part 2 of 2

REPORT ON
ELECTROMAGNETIC AND MAGNETIC SURVEYS
ON THE HOLY 1, 2, 3 AND 4 CLAIMS
CHEMAINUS PROJECT #6101
92B 13W LAT. 48°53' LONG. 123°50'
FOR
IMPERIAL OIL LIMITED (owner and operator)
IN THE
VICTORIA MINING DIVISION

by Z. Doborzynski
and R. Somerville, P. Eng.

Dated Oct. 1977

TABLE OF CONTENTS

POCKETS

POCKET 1

not microfilmed
same as in part 1

Map No. 1a Claim Location Map - Chemainus East 1"=1000'
Map No. 1b Claim Location Map - Chemainus West 1"=1000'

POCKET 2

Map No. 2 Grid #1 Electromagnetic Survey 1"=200'
Map No. 3 Grid #1 Magnetometer Survey 1"=200'

POCKET 3

Map No. 4 Grid #3 Electromagnetic Survey
Map No. 5 Grid #3 Magnetometer Survey

POCKET 4

Map No. 6 Grid #4 Electromagnetic Survey
Map No. 7 Grid #4 Magnetometer Survey

SUMMARY AND RECOMMENDATIONS

Three airborne EM conductors have been selected for ground follow-up. Two of these have been located and outlined, both anomalies are open.

Three drill holes are recommended to test the above conductors. The location of the third airborne EM conductor should be rechecked.

WORK PERFORMED

This report deals with ground electromagnetic and magnetometer surveys carried out in the vicinity of Mount Brenton on Vancouver Island. The claims surveyed (Map 1), line - miles of coverage and the number of readings taken are given below:

CLAIMS	UNITS	LINE MILES	EM READINGS	MAG. READINGS
Holy 1 & 2	24	7.4	441	715
Holy 3	12	8.0	444	611
Holy 4	4	2.0	130	121

INTRODUCTION

In April of this year the Mount Brenton area of Vancouver Island was surveyed with a Scintrex airborne electromagnetic system. Three airborne EM conductors were selected for ground follow-up.

LOCATION AND ACCESS

The survey area is approximately 11 miles northwest of the town of Duncan on Vancouver Island and just southwest of Mount Brenton (Fig. 1).

Access to the property is by logging roads maintained by MacMillan - Bloedel.

EQUIPMENT

(a) Electromagnetic Survey.

An Apex Parametric Maxmin II was used. This instrument is a two man portable electromagnetic system, employing a transmitter to generate a magnetic field, which in the presence of a conductive body will generate eddy currents in it. These eddy currents in turn generate secondary magnetic fields which along with the primary field are detected by a receiver coil. The primary field is cancelled or compensated by a reference signal sent from transmitter to receiver by means a cable connecting both coils. This system measures the in-phase and quadrature phase components of the anomalous magnetic fields.

Measurements can be made in either of two coil orientations. The most common is the horizontal loop configuration, where the receiver and transmitter coils are horizontal and coplanar; the other orientation known as vertical loop is where the transmitter coil is horizontal and the receiver coil is vertical.

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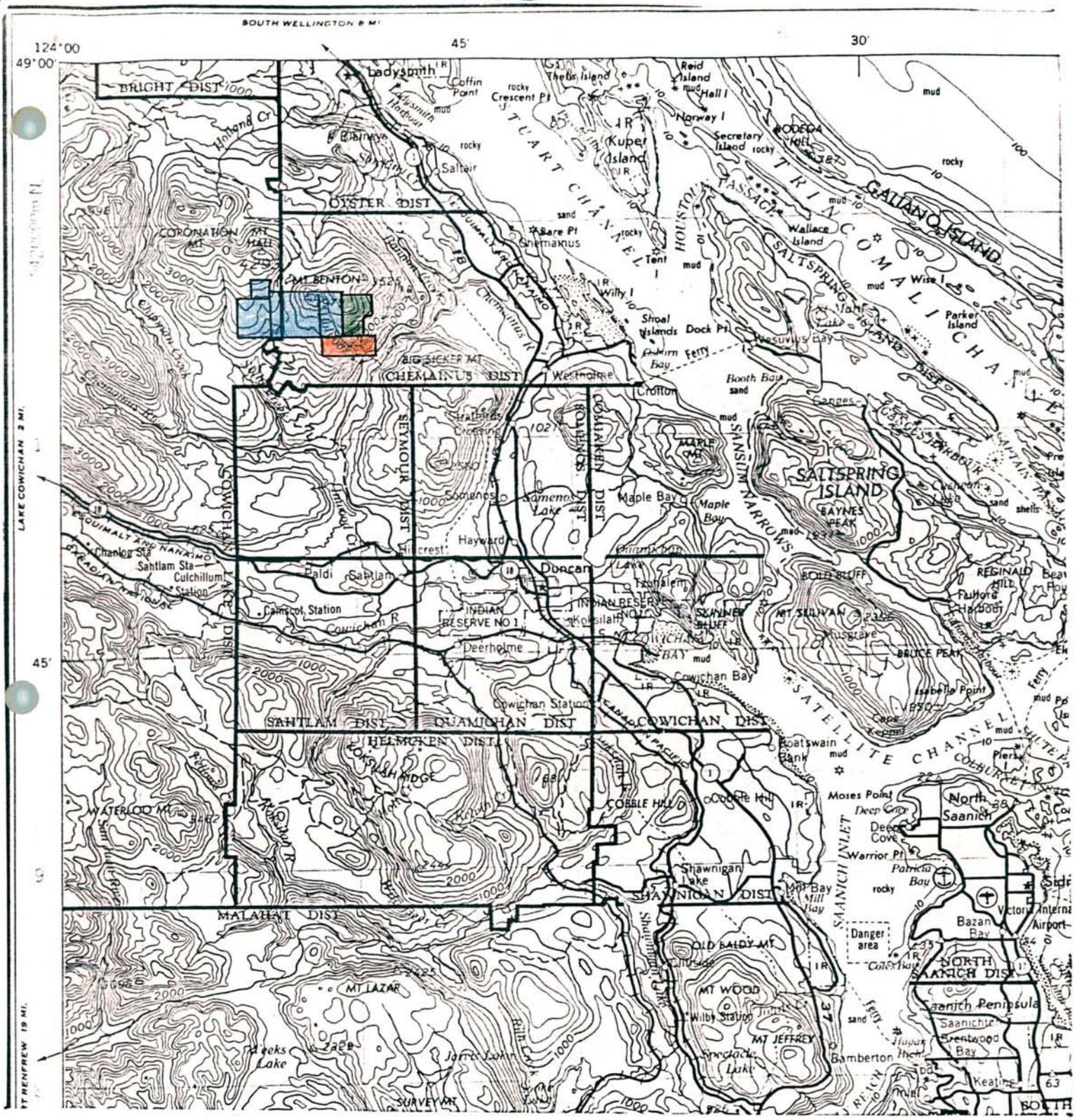

