Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

NO. 2788 MAP .....

Geological, geophysical and geochemical report on the MOX, SB-VENUS, CN-MARS groups of claims situated in the Highland Valley, 18 miles southeast of Ashcroft, British Columbia, Kamloops Mining Division, N.T.S. 89, Longitude 120°59', Latitude 50°32' and owned by SOUTH SEAS LTD. on behalf of PECHINEY DEVELOPMENT LIMITED

Field work August 1, 1969 - June 30, 1970

2788

Report by

J.P. Guelpa, Geologist
on behalf of
A. Haillot, P.Eng.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. H. J. HAILLOT

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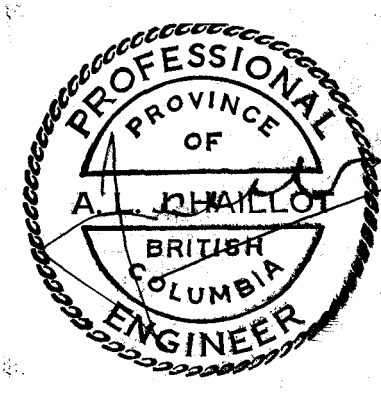

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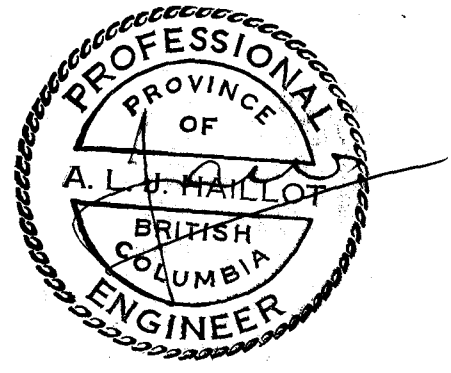
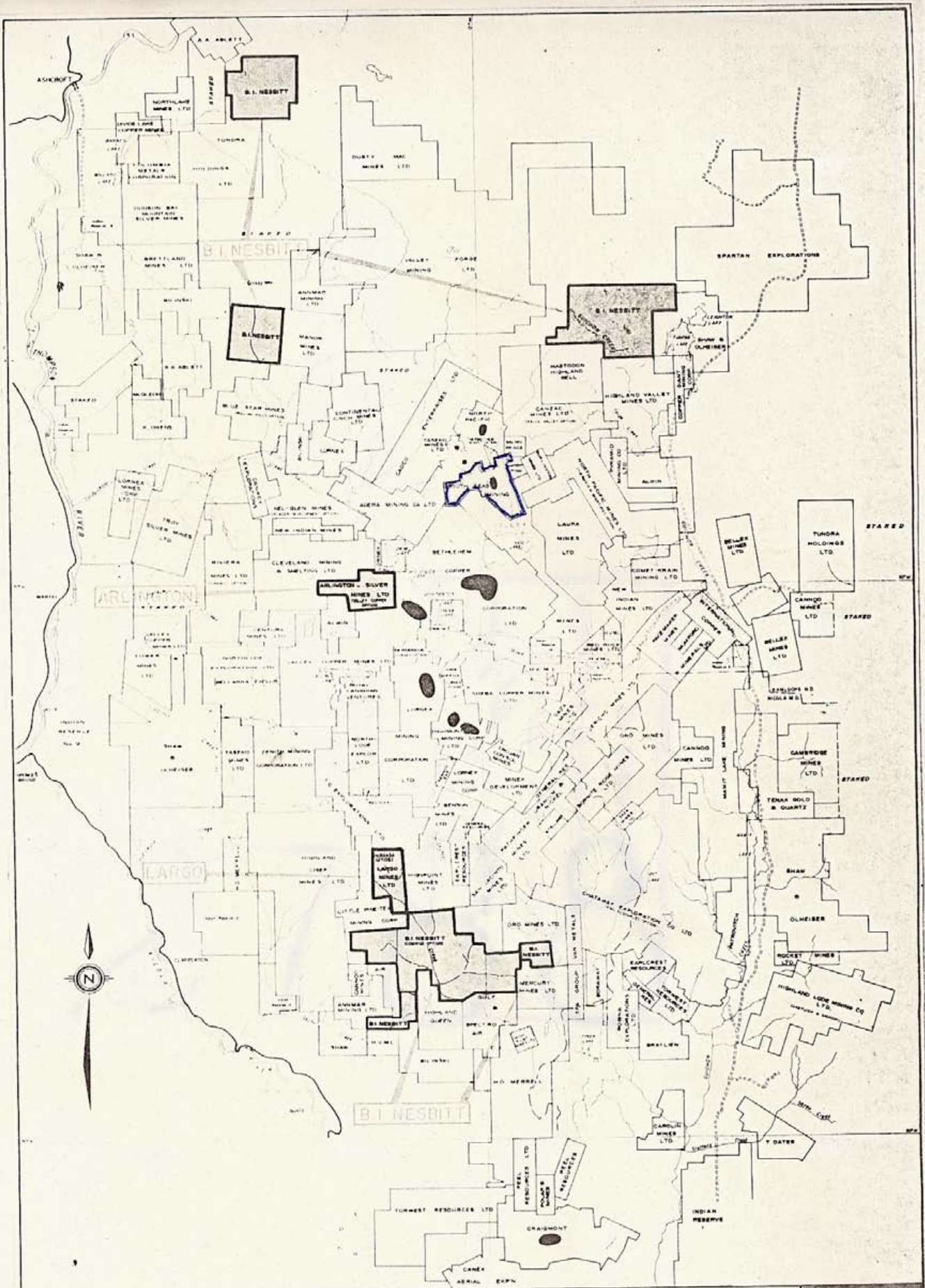




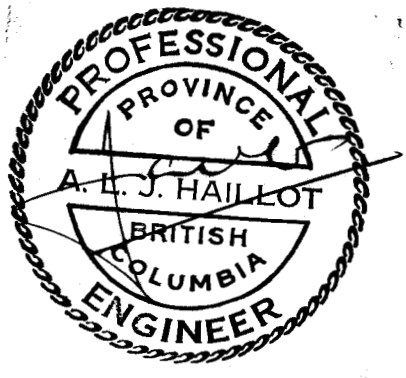
HIGHLAND VALLEY AREA, B. C.

MARCH—1969

ABSTRACT

The work carried out on the South Seas property has been performed first by MOKTA (CANADA) LTD. for PECHINEY DEVELOPMENT LTD., the optioner of the claims, then by PECHINEY DEVELOPMENT LTD. itself.

The South Seas property includes a small orebody known as the Trojan Mine. This report deals only with the works carried out outside of the mine which is situated on the Crown granted group of claims.



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CHAPTER I

EXPLORATION WORK ON THE PROPERTY

1. Introduction

The exploration work carried out on the South Seas property can be divided into 2 phases:

Phase I
- Blazing and flagging of lines 38 miles
- Mapping and Prospecting of the claims
- Magnetometer survey on the whole property
- Geochemical survey on selected areas
- Trenching on defined targets

These works have been completed from August 1969 to October 1969 by a crew of Mokta Canada Ltd. for Pechiney Development Ltd, first under the supervision of Mr. P. Sonnendrucker and Mr. J.P. Guelpa later on.

Phase II
- Line cutting
- IP survey
- Percussion drilling
- Diamond drilling
- Additional trenching

This phase was completed by various contractors from January 1970 to June 1970 under the supervision of J.P. Guelpa, resident geologist.

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2. The South Seas Property

2.1. Location and Access

The South Seas property is located in the Highland Valley, 18 miles east of Ashcroft. Access to the property is by 30 miles of paved road from Ashcroft and 3 miles of gravelled road.

The property is 2.3 square miles and has an irregular shape. It is bounded to the west by South Forge Mountain and to the east by Bose Hill; the Trojan Creek crosses the property from North to South.

The highest point of the property is 6,200', the lowest one is 4,800', so that the climate, although relatively dry, is pretty severe. The entire property is covered by a pine tree forest, easy to penetrate.

2.2. Claims and Ownership (see plan # 1 and # 1A)

The property consists of 94 claims: 24 Crown granted and 30 leased mineral claims which belong to South Seas Mining Ltd. Besides the Crown granted claims they have been grouped into 3 blocks.

The following table lists claims, groups, record numbers and dates of expiration.

CROWN GRANTED CLAIMS (24)	Lot N°
Bill # 1	5602
Bill # 3	5603
Bill # 4	5604
Bill # 5	5605
Bill # 6	5606
Bill # 7	5607
Bill # 8	5608
Bill # 9	5609

BILL - AJ GROUP	Lot N°
Bill # 10	5610
Bill # 11	5611
Bill # 12	5612
Bill # 13	5613
Bill # 14	5614
Bill # 15	5615
Bill # 16	5616

AJ # 1	5441
AJ # 2	5442
AJ # 3	5483
AJ # 4	5621
AJ # 5	5605
AJ # 6	5606
AJ # 7	5617
AJ # 8	5618
AJ # 1 FR	5602

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MINERAL CLAIMS (30)

Group: MOX

Claim Name	Record N°	Expiration Date
MOX # 1	41874	28.3.72
MOX # 2	41875	28.3.72
MOX # 1 Fr	22303	29.3.72

Group: SB-VENUS

Claim Name	Record N°	Expiration Date
LIL # 5	33191	14.3.71
TOM FR	26283	27.5.72
LIL # 7	43143	6.6.72
LIL # 7 FR	43142	6.6.72
SB # 1	23842	8.6.72
SB # FR	23841	8.6.72
SB # 2	23843	8.6.72
SB # 3	23844	8.6.72
OPAL # 2 FR	43650	26.6.72
MAT # FR	43648	26.6.72
BE # FR	44435	30.8.72
VENUS # 1FR	44433	30.8.72
VENUS # 2FR	44434	30.8.72

Group: CN-MARS

Claim Name	Record N°	Expiration Date
MARS # 2	75199	19.12.70
LIL # 4FR	33190	14.3.72
CN # 1	14849	30.5.73
CN # 2	14850	30.5.77
CN # 3	14851	30.5.77
CN # 4	14852	30.5.77
CN # 5	14853	30.5.77
CN # 6	14854	30.5.76

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Claim Name	Record N°	Expiration Date
CN # 7	14855	30.5.77
CN # 8	14856	30.5.76
MARS # 1	41876	28.3.76
MARS # 3	41877	28.3.76
MARS # 4FR	44436	30.8.76
MARS # 5	41878	28.3.76

3. Works completed: Summary

- Blazing and flagging of line line cutting
- Mapping and rock prospecting
- Magnetic survey
- Soil sampling
- Trenching
- Percussion drilling
- Diamond drilling

4. Geology

4.1. General Setting

The South Seas property is situated on the Guichon Creek batholith, an intrusive granodiorite of some 400 square miles. This pluton is well known for its various orebodies, such as Bethlehem copper, Valley Copper, Lornex.

The batholith has been recently studied by KE Northcote (B.C. Department of Mines) who distinguished phases (with intrusive contacts) and varieties (with gradual contacts) as follows:

Relatively old	Intermediate age	Relatively Young
Hybrid phase Quartz granodiorite	Gump lake phase Granodiorite quartz monzonite	Bethsaida phase Quartz monzonite granodiorite, Gnawed Mountain Porphyries, younger Bethlehem porphyries and associated intrusive breccias, leucocratic dykes and irregular shaped bodies
Highland Valley phase Guichon variety, quartz diorite, granodiorite	Bethlehem phase Granodiorite quartz monzonite	
Chataway variety granodiorite, quartz monzonite, Le Roy granodiorite, granodiorite quartz monzonite	Witches brook phase Variety A: granodiorite Variety B: granodiorite Variety C: granodiorite, quartz monzonite, granite Bethlehem porphyries	

The copper orebodies are preferentially located near the contact Guichon variety - Bethlehem phase (Bethlehem Copper) and Bethlehem phase Bethsaida phase (Valley Copper) in an area transected by many porphyritic dykes.

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4.2. Results

Plan # 2 is the geological map of the property. Detail mapping has been made difficult through the subcontinuous glacial overburden, however, two areas have allowed easier observations:

- the area covered by claims SB 1, SB FR, CN 6
- the area covered by claims BILL and AJ

To sum up: the surface of the property appears to be divided as follows:

- Tertiary volcanics	=	50 %
- Undifferentiated Guichon batholith	=	15 %
- Area without outcrop	=	35 %

4.2.1. Petrography

4.2.1.1. Guichon Granodiorite

The more widespread petrographic unit is the normal Guichon granodiorite (1). It is a light grey rock with green to black spots of mafic minerals. It is medium to coarse grained and equigranular.

Two types have been studied in thin sections:

- one has been named "Grey Guichon" because of its darker colour (specimen PS/301); it appears to be a slightly to moderately altered granodiorite.

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- the other one is a leucocratic facies believed to be a differentiation of the normal Guichon (Specimen PS/305 Under the microscope it shows a porphyritic texture and a slight evidence of cataclasis.

In the northwest part of the property we have distinguised several zones inside the Guichon according to the macrostructural features of the rock and the mineralogical alterations:

- Guichon granodiorite with epidote filled fissures (2)
- Guichon granodiorite with epidote and black cement filled fissures and fractures (3)
- Guichon granodiorite strongly fractured with large dyke-like fillings of black cement up to one foot (4). The black cement obviously includes some tourmaline together with other hydrothermal minerals such as chlorite epidote.

It commonly holds minor magnetite and sometimes fine scattered chalcopyrite. Stains of malachite are observed here and there. A pink potash alteration is widespread throughout zones (3) and (4).

4.2.1.2. Bethlehem Granodiorite (Witches brook)

This unit appears only in the north half of the property and has not a large extension. It is a fine grained slightly porphyritic rock.

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The thin section study (specimen PS 304) shows that the composition is a quartz monzonite; the rock displays sericite and clay alterations.

4.2.1.3. Fine Grained Diorite

A fine grained, suboophitic,dark coloured diorite appears as inclusion in the Guichon in the southeast and northwest parts of the property. It has not been studied in detail.

4.2.1.4. Fine Grained Granodiorite

A fine grained granodiorite believed to be a variety of the Guichon is found close to the northern boundary of the property. It has not been studied in thin section.

4.2.1.5. Plagioclase Porphyries (brown porphyries on the field)

A number of dykes of plagioclase porphyry has been found in different places on the property. The rock named "brown porphyry" on the field appears to be a dacite porphyry whose plagioclases have been strongly epidotized and whose matrix has been chloritized (specimen PS/303).

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4.2.1.6. A grey blue, very fine grained rock is believed to be a dyke-like andesite.

4.2.1.7. Tertiary Volcanics

The tertiary volcanics have not been studied in detail bearing no interest as far as copper prospecting is concerned.

4.2.2. Structural Geology

4.2.2.1. Photogeology

A photogeological study of the area has pointed out the existence of a number of subcircular shaped structures. Bethlehem Copper mine is situated on one of them and so is the Trojan Mine. Part of such a structure appears in the northwest area of the property on claims SB and CN 3; at last another small structure exists on claim MOX 2 around Salmo Lake.

4.2.2.2. Field Data

Only a few observations have been made on the field. However, 2 major structural trends have been observed: N35W and N55E. In the northwest part of the property they are particularly obvious because of the black cement fillings We point out that the strike of zones (3) and (4) in the Guichon coincide approximately with one of these trends.

Only a few faults have been seen on the field, the main ones being:

- a fault between Guichon and Bethlehem facies in the northwest end of the property; this fault has been followed for 1000'. Minor stains of malachite are found along it; it strikes N155E.

- a fault located 1500' south of the abandoned shaft of Highland mine; it strikes N95E.

5. Magnetometer Survey

A magnetometer survey has been performed along lines previously blazed and flagged; the lines were 400 feet apart and flagged every 100', making a grid of 400' x 100'.

The survey has been carried out with a fluxgate magnetometer MF1.

Fig. N° 1 is an extract of the aeromagnetic map showing the general setting of the property.

Plan N° 3 (scale 1" = 500') is a reduction of field maps previously established at a scale of 1" = 200'.

A comparison between geological and magnetic maps shows that:

- low magnetic areas correspond to the tertiary volcanic formation (less than +40γ)
- high magnetic areas correspond to outcropping Guichon granodiorite (over +700γ)
- mineralized occurrences are scattered outside the

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above roughly defined areas, so that it is not possible to establish a more accurate relationship

- two small dipole anomalies appear; one in the southeast corner of the property (South East anomaly), the other one in the west part of the property (Western anomaly).
- a fairly wide area of magnetic low appears some 500' east of South Forge Mountain upon a drift covered area

The two small dipoles anomalies have been subject to further examination consisting in:

- detailed magnetometer survey
- soil sampling

6. Detailed Work on Selected Areas: Magnetism and Geochemistry

6.1. South East Anomaly (see fig. # 3A, 3B)

The anomaly was surveyed according to a grid of 200' x 100' and soil samples were taken the same way. The positive area of the dipole anomaly corresponds to outcropping Guichon granodiorite which is intersected by a dyke of plagioclase porphyry. The negative area coincides with a deep creek devoid of outcrops.

The geochemistry has given readings higher than 100 ppm cu that seem directly related to the creek.

Scattered everywhere a number of subangular boulders of mineralized breccia have been encountered.

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Two trenches TRSE1 and TRSE2 have been dug with a bull-dozer without reaching the bedrock except in TRSE2 where a few feet of plain granodiorite have been exposed.

