REPORT ON

GEOPHYSICAL SURVEYS

BRIAN BORU PROSPECT

JONES SHOWING - OMINECA MINING DIVISION

BRITISH COLUMBIA

Part 1 of 3

BY

ASARCO Incorporated

Geophysical Office - Exploration Divison

Salt Lake City, Utah

October 7, 1981

CONTENTS

MAPS ACCOMPANYING REPORT:

INTRODUCTION

IP/resistivity, VLF-EM, and magnetic surveys were conducted at the Jones Showing west of Brian Boru Peak in the Hazelton Area, British Columbia, in July, 1981. The work was carried out by Asarco personnel on Gam IV claim for Asarco Exploration Company of Canada Ltd.

The Jones Showing consists of a number of shallow pits excavated in volcanic rocks containing base metal mineralization within about 100 meters of a sedimentary-volcanic contact.

Figures 1 and 2 indicate the location, claim boundaries, and grid lines. IP/resistivity results are presented on Figures 3 through 6, magnetics on Figures 7 and 8, and VLF-EM results on Figures 9 through 12.

SUMMARY

The combined geophysical coverages suggest that the sedimentary rocks on the west carry low percentage conductive disseminations (either carbon or sulfides), and are in contact with volcanics carrying higher percentages of disseminated sulfides. These disseminations probably decrease to the east away from the contact.

Heavier sulfides exposed in the test pits, if they are assumed to be either conductive or magnetic, appear to have limited lateral extent. No reliable judgements can be made about projections at depth.

The close agreement between n=1 and n=2 IP/resistivity results indicate that overburden is generally shallow and the penetration was adequate for a bedrock scan for polarizable minerals. The IP response is general and does not indicate small sulfide concentrations but furnishes a fairly good indication of overall sulfide contents in the absence of carbon or other polarizable materials.

Late snow patches, a permanent snow field on the eastern portion of the grid, and precipitious slopes and coarse scree to the north and south dictated the irregular and not entirely adequate IP/resistivity coverage. The coverage could be improved in a late season survey with 50 meter "a" spacing.

Expanded electrode arrays for deeper penetrations, however, would be difficult if not entirely impractical.

SURVEY AND INSTRUMENT SPECIFICATIONS:

IP/Resistivity Survey

Instrument	Transmitter: Scintrex IPC-8/250 Watt Receiver: Scintrex IPR-10
Instrument Accuracy	3% full scale, .1Mv/V resolution
Electrode Configuration	dipole-dipole, a=50 meters, n=1 and n=2.
Number of Stations & Coverage	n=1, 23 stations (1.15 Km.) n=2, 20 stations (.93 Km.)
Field Time Required	8 man days.

Magnetic Survey

Instrument	Geometrics G826 Proton Magnetometer
Instrument Accuracy	± 1 gamma - data corrected for diurnal drift.
Number of Stations & Coverage	246 stations (2.4 Km.)
Field Time Required	2 man days.

VLF-EM Survey

Instrument	Geonics EM-16
Instrument Accuracy	± 3% in-phase and quadrature
Transmitters	Stations: NLK/NPG Jim Creek, Wash. Frequency 18.6KHz and NPM Hawaii - Frequency 23.4KHz.
Number of Stations & Coverage	Jim Creek, Wash., 270 stations (2.64 Km.) Hawaii, 29 stations (.28 Km.)
Field Time Required	2 man days.

Line Surveying

Line surveying was conducted simultaneously with the geophysical surveys. A total of 4.1 kilometers of line were surveyed with hand held compass and chain. Stations were flagged and labeled at 50 meter intervals. No slope corrections were made.

DISCUSSION OF RESULTS

IP/Resistivity.

IP/resistivity data are presented in profile form in Figures 3 and 4 and contoured IP results for n=1 and n=2 are shown in Figures 5 and 6, respectively.

Profile 1, which lies entirely in the volcanics roughly parallel to the

sedimentary-volcanic contact, indicates high polarization levels for its entire length. Resistivities decrease from over 1000 ohm-meters to a few hundred ohm-meters to the southeast where the line approaches an oxidation zone exposed in the bluffs above. Electrical grounding difficulties in coarse scree and outcrop prevented extension of this line either over the Brian Boru Showing which is northeast of the line extension or the oxidation zone to the southeast.

Profile 2, also within the volcanics, indicates decreasing polarization and increasing resistivities to the eastward away from the sedimentary contact.

Profile 3 extends from within the volcanics in the area of the pits westward across the contact well into the sediments. High polarization over the pits and the contact area are evident with consistent polarization levels of 20 to 25 milliseconds over the sediments. Resistivities also decrease west of the contact to a consistent level of about 1000 ohm-meters.

In general, the induced polarization results are interpreted to indicate widespread disseminated sulfides in the volcanics near the contact, perhaps decreasing to the east. High background polarization over the sediments is indicative of low percentages of disseminated carbon or sulfides or both.

Magnetics.

The magnetic contouring (Figure 8) divides the area surveyed into three zones. On the west results are very flat over the sediments indicating very little magnetic variation over these rocks. The weak linear low and high between the base line and 1+00 meters west are assumed to be associated with magnetic changes across the contact and the contact has been tentatively placed along the magnetic low at about 1+00 west. The eastern two thirds of the contoured magnetics display erratic responses typical of volcanic rocks.

Hand picked samples of heavy sulfides from pit No. 3 were sufficiently magnetic to swing a compass needle, suggesting that there was sufficient magnetic pyrrhotite in the sulfide concentrations for direct magnetic detection. A weak magnetic anomaly directly over pit No. 3 seems to verify this.

Magnetite concentrations, rather than pyrrhotite, are considered a more likely explanation for the more intense magnetic highs on line 0+00 and on 0+50 south line.

The limited extent of the anomaly at pit No. 3 implies a limited extent to the heavy sulfides exposed here. The lack of magnetic indications in the area of the remaining pits would seem to preclude the presence of other magnetic sulfide concentrations.

VLF-EM.

A moderate conductor centered 10 meters east of pit No. 3 was located using the signal transmitted from Jim Creek, Washington (see Figure 10). This conductor was not detected on adjoining lines nor was it detected a few meters from the conductor center along the base line using the signal transmitted from Hawaii (see Figure 12).

A similar conductor was found centered 10 meters north of pit No. 1 using the Hawaiian transmission. Conversely, this conductor was not detected on nearby lines using the Jim Creek transmission.

These factors suggest narrow conductors of varying strike and of very limited strike length.

There are two other features on the VLF-EM results. These are broad weak linear indications at approximately 1+00 west and 1+50 east. The one on the west is approximately on the contact but it also coincides with a change in slope which is the favored explanation. The conductor east of the baseline has no topographic explanation and may be indicating a weakly conductive structure.

Reportedly some of the sedimentary rocks in the area are carbonaceous. The lack of VLF-EM conductors would indicate that carbon, if present, is disseminated. Flat polarization and resistivity responses seem to verify a lack of electrical continuity. Nevertheless, the high polarization background is indicative of the presence of some polarizable mineral or minerals in the small portion of the sediments covered by this survey.