LOCATION MAP NO. 1

CHEMAINUS - EAST

CLAIMS
Holy 1-4
MONS 1
991, 2

Scale 1:250,000

NTS 92 B 13

Measurements can be made at four frequencies 222, 444, 888 and 1777 Hz and at six transmitter - receiver separations varying from 100 to 800 feet.

In the present survey, the horizontal, coplanar coil configuration was used. The measurement frequency was 1777 Hz and the coil separation was 200 feet for Grids 1 and 4 and 300 feet for Grid 3. Readings were taken at 100 foot intervals in neutral areas and at 50 foot stations in anomalous areas.

The field data is plotted as profiles on Maps 2, 4 and 6 at a scale of 1" = 20%.

(b) Magnetometer Survey.

A Geometric G - 816 proton precession magnetometer was used. The instrument utilizes the fact that protons or hydrogen nuclei are analogous to minute magnets in the form of spheres spinning about their magnetic axes and polarized in earth's magnetic field. Applying a magnetic field, say 100 times that of the earth's, in a direction perpendicular to the earth's field, causes the orientation of the protons' moment to shift in the direction of this new field. By interrupting this external field, the magnetic moment will return to its original value and direction in the earth's field by precessing around it. The frequency of precession is proportional to the total magnetic field strength at the point of measurement.

The G - 816 magnetometer uses a container filled with kerosene or naphta as the source of hydrogen nuclei. It has a sensitivity of 1 gamma. However, without the use of a continuous base station recorder the accuracy of the readings is about 5 gammas (γ's)

In this survey readings where taken at 100 foot intervals except in anomalous areas where 50 foot stations were read. Diurnal drift was removed by rereading a base station at hourly intervals.

The data is plotted in profile form on Maps 3, 5 and 7 at a scale of 1" = 1000 gammas.

RESULTS

A. Grid 1 - Claims Holy 1 & 2

The electromagnetic map (Map 2) has delineated a conductor (B) extending from 32+00W at 1+00S to 68+00W at 4+50N. The anomalies indicate that the conductive body is very near surface and dips south. Conductivities along the body are variable. There is no direct correlation with magnetic data, however the conductor may lie near a change in rock type as seen by the change in magnetic contrast (Map 3). A second, short conductor (A) between 48+00W and 52+00W lies just north of conductor B. Conductor C on line 40+00W and 3+50S does not appear on adjacent lines.

The main anomaly appears to terminate east of 32+00W. The erratic positive readings on line 24+00W and 1+00S suggests a possible recurrence of conductor B or a new conductive body east of 24+00W.

The in-phase anomalies obtained on lines 28+00W, 36+00W and 40+00W at about 15N may be due to steep topographic variations because of negligible change in quadrature values.

B. Grid 3 - Claims Holy 3

The EM conductors A, B and C (Map 4) appear as two enechelon conductive zones. The individual profiles show strong positive shoulders, particularly south of the anomaly centers, indicating shallow depth of burial and a dip to the south. Conductor C is open to the east and conductor B may be open to the west.

Magnetometer results (Map 5) are featureless in the vicinity of the EM conductors.

C. Grid 4 - Claims Holy 4

The EM and Magnetometer data plotted on Maps 6 and 7 is barren of anomalies. The airborne EM target remains unexplained.

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RECOMMENDATIONS

Ground follow-up of three Airborne EM conductors has outlined two of the three targets. The location of the third airborne EM conductor will have to be rechecked from flight tapes.

Three drill holes are recommended, their location and associated data are given below.

DDH	GRID	LOCATION	AZIMUTH	DIP	DEPTH
1	1	48+00W & 0+50N	000	- 45°	250'
2	3	112+00W & 0+70N	000	- 45	290'
3	3	132+00W & 5+00N	000	- 45°	250

Z.B. Doborsynski

The work covered by this report was performed under my direct supervision. I concur, generally, in the conclusions.

R. Somerville, P. Eng.

CERTIFICATION

I, Zbigniew B. Doborzynski of 6167 Starfield Crescent, Mississauga, Ontario hereby certify that:

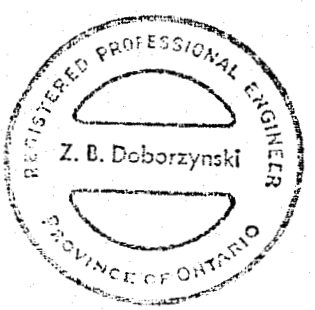
1. I am a Graduate of McGill University with a B.Eng in Applied Geophysics and Mining Engineering and a M.Sc in Applied Geophysics.