6.2. Western Anomaly (see fig. # 2A, 2B, 2C)

Detail magnetic survey according to a 200' x 100' grid at first and a 25' x 25' has given an accurate pattern of this anomaly. A negative axis corresponds to a thalweg trending 90° (magnetic azimut). Geochemistry has yielded some high readings (over 800 ppm) along two axis trending northwest, one of them corresponding roughly to the magnetic low, and at the same time to a small thalweg.

Two trenches have been dug. TRW#1 has widely exposed the bedrock and a rock sampling (horizontal channel sampling) has been carried out on both walls, each 10'. Three noticeable fillings of black cement, a few inches thick, have been found in the country rock consisting of normal Guichon granodiorite. The black cement is here strongly magnetic and some chalcopyrite is scattered in it, but the granodiorite itself is barren. The rock sampling has given results not exceeding .o1 Cu (see plan # 4).

TRW#2 did not reach the bedrock.

6.3. South East Areas, Scattering of Breccia Boulders ("Epandage du Sud-Est") (see fig. # 4)

This area mainly located on claim BILL 15 but overlapping claim AJ6 shows a noticeable scattering of breccia boulders and

is some 1500' long and 1200' wide. As most of the boulders have subangular shapes, it has been believed that they could indicate another occurrence of mineralized breccia nearly. A soil sampling has been performed; results are indicated on figure # 4.

Three trenches have been dug:

- TRSE # 3 did not reach the bedrock
- TRSE # 4 and TRSE # 5 were put across one small anomaly

TRSE # 4 did not reach the bedrock. However, three vertical profiles have been realized by taking silt samples in each of the 3 recognized levels in the glacial overburden. The results are listed below:

CHANNEL		1	2	3	4	5
Top	Level A	216	285	166	388	340
	Level B	198	181	188	175	198
Bottom	Level C	81	63	69	81	100

It appears to decrease vertically with the depth indicating that the anomaly is only superficial.

TRW# 5 dug to a depth of 16' has revealed 15' of finely fractured, black cement coated Guichon, stains of malachite and one speck of chalcopyrite have been observed. A rock sampling (horizontal channel sampling) has been made along both walls by sections of 10', but the results appear quite disappointing; they are as follows: .08 .03 .01 .02 .01 % Cu

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6.4. Claim MARS 2

A geochemical survey has been performed on claim MARS 2. The results are listed below. Some readings are higher than 200 ppm, but no anomaly has been found.

Results Geochemistry MARS 2 (ppm Cu)

	28S	24S	16BisS	16S
52W	10 ppm	15 ppm		
51W	15	30		
50W	15	30		30 ppm
49W	15	25		35
48W	150	30		35
47W	35	55		10
46W	80	35	75 ppm	35
45W	10	25	25	15
44W	95	25	50	25
43W	30	25	60	15
42W	235	20	35	15
41W	55	40	250	45
40W	85	25	250	20
39W	55	25	55	80
38W	35		50	205

7. Mineralization

Further to the preliminary exploration work including trenching the mineralized occurrences on the property can be summed up as follows:

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7.1. East of the mine, one mineralized occurrence has been found in trench TRSE5, but appears to be insignificant.

7.2. West of the mine, the following has been revealed:

- a finely disseminated chalcopyrite mineralization inside a variety of the Guichon granodiorite described before (specimen PS 305). The mineralization is most erratic and the occurrences are scattered on a surface some 500' wide and some 1100' long in the southeast corner of claim SB1 and on claim LIL 7FR close to the North Pacific Property.
- a zone of fractured granodiorite with abundant black cement coating fissures and filling fractures; specks of chalcopyrite are found here and there in the filling.

The so called North West Showing is typical for this kind of occurrence which is met here and there in zones (3) and (4) (see plan nº 2). The distribution of the mineralized points is a ring shaped one which seems to be marked by Highland Mines and Transvaal Mines outside the South Seas property.

8. IP Survey

IP surveys were run by Tom Gledhill, P.Eng., over the complete property, except the mine area and the volcanic formations. Tom Gledhill's report is annexed to this report (appendix nº VIII). No real new target has been revealed by the survey. However, a lightly anomalous area centred around 30W on BL 2 has been tested by a diamond drill hole of 849' (hole 70-6).

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9. Percussion Drilling on the Northwest Showing

The northwest showing situated on claims SB1 and SB FR has been tested by 8 percussion drill holes on a total length of 1930'. The work has been carried out by Josco Minin g, Highland Valley, after the access and all drill sites had been prepared by bulldozing.

Plan # 5 shows the location of holes with regard to the old trenches dug in 1967 in which some mineralization was exposed, and the results of assay.

Samples have been taken on standard 10' runs and dried in the laboratory.

The only positive result obtained from this percussion drilling programm is a 20' section assaying .50 % Cu and because of this no more drilling has been planned.

10. Diamond Drilling

Three diamond drill holes for a total length of 2503' have been carried out on the property in May/June 1970; the contractor was Connor's Drilling. The holes were drilled with the NQ wire line.

Hole 70-4 is located close to Salmo Lake on claim MOX # 1. Its object was to test a photogeological, subcircular shaped structure similar to the one on which the Trojan Mine is situated.

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This hole was driven vertically to a depth of 1001' but failed to go through the tertiary volcanics that cover the area.

Hole 70-5 is located in the southwest of the property on the side of South Forge Mountain, 100' west of the road to Transvaal. It had been planned to test a wide area of magnetic low which has been mentioned before. It is situated on claim LIL 4FR. The bearing of the hole is 270° (Ng), its dip is 60° west; it reached a depth of 653'.

Some minor chalcopyrite has been observed in fissures inside the granodiorite but the assays have proved that it is quite insignificant, the best result being only .04 % Cu. A black, strongly magnetic andesite has been intersected by the hole and can partly explain the magnetic anomaly.

Hole 70-6 is located on line 00 of the IP survey, approximately 400' northwest of hole 70-5. Its object was to test the same magnetic anomaly as in hole 70-5 and also to test the anomalous area indicated by the IP survey. It is situated on claim CN5. The bearing of the hole is 270° (Ng), its dip is 45W; it reached a depth of 849'.

Geology of this hole appears to be complicated. It consists of an alternation of granodiorite and volcanic facies and shows a light coloured breccia which is quite different from the breccia in the mine.

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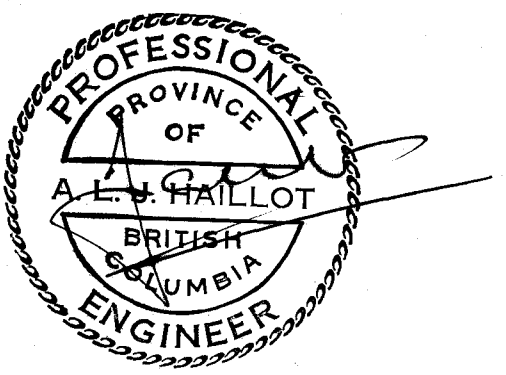
This light coloured breccia has no black cement in the matrix and is believed to be post mineralization. Indeed, some sections have shown pebbles of granodiorite that bear specks of chalcopyrite inside fissures; no mineralization has ever been observed in the matrix. However, 6 sections of each 10' have been submitted to analysis. The results once more appeared to be without interest; the best value being .05 % Cu.

Plan # 6A shows the geology of holes together with the results of assays.

11. Conclusion

None of the works carried out during the exploration phase has revealed a target requiring a further examination. Results obtained on the northwest part of the property are especially disappointing since much hope had been placed upon them considering the favourable geological environment.



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APPENDIX I

PERSONNEL CERTIFICATES

HAILLOT — André, Mining Engineer; Ecole Centrale des Arts et Manufactures de Paris / France; Graduate in 1938; since graduation engaged in various mining operations (coal, phosphate, base metals); Professional Engineer B.C.

SONNENDRUCKER — Pierre, Geological Engineer from ENSG (Ecole Nationale Supérieure de Géologie), Nancy, France; Graduate in 1955; engaged in various phases of mineral exploration since graduation in Africa and then Canada with MOKTA CANADA LTD. and with PECHINEY DEVELOPMENT LTD.

GUELPA — Jean Paul, Geologist, Graduate of University of Lyon, France in 1966. Since graduation engaged in mineral exploration in Quebec with the Department of National Resources and in B.C. with MOKTA CANADA LTD. and at present with PECHINEY DEVELOPMENT LTD.

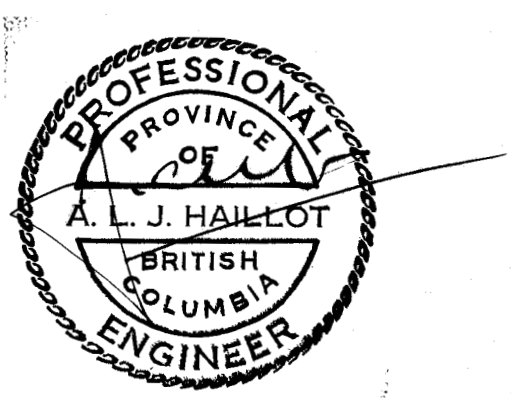
COUTELLIER	Gérard, Geologist from ENSG (Ecole Nationale Supérieure de Géologie), Nancy, France, age 24, previous experience: mapping in Saskatchewan with MOKTA CANADA LTD.
HUMBERT	André, Geologist from ENSG (Ecole Nationale Supérieure de Géologie), Nancy, France, age 24, previous experience: mapping in Saskatchewan with MOKTA CANADA LTD.
MEUSY	Gerard, Geologist from ENSG (Ecole Nationale Supérieure de Géologie), Nancy. France, age 24, previous experience: mapping in North Africa and in Saskatchewan with MOKTA CANADA LTD.
LACOMBE	Fernand, 2nd year student, Université de Montréal, previous experience in mapping during field seasons 1968 and 1969
HEBERT	Yves, 1st year student, Université de Montréal, previous experience in mapping during field seasons 1968 and 1969
LOWE	Ronald, 1st year student, Université de Montréal
CORTELESSA	Alain, cook, works in mining camps as a cook
HAILLOT	Philippe, worked as helper for the IP survey
SAINT LOUIS	Rene, U.B.C. student, worked as a helper for IP survey
LANG	James, U.B.C. student, previous experience: none worked as a helper for IP survey
TEEPLE	Charles, U.B.C. student, previous experience in line cutting and soil sampling with WESTERN GEOLOGICAL SERVICES B.C.

APPENDIX II

PERSONNEL AND DATES WORKED

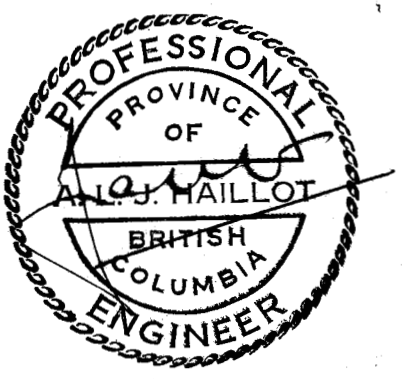
A. Haillot	President of Pechiney Development Ltd.; supervision of exploration works on the field at different times between August 69 and June 70	
P. Sonnendrucker	Geology (mapping): 43 man days Supervision and planning : 60 man days	Aug. 1 - Nov. 30
J.P. Guelpa	Geology (mapping : 38 man days Supervision (resident geologist): 206 man days	Sept. 22/69 - May 31/70
A. Humbert	Geological assistant : 26 man days Blazing, flagging of lines : 11 " " Magnetometer operator : 14 " " Soil and rock sampling : 10 " " Camp repairing : 10 " "	Aug. 1 - Nov. 6
G. Coutellier	Geological assistant : 26 man days Blazing and flagging of lines : 9 " " Magnetometer operator : 14 " " Soil sampling : 6 " " Supervision of bulldozing : 11 " " Data reduction : 10 " "	Aug. 1 - Oct. 15

F. Lacombe	Geological assistant : 11 man days	Aug. 1 - Aug. 30
	Blazing, flagging of lines : 14 " "	
	Camp repairing : 3 " "	
Y. Hebert	Geological assistant : 14 man days	Aug. 1 - Aug. 30
	Blazing, flagging of lines : 11 " "	
	Magnetometer operator : 3 " "	
R. Lowe	Camp maintenance (cooking) : 30 man days	Aug. 1 - Aug. 30
G. Meusy	Data reduction, logging of old drill holes : 23 man days	Sept. 9 - Sept. 30
P. Haillot	Helper for IP survey	May 1/70 -May27/70
R. Saint Louis	Helper for IP survey	"
J.V. Lang	Helper for IP survey	"
A. Cortelessa	Maintenance of camp (cooking for IP crew)	May 1 - May 27/70
C. Teeple	Maintenance of camp	July 1 - July10/70



Contractors:

Emery Mining Services - Kamloops
Alwin Mining - Highland Valley
Josco Mining - Highland Valley
Connor's Drilling - Merrit
Amex Exploration - Kamloops
Tom Gledhill, P.Eng.



APPENDIX III

COST BREAKDOWN AND SURVEYS OF THE ENTIRE PROPERTY

1. Geological Mapping (August - November 1969)

P. Sonnendrucker	35 days at $ 120		
J.P. Guelpa	38 days at $ 40		
A. Humbert	26 days at $ 30		
G. Coutellier	23 days at $ 30		
F. Lacombe	11 days at $ 20		
R. Hebert	14 days at $ 20	.....	$ 7,690.00

36.8 miles surveyed representing a cost of $ 209 per mile.

2. Blazing, Flagging of Lines (August 1969 - October 1969)

A. Humbert	11 days at $ 30		
G. Coutellier	9 days at $ 30		
F. Lacombe	14 days at $ 20		
R. Hebert	11 days at $ 20	.....	$ 1,100.00

40 miles of lines representing a cost of $ 30 per mile.

3. Line Cutting (April 1970)

Amex Exploration (Kamloops) ..... $ 3,052.00

30 miles of lines representing a cost of $ 101 per mile.

4. Magnetometer Survey (September 1969)

A. Humbert	14 days at $ 30		
G. Coutellier	14 days at $ 30		
R. Hebert	3 days at $ 20	..... $	900.00

5. Soil and Rock Sampling (October 1969)

A. Humbert	7 days at $ 30		
G. Coutellier	6 days at $ 30	..... $	390.00

6. Geochemical Analysis

342 soil samples at $ 1.20 .....$ 410.00

7. Bulldozing (October 1969 - March 1970 - May 1970)
(Trenching, building road and drill sites)

Emery Mining Service	112 hours at $ 35 =	3,920.00	
Alwin Mining	140 hours at $ 25 =	3,506.00	
Supervision: G. Coutellier			
	11 days at $ 30 =	330.00	$ 7.756.00

8. IP Survey (May 1970)

Tom Gledhill, P. Eng.	$ 8,071.00	
Helpers for IP survey:		
P. Haillot		
R. Saint Louis		
J. Lang		
A. Cortelessa (cook)		
each 27 days at $ 25 per day	$ 2,700.00	$ 10,771.00

28 miles of IP surveyed representing a cost of $ 384 per mile.

9. Percussion Drilling (Feb-March 1970)
(on claims SB1 and SB FR)

Josco Mining	$	5,668.00

10. Surface Diamond Drilling (May-June 1970)
(on claims CN5, LIL4 FR and Mox 1)

Connors Drilling	$	26,846.00

11. Assays

163 assays at $ 2.50		
88 assays at $ 2.00		
29 assays at $ 3.00	$	670.50

12. Data Reduction

A. Humbert	10 days at $ 30		
G. Meusy	23 days at $ 30		
G. Coutellier	10 days at $ 30	$	1,290.00

13. Supervision

P. Sonnendrucker	32 days at $ 120 = 3,840.00		
J.P. Guelpa	106 days at $ 40 = 424.00	$	4,264.00

14. Thin Sections

29 thin sections at $ 17	$	493.00

15. Camp Maintenance

A. Humbert	10 days at $ 30		
F. Lacombe	3 days at $ 20		
R. Lowe	30 days at $ 20	$	960.00

16. Rentals

Jeep Redhawk	3 months at 345 =	$ 1,035		
Truck Chevrolet	7 months at 300 =	$ 2,100		
Magnetometer)Geometrics)		$ 180		
Pump	12 months at 100 =	$ 1,200	....	$ 4,515.00

17. Field Cost Supply

363 man days at $ 7 ..... $ 2,541,00

18. General Expenses

Fuel, stove oil, gasoline, Esso Imperial	$ 2,100		
Propane gas Cigas	600		
Repairing and maintenance of camp installations: plumbing in bunk houses Murray Kawe	400		
B.C. Tel	450		
Travel expenses (from Montreal and Vancouver)	2,400	....	$ 5,950.00

$ 85,266.50

Declared before me at the City of Vancouver, in the Province of British Columbia, this 21st day of Dec. 1970, A.D.

A Commissioner for taking Affidavits within British Columbia or
A Notary Public in and for the Province of British Columbia.

