BOULDER LAKE PROPERTY

ASSESSMENT REPORT

ON

MAGNETIC AND VLF SURVEYS

NTS: 42 B/1

Submitted by:

P.A. Diorio
January, 1986
Toronto, Ontario

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BOULDER LAKE
ASSESSMENT

I INTRODUCTION

This report covers magnetometer and VLF-EM surveys performed over a group of claims in Muskego and Keith Townships referred to here as the Boulder Lake property. This work is part of an on-going gold exploration program being conducted by Utah Mines Ltd. These surveys were intended to help initial mapping of the property by giving some indication of the geology underlying the overburden.

II LOCATION AND ACCESS

The property consists of 34 contiguous located approximately 10 miles southwest of Foleyet, Ontario. The property is reached by Highway 101 which transects the claim group. (Figure 1).

III CLAIMS COVERED BY THE SURVEY

This report makes reference to data collected over most claims in the claim group, however, only two claims (P796557 and P797558) are considered here for assessment purposes.

Maps accompanying this report also include data for claims P825404 to P825430 which were previously submitted (Diorio, Nov. 1985). Claims P825431 to P825435 are also part of the same claim block but have not yet been covered by the surveys.

IV REGIONAL GEOLOGY

The regional geological setting of the Swayze Deloro metavolcanic-metasedimentary belt is outlined by Thurston et al, (1977).

All rocks in the Chapleau Area are of Early Precambrian age, with the exception of the carbonatite-alkalic complexes associated with the Kapuskasing Structural Zone. the Wawa and the Abitibi Sub-Province consist of volcanic and sedimentary belts generally withing greenschist facies of metamorphism. The volcanic and sedimentary belts are surrounded and intruded by Algoma igneous intrusive rocks.

The Abitibi Greenstone Belt extends westward from Quebec into the map area and is abruptly terminated at the Kapuskasing