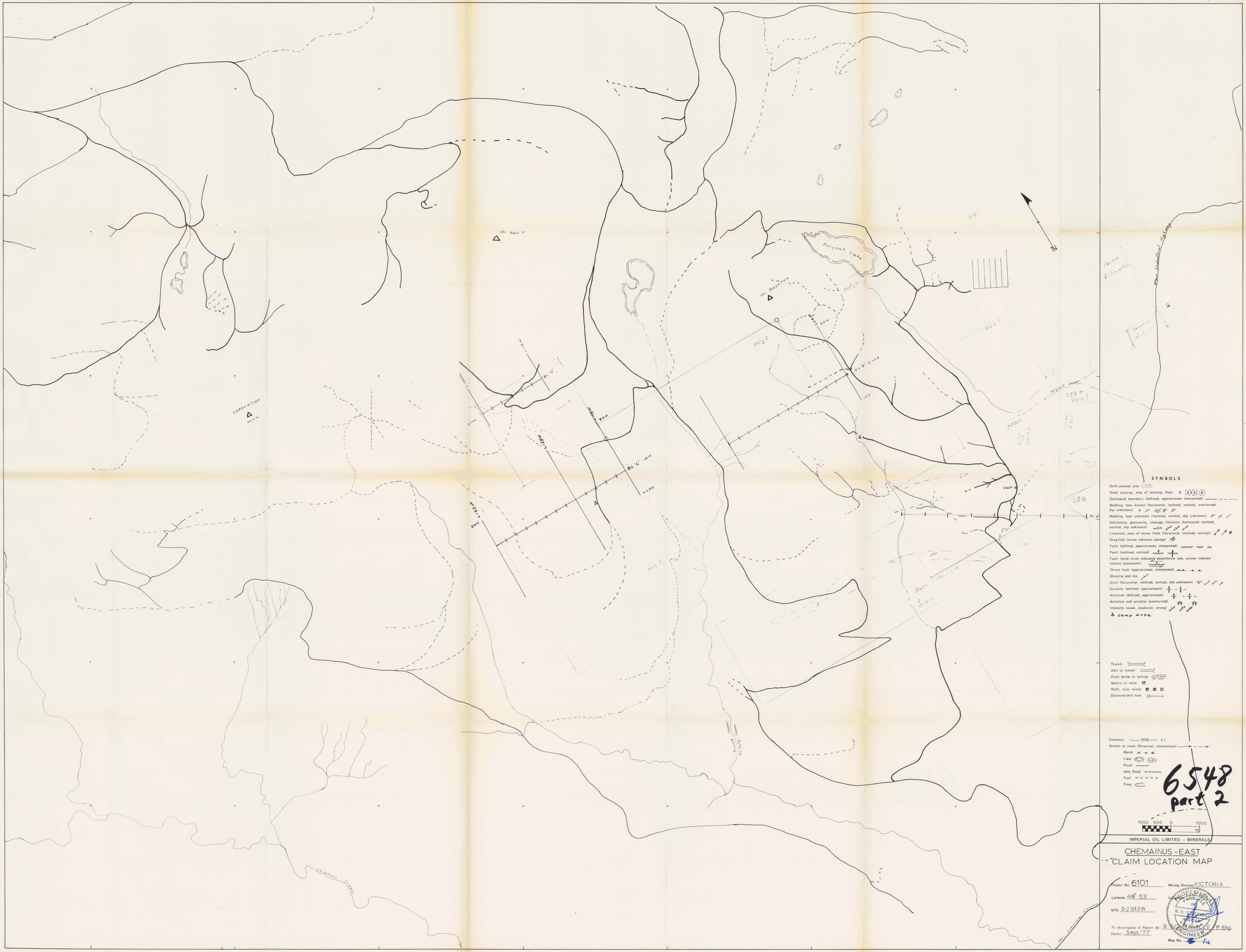
2. Since 1974, I have been employed by Imperial Oil Ltd. as a Minerals Geophysicist in Nova Scotia, Quebec, Ontario British Columbia and N.W.T.

3. I am a member of the Association of Professional Engineers of Ontario.

4. I hold no direct or indirect interest in the mining properties reported herein nor do I expect to receive any.

Z. Doborzynski





IMPERIAL OIL LIMITED – MINERALS

CHEMAINUS - EAST
CLAIM LOCATION MAP

Project No. 6101 Mining Division VICTORIA

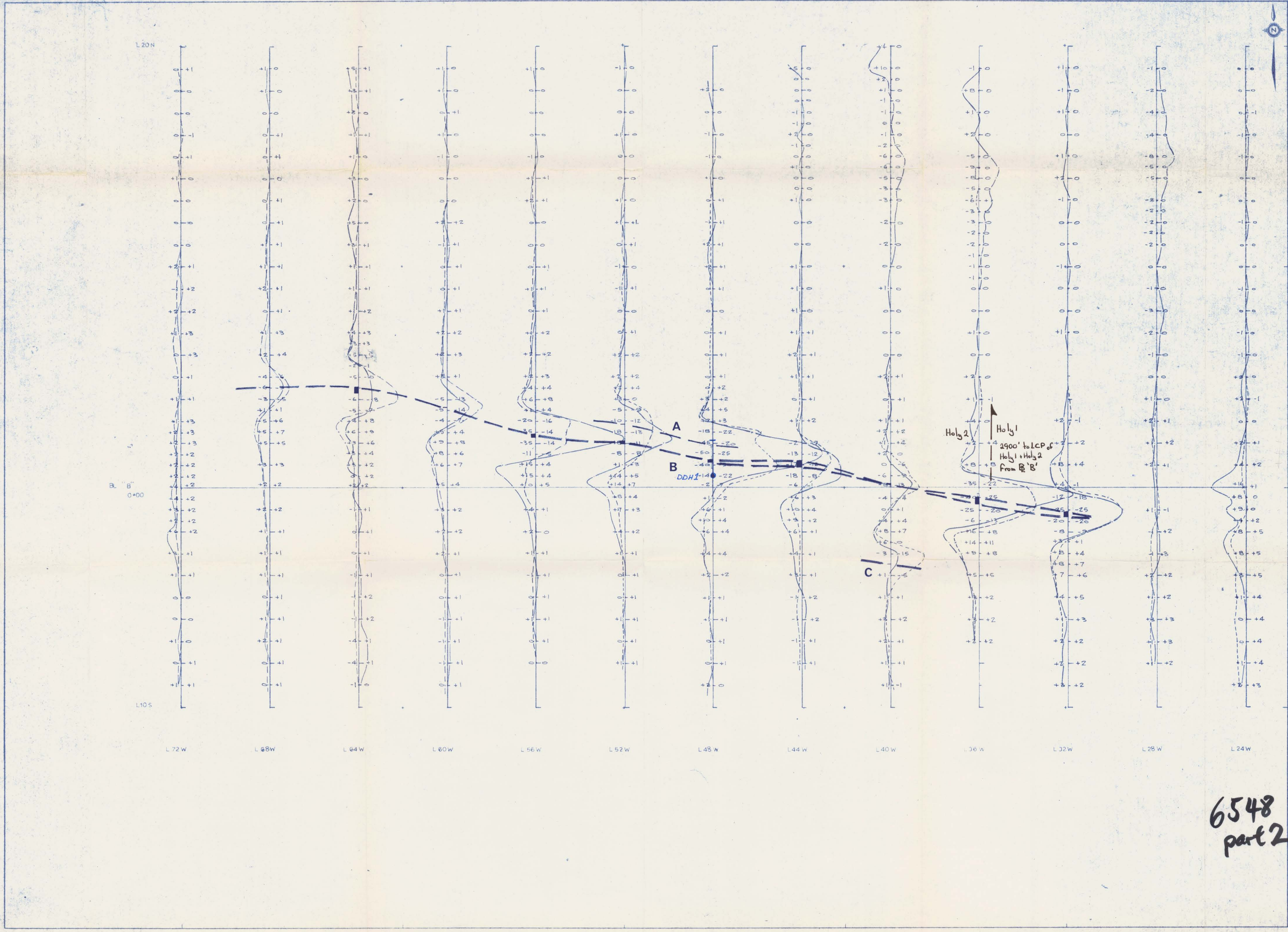
Latitude 48° 53' Longitude 123° 50'

