
PROJECT No 75-JV-28	DATA BY
NTS 42A/1 & 32D/4	DRAWN BY B H Madill, Tech.
DRAWING No PL-001	DATE Revised 03/27/91

SCALE 1 inch = 1/2 mile
FEET 0 1000 2000 4000 6000 8000
METRES 0 200 1000 2000

22/4/91

42A01NE0114 2.14155 TECK

210



2.14155

Claimposts :

☐ Unlocated

Scale:

50 0 50 100
metres

200 100 0 100 200
feet

Instrument : Scintrex IGS-2/VLF-4

Transmitter Station : Cutler, Maine

Frequency : 24.0 kHz.

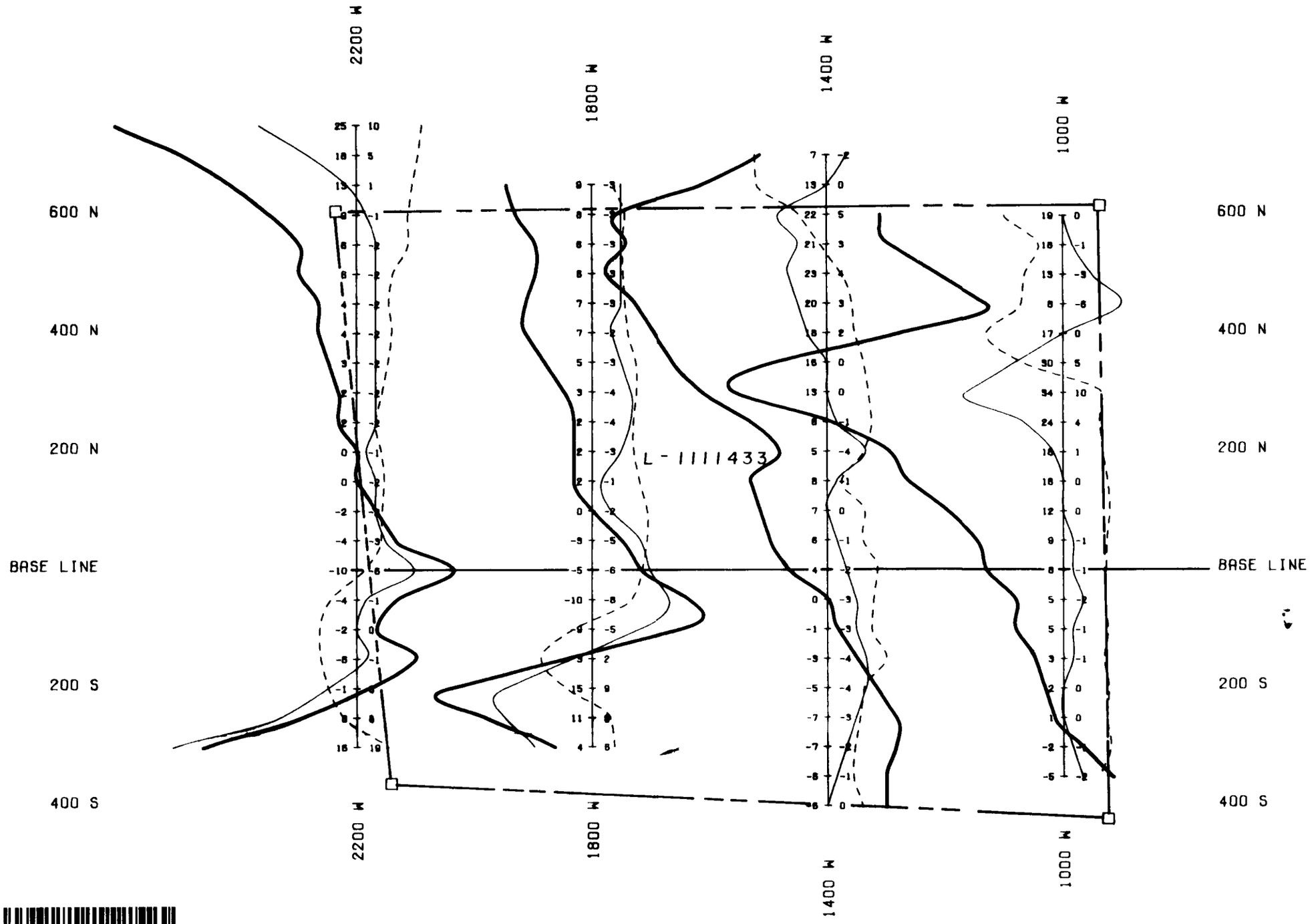
Contour interval : 5

22/4/91

BATTLE MOUNTAIN (CANADA) INC.