E.W. Perkins

EWP:am

E. W. PERKINS
Geologist

ASARCO

Geophysical Office — Exploration Department

E. W. Perkins
Manager

October 7, 1981

CERTIFICATION

I, Edward W. Perkins, of Salt Lake City, Utah hereby certify that:

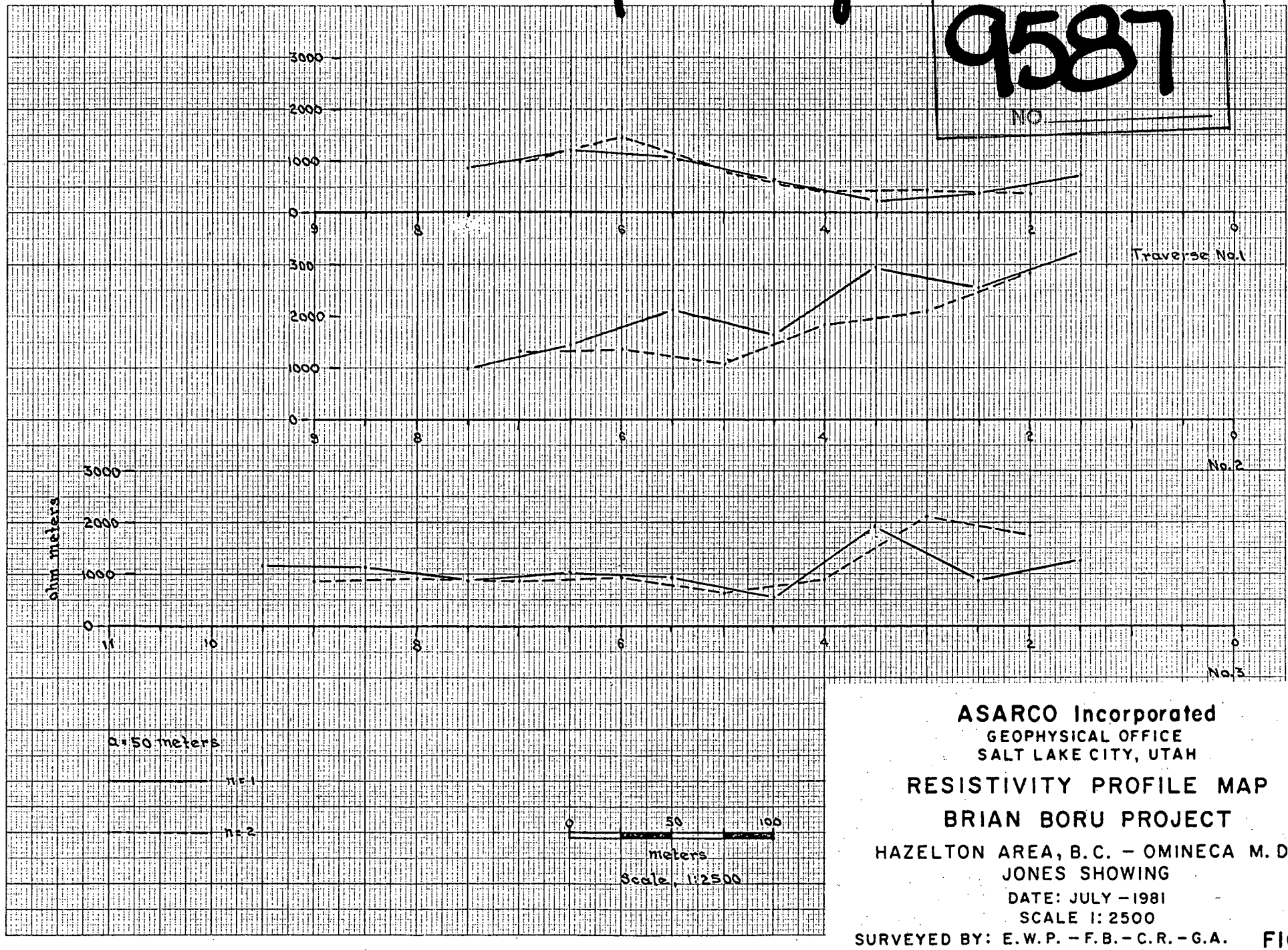
1. I am a graduate of the University of Maine in 1949 with a BA degree in geology.
2. I have been practising my profession of mineral exploration and exploration geophysics for thirty years.
3. I am a member of the Society of Exploration Geophysicists.

Edward W. Perkins

EDWARD W. PERKINS
Geologist

461510

Part 1 of 3



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GEOPHYSICAL OFFICE
SALT LAKE CITY, UTAH

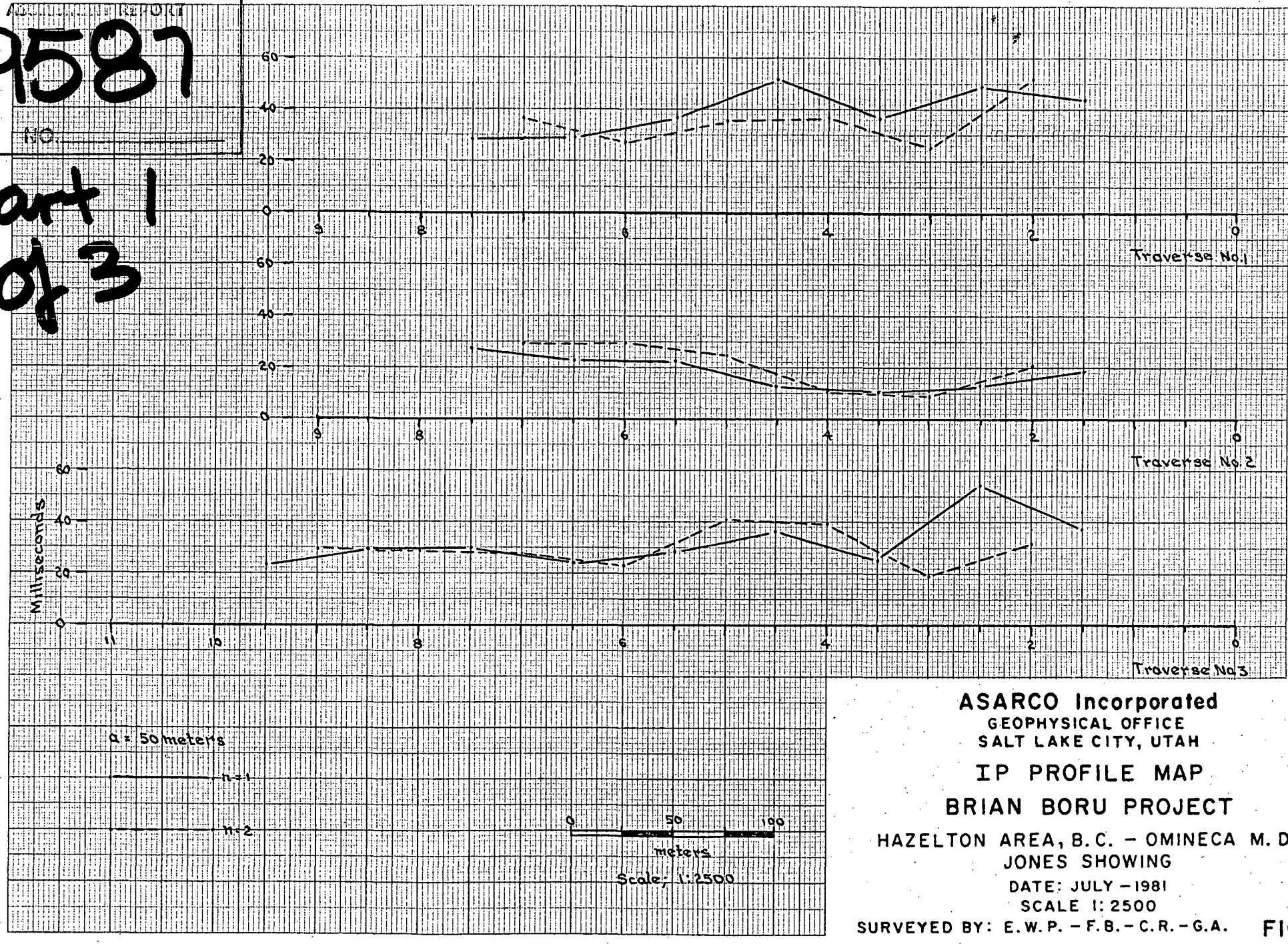
RESISTIVITY PROFILE MAP

BRIAN BORU PROJECT

HAZELTON AREA, B.C. – OMINECA M.D.
JONES SHOWING

DATE: JULY – 1981
SCALE 1: 2500
SURVEYED BY: E.W.P. – F.B. – C.R. – G.A.
COMPILED BY: E.W.P. • DRAWN BY: E.W.P.