SUB-MINING RECORDER

APPENDIX IV

COST BREAKDOWN OF THE SB-VENUS GROUP

1. Geological Mapping (October 1969)
   (on claims Venus 1 Fr; Venus 2 Fr; BE Fr;
   Maf Fr; Opal 2 Fr; SB 1; SB2; SB3; SB Fr;
   LIL 7; LIL 7 Fr; LIL 5 Fr; Tom Fr;)

   8 miles out of 36.8 ..... $ 1,672.00

2. Blazing, Flagging of Lines (August - September 1969)

   8 miles out of 36.8 ..... $ 240.00

3. Line Cutting (April 1970)

   Amex Exploration
   7 miles out of 30 ..... $ 700.00

4. Bulldozing (Building road and drill sites)
   on claims SB1 and SB Fr for percussion drilling
   (Feb. 1970)
   Alwin Mining 30 hours at $ 25 ..... $ 750.00

5. Magnetometer Survey (August 1969)

   $7\frac{1}{2}$ days at $ 30 ..... $ 220.00

6. Percussion Drilling (claims SB1 and SB Fr)
, (Feb-March 1970)

Josco Mining	$	5,866.00

7. Assays

147 at $ 2.50 29 at $ 3.00	$	454.50

8. IP Survey (May 1970)
(including salaries of helpers paid by Pechiney)

7 miles out of 28	$	2,688.00

9. Supervision

P. Sonnendrucker	15 days at $ 120		
J.P. Guelpa	31 days at $ 40	$	3,040.00

10. Camp Cost Supply

167 man days at $ 7	$	1,155.00

11. Rental of Vehicles

Jeep - one month at $ 345 Truck - one month at $ 300	$	645.00

12. Data Reduction

5 days at $ 30	$	150.00

13. General Expenses regarding the camp
(including fuel, stove oil, plumbing, B.C. Tel and travel expenses ..... $ 2,850.00

	$	20,430.50

$ 20,430.00 to be applied to the group for 10 years of assessment work.

Declared before me at the City
of Nanaimo
, in the
Province of British Columbia, this 9th
day of June 1970
, A.D.

A Commissioner for taking Affidavits within British Columbia or
A Notary Public in and for the Province of British Columbia.

SUB-MINING RECORDER

APPENDIX V

COST BREAKDOWN OF THE CN-MARS GROUP
(April 1970 - June 1970)

1. Line Cutting (April 1970)
   Amex Exploration
   8 miles out of 30 ..... $ 800.00

2. IP Survey (Including salaries of helpers) May 1970
   8 miles out of 28 ..... $ 3,072.00

3. Bulldozing (Building road and drill sites on claims CN- 5 and LIL 4 Fr.)
   Alwin Mining 20 hours at $ 25..... $ 500.00

4. Diamond drilling, Holes 70-5(LIL 4-Fr) and 70-6 (CN 5) (May - June 1970)
   Connors Drilling ..... $ 15,920.00

5. Assays
   16 assays at $ 2.50..... $ 40.00

6. Supervision
   P. Sonnendrucker 3 days at $ 120
   J.P. GUELPA 20 days at $ 40 ..... $ 1,160.00

7. Field cost supply
   60 man days per $ 7 ..... $ 420.00

Declared before me at the City of Vancouver, in the Province of British Columbia, this 21st day of Dec. 1970, A.D.

Total ..... $ 21,912.00

A Commissioner for taking Affidavits within British Columbia or A Notary Public in and for the Province of British Columbia.

$ 21,912.00 to be applied to the group for 10 years of assessment work.

SUB-MINING RECORDER

APPENDIX VI

COST BREAKDOWN OF THE MOX GROUP

1.	Geological Mapping on claims Mox 1, Mox 2, Mox 1 Fr; ½ mile out of 36.8	$	100.00
2.	Blazing, Flagging of Lines	$	60.00
3.	Bulldozing (Access and drill sites)	$	200.00
4.	Diamond Drilling, Hole 70-4 (1,001') (May 1970) Connors Drilling	$	10,920.00
5.	Supervision P. Sonnendrucker 2 days at $ 120 J.P. Guelpa 5 days at $ 40	$	440.00
6.	Rental of Truck ½ a month at $ 300/month	$	150.00
	T o t a l	$	11,870.00

$ 11,870 to be applied to the group for 10 years of assessment work.

Declared before me at the City
of Nanaimo, in the
Province of British Columbia, this 21st
day of Dec. 1970, A.D.

A Commissioner for taking Affidavits within British Columbia or
A Notary Public in and for the Province of British Columbia

SUB-MINING RECORDER

APPENDIX VII Thin section study.

Specimen #301:

Hand Specimen: Medium-grained, granular, plutonic rock with grey-green colour and very locally slightly stained with "limonite". Percent mafic constituents is not obvious because of poor contrast with grey-green feldspar. Some quartz is present. The rock is a quartz diorite. Joint surfaces are coated with a thin layer of chlorite.

Thin Section: Mineralogy is as follows:

Plagioclase (62%)--fiarly fresh appearance but replaced somewhat by calcite and to a minor degree by sericite. An_{43}, Albite and carlsbad-albite twinning, faint normal zoning. Most crystals lath shaped, anhedral to subhedral and 1 to 3 mm. long.

K-feldspar (10%)--entirely as interstitial grains, some of which have a slightly "cloudy" altered appearance.

Quartz (15%)--mainly equigranular, anhedral grains. Some are highly irregular and interstitial to plagioclase.

Chlorite (10%)--mainly in large, irregular, interstitial masses where it is mainly an alteration product of interstitial biotite and to a lesser degree of hornblende. Also less commonly in fibrous form in thin veinlets. Commonly associated with calcite especially where it is pseudomorphous after hornblende.

Hornblende (2%)--anhedral relicts of interstitial grains now largely replaced by calcite and chlorite.

Calcite (4%)--as local anhedral blebs that are an alteration product of plagioclase, more commonly as anhedral interstitial masses, and rarely in thin veinlets.

Sericite (1%)--as small laths in plagioclase.

Opaque Minerals (1%)--small amount of pyrite visible as finely disseminated grains in hand specimen. Some opaques are magnetite as rock is slightly magnetic. Minute opaque grains associated with chlorite are probably magnetite. Subhedral grains up to 0.5 mm. diam. are probably pyrite.

Apatite (trace)--small granules and euhedral crystals

Epidote (trace)--variety--pistacite. Occurs as minute granules in plagioclase.

Sonnendrucker--South Seas--2

Biotite (trace)--relict, ragged cores to some chlorite masses. Dark brown colour.

Sphene (trace)--a few small anhedral granules.

Limonite (trace)--slight stain locally in thin section.

The rock is a medium-grained quartz diorite that has been altered somewhat, particularly the mafic minerals. Both biotite and hornblende have been largely replaced by chlorite with minor magnetite and calcite. Introduction of carbonate has been appreciable and more-or-less pervasive, if not extensive. Calcite occurs as (1) replacedment of mafic minerals, (2) replacement of plagioclase, (3) interstitially, and (4) in thin veinlets. The feldspars, however, have not been altered extensively.

Specimen #302: Rock Sequence (pre at S 64-7)

Hand Specimen: Highly leucocratic quartzose rock with very faint grey-green tinge. Cut by thin veinlets of calcite with minor associated Mn (?) stain.

Thin Section: Most of th thin section is an aphanitic matrix consisting of a mosaic of quartz grains commonly intergrown along common edges and generally about 0.1 to 0.2 mm. diameter, or less in places. Scattered throughout, largely interstitially, are irregular masses of very fine-grained sericite. Locally calcite is abundant, mainly as highly irregular concentrations. Sericite patches probably represent altered feldspar grains in the matrix.

About 3% of the rock consists of relict phenocrysts of quartz and less abundant feldspar which is now completely replaced by a mesh of large lath-shaped grains of sericite.

Sonnendrucker--South Seas--3

The original nature of the rock is uncertain. It apparently was an "acidic" porphyry with an aphanitic matrix that has been extensively altered by sericitization and carbonatization. Parts of the rock have been deformed cataclastically, but how penetrative this deformation has been is masked by the highly altered nature of the rock.

The rock is cut by thin calcite veinlets.

Specimen #303: Porphyry (SE # 569-15)

Hand Specimen: The rock is a pink feldspar porphyry with about 30% feldspar phenocrysts set in a dark brown matrix. Feldspar phenos are lath-shaped and are from 1 to 2 mm. in length. Rare phenocrysts of quartz are present. The specimen has been extensively epidotized with some patches perhaps representing amygdules and others altered plagioclase phenocrysts. The rock is a dacite porphyry.

Thin Section:

Microcrystalline matrix (55%)--quartzo-feldspathic mosaic, extensively altered with grains of epidote, sericite and calcite and chlorite recognizable.

Altered Feldspar (20%)--only feldspar phenocrysts included here. Largely replaced by epdiote, calcite and chlorite--also minor sericite. Twinning is recognizable locally but composition cannot be determined. Up to 3 mm. long. A few phenos are completely replaced by a mesh of sericite.

Chlorite (8%)--small amounts are in replaced phenocrysts of plagioclase. Mostly as irregular patches in matrix.

Epidote (7%)--var. pistacite. Mainly as granular masses that replace plagioclase. Some associated with fibrous chlorite.

Quartz (6%)--large rounded phenocrysts up to 4 mm. long.

Calcite (4%)--as alteration product of plagioclase phenocrysts where it is associated with epidote. Also as minute grains in matrix.

Apatite (trace)--as a few fine-grained anhedral crystals.

Opaque Minerals (trace)--small euhedral grains, rare, probably magnetite.

The rock is a dacite porphyry that has undergone extensive local epidotization of plagioclase phenocrysts and extensive chloritization of the matrix. Sericite has been formed both in phenocrysts and matrix.

Specimen #304:

Hand Specimen: Fine-grained plutonic rock with about 5% mafic and 95% felsic constituents. Quartz, plagioclase and K-feldspar are present in roughly euqal proportions. Rock has a pinkish caste due to interstitial K-feldspar. Specimen is a fine-grained, leucocratic quartz monzonite. The rock is faintly magnetic and contains visible pyrite.

Thin Section: Mineralogy is as follows:

Plagioclase (40%)--a few phenocrysts up to 3 mm. long forming stubby prisms. Composition is An_{20}. Remainder occurs in matrix forming mosaic texture with K-spar and quartz. Slightly sericitized with alteration mainly in cores. Faint normal zoning.

Quartz (30%)--interstitial, anhedral, with mosaic texture.

K-feldspar (22%)--interstitial microperthite.

Hornblende (3%)--elongate crystals up to 1.5 mm. long. Anhedral and slightly poikilitic.

Biotite (2%)--dark brown, fresh appearance, anhedral books. A few grains show faint signs of chloritization. Most have slightly ragged edges.

Opaque Minerals (1%)--in part magnetite (rock is magnetic). Also trace amounts of pyrite.

Sphene (1%)--small anhedral grains mainly associated with patches of mafic and opaque minerals.

Apatite (0.5%)--minute, euhedral crystals

Epidote (0.5%)--var. pistacite. A few feathery patches of radiating fibres.

Chlorite (trace)--slight alteration of some biotite.

The rock is a fine-grained quartz monzonite (or if volcanic could be considered a quartz latite). It is slightly porphyriitic, containing a few phenocrysts of plagioclase. Most plagioclase is slightly altered, mainly in cores of grains. Alteration products are in part sericite but a pervasive "cloudy" appearance may be due to argillic alteration. Trace amounts of chlorite occur as an alteration product of biotite.

Specimen #305: Quartz QD Wallace (L20N-9W- SB1)

Hand Specimen: Medium-grained, even-grained, leucocratic rock with tabular feldspars and less than 10% mafic minerals. Fresh appearance. Rock is a quartz diorite. Contains irregular blebs of chalcopyrite disseminated sporadically throughout. Mafic pathces are slightly magnetic.

Thin Section: Mineralogy is as follows:

Plagioclase (74%)--An_{44}. Lath-shaped crystals up to 3 mm. long. Euhedral to subhedral. Normally zoned with polysynthetic twinning. Replaced moderately by calcite. A few crystals have bent cleavage traces.

Quartz (15%)--as strained, anhedral crystals about 0.5 mm. diameter and as minute interstitial grains.

Calcite (5%)--as minute replacement patches scattered throughout plagioclase and locally as concentrated patches with chlorite. A small amount is in thin veinlets.

Sonnendrucker--South Seas--6:

Hornblende (3%)--locally almost completely replaced by calcite, chlorite and minor amounts of epidote. Twinned. Faintly pleochroic in faint greens to yellows to colourless.

Chlorite (3%)--interstitial and associated with calcite in patches. Apparently pseudomorphic after an unknown mafic mineral. Also as minute, highly irregular patches that replace plagioclase.

Sphene (2%)--as large anhedral crystals up to 1.5 mm. long and interstitially.

Epidote (trace)--a few anhedral granules.

Apatite (trace)--a few anhedral crystals.

Opaque Minerals (trace)--associated with chlorite and hornblende as minute, anhedral grains--probably magnetite.

The rock has a porphyritic texture, containing about 15% aphanitic interstitial matrix and about 85% medium-grained phenocrysts. The porphyritic aspect is not apparent in hand specimen. There is slight evidence of cataclasis in curved cleavage planes in a few plagioclase phenocrysts and slightly strained quartz. All plagioclase is somewhat carbonatized. Some grains are pervasively altered while in others carbonatization is confined to a restricted area or a particular zone. Calcite veinlets are associated with areas of most extensive carbonatization. The veinlets carry through plagioclase and mafic patches (now chlorite and calcite) but do not persist through quartz. In quartz grains the fractures have healed by recrystallization of the quartz.

The rock is a quartz diorite, slightly porphyritic in nature, and moderately to extensively altered, mainly by carbonatization and less extensively by chloritization.

J. Sinclair

Specimen 64-1-33' (35'?) Quartz Diorite

Core Specimen: Medium-grained, homogeneous, massive granitoid rock. Colour medium greenish-gray; Colour Index 25. Cut by one thin quartz vein.

Thin Section

58% Plagioclase - as framework of well-twinned, subhedral grains. Composition andesine An_{32-45}, somewhat variable and with slight, normal, anhedral zoning; more sodic where altered. Most is slightly to moderately altered, with fine inclusions of sericite, carbonate, minor chlorite and rare epidote.

2%? Orthoclase - untwinned and relatively clear. Rare angular grains filling interstices of plagioclase framework.

15% Quartz - angular grains intersertial to plagioclase.

7% Altered Clinopyroxene - mostly replaced by brownish carbonate + minor opaques, hematite, and chlorite. A few bits of relict pyroxene in cores.

12% Green Hornblende - euhedral to intersertial. Some as overgrowths on altered pyroxene. Partly altered to carbonate + minor chlorite.

5% Biotite - partly chloritized and "feathered" on edges.

1% Opaques - mostly magnetite? - subhedral to anhedral grains, most surrounded by biotite or chlorite.

<1% Apatite - abundant small, long, euhedral prisms.

trace Tourmaline (anhedral), Zircon, Epidote.

Vein: Approx. 0.5mm wide. Clear mosaic quartz and green chlorite as aggregates of small rosettes - mostly along margins.

Zone of extensive alteration adjacent to vein - "grades out" over 8mm. Plagioclase cloudy-altered, sodic, full of inclusions of sericite, carbonate, and chlorite. Mafics fully altered to chlorite and carbonate with included bits of opaques and dark translucent materials. Bits of yellowish-green epidote scattered through alteration zone.

Specimen also has a later set of parallel, very thin veinlets of fine-grained chlorite and carbonate. Approximately parallel to larger vein, but locally cuts across aggregates of "rosette chlorite."

Rock is a slightly altered, clinopyroxene-hornblende-biotite quartz diorite. Cut by quartz/chlorite vein and later veinlets of carbonate/chlorite.

Specimen 64-8B-150' — Altered Quartz Diorite - Green Gulch

Core Specimen: Medium grained, massive, homogeneous rock. Approx. 18% of black mafic minerals distributed through pale green mixture of altered feldspar and minor quartz. Mafics magnetic in part.

Thin Section:

65% Altered Feldspar: pseudomorphed by mixture of fine-grained sericite and patchy carbonate. Subhedral forms and rare twinned albite relicts indicate most or all was originally plagioclase.

20% Quartz: intersertial; excellent relict igneous texture.

5% Altered Hornblende? - pseudomorphed by brownish carbonate + minor chlorite, sericite, and opaques. Small patches of relict brownish material that appear to be incompletely recrystallized relicts. Vague prismatic form and overgrowths of biotite suggest mineral was hornblende, possibly some pyroxene.

12% Biotite - large flakes, partly chloritized and frayed-looking.

1% Magnetite - scattered anhedral grains, many overgrown by biotite.

<1% Apatite common accessory.

Rock is an extensively altered Quartz Diorite. Feldspars and some mafics almost fully replaced, largely by carbonate. Most of biotite remains, but partly chloritized, frayed-looking, and contains thin lenses of fine-grained alteration minerals along cleavages.

Specimen 64-10B-407' Breccia

Core Specimen: Heterogeneous breccia composed of rock fragments in dark green matrix. Fragments mostly pink granodioritic material, lesser pale green, finely laminated, aphanitic felsite(?), and one of pink leucogranite. Trace disseminated chalcopyrite.

Thin Section: (green aphanitic rock not present in slide)

Granodiorite Fragments

55% Altered Plagioclase - as subhedral laths, ranging from albite with included bits of sericite, to grains in which cores are fully replaced by sericite aggregates and/or coarse carbonate. Carbonate quite abundant; some pseudomorphs are essentially single grains of carbonate with thin rims of albite.

5%? K-feldspar - probably orthoclase. Brownish turbid and sericitic. Occurs as irregular patches in some plagioclase, and as local intersertial grains.

30% Quartz - intersertial around euhedral plagioclase; some relatively coarse.