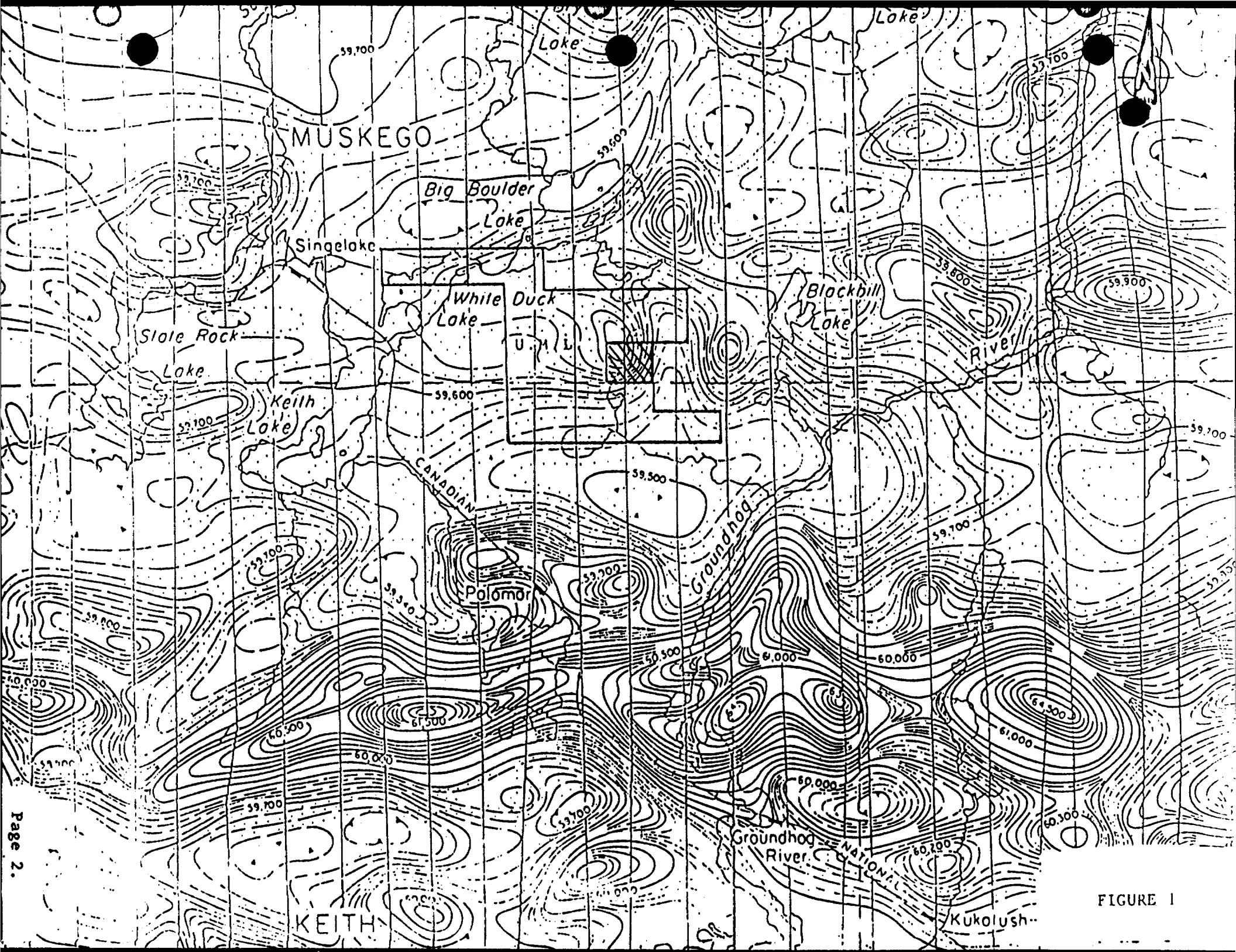

MUSKEGO
Big Boulder Lake
Singelake
White Duck Lake
Slole Rock Lake
Keith Lake
Blackbill Lake
River
CANADIAN
Groundhog
Polomar
Groundhog River
NATIONAL
Kukolush
KEITH
59,700
59,600
59,500
59,900
59,800
60,000
61,000
61,500
60,500
64,500
60,300
60,200

FIGURE 1

Structural Zone. Several volcanic complexes have ben delineated in the Abitibi Greenstone belt by Goodwin and Riddler (1970).

The Deloro volcanic complex extends for 24 km from the Timmins - Nighthawk Lake Area to the Foleyet - Horwood Lake Area, where it is terminated by faults and granitic intrusions. Metavolcanic and metasedimentary rocks in the southern portion of the Muskego Twp. and in the northern portion of the Keith Twp. are within the northern margins of the Deloro volcanic complex.

V LOCAL GEOLOGY

This section contains a description of the geology of the northern half of Keith Twp. and the southern portion of Muskego Two.

The area is covered by intermediate to mafic metavolcanic rocks consisting of pillowed and amygdaloidal basalts, mafic tuffs, chloritic schists, fragmental volcanics, and tremolitic volcanic rocks. These rocks are interlayered with less abundant felsic volcanics, and interbedded with metasedimentary rocks. The felsic volcanic rocks consist of agglomerate, tuffs, sericite schists, quartz, porphyries and feldspar porphyries. Several east-west trending metasedimentary units occur in the area, and consists of conglomerate, quartzite, arkose, greywackes and argillite. Thin iron formation (magnetic and hematite type) units trending east-west, outcrop in the northern half of Keith Township.

Several faults (north and northeast trending) with left lateral movement occur in the area.

VI PREVIOUS EXPLORATION HISTORY

Generally, the area has not been mapped in detail, there are several unmapped portions and for Muskego Township essentially no exploration assessment work submitted. The area staked by Utah Mines Ltd., (Boulder Lake Property) is untested as far as exploration is concerned. An IP survey was filed for assessment under separate cover (Diorio, August 1985). As previously

mentioned, Mag and VLF surveys covering claims P825404 to P825430 were also filed for assessment (Diorio, November 1985)

VII SURVEY GRID

Prior to commencement of the geophysical surveys, cut line grids were established to cover most of the mining claims. This linecutting was carried out by Exploration Services Limited, Noranda, Quebec under contract to Utah Mines Ltd. Grid on claims P796557 and P796558 was cut by Utah Mines Ltd. personnel and is contiguous with the rest of the grid.

The survey grid was established as shown on the accompanying maps. The grid uses an east-west base line (station 0 N) established 1300 feet north of the Keith-Muskego Township lines. Control lines were cut at 2640 feet north and 2640 feet south of this base line. Traverse lines were cut at 400 foot intervals and stations established every 100 feet. At each station wood pickets were emplaced, which were clearly marked with their respective grid designations.