FIG. 3



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SALT LAKE CITY, UTAH

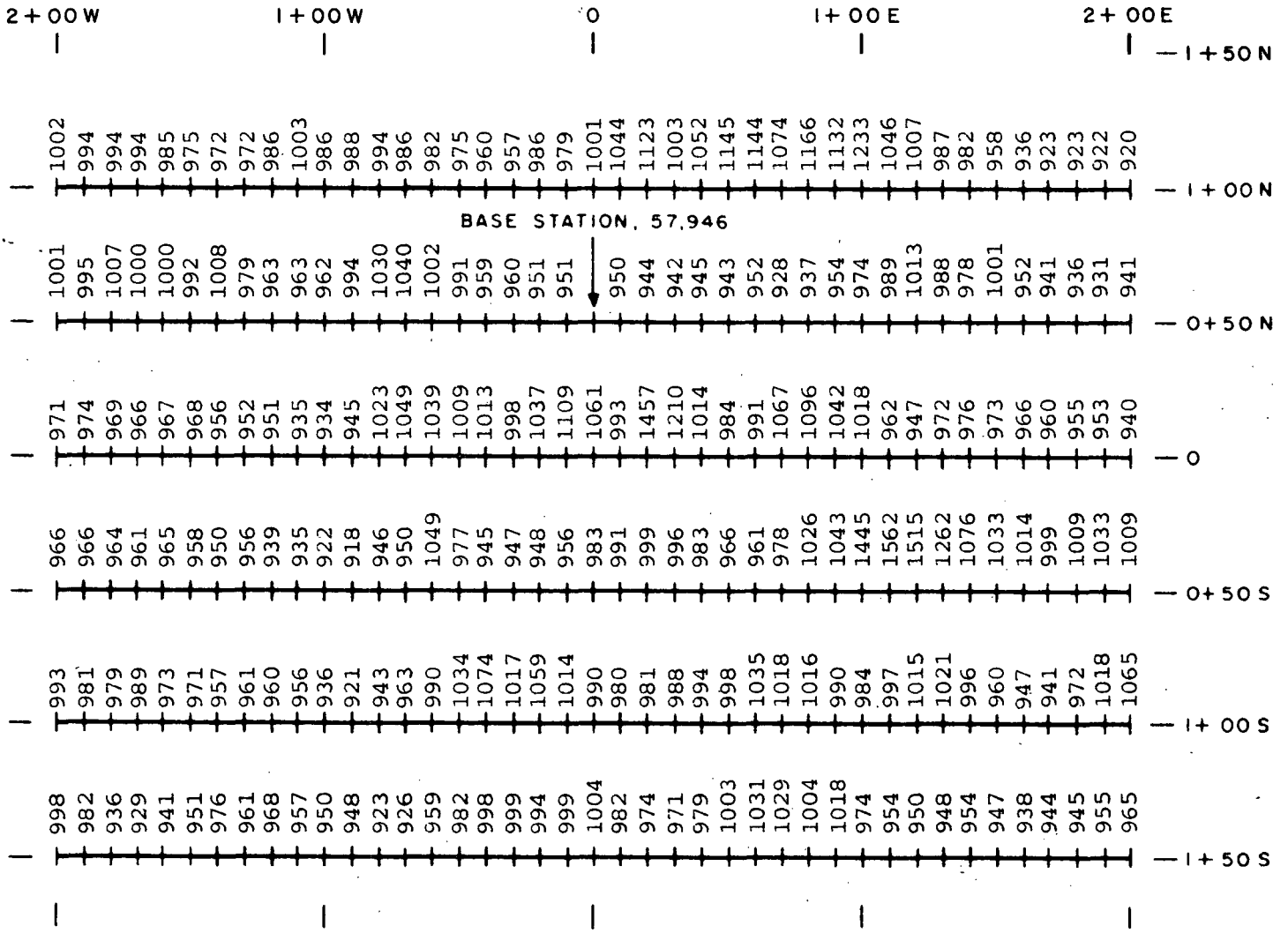
IP PROFILE MAP

BRIAN BORU PROJECT

HAZELTON AREA, B.C. – OMINECA M.D.
JONES SHOWING

DATE: JULY – 1981
SCALE 1: 2500
SURVEYED BY: E.W.P. – F.B. – C.R. – G.A.
COMPILED BY: E.W.P. • DRAWN BY: E.W.P.

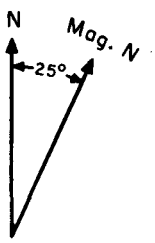
FIG. 4
4 OF 12

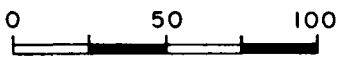


NOTE:

ADD 57,000 GAMMAS FOR TOTAL INTENSITY.

part 1 of 3





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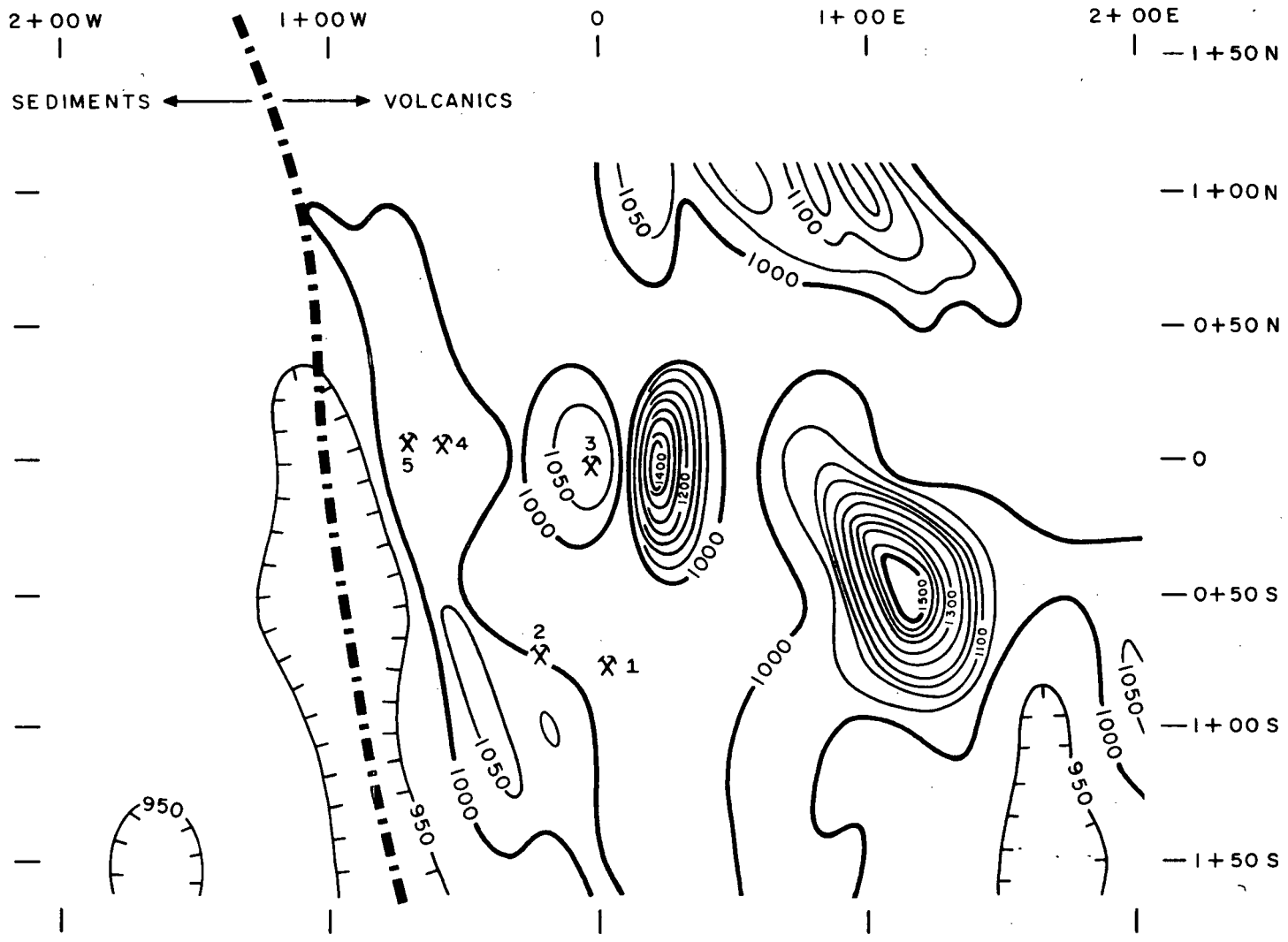
MAGNETIC STATION VALUES
BRIAN BORU PROJECT