KIRKLAND LAKE PROJECT
Queenston Mining Inc.
ONTARIO
CLAIM L 1111433
VLF EM SURVEY
(Fraser Filtered)

Project No. 75 JV 28	Scale 1:2500
NTS 42 A/1	Data by JVX Ltd.
Drawing No. 5	Date March 1991



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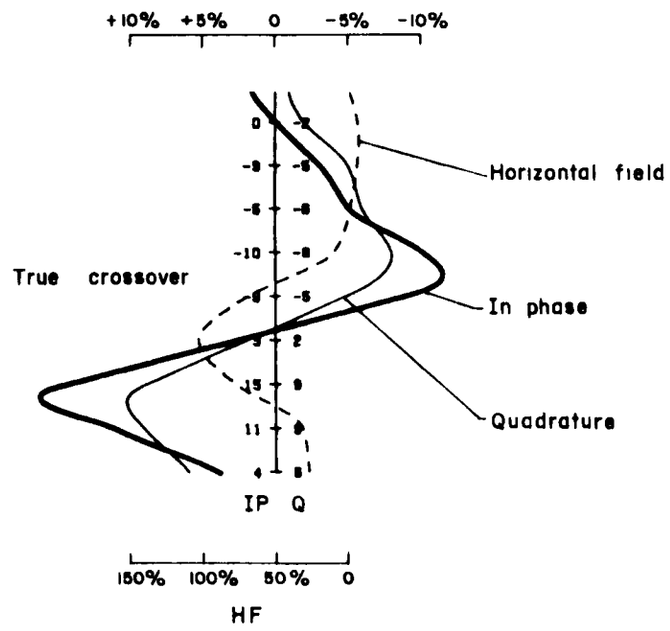
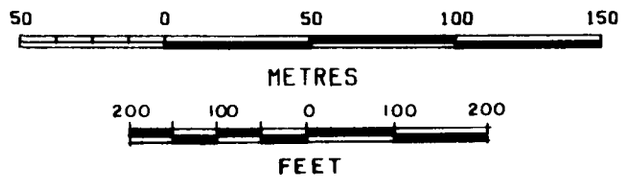
LEGEND

IP & Q



2·14155



BATTLE MOUNTAIN (CANADA) INC.