NTS 92 B13W

To Accompany A Report By: R. SOMERVILLE P. Eng.

Dated: Sept.'77

Map No. 1a



ELECTROMAGNETIC SURVEY

LEGEND

INSTRUMENT - APEX PARAMETRICS MAXMIN II

FREQUENCY - 1777 HZ

Tx - Rx SEPARATION - 200 FT.

—·— IN PHASE COMPONENT

---x--- OUT OF PHASE COMPONENT

SCALE - I.P. O.P.

110 +10

100 — 200 — 400 FT.

90 -10

EM ANOMALIES

DEFINITE

POSSIBLE

SYMBOLS

Drift-covered area

Rock outcrop, area of outcrop, float

Geological boundary (defined, approximate, interpreted)

Bedding, tops known (horizontal, inclined, vertical, overturned, dip unknown)

Bedding, tops unknown (inclined, vertical, dip unknown)

Schistosity, gneissosity, cleavage, foliation (horizontal, inclined, vertical, dip unknown)

Lineation, axes of minor folds (horizontal, inclined, vertical)

Drag-fold (arrow indicates plunge)

Fault (defined, approximate, interpreted)

Fault (inclined, vertical)

Fault (solid circle indicates downthrow side, arrows indicate relative movement)

Thrust fault (approximate, interpreted)

Shearing and dip

Joint (horizontal, inclined, vertical, dip unknown)

Syncline (defined, approximate)

Anticline (defined, approximate)

Anticline and syncline (overturned)

Intensity (weak, moderate, strong)

Trench

Adit or tunnel

Rock dump or tailings

Quarry or mine

Shaft, raise, winze

Diamond-drill hole

Contours — 2500 — C.I.

Stream or creek (Perennial, intermittent)

Marsh

Lake

Road

Jeep Road

Trail

Trees

Scale 1" = 200'

200 100 0 200

IMPERIAL OIL LIMITED – MINERALS

CHEMAINUS

GRID #1

Project No. 6101 Mining Division Victoria

Latitude 48° 53' Longitude 123° 50'