VIII METHOD OF GEOPHYSICAL SURVEYS

(a) Magnetic Survey

The magnetic survey was carried out using a Scintrex MP-3 hand held Proton precession magnetometer. Magnetometers of this type make us 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 produced by D.C. current through a coil surrounding a proton rich fluid (kerosene). When the current is switched off, the protons process 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 of chemical variations. The frequency is measured by observing the current induced in a coil surrounding in fluid. A

magnetometer based on this principle is effectively free from drift. The Scintrex magnetometer used for this survey employs a sensor mounted on a staff which is held at arm's length from the operator, thereby reducing possible magnetic or electromagnetic effects introduced by the operator. 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 ± 0.1 gamma.

Magnetic readings must be corrected for the time varying component of the geomagnetic field. This was done by correcting all readings with respect to a base station located on the grid at the base line (LON) and L40W. The correction was carried out using this syncronized base station magnetometer.

(b) VLF-EM Survey

The electromagnetic survey was carried out using a Scintrex VLF-3 Electromagnetic System. The VLF-3 is a receiver that measures the VLF magnetic field component from transmitter stations normally used for navigation and military submarine communications. The survey at Boulder Lake made use of the VLF transmitter in Cutler Maine operating at a frequency of 24.0 KHz.

The VLF-3 measures three components of the VLF-magnetic field:

1. the horizontal amplitude in a direction perpendicular to a line joining the operator to the station;
2. vertical in-phase amplitude and;
3. vertical quadrature amplitude.

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

IX INTERPRETATION AND RESULTS

(a) Magnetic Survey

The magnetic data is presented on separate plan maps at a scale of 1" = 400'.

(1) Contour Plan (50 gamma contour interval)
(2) Posted Data Values (gammas)

Magnetic data on the north half of the grid is dominated by strong anomalies (500-5000 gammas) which probably represent near surface or exposed basalt and/or its intrusive equivalent (gabbro/diabase) along with minor amounts of magnetite iron formation.

South of the base line on L80W to L40W at approximately station 6S is a similar magnetic anomaly. This unit is bounded on the north by a VLF anomaly (B) and lies roughly 300' south of the peak of a strong linear IP chargeability anomaly. (IP data are filed for assessment under separate cover).

(b) VLF-EM Survey

VLF data are presented on the following plan maps at a scale of 1" = 400':

1. Horizontal Field Contours with posted data values (arbitrary units).
2. Vertical In-Phase and Out-Of-Phase Profiles with conductor axes marked (100% per inch)
3. Vertical In-Phase and Out-Of-Phase posted data values (%).

A number of anomalies, as indicated by peaks in the horizontal field and cross overs in the in-phase component, are marked on the accompanying maps. Conductor A and B are closely related to IP chargeability highs and warrant sampling by overburden stripping and, pending on encouraging outcome, diamond drilling. Other anomalies may represent shear zones and should be explored using geochem and geologic mapping.

P. Diorio

Peter A. Diorio

PAD/ak

900

Mining Lands Section

File No 2.8811

Control Sheet

TYPE OF SURVEY

✓ GEOPHYSICAL

____ GEOLOGICAL

____ GEOCHEMICAL

____ EXPENDITURE

MINING LANDS COMMENTS:

log

LD

J. Hurst

Signature of Assessor

Jan 24/86

Date

Ministry of Northern Affairs and Mines
Ontario

Report of Work
(Geophysical, Geological, Geochemical and Expenditures)

#431/85-2.8811

Mining Act

Jan 16/86

Instructions: – Please type or print.
– 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 in the "Expend. Days Cr." columns.
– Do not use shaded areas below.

Type of Survey(s)	Township or Area
MAGNETOMETER AND VLF ELECTROMAGNETIC	MUSKEGO & KEITH TWPS

Claim Holder(s)	Prospector's Licence No.
UTAH MINES LTD	T-793

Address: 5 BIRCH ST. N, TIMMINS, ONTARIO, P4N 6C8

Survey Company	Date of Survey (from & to)	Total Miles of line Cut
UTAH MINES LTD	26 11 85 (Day / Mo. / Yr.) 26 11 85 (Day / Mo. / Yr.)	1.5 miles

Name and Address of Author (of Geo-Technical report): DUNCAN F. MCIVOR/c/o UTAH MINES LTD 5 BIRCH ST.N, TIM.,ONT.,P4N 6C8

Credits 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	40
	Geophysical - Magnetometer	20
For each additional survey: using the same grid: Enter 20 days (for each)	Geophysical - Radiometric	
	Geophysical - Other	
	Geological	
	Geochemical	

Man Days		Days per Claim
Complete reverse side and enter total(s) here	Geophysical - Electromagnetic	
	Geophysical - Magnetometer	
	Geophysical - Radiometric	
	Geophysical - 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.
P	796557	
	796558	

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.