TECK "A" PROPERTY

KIRKLAND LAKE, ONTARIO

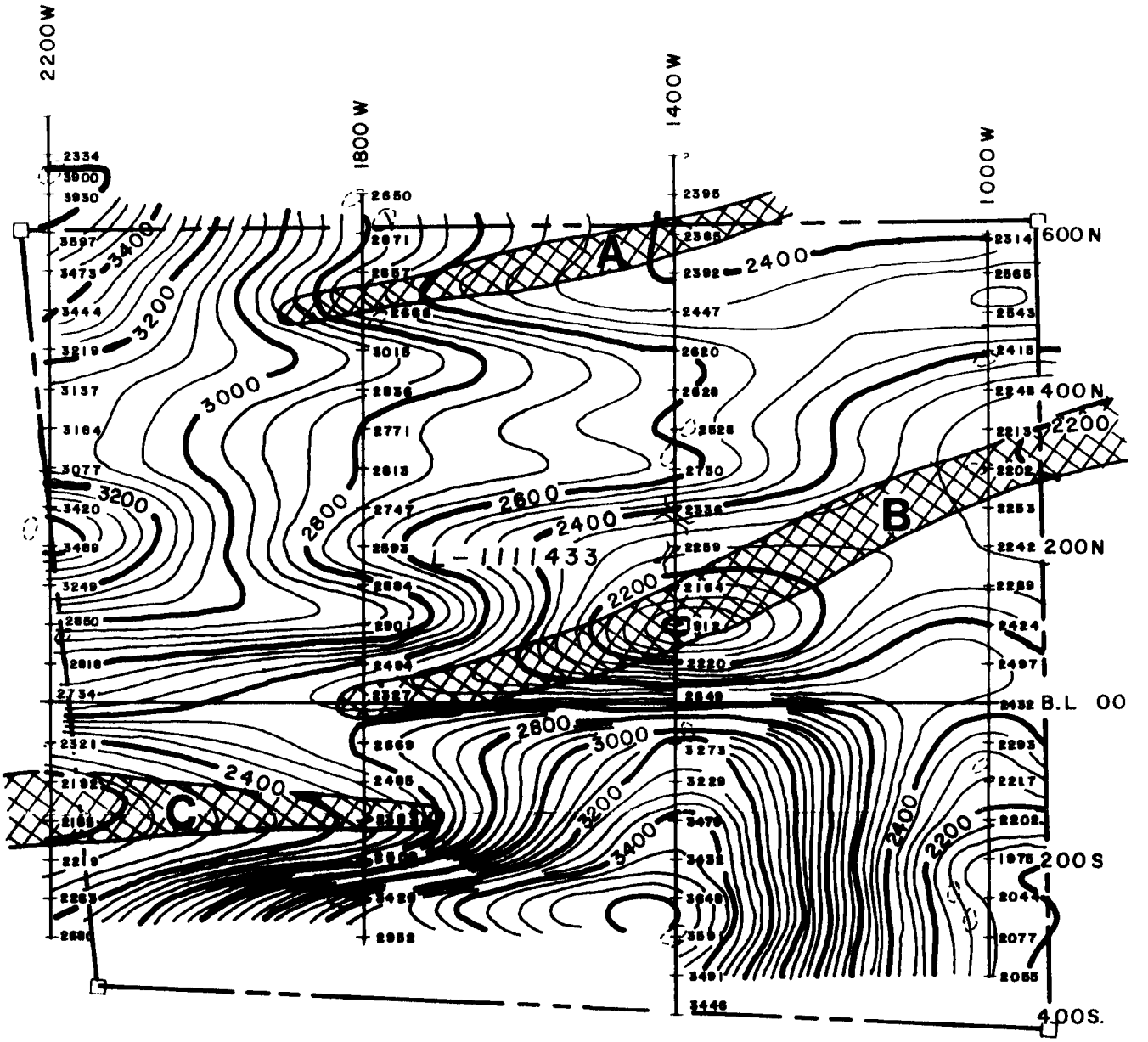
VLF PROFILES -- 24.0KHZ

VLF STATION : NAA,CUTLER,MAINE
POSITIVE Z-DIR = LEFT : Z-SCALE 1CM = 5.0%
HORIZONTAL FIELD BASE VALUE = 50.0%
SCINTREX IGS-2 / VLF-4

— CLAIM 1111433 —
SCALE 1:2500
PLATE 5

COMPILED BY	PROJECT NO.: 75-JV-28	Drawing No 4
JVX LTD.	N.T.S.: 42A/1 & 32D/4	
JULY, 1990		

W.B. 2/14/91



42A01NE0114 2.14155 TECK

2.14155

240

Claimposts :

☐ Unlocated

Scale

50 0 50 100
metres

200 100 0 100 200
feet

Instrument : Scintrex IGS-2/MP-2

Type : Total Field Proton Precession

Contour Interval : 50 nT.