10% Altered Mafics - mostly chlorite + sericite, carbonate, sphene, and opaques. A few mostly coarsely foliate white mica - may be relicts of primary muscovite? Surement pas

<1% Apatite, Sphene (primary in part?), Zircon (trace), and scattered anhedral Opaques.

Leucocratic Granitoid Fragment: Relatively equigranular (1.0 to 0.5mm), xenomorphic mosaic of quartz (40%) and slightly altered feldspar. Feldspar is twinned albite and untwinned K-feldspar (orthoclase?); K-feldspar slightly more abundant. Both feldspars contain bits of included sericite and are locally replaced by patchy carbonate. Mafic minerals less than 1%; anhedral grains of opaques and chlorite. Rock is a leucogranite, probably aplite.

Matrix: Fragments (50-80% of matrix) of quartz and altered plagioclase and minor K-feldspar. Intimately mixed with chlorite + sericite + tourmaline + minor sphene, opaques, local patchy carbonate, and rare introduced quartz. Tourmaline as small, randomly-oriented needles - common but not abundant.

Rock is a somewhat altered breccia; alteration products in fragments similar to "introduced" matrix components - indicating that alteration and matrix crystallization was very closely related.

Specimen 64-12-503' Breccia and Altered Felsite

Core Specimen: Part of specimen is aphanitic, finely-laminated, pale green to whitish, porphyritic felsite; chalky and altered-looking. Rest of specimen is breccia of pink granitoid rock in matrix of dark green, fine-grained material. Contact between green felsite and breccia is irregular. A small piece of felsite appears to be totally enclosed within breccia.

Thin Section: (cuts felsitic material only)

5% (or less) Altered Phenocrysts - sharply euhedral, up to 1.5mm. All fully pseudomorphed by sericite, carbonate, and mosaic quartz in different proportions - some almost all carbonate. Short tabular habit suggests mineral was feldspar - type unknown;

trace Quartz Phenocrysts - euhedral, slightly rounded;

trace Opaque Phenocrysts - two rounded grains in section;

95% Groundmass: Essentially a fine-grained (0.1 to 0.2mm) mosaic of xenomorphic feldspar + quartz. Strongly turbid appearance, due to abundant very fine sericite, brown translucent material, and probably other minerals not identified. Scattered patches or "spots" of carbonate and of extremely fine sericite. Relative proportions of quartz and feldspars obscured by turbid character. Trace Apatite, Zircon.

Prominent laminated structure marked by distinct differences in relative "turbidity" (abundance of alteration materials), and by diffuse lenses or elongate zones of the extremely fine-grained sericite. Rock also has thin lenses of clear mosaic quartz, parallel to laminated structure, of unknown origin. One quartz lense has sharp "U"-shape, as if folded? Lamination curves around phenocrysts, and probably represents a primary flow structure.

Rock is an altered porphyritic felsite, possibly rhyolite? (Relative content of quartz uncertain).

Relationship between breccia and felsite, possibly rhyolite? (breccia not cut in thin section). Small piece of felsite in breccia, as seen in core, suggests that felsite is a fragment and thus "pre-breccia." Irregular contact may be explained by squeezing of "soft" altered felsite during deformation.

Specimen 64-14-470' Altered Breccia

Core Specimen: Massive, heterogeneous breccia with greenish, variagated colour. Rounded to angular fragments up to several cm across, mostly of green aphanitic rock, pink to pale green granitoids, and pinkish felsitic-looking rock. Minor visible quartz in specimen.

Thin Section:

In thin section, this specimen is clearly recognizable as a breccia composed of highly altered rock fragments of several distinctive types. The principle alteration minerals are carbonate, sericite, chlorite, and various opaque to translucent materials (hematite, sphene, trace epidote, and probably others). In some places the primary textures and boundaries of fragments are clearly distinguishable, in other parts these features are largely obscured by the alteration minerals. The recognizable "elements" of the rock are as follows:

Granitoid Fragments - essentially pseudomorphs of subhedral plagioclase with intersertial quartz. Feldspar altered to sericite + carbonate. Mafics (biotite in part) replaced by chlorite ± carbonate. Replacement by coarse patchy carbonate very extensive locally.

Pinkish Felsitic Fragments - composed of very fine-grained mixture of feldspar and sericite, with minor quartz, chlorite, opaques. Apparently a sericitized felsite, relatively quartz-poor (originally latite?).

Green Aphanitic Fragments - almost entirely very fine-grained sericite, with minor chlorite and distributed grains of quartz. Contains scattered clots of coarser mosaic quartz ± carbonate (origin unknown); also diffuse zones of feldspathic material as described above - these suggest that the rock is an intensely sericitized felsite. Shape of "fragments" is somewhat irregular, suggesting that the sericite aggregates might actually be replacement "patches". On the other hand, the irregular shapes might be due to squeezing and deformation of the "soft" micaceous material. The overall "sharp" aspect of the sericite rock (as seen in the sawed specimen) suggests that they are fragments of a distinctive rock type, rather than zones of replacement.

Matrix and Crushed Material - thoroughly mixed aggregate of crushed quartz, altered feldspar, chlorite, carbonate, and opaque to translucent materials. Chlorite in part as replacement of ground-up mafics, also as small rosettes ("introduced" matrix chlorite). Quartz in part fills fractures in rock fragments. Trace tourmaline also present.

Apatite - common accessory, presumably from granitoid rock.

Rock is a "mixed" breccia of granitoid and altered felsitic rocks. Alteration minerals mostly carbonate, sericite and chlorite. Extensive replacement locally abscures primary igneous textures and breccia structure.

Specimen 64-14-500' Altered Porphyritic Dacite

Core Specimen: Pale greenish-grey, homogeneous porphyritic rock. Phenocrysts 1 to 4mm of pale greenish altered feldspar (approx. 30%) and altered mafic mineral (3%). Groundmass aphanitic, soft, chalky-looking, pale grey. One end of core slightly sheared.

Thin Section:

32% Altered Feldspar phenocrysts - totally pseudomorphed by sericite (2/3) and carbonate (1/3) plus minor chlorite and brownish diffuse material. Mica partly in clusters of radiating flakes. Relict euhedral forms suggest feldspar was plagioclase. Several of phenocrysts slightly deformed and "lensed."

3% Altered Mafic phenocrysts - mainly chlorite with lesser carbonate, sericite, bits of sphene, and brown translucent alteration material. Prismatic form with excellent "diamond" cross-section indicates mineral was hornblende.

<1% Quartz - scattered euhedral phenocrysts

trace Opaques, Apatite, Zircon, Tourmaline

65% Altered Groundmass - very fine-grained (<0.05mm), homogeneous, turbid-looking mixture of sericite (2/3) and chlorite (1/3), with minor carbonate and diffuse brownish material. Quartz not recognized but probably present. Groundmass contains a few rounded clots of chlorite plus minor sericite and carbonate; these may represent amygdules(?).

Rock is an intensely altered feldspar porphyry with a composition about that of dacite. Probably a dike or flow rock. Phenocrysts completely pseudomorphed as described; groundmass also appears to be fully recrystallized.

Section contains evidence of incipient shearing. A few phenocrysts slightly deformed and vaguely lensoid. Also get sinuous, subparallel, diffuse "trains" of fine-grained sericite that appear to represent incipient shears and fracture surfaces. One end of core specimen slightly schistose.

Specimen 64-15-70' Altered Felsite

Core Specimen: Aphanitic, pale buff rock with scattered grains (to 2mm) of pink, pale green, and black material (altered phenocrysts?). Very fine, laminated structure marked by subtle colour differences and alignment of phenocrysts. One inclusion (15mm across) of greenish altered granitoid rock.

Thin Section:

10% Altered Phenocrysts: Sharply euhedral to almost rounded forms. Some recognizable as pseudomorphs of feldspar, others are altered mafics, and some are of uncertain origin.

Altered Feldspar - euhedral laths, replaced by a mixture of sericite and patchy carbonate + minor quartz and chlorite. A few have relicts of turbid, motley-looking feldspar - untwinned, probably K-feldspar? Some of pseudomorphs may have been plagioclase, but no albite twinning observed.

Altered Mafics - mixture of chlorite + different proportions of quartz, sericite, carbonate, sphene, and translucent brown hydroxide. Chlorite as distinctive rounded "rosettes". A few small phenocrysts of opaque mineral.

Quartz Phenocrysts - several only in section. Euhedral, but seem to be slightly resorbed.

Thin Section also contains several lenses of mosaic quartz, greatly elongated parallel to lamination. Possibly represent flattened amygdules?

90% Groundmass - turbid-looking, very fine-grained xenomorphic mosaic composed mainly of feldspar mixed with abundant specks of sericite, chlorite, and brownish translucent material. Scattered grains of quartz and tabular chlorite (altered mafics), and trace apatite. Composition of feldspar is obscured by turbid alteration (untwinned and low refractive index). Quartz seems to be sparse - a few percent at most.

Laminated structure marked mainly by differences in relative degree of "turbidity" or alteration, and to lesser degree by slight differences in grain size. All elongated elements are aligned parallel to lamination. Lamination is probably a primary **flow** structure.

Altered Granitoid Fragment - Mostly subhedral plagioclase (65%) with intersertial quartz (20%) and altered mafics (15%). Plagioclase completely replaced by sericite + patchy carbonate. Trace of turbid relict feldspar distinct from altered plagioclase - probably K-feldspar. Mafics altered to parallel intergrowths of chlorite and white mica + bits of sphene. Approx. 1% of opaques, mostly surrounded by chlorite.

Fragment is altered quartz diorite.

Specimen 64-15-70' (continued)

Rock is an altered porphyritic felsite, probably trachyte or latite. Possibly a rhyolite or dacite (contains sparse quartz phenocrysts, but content of quartz in groundmass seems to be quite low). Included fragment of altered quartz diorite.

Specimen 64-16-130' Granodiorite Breccia

Core Specimen: Massive, homogeneous breccia composed of 40-60% pale pink feldspathic fragments (up to ½ inch), set in dark, greenish-black, fine-grained matrix. Both matrix and fragments cut by diffuse veinlets and patches of very fine-grained, dull green epidote. Veinlets crudely but distinctly parallel.

Thin Section:

Fragments (approx. 55%) Altered granodiorite

60% Altered Plagioclase - subhedral laths of turbid albite with numerous small inclusions of carbonate and epidote. Some grains largely replaced by coarser epidote.

20% Quartz - intersertial to plagioclase

10% Microcline - anhedral intersertial grains, strongly turbid

10% Altered Mafic - chlorite with included bits of sphene, translucent brown material, and local carbonate. Tabular form suggests primary mineral was biotite.

<1% Apatite - scattered euhedral grains

Matrix (30%) Mixture of crushed feldspar and quartz set in fine-grained green chlorite with minor bits of sphene, brown translucent material, and epidote. Chlorite content ranges from trace to approximately 2/3 of total matrix.

Fragments range from pieces of granodiorite with relict igneous texture, to pieces of crushed (but not dispersed) quartz and feldspar. Larger fragments crushed along margins and locally tend to "grade" into chloritic matrix.

Epidote "Veins" (15%) Diffusely-bounded patches of fine-grained mosaic epidote (up to 100%). Replaces matrix and locally fragments, invading plagioclase mainly. Rarely appears to be filling very thin fractures.

Rock is an altered and brecciated biotite(?) granodiorite. Cut by diffuse, crudely parallel veins or zones of epidote.

Specimen 64-20-245' Altered Porphyritic Latite

Core Specimen: Homogeneous, massive, medium-grained, pink granitoid rock. Mainly salmon-pink feldspar with dull, altered appearance. Larger feldspars zoned with greyish cores. Mafic minerals approx. 15%, altered, greenish-black. Texture bimodal; 60% subhedral feldspars and mafics to 3mm long, set in fine-grained altered matrix. No visible quartz. Rock slightly magnetic.

Thin Section:

45% Altered Plagioclase - Euhedral to subhedral grains 1-3mm, with excellent relict twinning. Strongly altered and turbid; albite with numerous shreds and patches of sericite and lesser carbonate. Sericitic replacement almost complete in places, especially cores of larger grains. Pink colour due to turbid, reddish-brown "pigment." Zoned grains tend to have more sericite and less pigment in cores.

12% Altered Hornblende(?) - completely pseudomorphed by patchy intergrowth of carbonate plus green chlorite with lesser sericite, opaques, and brown translucent materials. Prismatic form with "diamond" cross-section indicates primary mineral was hornblende.

3% Quartz - scattered anhedral grains up to $\frac{1}{2}$mm.

3% Opaques - scattered anhedral grains - magnetite.

37% Groundmass - fine-grained (<0.0mm), turbid-looking mosaic composed largely of subhedral feldspar with lesser quartz, carbonate, sericite, chlorite, and opaque materials. Some of feldspar recognized as sodic plagioclase; K-feldspar not identified but possibly present.

trace Apatite, Zircon.

Rock is an altered, (hornblende-) plagioclase porphyry. Composition is somewhat unusual - low quartz and mafics, abundant plagioclase. Primary mafics replaced by chlorite + carbonate, and plagioclase extensively sericitized. Alteration is "hydrothermal" - rock shows no sign of deformation.

Specimen 64-21-507' Granodiorite Breccia

Core Specimen: Homogeneous breccia composed of about 50% pinkish granitoid fragments (to $\frac{1}{2}$ inch) in soft, very dark, aphanitic matrix. Several greenish fragments. Trace scattered magnetite grains.

Thin Section:

Fragments:

50% Altered Plagioclase - well-twinned, subhedral, turbid appearance. Composition now albite, with numerous included bits of sericite and carbonate. Some grains almost fully replaced by patches of fine-grained sericite or coarser carbonate.

30% Quartz - intersertial to plagioclase

5%? Microcline - brownish turbid alteration; intersertial to plagioclase

15% Mafic Mineral - altered to chlorite plus bits of sphene and brownish translucent material. Tabular habit suggests primary mineral was biotite.

<1% Opaques - scattered anhedral grains, magnetic.

trace Zircon, Apatite - common accessories.

Most fragments have excellent relict igneous texture; a few are internally crushed.

Matrix Composed essentially of a mixture of crushed quartz and feldspar, fine-grained chlorite, and (locally) tourmaline. Quartz and feldspar fragments are angular and range from closely to loosely packed. Fine-grained chlorite with minor sericite makes up approximately 10-50% of matrix.

Tourmaline occurs as slender needles (approx. 0.1mm X 0.005mm) in loosely-defined "zones", and comprises 0-20% of matrix. Partly mixed with chlorite, but best developed along margins of quartz grains - often invading the quartz. Orientation of needles is random to subradiating.

Matrix minerals, especially tourmaline, locally invade and replace breccia fragments.

Rock is an altered and crushed biotite granodiorite. Plagioclase altered to albite + sericite + carbonate. Biotite is fully chloritized. Matrix tourmaline and chlorite presumably introduced. Boundaries of fragments are typically sharp, suggesting that rock was at least partly altered before brecciation.

Specimen 64-23-74' Altered Breccia

Core Specimen: Massive, heterogeneous breccia composed of fragments of altered porphyritic rock, aphanitic greenish material, pink to pale green feldspar, altered mafics, quartz, and whitish carbonate. Green aphanitic material locally appears as distinct rims on dark grains. Disseminated specks (approx. 1%, up to ½mm) of sulphide; mostly pyrite, trace chalcopyrite?

Thin Section: (Section is cut mostly through large fragment of altered porphyry)

Porphyritic Fragment: Dacite or Rhyodacite

33% Plagioclase Phenocrysts - vaguely subhedral pseudomorphs composed of sericite with local carbonate. No relict feldspar seen.

12% Mafic Phenocrysts - sharply euhedral, up to 5mm, with form of hornblende (possibly also pyroxene?). Fully replaced by mixture of chlorite + sericite, local carbonate, quartz, bits of sphene. Chlorite as sub-radiating, rosette-like grains. Several opaque phenocrysts, invaded by patchy carbonate.

10% Carbonate - coarse patchy material, brownish appearance. Occurs mainly in vague zone concentric with margin of fragment, 5 to 10mm from edge.

45% Groundmass - fine-grained (0.02mm) xenomorphic mosaic of about equal amounts of quartz and feldspar, mixed with minor chlorite, sericite, carbonate, opaques, and common apatite. Feldspar untwinned, with very fine included sericite.

Breccia - crushed and altered granitoid material.

Pieces of quartz and altered plagioclase, some fractured. Larger pieces have relicts of igneous fabric. Plagioclase is albite with sparse to very abundant included sericite ± carbonate. Fragments mixed with green to colourless chlorite, sericite, brownish carbonate, translucent brown material, and minor introduced mosaic quartz. Patch of very fine-grained sericite at one edge of slide (= green aphanitic material seen in sawed specimen) - possibly a fragment of altered felsite?

Rock is an intensely altered breccia, containing large fragment of dacitic (or rhyodacitic) porphyry. Margins of porphyry nearly obscured in thin section, due to extensive alteration and replacement. Distinct "zoning" (marked by colour changes and introduced carbonate) concentric with margins of fragment. These features indicate that the alteration, at least in part, took place after formation of the breccia.

Specks of euhedral to anhedral sulfide disseminated through all elements of the rock.

Specimen U3-158'

Altered Porphyritic Latite

Core Specimen: Homogeneous, massive, pale greenish porphyritic rock. Phenocrysts of pale pinkish feldspar to 4mm long (approx. 35%) and greenish-black mafic mineral (3%). Groundmass - greenish, aphanitic.