RECEIVED
JAN 08 1986
MINING LANDS SECTION

RECORDED
NOV 27 1985

PORCUPINE MINING DIVISION
RECEIVED
NOV 27 1985

Total number of mining claims covered by this report of work: 2

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.

For Office Use Only		
Total Days Cr. Recorded: 120	Date Recorded: Nov 27/85	Mining Recorder: Stanley
	Date Approved as Recorded: 86.1.27	Branch Director:

Date	Recorded Holder or Agent (Signature)
Nov. 27/85	Duncan McIvor

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: Duncan F. McIvor c/o Utah Mines Ltd. 5 Birch St. North Timmins Ont P4N 6C8 (264-7221)

Date Certified: Nov. 27, 1985

Certified by (Signature): Duncan McIvor

1362 (85/9)

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 AND VLF

Township or Area MUSKEGO AND KEITH TOWNSHIPS

Claim Holder(s) UTAH MINES LTD.

Survey Company UTAH MINES LTD.

Author of Report P.A. DIORIO

Address of Author 900-25 ADELAIDE ST. E. TOR. ONT. M5C 1Y2

Covering Dates of Survey NOVEMBER 26/85 to JANUARY 7/86
(linecutting to office)

Total Miles of Line Cut 30

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: JANUARY 7, 1986 SIGNATURE: P.A. DIORIO
Author of Report or Agent

Res. Geol._____ Qualifications 24695

Previous Surveys

File No.	Type	Date	Claim Holder

MINING CLAIMS TRAVERSED
List numerically

(prefix)	(number)
P	796557
	796558

If space insufficient, attach list

TOTAL CLAIMS 2 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 = 150 VLF = 72 Number of Readings MAG = 150 VLF = 216

Station interval MAG = 50' VLF = 100 Line spacing 400'

Profile scale as shown on maps

Contour interval as shown on maps

MAGNETIC

Instrument Scintrex MP-4

Accuracy – Scale constant ± 0.1 gammas

Diurnal correction method Synchronous base station

Base Station check-in interval (hours) N/A

Base Station location and value Line 40 W Station 0 N

Value = 58916.2 Gammas

ELECTROMAGNETIC

Instrument Scintrex VLF-3

Coil configuration

Coil separation

Accuracy ± 1%

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

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

Parameters measured Horizontal, Vertical In-Phase, Vertical Out-of-Phase Magnetic field components in percent.

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_____

UTAH MINES LTD.

MINERAL EXPLORATION

SUITE 900, 25 ADELAIDE STREET EAST, TORONTO, ONTARIO, CANADA M5C 1Y2
(416) 368-3884

January 15, 1986.

Mr. Ray Pichette,
Supervisor Mining Land Section,
Ministry of Natural Resources,
Room 6610, Whitney Block,
99 Wellesley Street, West,
Toronto, Ontario.
M7A 1W3

Dear Sir:

Please find enclosed duplicate copies of an assessment report covering geophysical surveys performed on claims P796557 and P796558 in Keith and Muskego Townships.

Respectfully Submitted,

Peter A. Diorio

PAD/ak

Enclosures

OSWALD TWP. (M-1042)

FOLEYET TWP. (M-812)

REEVES TWP. (M-1074)

KEITH TWP. (M-962)

THE TOWNSHIP OF

MUSKEGO

DISTRICT OF SUDBURY

PORCUPINE MINING DIVISION

SCALE: 1-INCH 40 CHAINS

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	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
MINES CANCELLED	
PATENTED for S.R.O.	

NOTES

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

Subdivision of this township into lots and concessions was annulled march 9, 1962.