HAZELTON AREA, B.C. – OMINECA M.D.
JONES SHOWING
DATE: JULY – 1981
SCALE 1: 2500
SURVEYED BY: F.B. – C.R.
COMPILED BY: E.W.P. • DRAWN BY: W.J.H.

FIG. 7
7 OF 12



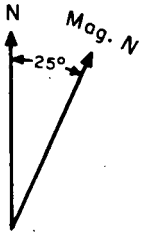
NOTES:

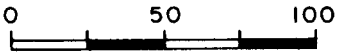
BASE STATION: 0+50N, 0+00W, 57,946 GAMMAS.
ADD 57,000 GAMMAS TO CONTOUR VALUE FOR TOTAL INTENSITY.
CONTOUR INTERVAL: 50 GAMMAS.

LEGEND:

X PIT.

Part 1 of 3





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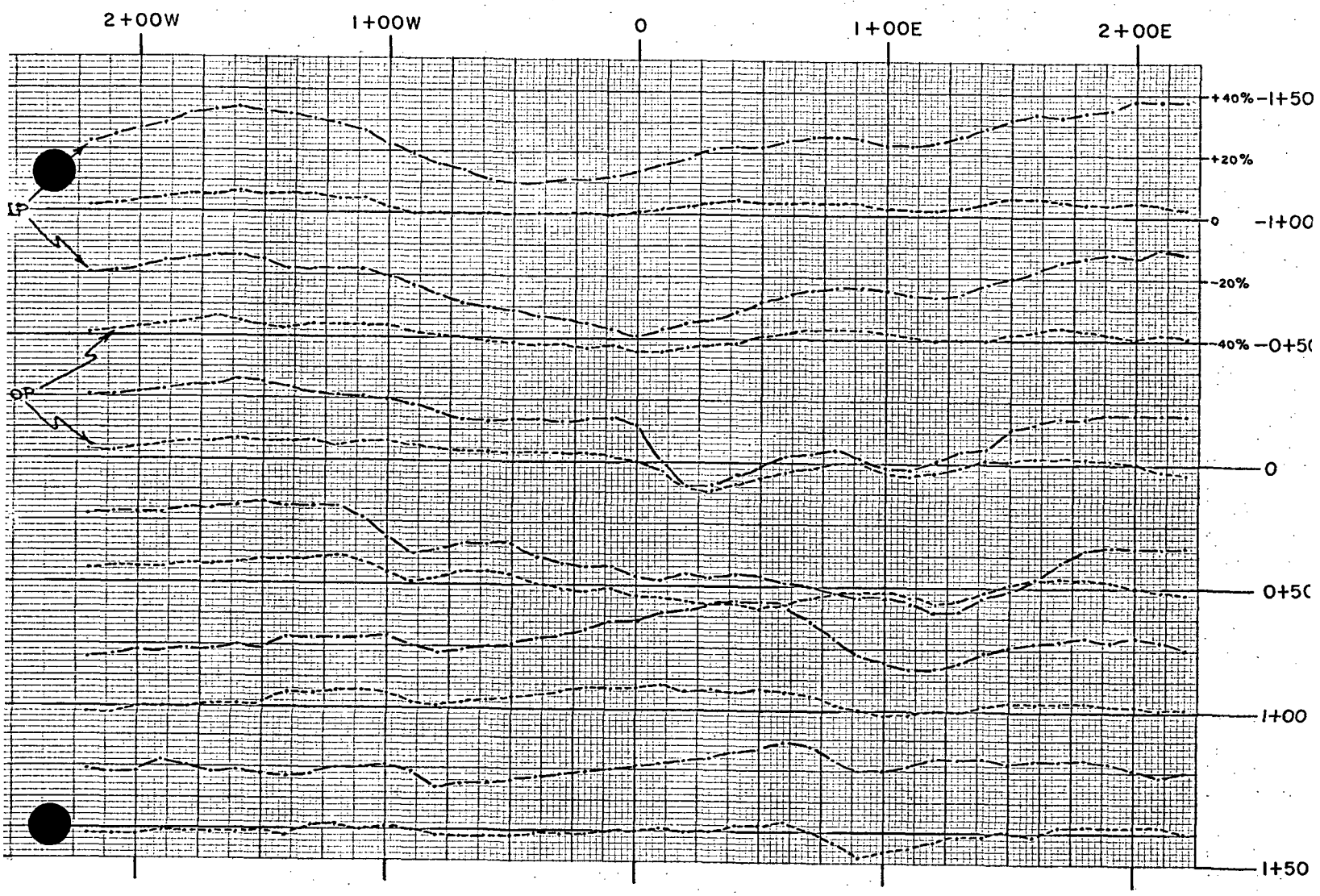
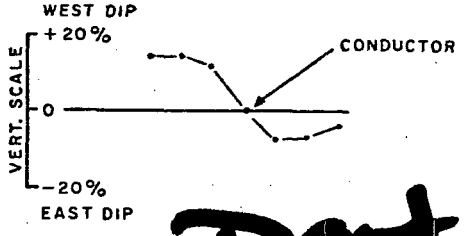
MAGNETIC CONTOUR MAP
BRIAN BORU PROJECT

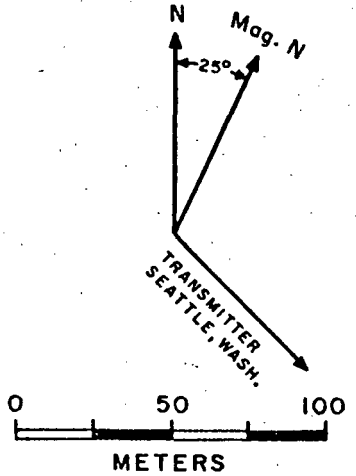
HAZELTON AREA, B.C. – OMINECA M.D.
JONES SHOWING
DATE: JULY – 1981
SCALE 1: 2500
SURVEYED BY: E.W.P. – F.B. – C.R. – G.A.
COMPILED BY: E.W.P. • DRAWN BY: W.J.H.