NTS 92B-13W

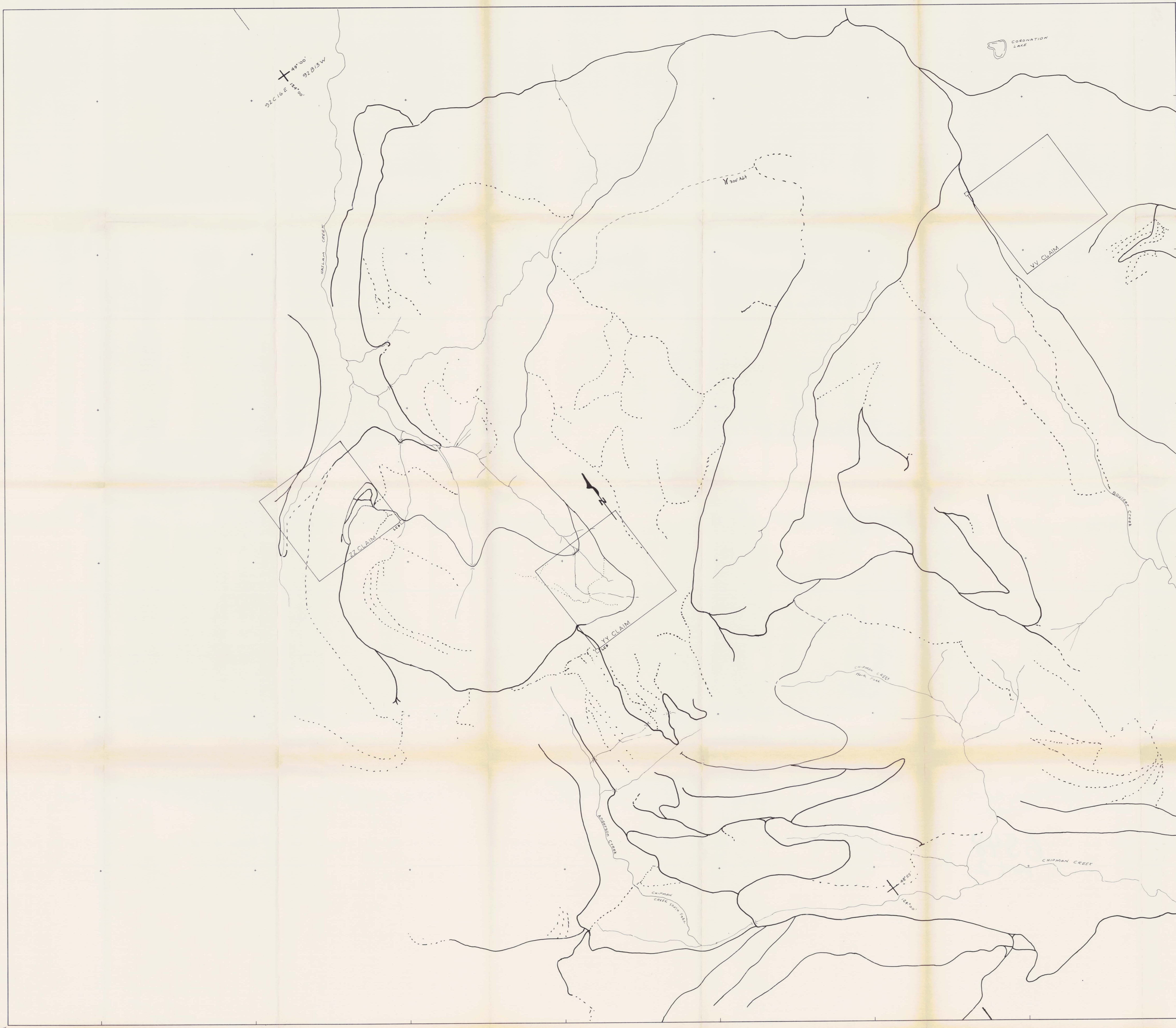
To Accompany A Report By: D. Somerville

Dated: Sept 1977

Map No. 2

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — D. SOMERVILLE

6548 part 2



SYMBOLS

- Drift-covered area
- Rock outcrop, area of outcrop, float
- Geological boundary (defined, approximate interpreted)
- Bedding, tops known (horizontal, inclined, vertical, overturned, dip unknown)
- Bedding, tops unknown (inclined, vertical, dip unknown)
- Schistosity, gneissosity, cleavage, foliation (horizontal inclined, vertical, dip unknown)
- Lineation, axes of minor folds (horizontal, inclined, vertical)
- Drag-fold (arrow indicates plunge)
- Fault (defined, approximate, interpreted)
- Fault (inclined, vertical)
- Fault (solid circle indicated downthrow side, arrows indicate relative movement)
- Thrust fault (approximate, interpreted)
- Shearing and dip
- Joint (horizontal, inclined, vertical, dip unknown)
- Syncline (defined, approximate)
- Anticline (defined, approximate)
- Anticline and syncline (overturned)
- Intensity (weak, moderate, strong)

- Trench
- Adit or tunnel
- Rock dump or tailings
- Quarry or mine
- Shaft, raise, winze
- Diamond-drill hole

- Contours — 2500 — C.I.
- Stream or creek (Perennial, intermittent)
- Marsh
- Lake
- Road
- Jeep Road
- Trail
- Trees

6548
part 2

1000 500 0 1000

IMPERIAL OIL LIMITED – MINERALS

CHEMAINUS - WEST
CLAIM LOCATION MAP

Project No. 6101
Mining Division Victoria
Latitude 48°55'
Longitude 124°00'
NTS 92 B/13 W
92 C/16 E

To Accompany A Report By: R. Somerville P. Eng.
Dated: Oct. 1977

Map No. # 16

L 20N

B "B"
0+00

L 10S

L 72W

L 68W

L 64W

L 60W

L 56W

L 52W

DDH1

L 48W

L 44W

L 40W

Holy 2 | Holy 1

2900' to LCP of Holy 1 + Holy 2 from B "B"

L 36W

L 32W

L 28W

L 24W

MAGNETOMETER SURVEY

LEGEND

INSTRUMENT - GEOMETRICS G816 PROTON PRECESSION MAGNETOMETER

ACCURACY - ±5 γ's

SCALE

INTERPRETED CONTACT

INTERPRETED BREAK

ASSUMED GEOMAGNETIC FIELD STRENGTH IS 56,600 γ's

SYMBOLS

Drift-covered area

Rock outcrop, area of outcrop, float

Geological boundary (defined, approximate interpreted)

Bedding, tops known (horizontal, inclined, vertical, overturned, dip unknown)

Bedding, tops unknown (inclined, vertical, dip unknown)

Schistosity, gneissosity, cleavage, foliation (horizontal inclined, vertical, dip unknown)

Lineation, axes of minor folds (horizontal, inclined, vertical)

Drag fold (arrow indicates plunge)

Fault (defined, approximate, interpreted)

Fault (inclined, vertical)

Fault (solid circle indicated downthrow side, arrows indicate relative movement)

Thrust fault (approximate, interpreted)

Shearing and dip

Joint (horizontal, inclined, vertical, dip unknown)

Syncline (defined, approximate)

Anticline (defined, approximate)

Anticline and syncline (overturned)

Intensity (weak, moderate, strong)

Trench

Adit or tunnel

Rock dump or tailings

Quarry or mine

Shafts, raise, winze

Diamond-drill hole

Contours — 2500 — C.I.