Thin Section:

45% Altered Plagioclase - as sharply euhedral phenocrysts 0.5 to 4mm long. Altered and somewhat brownish turbid; albite with abundant shreds of sericite plus minor epidote, chlorite, and trace carbonate. Some grains almost fully replaced.

5% Altered Mafic Phenocrysts - pseudomorphed by clear carbonate and chlorite with included bits of brown material (sphene? in part). Long euhedral prisms with "diamond" cross-section (1.0 to 0.2mm across) - indicates primary mineral was hornblende. Many of the pseudomorphs have clear carbonate in cores, and are surrounded by patchy overgrowth of turbid carbonate that occurs outside margins of pseudomorph.

<1% Opaques - scattered anhedral grains.

<1% Quartz - a few scattered anhedral grains.

<1% Apatite - common small euhedral crystals

50% Altered Groundmass - mostly fine- to very fine-grained, complexly intergrown, sericitized and turbid feldspar. Some of fine feldspar is subhedral prismatic (plagioclase?), but some is xenomorphic (K-feldspar?). Abundant mixed-in chlorite, sericite, opaques, brown translucent material, and carbonate. Much of turbid matrix carbonate appears to have developed around margins of chloritized mafics.

Rock is an altered, porphyritic, hornblende latite. Primary texture well-preserved despite extensively sericitized feldspar and fully altered mafics.

Specimen U5-62' Altered Porphyritic Dacite

Core Specimen: Massive, homogeneous, altered-looking feldspar porphyry, with overall brownish colour. Phenocrysts (approx. 50% of total) mainly euhedral feldspar to 3mm; pinkish to amber colour, some zoned with greyish cores. Several percent altered mafic phenocrysts. Groundmass is fine-grained, darker colour than feldspar phenocrysts.

Thin Section:

Phenocrysts - approx. 50% of total, mostly altered plagioclase.

45% Altered Plagioclase Phenocrysts - strongly altered, with brownish turbid appearance. Ranges from euhedral, well-twinned albite with abundant inclusions of sericite and carbonate, to pseudomorphs composed almost entirely of fine-grained sericite with minor carbonate and chlorite. Cores of some contain less of the brownish pigment.

5% Altered Mafic Phenocrysts - chlorite containing included bits of opaques and brown translucent material, with patches of very fine-grained sericite. Some of pseudomorphs have relict euhedral prismatic form suggestive of hornblende or pyroxene; others irregular in shape and of unknown origin. Several anhedral grains of opaque mineral appear to be small phenocrysts.

Groundmass - approx. 50% of total - mixture of altered feldspar and quartz (grain size average 0.5mm), with finer chlorite and sericite. Relict texture marked by subhedral feldspar and partly obscured by alteration minerals.

25% Altered Feldspar - subhedral to anhedral, sericitized and brownish turbid. Some recognized as well-twinned plagioclase, but much not recognizable and may be K-feldspar in part.

15% Quartz - anhedral grains to 0.5mm.

10% Alteration minerals - fine-grained, mostly chlorite and sericite, with opaques, brown translucent material, and minor carbonate.

trace Zircon, Apatite.

Rock is an extensively altered plagioclase porphyry, with original composition probably that of dacite. Plagioclase largely sericitized, and mafics fully chloritized. Primary mafic possibly hornblende (at least in part), but uncertain.

Specimen U6-100 — Fractured Altered Granodiorite

Core Specimen: Massive, light greenish, somewhat heterogeneous-looking rock of indistinct character. Visible quartz, altered feldspar, pale green aphanitic material, and buff carbonate. Trace chalcopyrite.

Thin Section:

50% Altered Feldspar - subhedral form indicates mineral was mostly plagioclase. Ranges from twinned albite with abundant inclusions, to grains replaced entirely by fine-grained shreddy aggregates of sericite and patches of coarser carbonate.

30% Quartz - mostly intersertial to plagioclase; less as finer mosaic material mixed with sericite, and rarely along distinct fractures.

20% Carbonate (exclusive of carbonate in plagioclase pseudomorphs) - brownish stained appearance; patchy mosaic texture. Some has included bits of brownish minerals (epidote, "hydroxides," and possibly sphene in part) and appears to represent replaced primary mafics. Remainder seems to be "introduced" carbonate developed along poorly-defined fractures and in crushed areas.

<1% Opaques - scattered anhedral grains

trace Apatite, Zircon - common accessories

trace Tourmaline - several large grains, fractured and veined by carbonate. Associated in zone with quartz, sericite, and carbonate - possibly represents an area of replacement of crushed rock.

The fundamental character of this specimen is somewhat obscured by alteration. Appears to be a partly crushed, altered, and replaced rock with an original composition about that of granodiorite; apparently not a "mixed" or "dispersed" breccia. Least altered plagioclase is extensively fractured but grains still intact. Mottled and somewhat heterogeneous aspect as seen in core apparently due to vague veins and patchy replacement of crushed material by carbonate $\pm$ quartz.

Specimen U-6-109' Altered Breccia

Core Specimen: Heterogeneous, mottled-looking, greenish rock of brecciated character. Mostly crushed and altered granitoid rock, with a few fragments of pale green aphanitic material. Minor vein quartz with chalcopyrite and trace pyrite. Also scattered spots of whitish carbonate.

Thin Section: Textural details very obscure under microscope; rock is complex mixture of mainly quartz, carbonate, and sericite. Recognizable elements are as follows:

Altered Rhyolite Fragment(?) - 3mm across; homogeneous, very fine-grained, xenomorphic mosaic of quartz and sericitic feldspar.

Pseudomorphs of Plagioclase - mixture of fine-grained sericite and olive-coloured mineral (possibly stained chlorite?) + patchy carbonate. Euhedral in part - from granodioritic rock.

Introduced Carbonate - irregular patches.

Sphene, Apatite - minor constituents.

Introduced Quartz - as clear mosaic material, many grains euhedral. Forms outer part of vein-like zone 8mm across. Central part of this zone composed of mixture of brownish carbonate and unknown mineral with very conspicuous bladed habit. Bladed mineral appears to be fully altered to sericite + colourless chlorite(?). Anhedral grains of opaque (chalcopyrite?) associated with vein quartz.

Rock is an extensively altered breccia, apparently composed of crushed granitoid material and felsite fragments. Original character largely destroyed by alteration and introduction of quartz and carbonate. Unknown bladed mineral in vein-like body.

Specimen U-6-123'

Altered Breccia

Core Specimen: Massive, mottled-looking, greenish rock of barely discernable brecciated character. Contains pieces of altered granitoid rock, green aphanitic material, and scattered spots of pale yellowish carbonate. Trace specks of pyrite.

Thin Section: Heterogeneous and complex mixture of mostly quartz, sericite, and carbonate. Recognizable as a breccia of several rock types, but in many places the nature of the original material is largely obscured by alteration. Principle elements are as follows:

Granitoid Fragments - altered subhedral feldspar with intersertial quartz (25%). Feldspar pseudomorphed by mixture of sericite + coarse carbonate. Common but minor opaques, brown translucent material, and apatite; trace zircon, chlorite.

Green Aphanitic Fragment - Several percent of euhedral phenocrysts of quartz and feldspar (altered to carbonate/sericite). Groundmass ranges from almost all fine sericite, to xenoblastic mosaic feldspar + sericite and minor quartz. Prominent thin lamination marked by differences in sericite content, and by thin parallel quartzose lenses. Rock appears to be a highly sericitized, porphyritic rhyolite with relict flow structure.

Other fine-grained sericitic patches in thin section appear to represent more fragments of highly altered felsites.

Crush Fragments - some angular pieces of quartz and altered feldspar recognizable through "matrix" of rock.

"Introduced" Materials

Quartz - clear mosaic grains, some euhedral, in lenses and vein-like bodies.

Carbonate - brownish appearance, as scattered coarse patches.

Opaques - anhedral to subhedral scattered pyrite.

Sericite - abundant throughout matrix.

Chlorite - trace only, very pale green.

Rock is an altered breccia with fragments of granodioritic material and altered felsites. Textural details largely obscured by abundant sericite, carbonate and local introduced quartz. Chlorite content conspicuously very low; tourmaline not observed.

Specimen U6-135 Granodiorite Breccia

Core Specimen: Massive breccia composed of about 60% of fragments of granitoid rock (1/16" to 1") set in dark, greenish-black, aphanitic matrix. Feldspar in fragments is pale pink to pale green. Trace coarse quartz visible in matrix.

Thin Section:

Fragments: approx. 60% of total, mostly angular.

60% Altered Plagioclase - subhedral, twinned albite with abundant included sericite flakes, traces of chlorite, and common patches of coarse carbonate. Slightly turbid, brownish appearance.

K-feldspar? - a few % of altered, turbid feldspar appears motley and poorly twinned - possibly K-feldspar but not certain.

25% Quartz - intersertial to plagioclase.

15% Altered Mafics - pseudomorphed by relatively coarsely foliate chlorite with included granules of sphene and brown translucent material. Some of pseudomorphs have up to 2/3 of sericite in cores (in parallel growth with surrounding chlorite). Form of pseudomorphs suggest most of primary mineral was biotite, some possibly hornblende.

1% Opaques - scattered anhedral grains.

trace Apatite, Zircon - apatite common, some euhedral.

Matrix - 40% of total. Composed of angular fragments of feldspar and quartz and altered mafics, mixed with approximately equal amount of chlorite and tourmaline. Matrix chlorite occurs as fine-grained aggregates and is distinct from coarsely foliate chlorite that replaces primary mafics; locally develops as patches of small rosettes. Tourmaline occurs as fine needles intimately mixed with chlorite, locally in radiating clusters. Scattered grains of coarse quartz with abundant included tourmaline also a part of the matrix. Chlorite and tourmaline locally invades and replaces fragments along cracks and margins.

Rock is an altered and brecciated biotite granodiorite or quartz diorite. Plagioclase altered to albite + sericite + carbonate; mafics pseudomorphed by chlorite $\pm$ sericite. Matrix "cement" is of fine-grained chlorite and tourmaline and minor coarse quartz.

Specimen U6-223' Altered Granodiorite

Core Specimen: Medium-grained, massive, homogeneous, granitoid rock. Colour index 15. Feldspar pink to pale greenish-gray. Rock is slightly magnetic.

Thin Section:

40% Plagioclase - subhedral twinned grains. Numerous included shreds of sericite. Composition albitic and apparently slightly variable (obscured by alteration, but index less than quartz).

30% Quartz - intersertial to plagioclase.

15% K-feldspar - poorly twinned, brownish turbid appearance.

10% Hornblende - medium-dark in colour, green to greenish brown. Occurs both as prismatic subhedra and intersertial to plagioclase. Relatively unaltered.

<1% Clinopyroxene(?) - as numerous inclusions with optical continuity in several of the larger hornblende grains. (Identification not positive, but occurrence, relief, extinction, and colour all appropriate for clinopyroxene.)

4% Altered Biotite - largely chloritized, with traces of frayed relict biotite. Lenses of colourless mineral (prehnite?) along cleavages.

<1% Sphene(?) - several clear primary grains.

<1% Epidote - scattered anhedra grains, some relatively strongly coloured.

<1% Opaques - anhedral magnetite; trace sulphide with square outline.

trace Apatite, Zircon

<1% Carbonate, Chlorite, Prehnite(?) - as alteration minerals in small local patches.

trace Sphene - as small bits in chloritized biotite.

Rock is a partly altered, biotite-hornblende granodiorite. Plagioclase sericitized, biotite chloritized, hornblende largely unaltered. Excellent igneous texture (subhedral plagioclase with intersertial K-feldspar and quartz). Shows sequential crystallization of mafics: clinopyroxene enveloped by hornblende in turn partly overgrown by biotite.

Specimen U7-39' Breccia of Plagioclase Porphyry and Granodiorite

Core Specimen: Massive, heterogeneous breccia. One end of core is porphyritic rock composed of 50% pink euhedral feldspar (to 2mm), minor mafic phenocrysts, and dark greenish aphanitic groundmass. Remainder of core composed of fragments of pale pink granitoid rock set in greenish-black, fine-grained matrix. Coarse glassy quartz also visible in matrix. Most of matrix occurs in crudely parallel zones, as if filling a set of fractures.

Thin Section:

Porphyritic Rock Extensively altered latite or dacite.

45% Altered Plagioclase - mostly as subhedral, well-twinned phenocrysts. Albite with abundant inclusions of sericite, carbonate, and trace chlorite. Brownish turbid appearance. Also occurs as small euhedral tablets in groundmass.

5% Altered K-feldspar? - strongly turbid, reddish-brown; as patches of extremely fine-grained material (apparently mostly sericite) occurring in groundmass.

25% Quartz - xenomorphic mosaic material in groundmass mixed with altered feldspar and alteration minerals (sericite, carbonate, chlorite, opaques).

23% Chlorite - partly as pseudomorphs of mafic phenocrysts with indistinct form. Remainder as smaller flakes abundantly mixed through groundmass.

2% Opaques, brown translucent material - as small scattered bits - most associated with chlorite as if an alteration product.

Groundmass of porphyritic rock is essentially an xenomorphic mosaic of quartz and feldspar mixed with abundant chlorite, sericite, and carbonate.

Granitoid Fragments

55% Altered Plagioclase - twinned subhedral albite with abundant included sericite and carbonate. Locally extensively replaced by coarse patchy carbonate.

5%? Altered K-feldspar? - turbid brownish patches of extremely fine-grained material - mostly sericite?

25% Quartz - intersertial

15% Altered Mafic - coarsely foliate chlorite with included bits of sphene(?) and translucent brown material. Form suggests primary mineral was mostly biotite.

<1% Opaques, Apatite, Zircon

Matrix - mixture of various proportions of fine-grained chlorite, tourmaline needles, crushed quartz and feldspar, and coarser quartz with included tourmaline. Fine-grained sericite, and patchy carbonate locally abundant. Chlorite in part occurs as aggregates of small rosettes. Tourmaline very abundant, occurring as fine needles, often in radiating asterisk-

Specimen U7-39' (continued)

like clusters. Matrix minerals locally invade rock fragments along margins and fractures.

Rock is a breccia composed of extensively altered feldspar porphyry (originally dacite or latite), and crushed, altered granodiorite. Dark matrix of fine-grained chlorite + tourmaline and coarse quartz; fills areas between fragments of granodiorite and invades host along fractures.

Specimen U8-8.5' Veined Granitoid

Core Specimen: Medium-grained, homogeneous, altered granitoid rock, light greenish colour. Cut by whitish veins containing mostly quartz and pale greenish material, with several rounded "islands." Margins of veins sharply defined by thin black zone. One later veinlet of quartz and carbonate (not present in thin section).

Thin Section:

Granitoid Rock:

60% Altered Feldspar - fully replaced by fine-grained aggregates of sericite with minor irregular patches of brownish carbonate. Subhedral forms indicate feldspar was mostly or all plagioclase.

25% Quartz - intersertial to pseudomorphed feldspar.

15% Altered Mafics - mainly brownish carbonate, with some intermixed white mica and colourless chlorite. Local inclusions of brown high relief minerals (euhedral metamict in part) and translucent material. Flaky habit in part suggests primary mineral was biotite.

<1% Opaques - scattered anhedral grains

trace Apatite, Zircon.

Veins: Replacement bodies (average 4mm wide) with sinuous outlines and rounded islands of host rock. One of inclusions is crushed - suggesting that vein developed along fracture. Vein is markedly zoned as follows:

Outer Zone - thin, discontinuous; clear quartz (0.2 to 0.5mm)

Second Zone - very sharp and continuous "rind" of extremely fine needles of tourmaline (0.2 to 0.3mm long). Oriented approximately normal to wall of vein, with needles tending to radiate into core. Slightly coarser tourmaline locally occurs in host rock adjacent to vein.

Third Zone - irregular zone of mixed brown carbonate, quartz, colourless chlorite in small rosettes, minor sericite and sparse tourmaline.

Core Zone - mainly clear mosaic quartz, some euhedral, with trace sericite, carbonate, and chlorite. Grain size of quartz is relatively coarse - like that of host rock.

Rock is an altered trondjemite or granodiorite. Feldspars replaced by sericite; mafics replaced by brownish carbonate. Cut by zoned, quartz/tourmaline replacement vein.

Specimen U8-130' Altered Granodiorite

Core Specimen: Massive, homogeneous, medium-grained, altered, granitoid-looking rock. Colour medium grey-green. Quartz, feldspar and dark altered mineral visible in specimen. Several very fine dark veinlets.

Thin Section:

55% Altered Plagioclase - euhedral to subhedral, well-twinned albite with numerous included shreds of sericite, patches of carbonate and minor chlorite. Some grains almost fully replaced.

25% Quartz - intersertial to plagioclase

5%? K-feldspar - intergranular to plagioclase; motley appearance, sericitic alteration.

15% Altered Mafics - chlorite with included bits of translucent brown material (sphene? in part). Most of chlorite has tabular form as if pseudomorphous after biotite. Some has prismatic form, possibly after hornblende. Minor chlorite occurs as aggregates of small rosettes - probably not direct replacement of primary mafic mineral. Some of tabular chlorite has thin lenses of colourless mineral (prehnite?) along cleavages.

<1% Opaque - scattered anhedral grains

<1% Colourless alteration mineral, (intermediate birefringence) in part may be prehnite? Some has lower birefringence and appears to be a colourless chlorite.

trace Apatite

local Tourmaline - as long thin needles (0.01mm diam.) mostly included in quartz. Occurs in 1) one patch in section, and along one 2) thin veinlet.