FIG. 8
8 OF 12





Part 1 of 3



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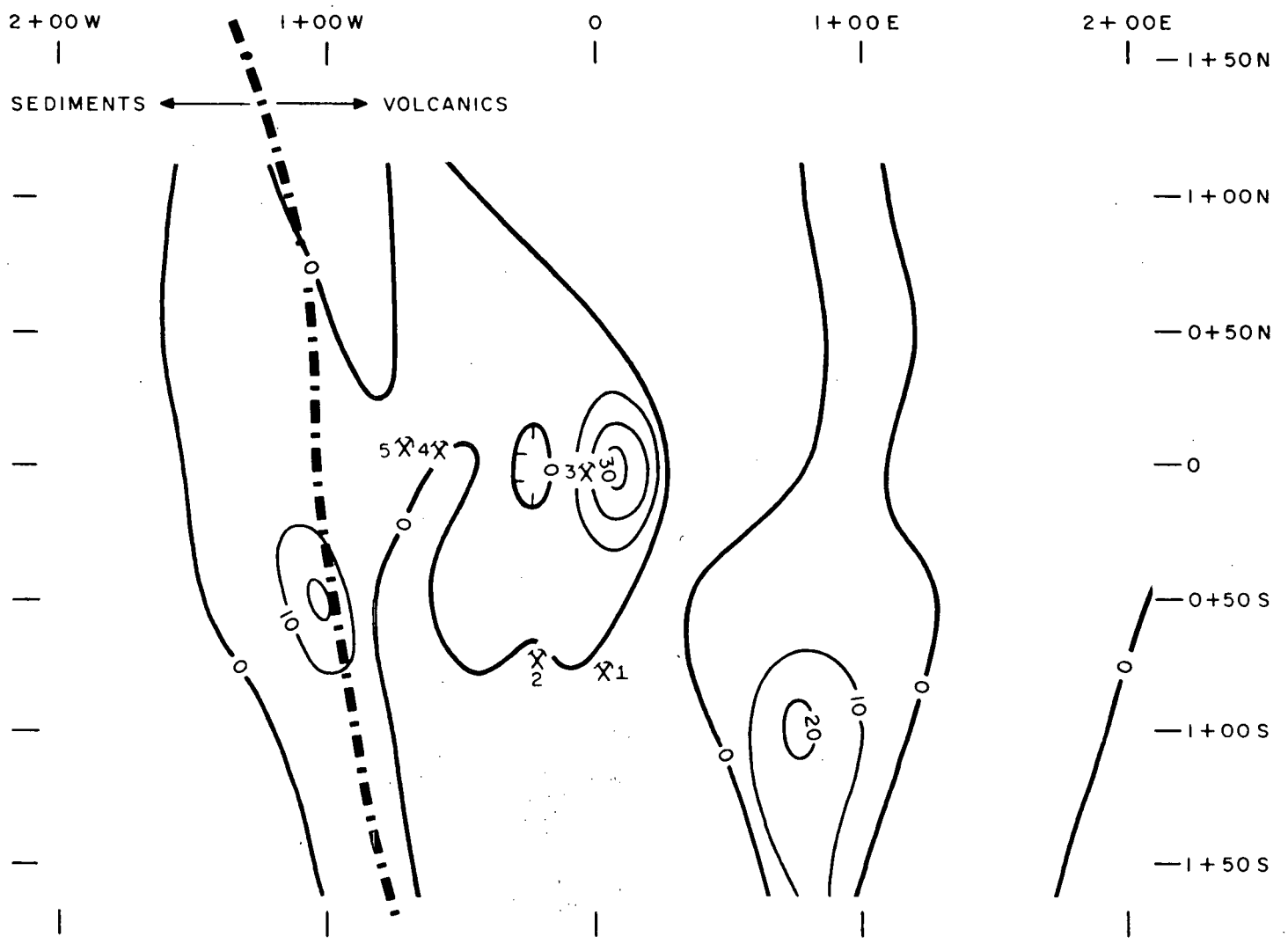
VLF-EM PROFILE MAP
BRIAN BORU PROJECT

HAZELTON AREA, B.C. - OMINECA M.D.
JONES SHOWING
DATE: JULY - 1981
SCALE 1:2500
SURVEYED BY: E.W.P. - F.B. - C.R. - G.A.
COMPILED BY: E.W.P. • DRAWN BY: E.W.P.

FIG. 9



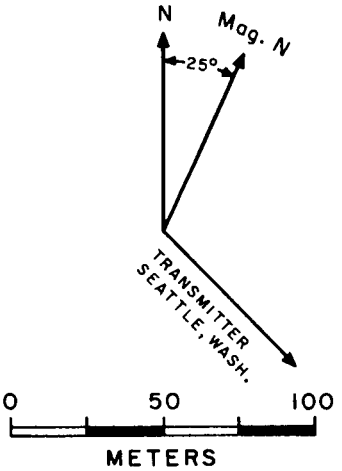
NOTE:

CONTOUR INTERVAL: 10 FRASER UNITS.

LEGEND:

2X PIT.

Part 1 of 3



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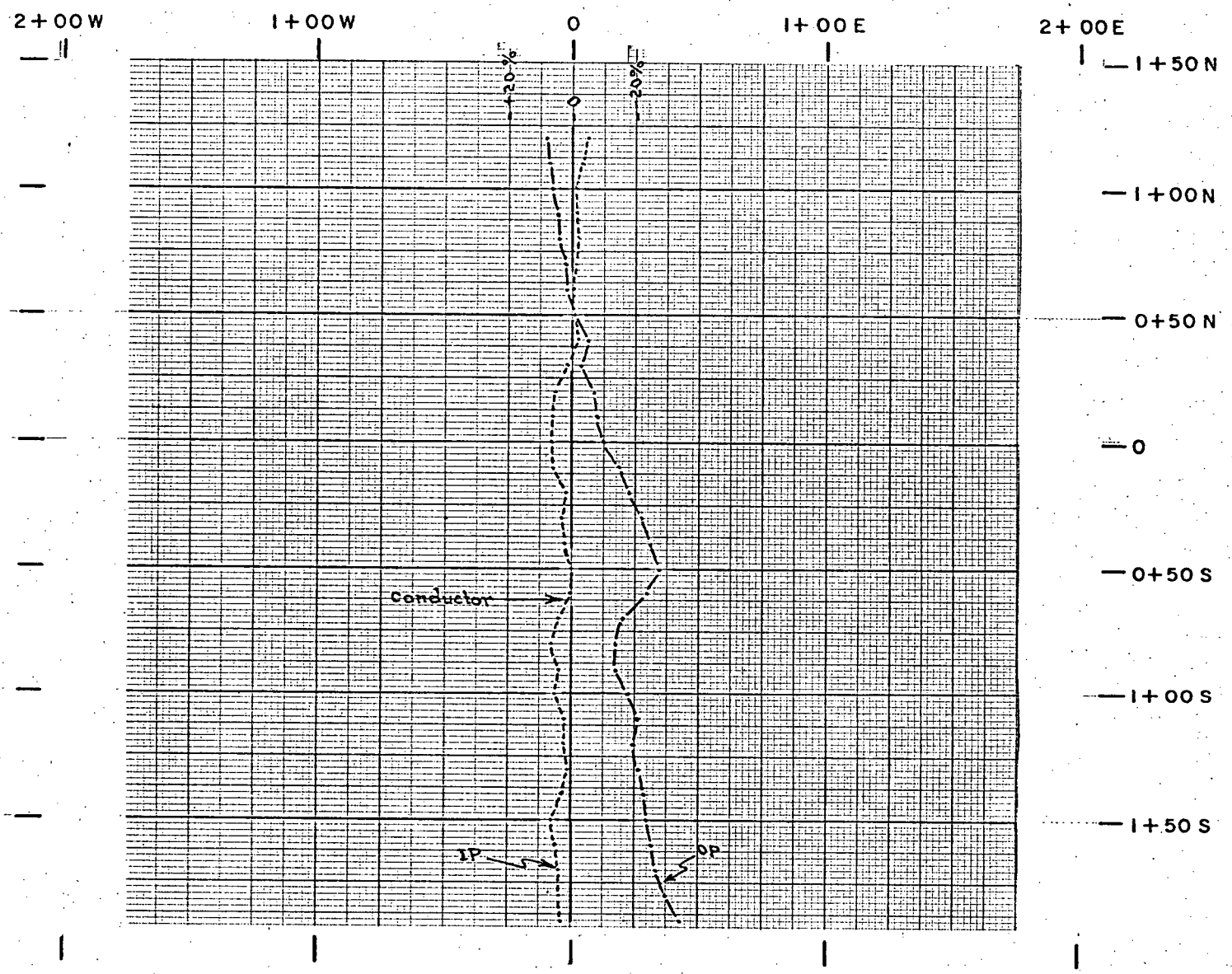
VLF-EM FRASER CONTOUR MAP