Stream or creek (Perennial, intermittent)

Marsh

Lake

Road

Jeep Road

Trail

Trees

Scale 1" = 200

200 100 0 200

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
R. D. SOMERVILLE

IMPERIAL OIL LIMITED — MINERALS

CHEMAINUS

GRID #1

Project No. 5101 Mining Division Victoria

Latitude 48° 53' Longitude 123° 50'

NTS 92B-13W

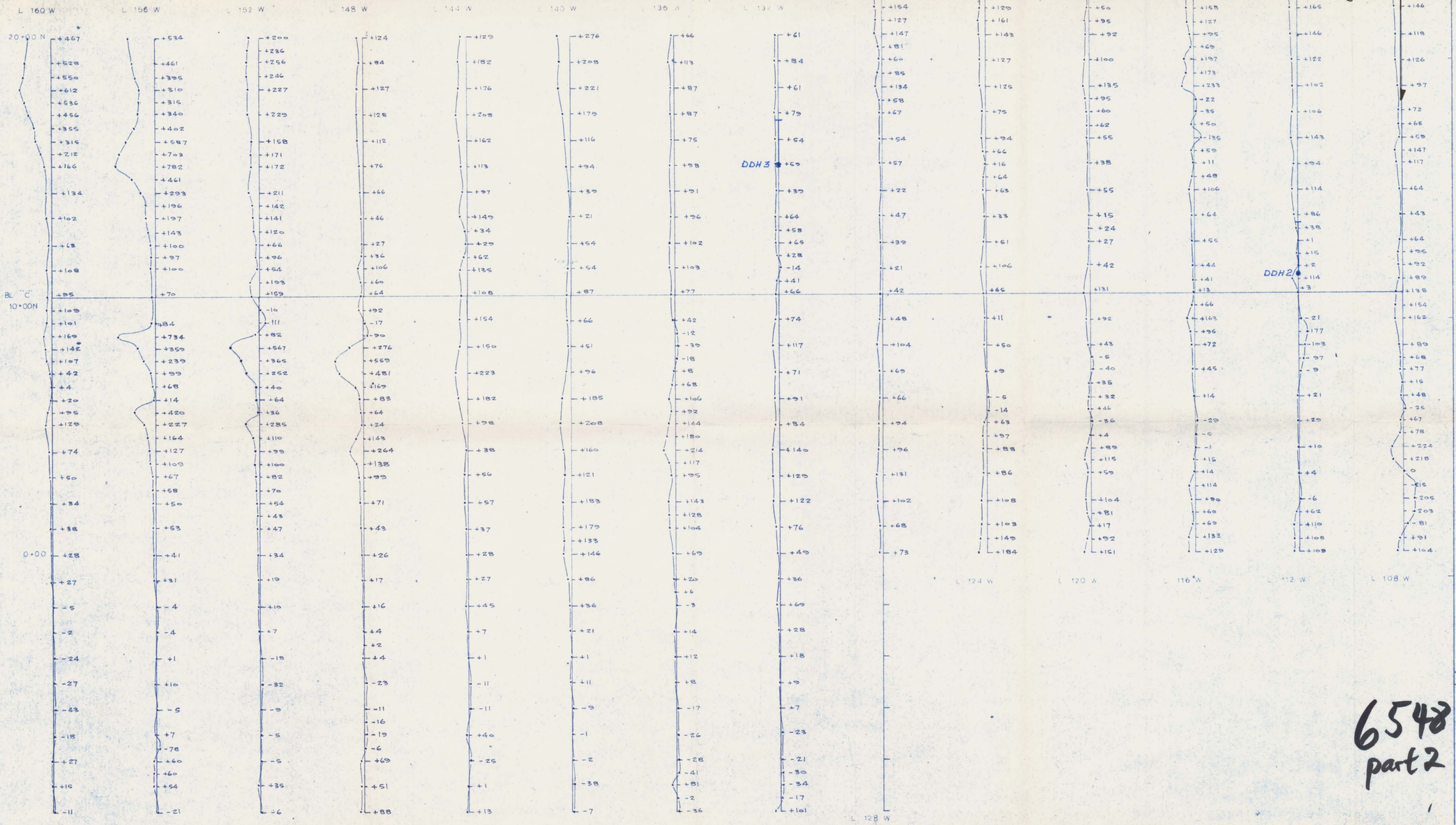
To Accompany A Report By R. Somerville

Dated Sept 1977

Map No. 3

6548 part 2


ELECTROMAGNETIC SURVEY
LEGEND
INSTRUMENT-APEX PARAMETRICS MAXMIN II
FREQUENCY - 1777 HZ
Tx-Rx SEPARATION - 300 FT.
IN PHASE COMPONENT
OUT OF PHASE COMPONENT
SCALE - I.P. O.P.
110 +10
100
200
400 FT.
90 -10
EM ANOMALIES
DEFINITE
POSSIBLE
SYMBOLS
NW corner
Holy 2
Holy 4
Holy 3
LCP
A
B
C
DDH3
DDH2
L 160 W
L 156 W
L 152 W
L 148 W
L 144 W
L 140 W
L 136 W
L 132 W
L 128 W
L 124 W
L 120 W
L 116 W
L 112 W
L 108 W
20+00 N
BL "C" 10+00N
0+00
Scale 1" = 200'
200 100 0 200
IMPERIAL OIL LIMITED – MINERALS
CHEMAINUS
GRID #3
Project No. 6101
Mining Division Victoria
Latitude 48° 53'
Longitude 123° 50'
NTS 92B-13W
To Accompany A Report By: R. Somerville
Dated: Sept 1977
Map No. 4
6548 part2



MAGNETOMETER SURVEY

LEGEND

INSTRUMENT - GEOMETRICS G816 PROTON PRECESSION MAGNETOMETER

ACCURACY - ±5 γ's

SCALE

INTERPRETED CONTACT

INTERPRETED BREAK

ASSUMED GEOMAGNETIC FIELD STRENGTH IS 56,600 γ's

SYMBOLS

Drift-covered area

Rock outcrop, area of outcrop, float

Geological boundary (defined, approximate, interpreted)

Bedding, tops known (horizontal, inclined, vertical, overturned, dip unknown)

Bedding, tops unknown (inclined, vertical, dip unknown)

Schistosity, gneissosity, cleavage, foliation (horizontal, inclined, vertical, dip unknown)

Lineation, axes of minor folds (horizontal, inclined, vertical)

Drag fold (arrow indicates plunge)

Fault (defined, approximate, interpreted)

Fault (unclined, vertical)

Fault (solid circle indicated downthrow side, arrows indicate relative movement)

Thrust fault (approximate, interpreted)

Shearing and dip

Joint (horizontal, inclined, vertical, dip unknown)

Syncline (defined, approximate)

Anticline (defined, approximate)

Anticline and syncline (overturned)

Intensity (weak, moderate, strong)

Trench

Adit or tunnel

Rock dump or tailings

Quarry or mine

Shaft, raise, winze

Diamond drill hole

Contours 2500 C.I.