Rock is an altered, hornblende-biotite trondjhemite or granodiorite. Plagioclase altered to albite + sericite + carbonate; mafics chloritized.

Thin veinlet marked by tourmaline needles in quartz, apparently developed along a fracture. Also later, very thin veinlets of carbonate with heavy brownish stain; discontinuous and approximately parallel.

Specimen U8-199.5' Altered Granodiorite

Core Specimen: Medium-grained, homogeneous, massive granitoid rock. Visible quartz and altered-looking, pink to greenish feldspar. Altered mafic minerals 10-12%. Common small branching veinlets of very dark, fine-grained material. Thickest veinlet 2mm wide, with white quartz along centre.

Thin Section:

55% Altered Plagioclase - subhedral grains, 1-3mm, of albite with numerous included flakes of sericite and patches of carbonate. Replacement quite extensive in some grains.

5% (or less) Altered K-Feldspar? - angular to irregular patches inserted between plagioclase grains. Extremely fine-grained scaly mosaic, (rarely with radially-oriented arrangement) and brownish turbid appearance. Appears to be mainly fine sericite.

25% Quartz - intersertial to plagioclase

12% Altered Mafics - mostly coarsely foliate chlorite with included bits of brown mineral (rutile? in part), translucent material (hydroxides?), and minor opaques. Rarely cores of pseudomorphs have white mica intergrown parallel with chlorite. Form indicates that primary mineral was mostly (or all) biotite.

<1% Opaques - scattered anhedral grains

trace Zircon, Apatite - some euhedral

Section also contains one clot (diam. approx. 4mm) of granulose mosaic plagioclase + chlorite + opaques + minor sericite. Origin unknown.

Veins: Mainly chlorite occuring as aggregates of small (0.01mm diam.) rosettes, some concentrically zoned. Also common tourmaline as fine needles (0.02mm diam.) mixed with chlorite. Coarser mosaic quartz (1 to 0.5mm) forms core of thicker vein. Veins are locallized along fractures, and appear in part to replace host rock.

Rock is an altered and slightly fractured biotite granodiorite or trondjemite. Plagioclase altered to albite + sericite + carbonate; mafics chloritized. Several veinlets of chlorite + tourmaline $\pm$ quartz.

Specimen U10-125' Altered Breccia : Goichon vent

Core Specimen: Massive, homogeneous, altered-looking breccia. Approximately 55% pale greenish fragments angular to sub-angular, mostly 1/16 to 1/8". Fragments appear to be of altered granitoid rock; a few are of pale green aphanitic material. Matrix is composed of dark, greenish-black aphanitic material and visible quartz.

Thin Section:

Fragments of Granitoid Rock (approx. 50% of total)

60% Altered Feldspar - totally replaced by fine-grained, mat-like aggregates of sericite with minor chlorite and brownish carbonate. Blocky subhedral form suggestive of plagioclase, but alteration obscures form of many grains.

25% Quartz - intersertial to feldspar; relatively free of inclusions.

15% Altered Mafic Mineral - chlorite with common inclusions of brown turbid materials (carbonate and sphene? in part). Tabular form suggests primary mineral was mostly biotite.

trace Apatite, Zircon

Aphanitic Fragments (5% or less of total) - Very fine-grained aggregates of sericite with minor chlorite. Thin rims of turbid brown carbonate mixed with fine-grained chlorite. These fragments may represent pieces of felsitic rock or large pieces of altered feldspar?

Matrix (45% of total)

2/3 Quartz/Tourmaline - mosaic quartz with grain size approximately like that of quartz in fragments (0.5 to 1.0 average), containing up to 35% of tourmaline needles (0.01mm diameter). Tourmaline typically concentrated toward margins of fragments and tends to radiate away from fragments.

1/3 Chlorite, Carbonate, Sericite - chlorite in aggregates of small rosettes. Brownish turbid carbonate locally tends to rim fragments.

Rock is a brecciated and intensely altered granitoid, probably a biotite granodiorite. Breccia matrix is coarse quartz with included tourmaline, fine-grained chlorite and sericite, and carbonate.

Primary minerals and texture largely destroyed by alteration minerals. Brecciated character which is so obvious in sawed specimen is somewhat obscure under microscope. Carbonate locally appears to replace the fragments in part. These features suggest that at least part of the alteration took place after the original rock had been crushed.

Specimen U10-~~[illegible]~~ (128'?)

Altered Breccia
"Pseudo breche verte"

Core Specimen: Heterogeneous, somewhat mottled-looking, greenish rock. Contains one larger piece (8mm across) of aphanitic, pale green to gray material. Remainder consists of visible quartz, greenish altered feldspar(?), and yellowish carbonate.

Thin Section:

Large fragment - sericitized felsite?

Composed partly of fine-grained, xenomorphic mosaic of feldspar and minor quartz, heavily dusted with specks of sericite and minor pale chlorite. Abundant inclusions obscure nature of feldspar and relative abundance of quartz (quartz content seems to be 1/5 or less). This feldspathic material grades into very fine-grained rock composed almost entirely of sericite + minor pale chlorite and scattered grains of quartz. Feldspathic and sericitic material arranged in vaguely parallel zones - suggesting primary flow structure (but quite uncertain).

Fragment also contains several % of sharply-defined clots of coarser mosaic quartz and/or brownish carbonate. Some of carbonate contains feathery inclusions of brown to reddish (hematite) translucent material. Clots possibly represent amygdules or altered phenocrysts - but don't have any distinctive shape.

Nature of this fragment somewhat uncertain, but seems most likely to be a sericitized, feldspathic felsite.

Remainder of Rock - crushed granitoid

- chlorite très mineure - pas de tourmaline au microscope

Composed of a very complex mixture of quartz, altered feldspar and sericite, and carbonate. Primary igneous texture locally discernable but mostly destroyed. Brecciated character indicated by vaguely defined rock fragments and fractured quartz and plagioclase, but also obscured by extensive alteration. Major constituents are as follows

35% Quartz - partly intersertial to altered plagioclase (relict from granodiorite), partly as xenomorphic mosaic mixed with sericite (altered crush material ?), partly in mosaic patches with included tourmaline and rare euhedral forms (similar to "coarse matrix quartz" as seen in other breccia specimens).

10% Plagioclase - fractured, subhedral albite with included sericite and carbonate.

40% Sericite + minor colourless Chlorite - very abundant as fine-grained patches. Some with form suggesting replacement of plagioclase - others irregular. Extremely fine-grained aggregates in part.

15% Carbonate - as irregular patches, relatively clear to strongly brownish turbid. Often with feathery inclusions of opaques, translucent brown to reddish (hematite) material. In part probably replaces primary mafics.

Specimen U10-88' (128'?) (continued)

<1% Tourmaline - as small scattered needles, mainly in quartz, not abundant.

<1% Apatite, Zircon, Opaques

Rock appears to be an intensely altered breccia of felsite (?) and crushed granitoid rock. Primary igneous texture and brecciated character partly destroyed by alteration and recrystallization, with addition of quartz + tourmaline and probably some carbonate.

Specimen has set of subparallel, very thin, brown-stained carbonate veinlets that cut across all other elements in rock.

APPENDIX VIII

PECHINEY DEVELOPMENT LTD.(N.P.L)

GEOPHYSICAL REPORT

ON

INDUCED POLARIZATION SURVEYS

SOUTH SEAS MINING OPTION

CLAIMS: VENUS, OPAL, TCM, LIL, MARS, BILL, MCX, SB, CN, AND AJ.

THIRTY MILES NORTH OF MERRIT,B.C.

Quadrangle Corners 50°, 120° and 121°

Kamloops Mining Division

Author: Tom Gledhill,P.Eng.(B.C.)

For: Pechiney Development Limited (N.P.L.) on South Seas Mining Option

Work Period: May 4th to June 16th, 1970.

Dated June 17th, 1970.

Table of Contents

Pechiney Development Limited (N.P.L.)

Geophysical Report

on

Induced Polarization Surveys

South Seas Mining Option

SUMMARY

Induced Polarization surveys were run over most of the South Seas Option. The purpose was to look for additional breccia zones or disseminated sulphide zones that would be copper bearing.

Three zones were located. One was quite weak and irregular. A broad zone was located near a grounded telephone line while a third zone occurs on two lines and is shallow. Geological examination followed by drilling or trenching is recommended.

A side or depth effect from the Trojan deposit was also located on one of the traverses.

Pechiney Development Limited (N.P.L.)

Geophysical Report

on

Induced Polarization Surveys

South Seas Mining Option

I. INTRODUCTION

At the request of Pechiney Development Limited, Induced Polarization surveys were carried out over the South Seas Mining Option, Highland Valley, Kamloops Mining Division, B.C.

The survey was to explore for additional sulphides that might be associated with the intrusive granites of the claim group.

II. GENERAL GEOLOGY

Porphyry copper deposits in the Highland Valley of British Columbia are all closely associated with the Guichon batholith. Widespread low grade disseminated copper mineralization occurs over a large area. The Trojan deposit located on this claim group is a higher grade deposit located in a breccia.

III. PURPOSE OF THE SURVEY

The Induced Polarization survey was employed in order to locate any areas of disseminated sulphides in the hope that if located they would be copper bearing. The Trojan deposit is in a breccia zone.

IV. DISCUSSION OF RESULTS

A series of weak anomalies were located along Baseline No.1 on lines 12S, 4S, 00, 4N, 8N, 24N and 28N. These are weak and non recurring anomalies and should only be pursued when geologic evidence gives further encouragement.

One of the better anomalies occurs on Baseline No.2 at 18E to 28E. This anomaly does not occur at surface and could arise from the side or depth effect of the Trojan deposit.

The zone that shows the most persistant nature is the zone extending from Baseline No.2 line 00 to 12N centred around 30W. This zone unfortunately occurs near a grounded telephone line so caution should be employed in investigating its cause. A diamond drill hole in the centre of the zone should be employed if other explanations fail.

A small anomaly, located on Baseline No.3 at 4N and 8N near the baseline, is near-surface and

bulldozing or trenching would be the easiest way to explore this feature.

V. CONCLUSIONS AND RECOMMENDATIONS

The Induced Polarization survey did not locate any strong anomalous zones. But it did locate three areas where further geological work is recommended. The side or depth extension of the Trojan deposit was located.

It is recommended that the zone on Baseline No.1 be examined geologically. The zone at 30W Baseline No.2 (where the telephone line is located) should be checked geologically and the possibility of a diamond drill hole considered. The zone at Baseline No.3, line 4N and 8N, could be bulldozed or trenched since indications are that the cause is shallow.

Respectfully submitted,

Tom Gledhill

Tom Gledhill, B.A., P.Eng.
Geophysicist

June 17th, 1970.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
T. R. GLEDHILL
Expiry Date: June 24, 1970

TRG 17/6/70

APPENDIX A

Declaration

	Function	Dates	Day
Tom Gledhill	Geophysicist	June 1-16,1970	16 days
George Beier	Field Technician	May 4-27,1970	24 days
Eldo Hildebrand	Field Technician	May 4-27,1970	24 days

2 helpers supplied by Pechiney Development Limited

M. Thomas	Draftsman	June 1-16, 1970	14 days

Equipment rental
Transportation } Copy of Invoice Supplied
Room and board

Equipment: Variable Frequency Induced Polarization equipment Model P654

Property: South Seas Option Highland Valley, B.C.

Sponsor: Pechiney Development Limited (N.P.L.)

Contractor: Tom Gledhill, P.Eng.
21 Sandalwood Place
Don Mills, Ontario

Tom Gledhill

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
T. R. GLEDHILL

Expiry Date: June 24, 1970

TRG 17/6/70

Induced Polarization

Theory and Method of Survey

Induced Polarization (I.P.) surveys refer to a measurement of the blocking or back voltage - polarization of metallic conductors in a medium of ionic solution conduction.

This electro-chemical relationship occurs whenever metallic-type minerals such as base metal sulphides have an electrical current pass through them. In ordinary resistivity surveys, the current travels by conduction through the ions present in the water content of the ground. This is possible because almost all of the minerals have a much higher resistivity than the aqueous portion of the ground. A group of "metallic" type minerals have specific resistivities much lower than the ground water.

The I.P. effect occurs at the interfaces, where the mode of conduction from ionic in solutions to electronic in the metallic minerals is present in the rock.

This blocking action or induced polarization which depends on the energies necessary to allow ions to give up or receive electrons from the metallic surface, increases with the time that a direct current is allowed to pass through the rock. Thus as ions accumulate against the

metallic interface the resistance to current flow increases. In time these excess ions reduce the amount of current flow through the metallic particle. This phenomena is repeated at each of the infinite number of solution-metal interfaces present in the metallic rich rock.

When the direct current voltage that is used to cause a direct current is cut off, then the charged ions forming the polarization return to their normal position. This movement of charge creates a small, but measurable current flow on the surface of the ground.

Using an alternating current source, the effective resistivity of the system will change with the frequency of the switching.

The recorded values of the per cent frequency effect or F.E. are a measurement of the polarization in the rock mass. An often more useful quantity is the metal factor (M.F.) which is obtained by normalizing the F.E. for varying resistivities.

I.P. is used in the search for disseminated metallic sulphides of less than 20% by volume.

Field procedure in most I.P. surveys is as follows:

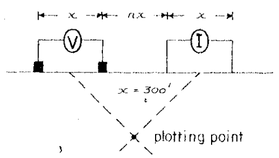
Current is applied to the ground at two points x feet apart. The potentials are measured at two other

points x feet apart in line with the current electrodes and the separation of the near current and potential electrodes is nx where n=1,2,3,etc.

The measurements are made along a picket line with constant distance nx feet employed between the nearest current and potential electrodes and several values of n may be employed (n=1,2,3,etc.)

In plotting the results, the values of the apparent resistivity, metal factor, the percentage frequency effect measured for each set of electrodes are plotted at the intersection of two imaginary lines drawn from the centre of the current and potential electrodes at 45° to the surface to meet at a mid point below the electrode array. Each of the three quantities are plotted in upright psuedo-sections.

Electrode Configuration



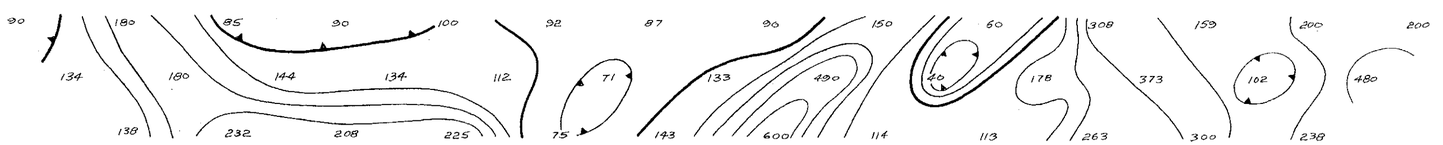
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

18W 12W 6W 00 6E 12E 18E 24E 30E

Base Line No. 1 **Line No. 00**



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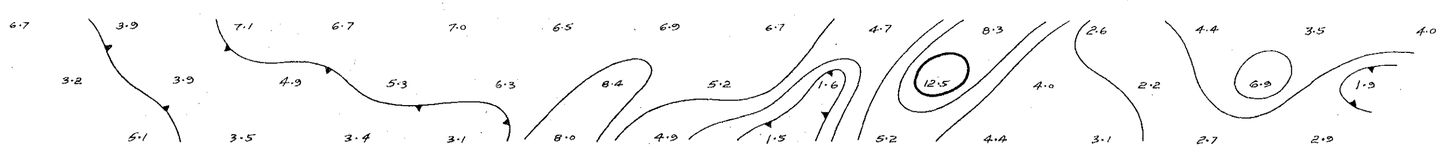
Apparent Resistivity (ohm feet)



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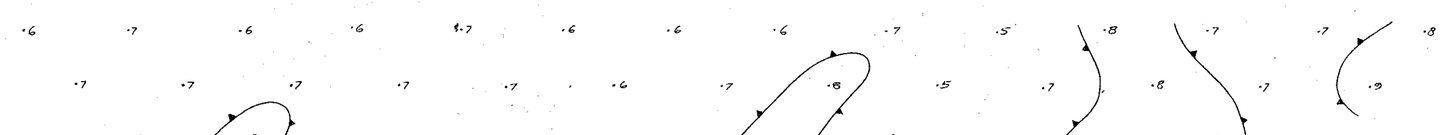
Metal Factor

2788



n = 1
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n = 3

Frequency Effect (%)

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA T. R. GLEDHILL

Expiry Date: June 24, 1970

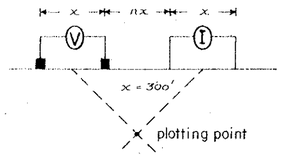
TRG 17/6/70

SCALE- 1" = 300'; DATE- 8 May 1970

Contour at logarithmic multiples of –
– 10, 15, 20, 30, 50, 75, 100

Base Line No 1 Line No 00

Electrode Configuration



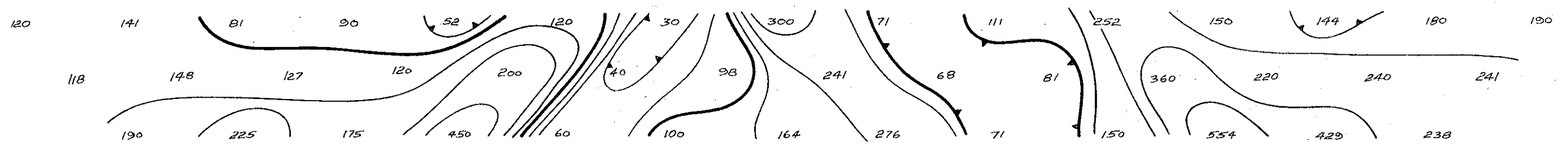
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