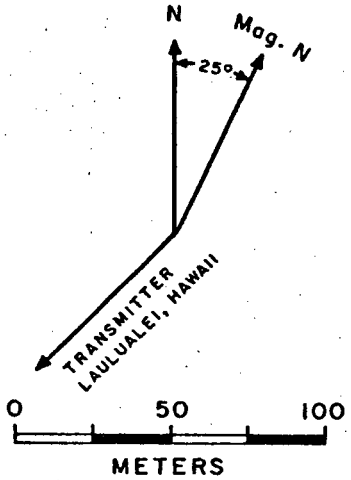
BRIAN BORU PROJECT

HAZELTON AREA, B.C. – OMINECA M.D.
JONES SHOWING
DATE: JULY – 1981
SCALE 1: 2500
SURVEYED BY: E.W.P. – F.B. – C.R. – G.A.
COMPILED BY: E.W.P. • DRAWN BY: W.J.H.

FIG. 10
10 OF 12



Part 1 of 2



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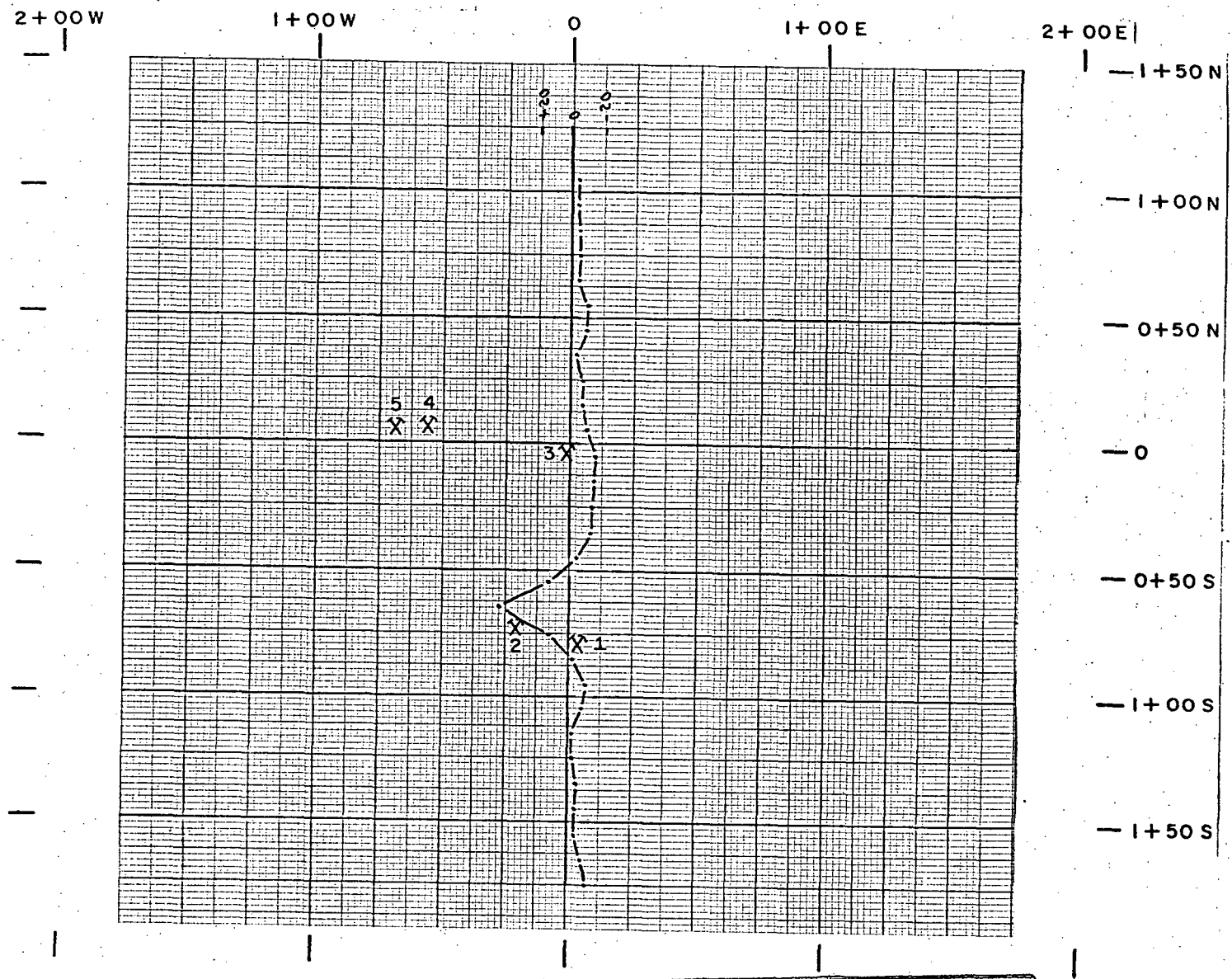
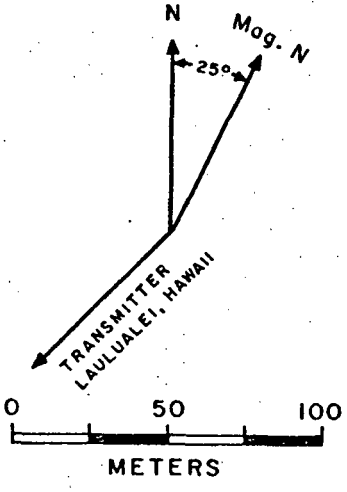
VLF-EM PROFILE MAP
BRIAN BORU PROJECT

HAZELTON AREA, B.C. – OMINECA M. D.
JONES SHOWING
DATE: JULY – 1981
SCALE 1: 2500
SURVEYED BY: E.W.P. – F.B. – C.R. – G.A.
COMPILED BY: E.W.P. • DRAWN BY: E.W.P.