Stream or creek (Perennial, intermittent)

Marsh

Lake

Road

Jeep Road

Trail

Trees

Scale 1" = 200'

200 100 0 200

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA R. D. SOMERVILLE

IMPERIAL OIL LIMITED – MINERALS

CHEMAINUS

GRID "3"

Project No. 6191 Mining Division Victoria

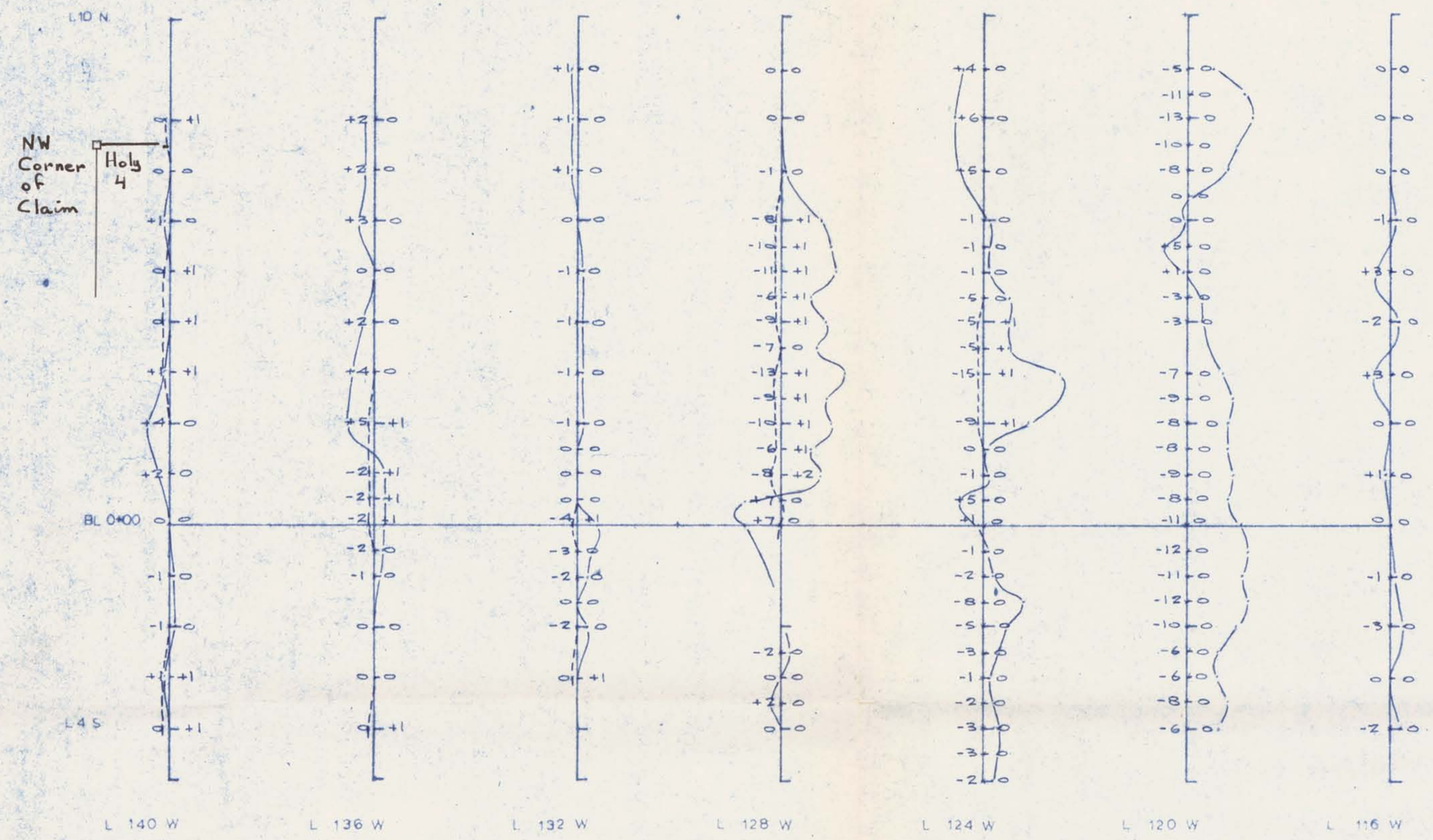
Latitude 48° 53 Longitude 123° 50

NTS 92B-13W

To Accompany A Report By R. Somerville

Dated Sept. 1977 Map No. 5

6548 part 2



ELECTROMAGNETIC SURVEY

LEGEND

INSTRUMENT - APEX PARAMETRICS MAXMIN II

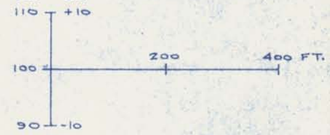
FREQUENCY - 1777 HZ

Tx - Rx SEPARATION - 200 FT.

—·—·— IN PHASE COMPONENT

---x--- OUT OF PHASE COMPONENT

SCALE - I.P. O.P.



EM ANOMALIES

DEFINITE

POSSIBLE

SYMBOLS

Drift covered area

Rock outcrop, area of outcrop, float

Geological boundary (defined, approximate, interpreted)

Bedding, tops known (horizontal, inclined, vertical, overturned, dip unknown)

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Thrust fault (approximate, interpreted)

Shearing and dip

Joint (horizontal, inclined, vertical, dip unknown)

Syncline (defined, approximate)

Anticline (defined, approximate)

Anticline and syncline (overturned)

Intensity (weak, moderate, strong)

Trench

Adit or tunnel

Rock dump or tailings

Quarry or mine

Shaft, raise, winze

Diamond drill hole

Contours 2500 C.I.