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

Order No.	File	Date	Disposition
~~C.80/81~~	~~163002~~	~~AUG.3,1972~~	~~S.R.O.~~ Re reopened
	163006	DEC. 27, 1972	S.R.O.
~~W21/78~~	~~188509~~	~~MAY 8, 1978~~	~~S.R.O.~~ Re-opened

Re-opened for prospecting

SAND AND GRAVEL

M.T.C. Gravel Reserve Oct. 10, 1979.

PLAN NO. M-881

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

42B01NE0010 2.8811 MUSKEGO

200

BOULDER L.

BEAVERFLOOD L.

IVY L.

LAKE

Foleyet 10 miles

HIGHWAY 101

CLAIM LOCATIONS

825435
825430 825429 825428 825427 825426 825425
825419 825420 825421 825422 825423 825424
825404 825405 825406 796558 796557
825407 825408 825409 825417 825418
825410 825411 825412 825413 825414 825415 825416

2.8811

UTAH MINES LTD
Exploration Dept.
Toronto : CANADA.

BOULDER LAKE MAG SURVEY

50 Gamma Contour Int.

Date	Drawn	Checked	Revised	NTS	File	Map
Dec 85	WP7585	-	-	-	-	-

0 400 800 1200
Ft.

42B01NE0010 2.8811 MUSKEGO

P. Dionis

UTAH MINES LTD
Exploration Dept.
Toronto : CANADA

BOULDER LAKE

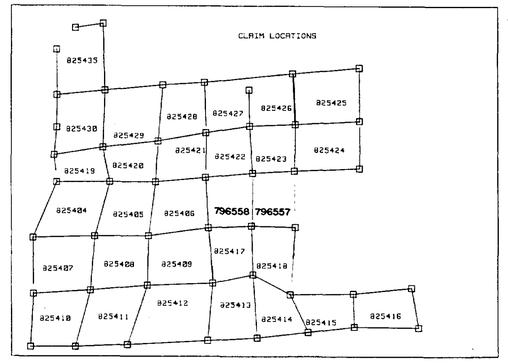
TOTAL FLD MAGNETOMETER

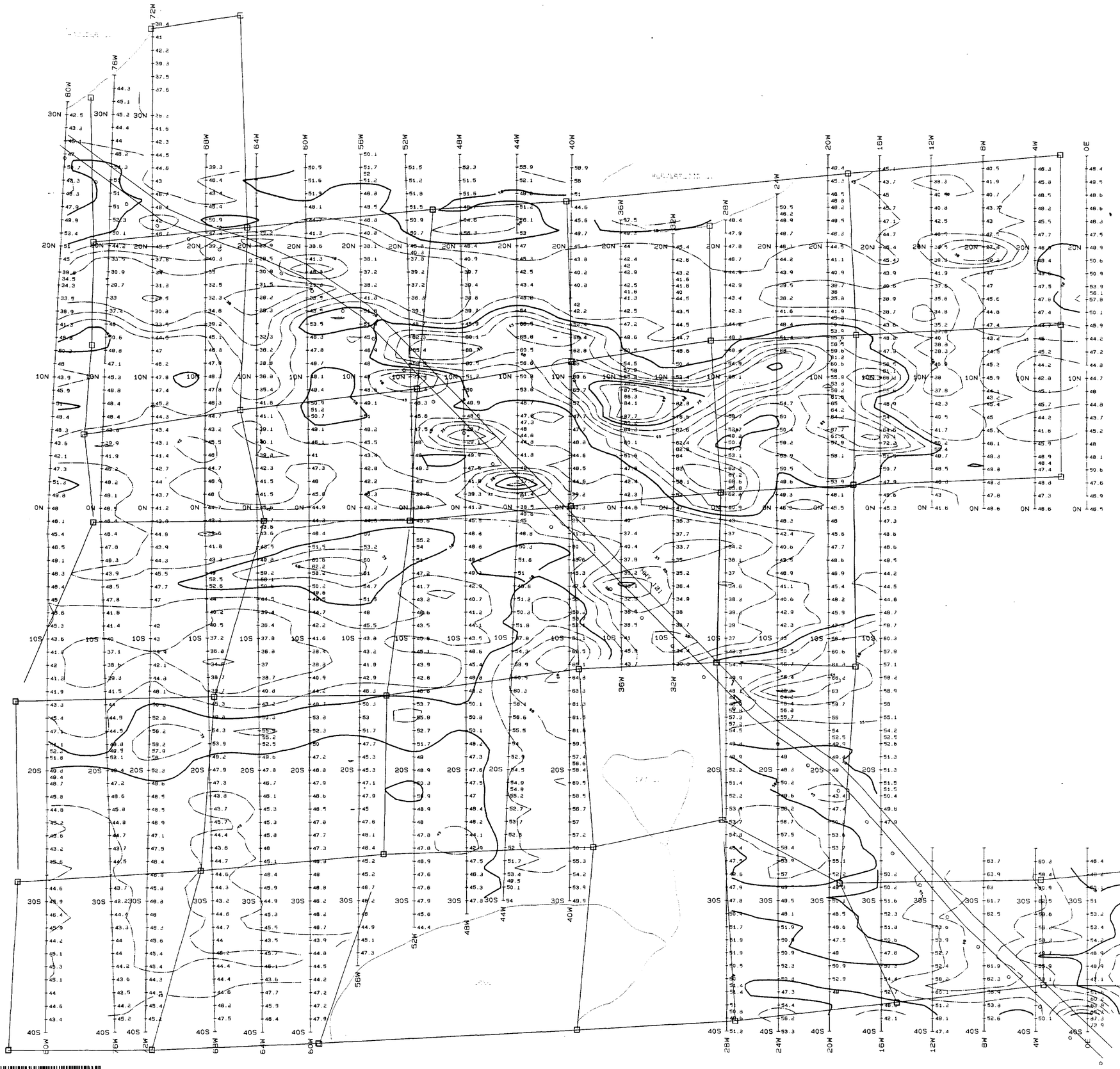
Date	Drawn	Checked	Approved	NTS	File	Map
JUN 88	KP/SH	-	-	110/16	-	1 of 1