FIG. 11
11 OF 12



Part 1 of 3



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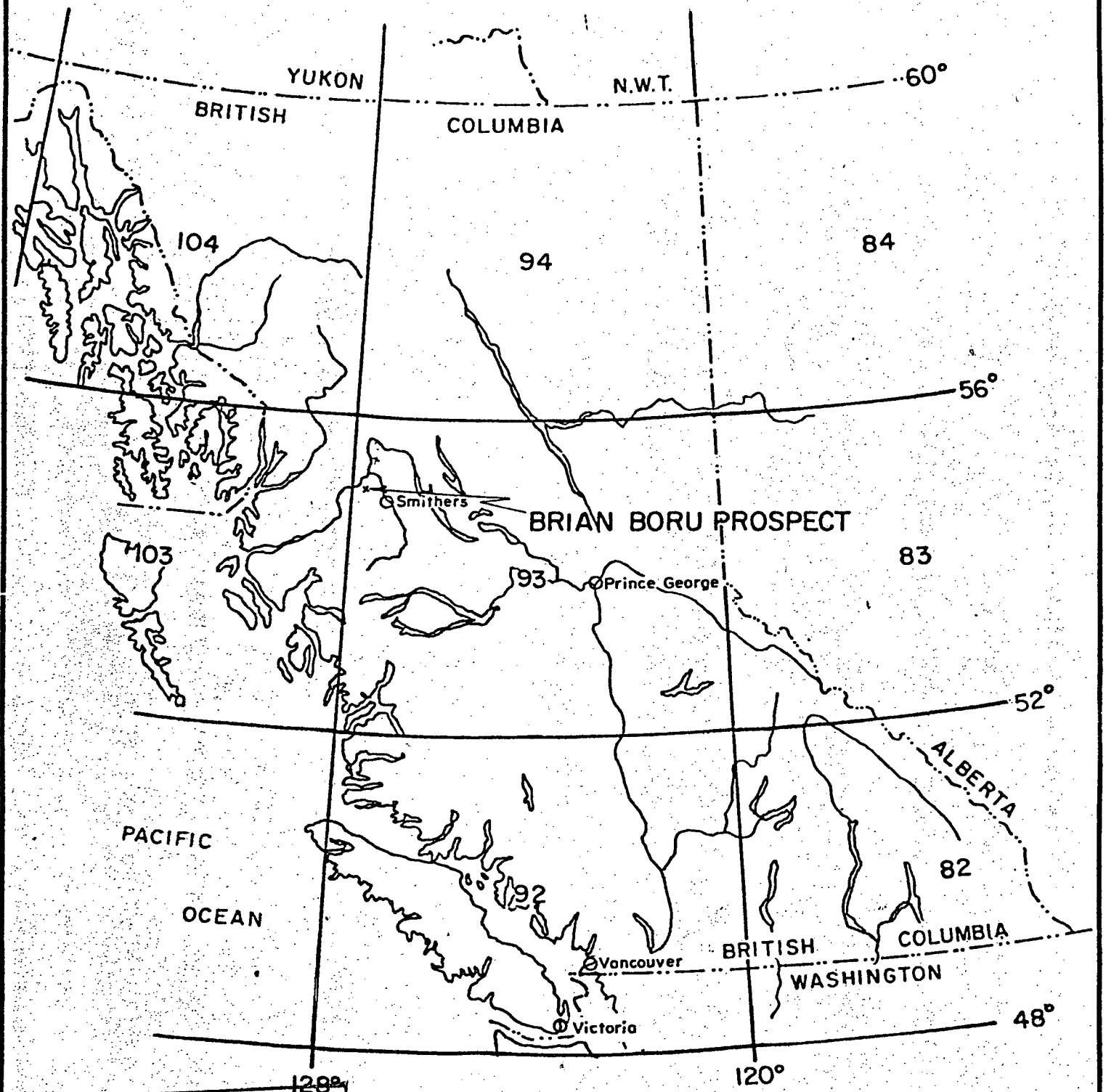
VLF-EM FRASER PROFILE MAP
BRIAN BORU PROJECT

HAZELTON AREA, B.C. – OMINECA M.D.
JONES SHOWING
DATE: JULY – 1981
SCALE 1: 2500
SURVEYED BY: E.W.P. – F.B. – C.R. – G.A.
COMPILED BY: E.W.P. • DRAWN BY: E.W.P.

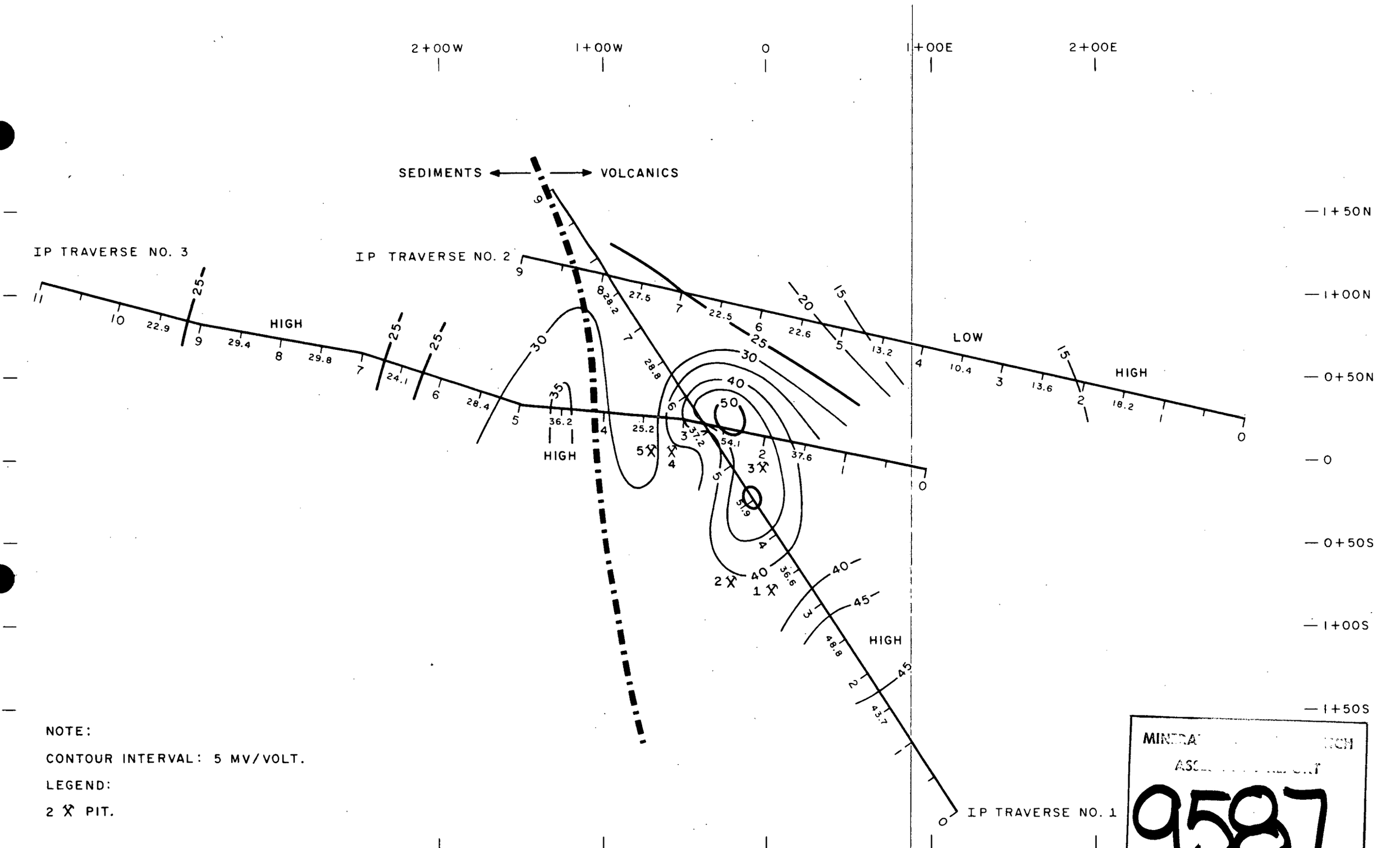
FIG. 12
12 OF 12



Part 1 of 3

ASARCO	Vancouver			
BRIAN BORU PROSPECT LOCATION MAP HAZELTON AREA OMINECA M.D.				
Drawn by	Date	N.T.S.		Figure
D.H.O.	SEPT/80	93M/4E		1