Stream or creek (Perennial, intermittent)

Marsh

Lake

Road

Jeep Road

Trail

Trees

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
R. D. SOMERVILLE

Scale 1" = 200'

200 100 0 200

IMPERIAL OIL LIMITED - MINERALS

CHEMAINUS

GRID #4

Project No. 6101 Mining Division Victoria

Latitude 48° 53' Longitude 123° 50'

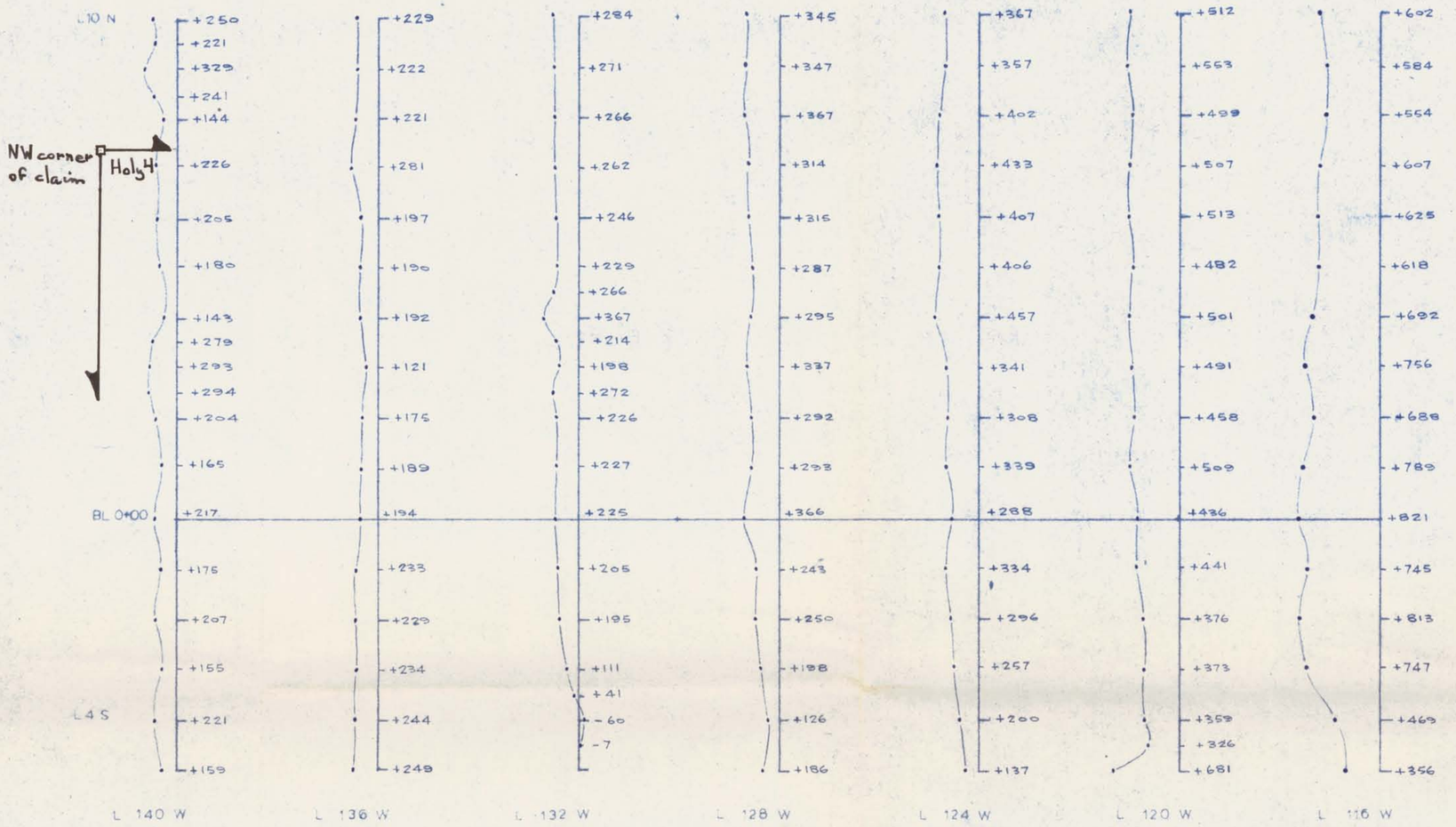
NTS 92 B-13W

To Accompany A Report By R. Somerville

Dated Sept 1977

Map No. 6

6548
part 2



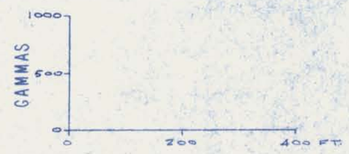
MAGNETOMETER SURVEY

LEGEND

INSTRUMENT - GEOMETRICS G816 PROTON PRECESSION MAGNETOMETER

ACCURACY - ±5 γ's

SCALE



INTERPRETED CONTACT

INTERPRETED BREAK

ASSUMED GEOMAGNETIC FIELD STRENGTH IS 56,600 γ's

SYMBOLS

Drift covered area

Rock outcrop, area of outcrop, float

Geological boundary (defined, approximate, interpreted)

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Drag fold (arrow indicates plunge)

Fault (defined, approximate, interpreted)

Fault (inclined, vertical)

Fault (solid circle indicated downthrow side, arrows indicate relative movement)

Thrust fault (approximate, interpreted)

Shearing and dip

Joint (horizontal, inclined, vertical, dip unknown)

Syncline (defined, approximate)

Anticline (defined, approximate)

Antiline and syncline (overturned)

Intensity (weak, moderate, strong)

Trench

Adit or tunnel

Rock dump or tailings

Quarry or mine

Shaft, raise, winze

Diamond drill hole

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
R. D. SOMERVILLE

Contours 2500 C.I.

Stream or creek (Perennial, intermittent)

Marsh

Lake

Road

Jeep Road

Trail

Trees

Scale 1" = 200'

200 100 0 200

IMPERIAL OIL LIMITED MINERALS

CHEMAINUS

GRID #4

Project No. 6101 Mining Division Victoria

Latitude 48° 53' Longitude 123° 50'

NTS 92 B-13W

To Accompany A Report By R. Somerville

Dated: Sept 1977

Map No. 7

6548
part 2