0 400 800 1200
Ft.

2.8811

P Dimin





28811

UTAH MINES LTD

Exploration Dept.

Toronto ; CANADA.

BOULDER LAKE VLF

HORIZONTAL FIELD STRENGTH

Cutler Maine 24.0 KHz

5 Unit Contour Interval

Date	Drawn	Checked	Revised	NTS	File	Map
Dec 85	HP7595	-	-	-	-	-

0 400 800 1200

Ft.

BOULDER L.

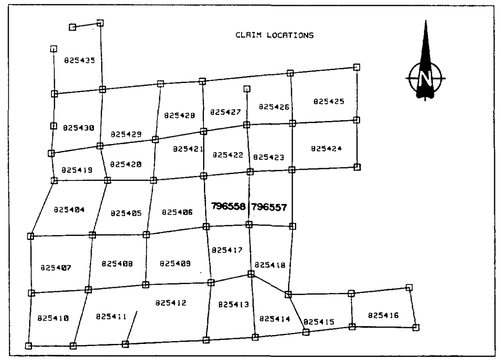
BEAVERFLOOD L.

IVY L.

LAKE

Power Line

Hwy 101



28811

UTAH MINES LTD
Exploration Dept.
Toronto : CANADA.

BOULDER LAKE VLF

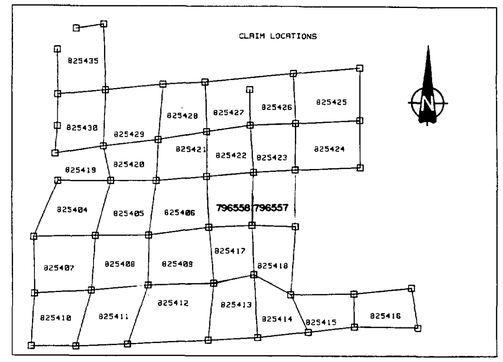
—— In Phase (100% per inch)

– – Out of Phase (100% per inch)

—— Horizontal Field (50% per inch with 50 Unit Bkgd removed)

Date	Drawn	Checked	Revised	NTS	File	Map
Dec 85	HP/SB	-	-	42B/1	Blving	1

0 400 800 1200
Ft



28811

UTAH MINES LTD
Exploration Dept.
Toronto ; CANADA.

BOULDER LAKE VLF SURVEY
CUTLER MAINE Freq 24.0 Khz

Vertical In phase (%)
Vertical Out of Phase (%)

Date	Drawn	Checked	Revised	NTS	File	Map
Dec 85	HP7585	-	-	-	-	1

0 400 800 1200 Ft

P. Dion