VanCal

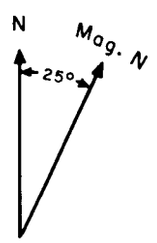


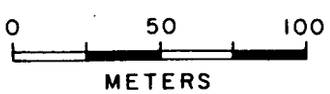
NOTE:

CONTOUR INTERVAL: 5 MV/VOLT.

LEGEND:

2 ⚒ PIT.





Part 1 of 3

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SALT LAKE CITY, UTAH

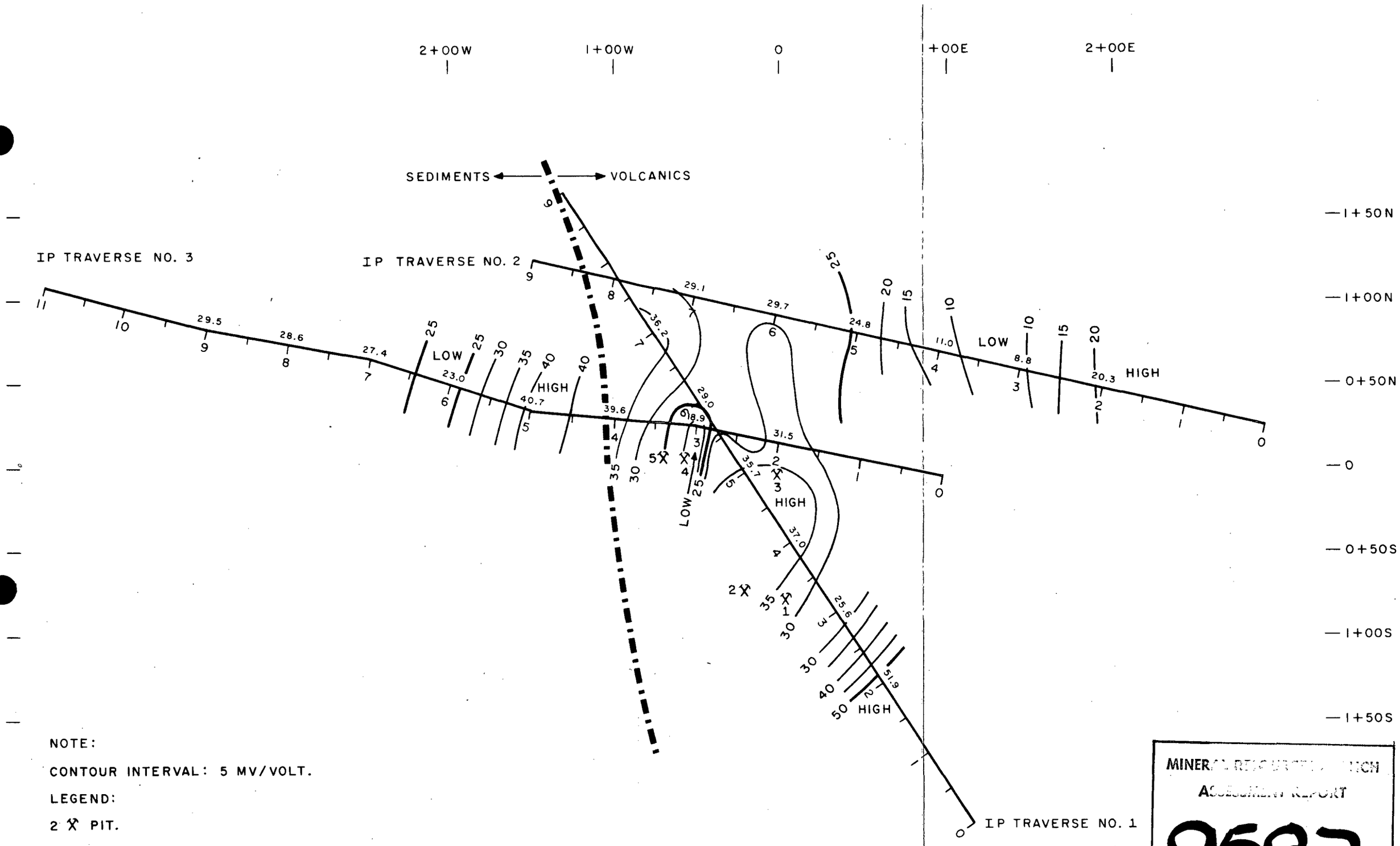
IP CONTOUR MAP — n = 1, a = 50 meters

BRIAN BORU PROJECT

HAZELTON AREA, B.C. – OMINECA M.D.
JONES SHOWING

DATE: JULY – 1981
SCALE 1: 2500
SURVEYED BY: F.B. – E.W.P. – C.R. – G.A.
COMPILED BY: F. B. • DRAWN BY: W.J.H.

FIG. 5
5 OF 12

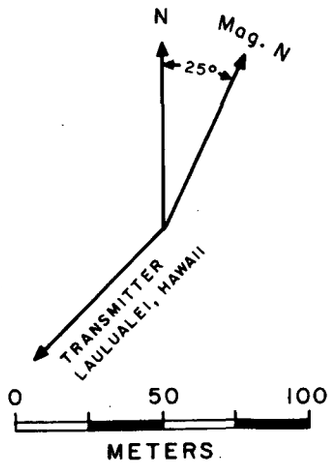


NOTE:

CONTOUR INTERVAL: 5 MV/VOLT.

LEGEND:

2 ⚒ PIT.



Part 1 of 3

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SALT LAKE CITY, UTAH

IP CONTOUR MAP — n = 2, a = 50 meters
BRIAN BORU PROJECT

HAZELTON AREA, B.C. – OMINECA M.D.
JONES SHOWING

DATE: JULY – 1981
SCALE 1: 2500
SURVEYED BY: F.B. – E.W.P. – C.R. – G.A.
COMPILED BY: F.B. • DRAWN BY: W.J.H.

FIG. 6
6 OF 12

GAM I
(1937)

GAM II
(1976)

GAM III
(2177)

GAM IV
(2178)

Killarney grid

IP
DEPTH PROBE

Jones grid

IP-TRAVERSE NO. 3

IP-TRAVERSE NO. 2

IP-TRAVERSE NO. 1

Brian Boru Creek

LEGEND:

STREAMS

LEGAL CORNER POST

CORNER POST

N

0 100 200
METERS

Part 1 of 3

MINERAL TITLES BRANCH
ASSESSMENT REPORT
9587

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GEOPHYSICAL OFFICE
SALT LAKE CITY, UTAH

CLAIM BOUNDARY MAP
SHOWING KILLARNEY GRID & JONES GRID
BRIAN BORU PROJECT

HAZELTON AREA, B. C. – OMINECA M. D.
JONES SHOWING

SCALE 1: 5000 DATE: JULY – 1981

FIG. 2
2 OF 12