18W 12W 6W 00 6E 12E 18E 24E 30E

Base Line NO. 1 **Line NO. 4N**



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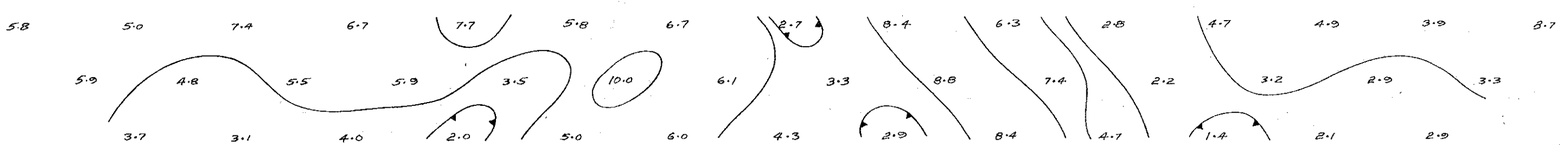

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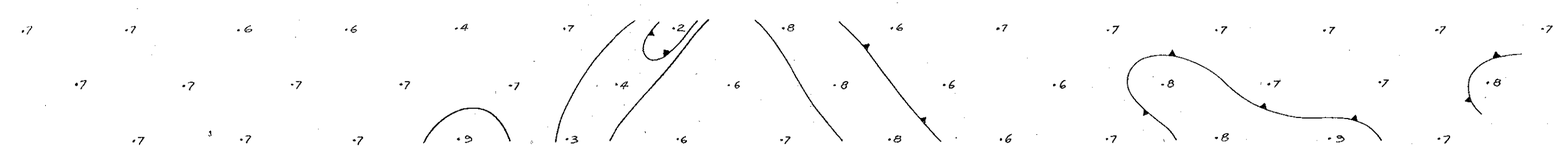
Metal Factor



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Frequency Effect (%)

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA T. R. GLEDHILL

Expiry Date: June 24, 1970

TRG 12/6/70

SCALE- 1" = 300'; DATE- 8 May 1970

Contour at logarithmic multiples of –
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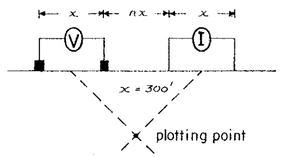
Base Line NO 1 Line NO 4N

Electrode Configuration



INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

12W 6W 00 6E 12E 18E 24E 30E

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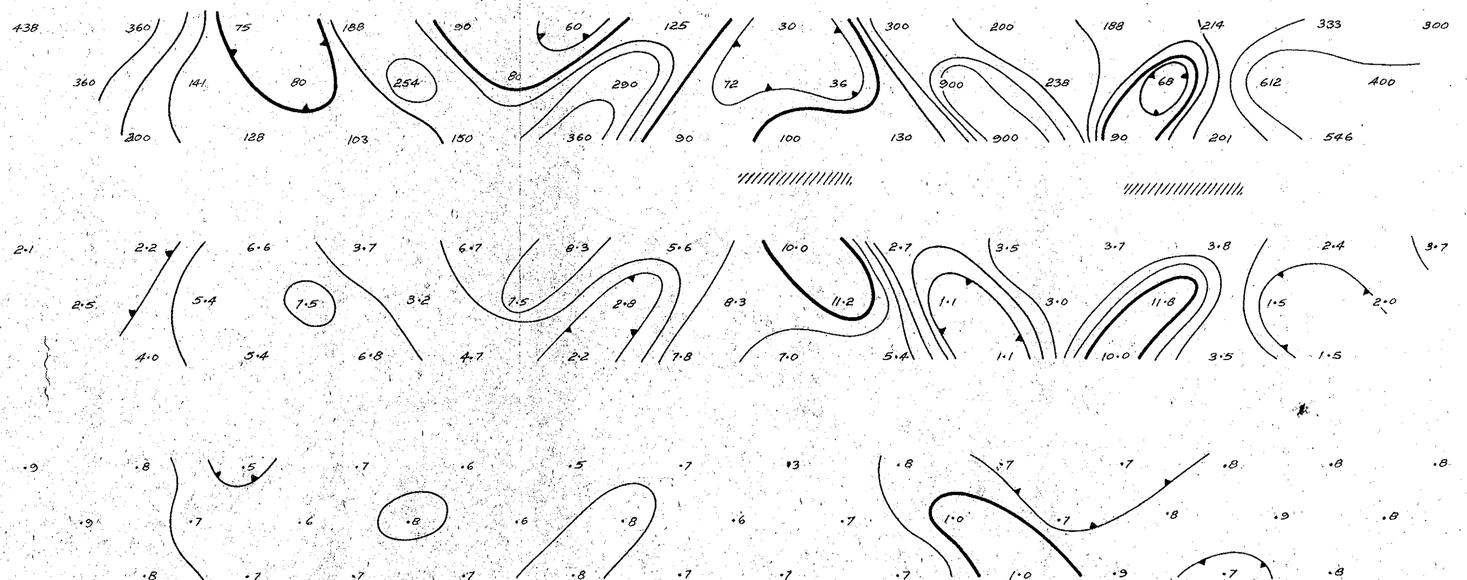


n = 1 — Apparent Resistivity (ohm feet)
n = 2
n = 3

n = 1 — Metal Factor
n = 2
n = 3

n = 1 — Frequency Effect (%)
n = 2
n = 3

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
T. R. GLEIHILL

Expiry Date: June 24, 1970
TRG 17/6/70

SCALE- 1" = 300'; DATE- 24 May 1970

Contour at logarithmic multiples of —
— 10, 15, 20, 30, 50, 75, 100

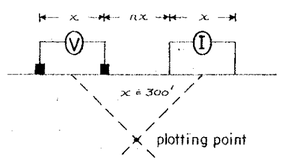
Base Line No 1 Line No 4S

INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

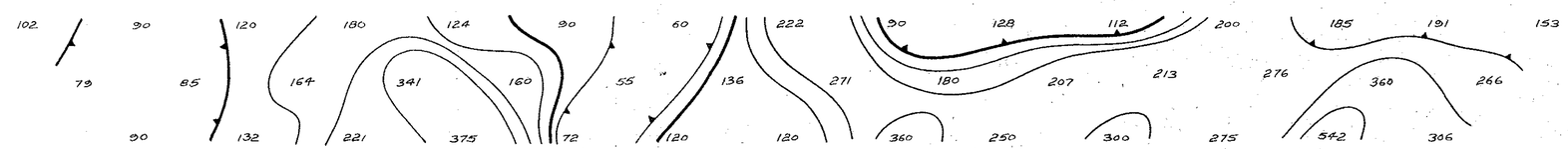
Highland Valley, B.C.

Electrode Configuration



24W 18W 12W 9W 6W 00 6E 12E 18E 24E

Base Line No. 1 **Line No. 8N**



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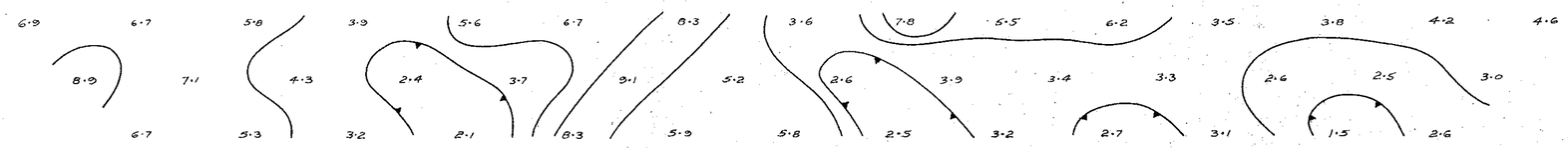

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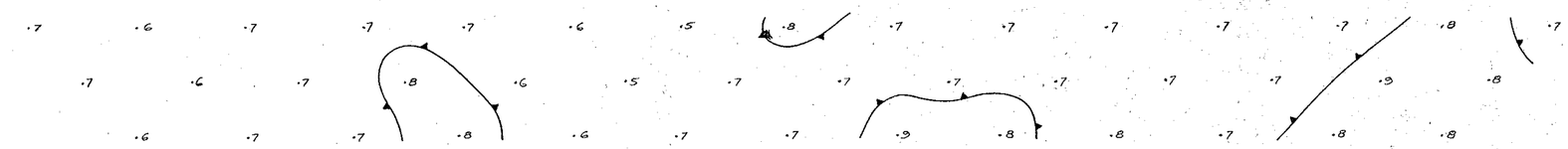
Metal Factor



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Frequency Effect (%)

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA T. R. GLEDHILL

Expiry Date: June 24, 1970

TRG 11/6/70

SCALE- 1" = 300'; DATE- May 1970

Contour at logarithmic multiples of —
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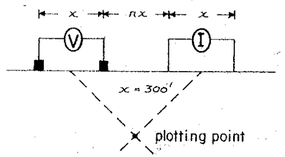
Base Line No 1 Line No 8N

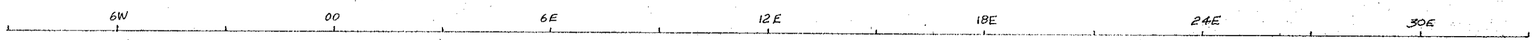
Electrode Configuration



INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.



Base Line No. 1 **Line No. 8S**

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA T. R. GLEDHILL

Expiry Date: June 29, 1970

T.R.G. 17/6/70

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Contour at logarithmic multiples of –
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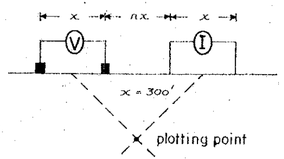
Base Line NO 1 Line NO 8S

Electrode Configuration



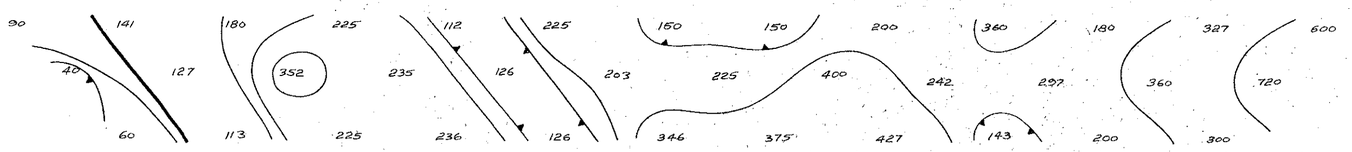
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

12W 6W 00 6E 12E 18E 24E 30E

Base Line No. 1 **Line No. 12 N**



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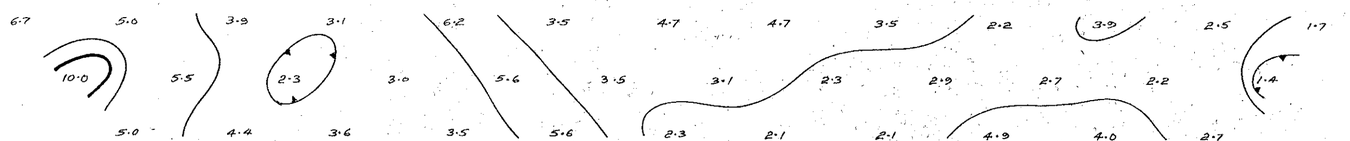

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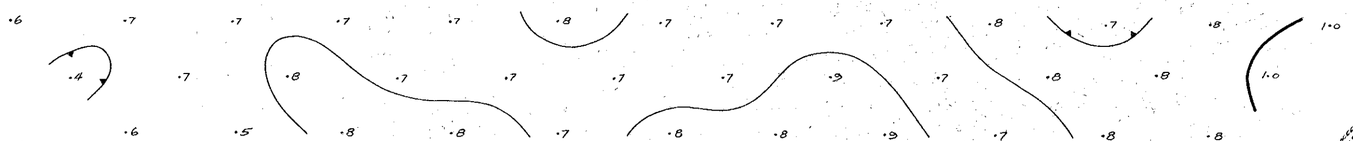

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Frequency Effect (%)

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA T. R. GLEDHILL

Expiry Date. June 24, 1970

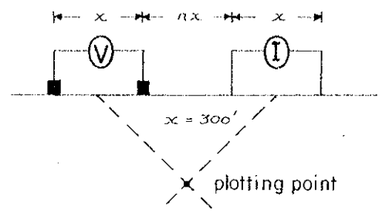
TRG 11/6/70

SCALE - 1" = 300' ; DATE - 10 May 1970

Contour at logarithmic multiples of —
— 10, 15, 20, 30, 50, 75, 100

Base Line NO 1 Line NO 12 N

Electrode Configuration



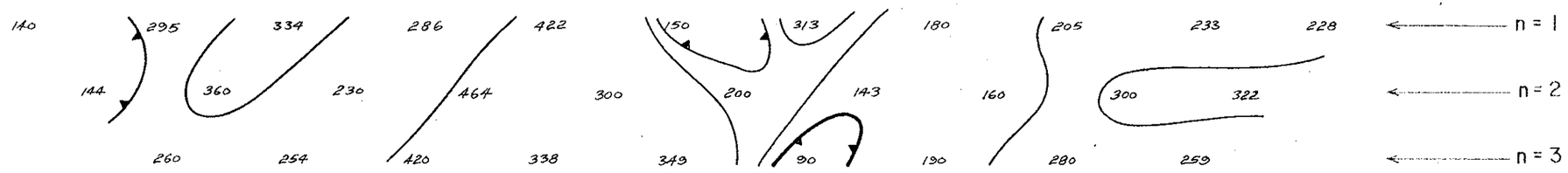
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

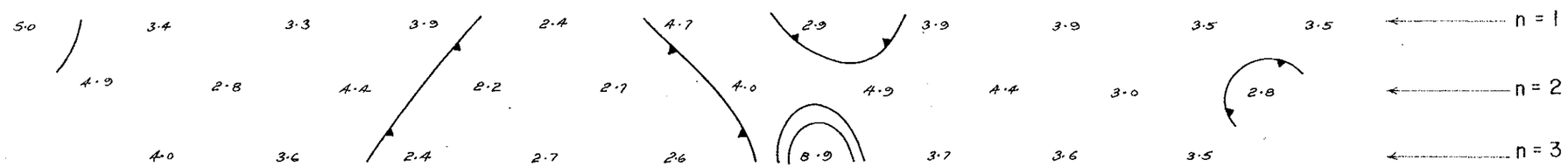
Highland Valley, B.C.

00 6E 12E 18E 24E 30E

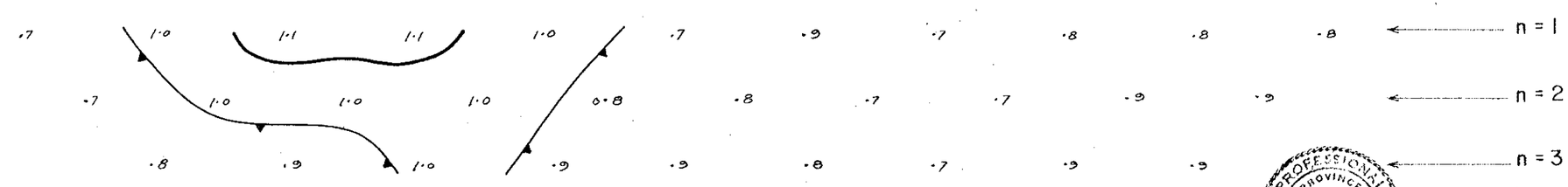
Base Line No. 1 **Line No. 12 S**



Apparent Resistivity (ohm feet)



Metal Factor



Frequency Effect (%)

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA T. R. GLEDHILL

Expiry Date: June 21, 1970

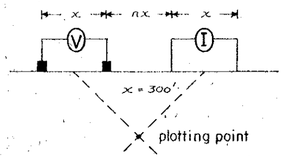
TRG 11/6/110

SCALE - 1" = 300'; DATE - 6 May 1970

Contour at logarithmic multiples of —
— 10, 15, 20, 30, 50, 75, 100

Base Line No 1 Line No 12S

Electrode Configuration



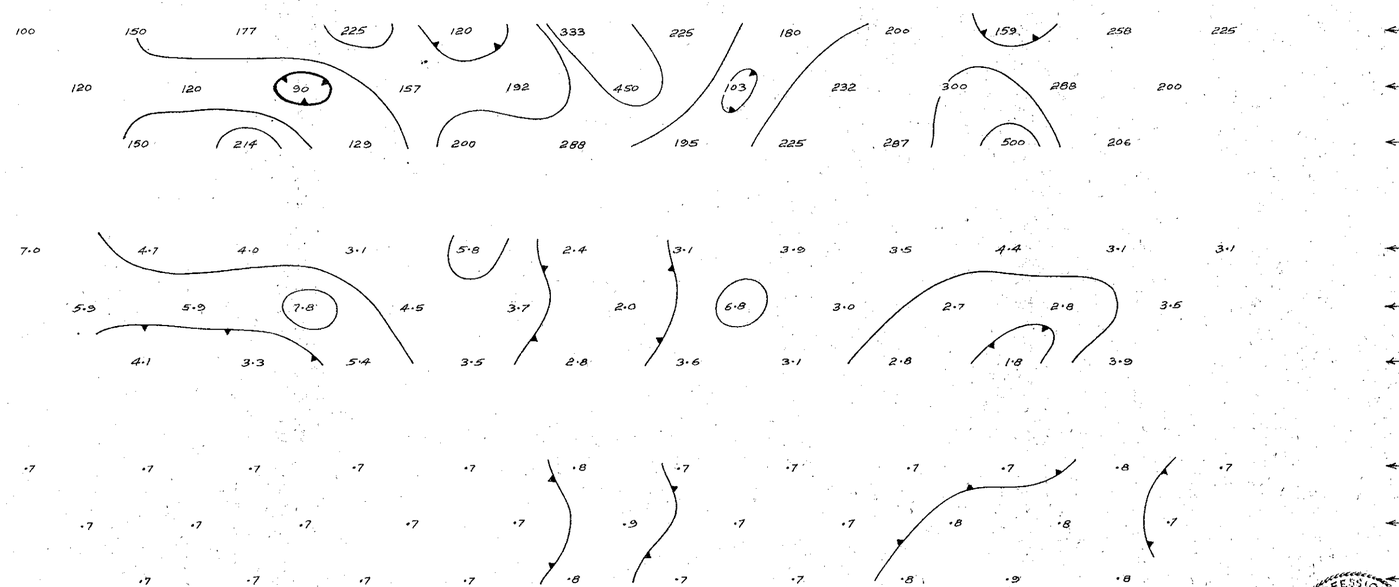
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