Datum Level : 58000 nT

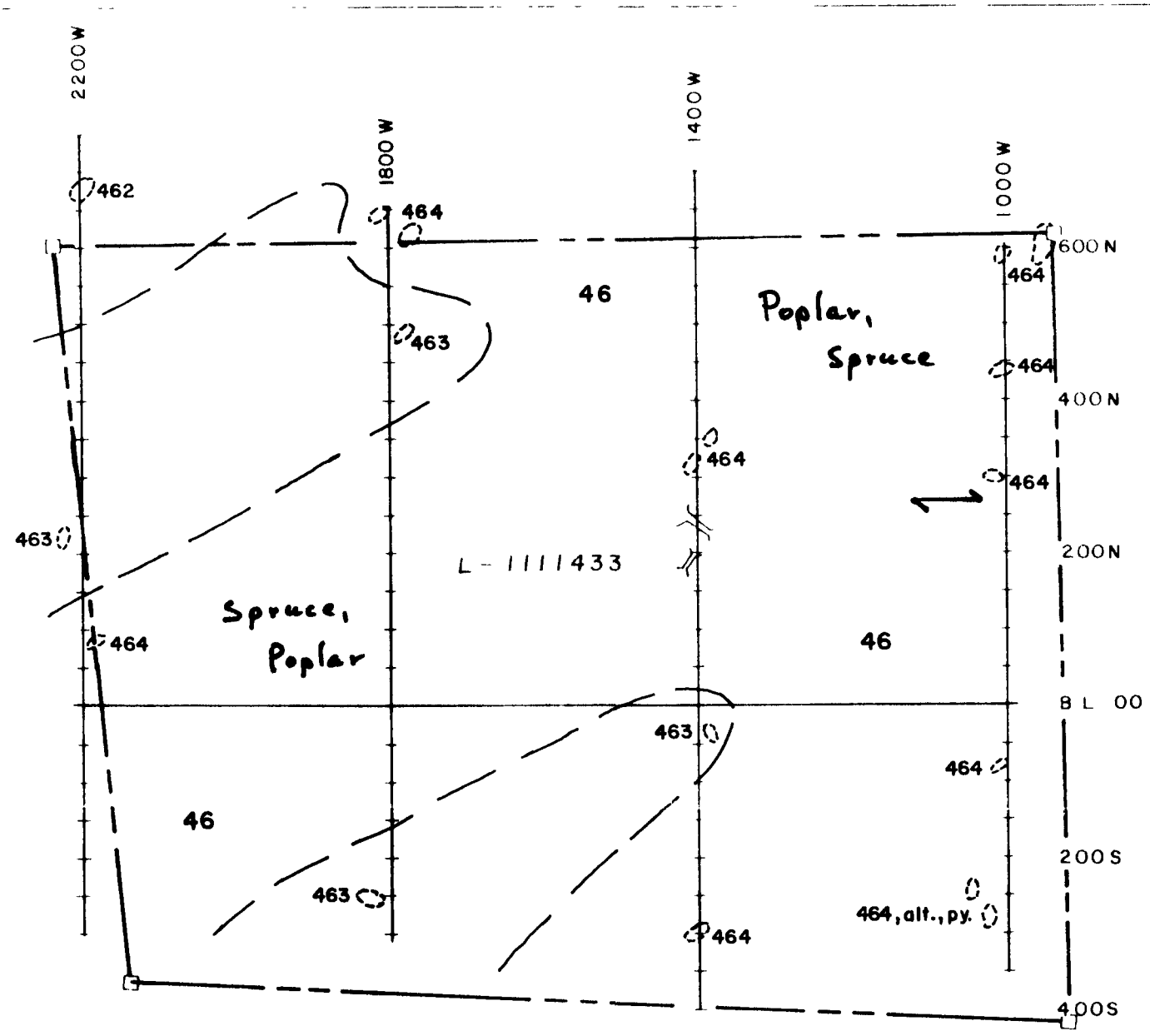
Low Susceptibility

22/4/91

BATTLE MOUNTAIN (CANADA) INC

KIRKLAND LAKE PROJECT
Queenston Mining Inc
ONTARIO
CLAIM L1111433
TOTAL FIELD MAGNETIC SURVEY

Project No 75-JV-28	Scale 1 : 2500
NTS 42 A/1	Data by JVX Ltd
Drawing No 3	Date March 1991



2.14155

250

Scale

50 0 50 100
metres

200 100 0 100 200
feet

LEGEND

- 46 Syenite
- 461 Augite Syenite
- 462 Mela Syenite
- 463 Meso Syenite
- 464 Leuco Syenite
- Historic Trench
- Outcrop
- Claim Post

BATTLE MOUNTAIN (CANADA) INC

KIRKLAND LAKE PROJECT
Queenston Mining Inc
ONTARIO
CLAIM L 1111433
GEOLOGY PLAN

Project No 75-JV-28	Scale 1:2500
NTS 42 A/1	Data by H.D.L., V.S., K.B.
Drawing No 2	Date March 1991

22/4/91