12W 6W 00 6E 12E 18E 24E

Base Line No. 1 **Line No. 16N**



PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
T. R. GLEDHILL

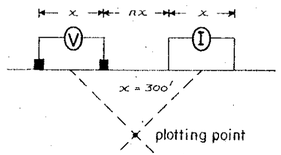
Expiry Date: June 24, 1970

SCALE - 1" = 300'; DATE - 10 May 1970

Contour at logarithmic multiples of —
— 10, 15, 20, 30, 50, 75, 100

Base Line No 1 Line No 16N

Electrode Configuration



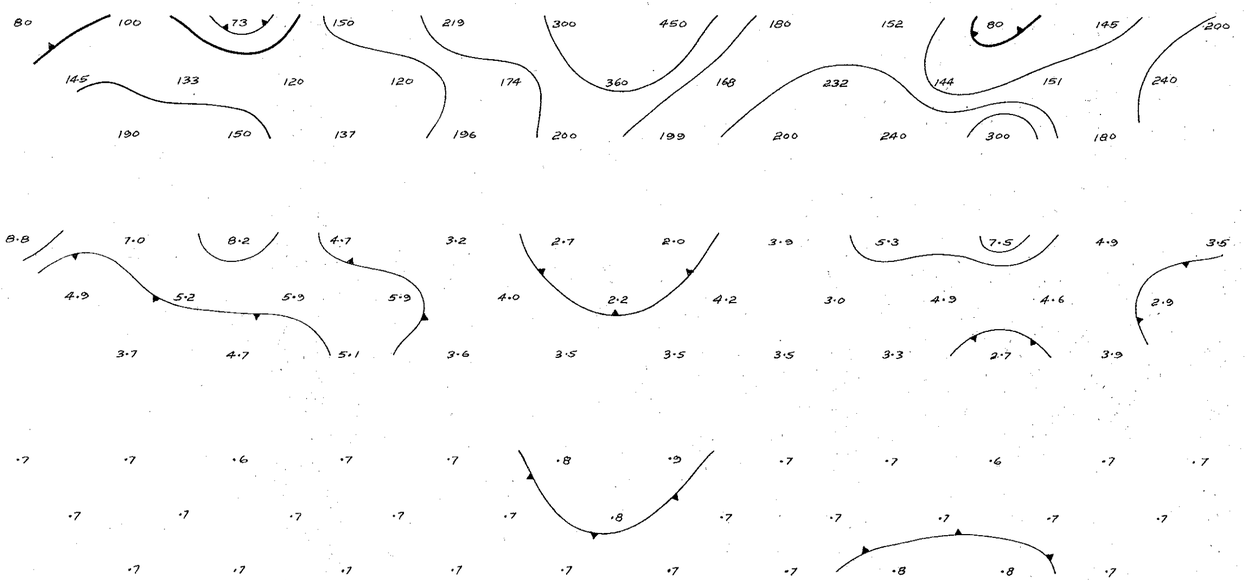
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

12W 6W 00 6E 12E 18E 24E

Base Line No. 1 **Line No. 20N**



n = 1
n = 2
n = 3

Apparent Resistivity (ohm feet)

n = 1
n = 2
n = 3

Metal Factor

n = 1
n = 2
n = 3

Frequency Effect (%)

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA T. R. GLEDHILL

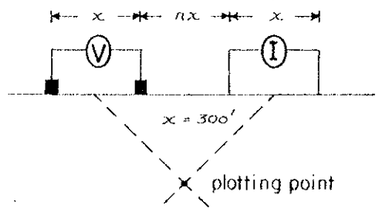
Expiry Date June 30, 1970

SCALE- 1" = 300'; DATE- 10 May 1970

Contour at logarithmic multiples of –
– 10, 15, 20, 30, 50, 75, 100

Base Line No 1 Line No 20N

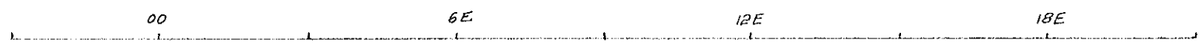
Electrode Configuration



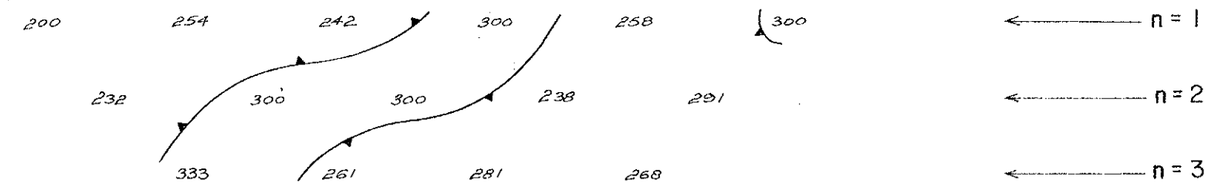
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

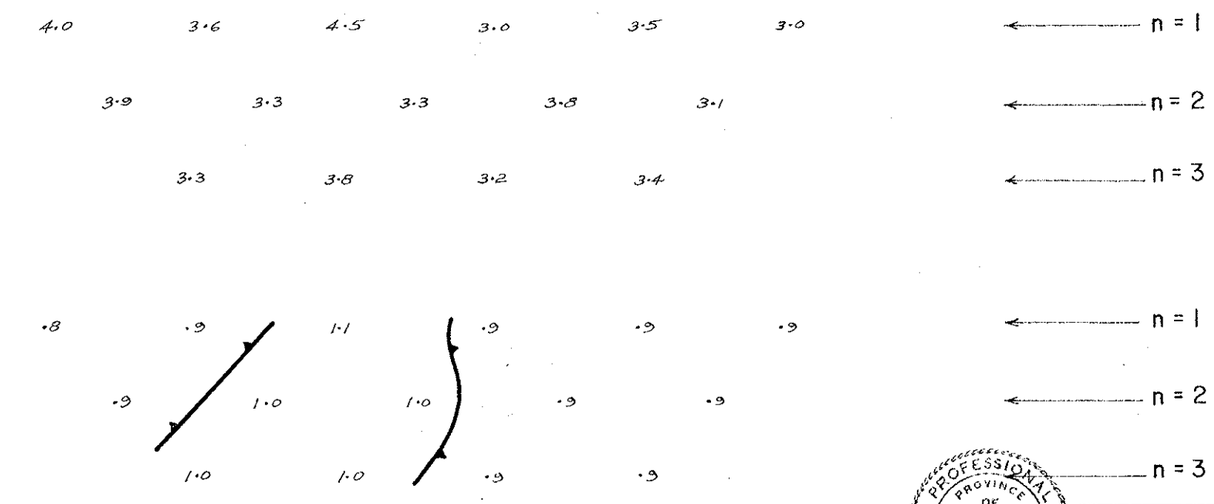
Highland Valley, B.C.



Base Line No. 1 **Line No. 20S**



Apparent Resistivity (ohm feet)



Metal Factor

Frequency Effect (%)

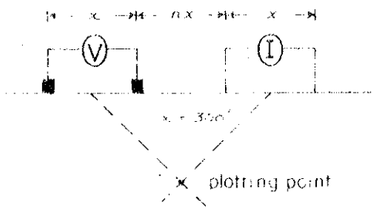
PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
T. R. GLEDHILL
Expiry Date: June 24, 1970

SCALE- 1" = 300'; DATE- 5 May 1970

Contour at logarithmic multiples of —
— 10, 15, 20, 30, 50, 75, 100

Base Line NO 1 Line NO 20S

Electrode Configuration



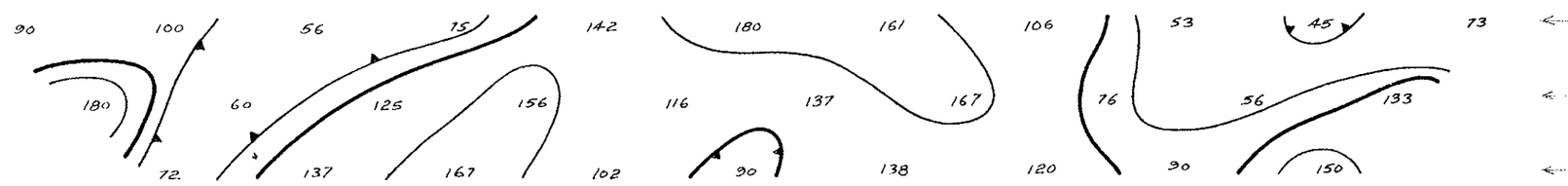
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

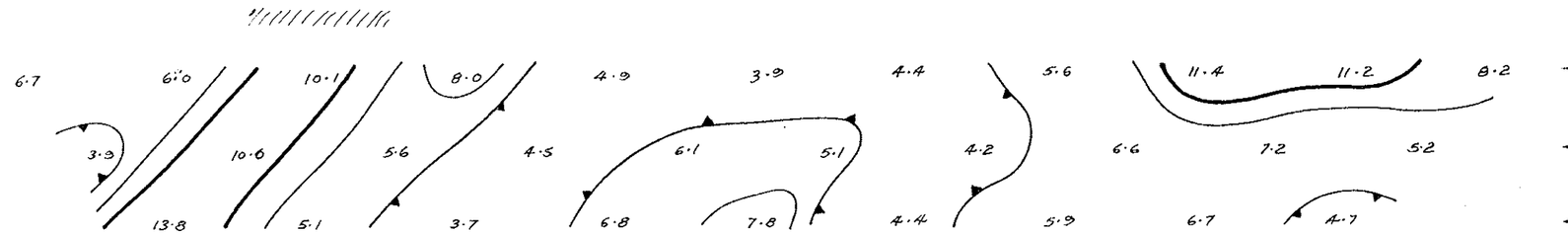
Highland Valley, B.C.

12W 6W 00 6E 12E 18E

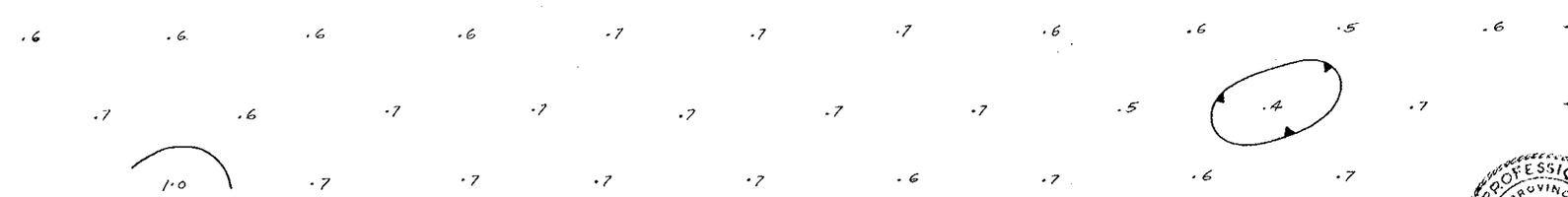
Base Line No. 1 **Line No. 24N**



Apparent Resistivity (ohm feet)



Metal Factor



Frequency Effect (%)

PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — T. R. GLEDHILL

Expiry Date June 30, 1970

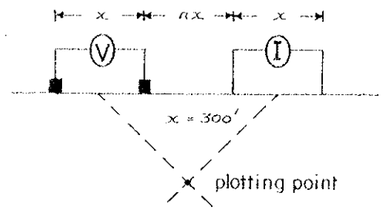
TRG 11/6/70

SCALE - 1" = 300'; DATE - 12 May 1970

Contour at logarithmic multiples of — — 10, 15, 20, 30, 50, 75, 100

Base Line No 1 Line No 24N

Electrode Configuration



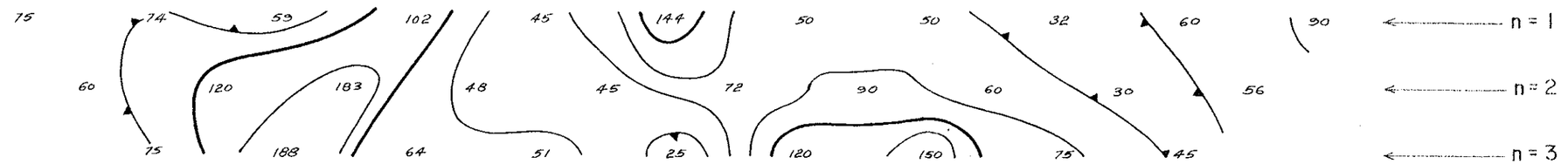
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

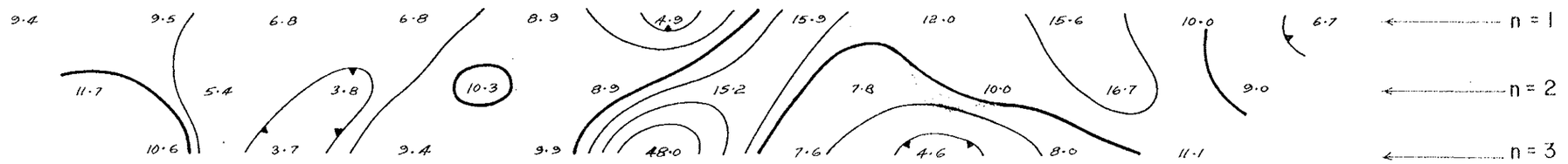
Highland Valley, B.C.

12W 6W 00 6E 12E 18E

Base Line No. 1 **Line No. 28N**



Apparent Resistivity (ohm feet)



Metal Factor

Frequency Effect (%)

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
T. R. GLEDHILL

Expiry Date: June 24, 1970

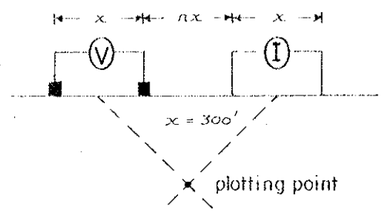
TRG 11/6/70

SCALE - 1" = 300'; DATE - 12 May 1970

Contour at logarithmic multiples of —
— 10, 15, 20, 30, 50, 75, 100

Base Line No 1 Line No 28N

Electrode Configuration



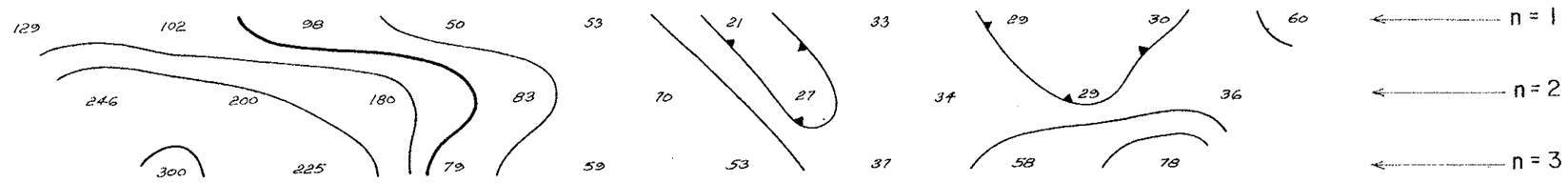
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

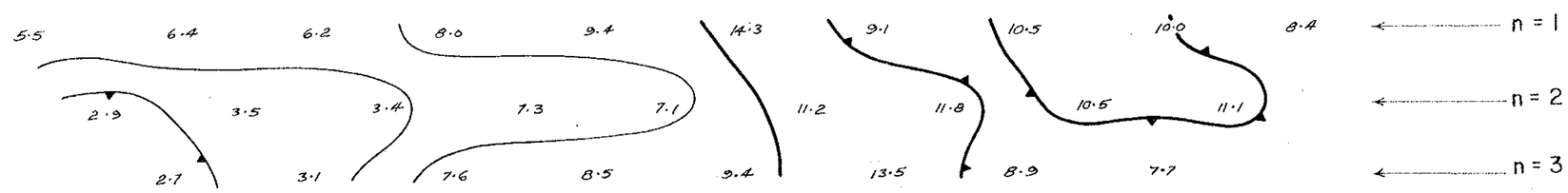
Highland Valley, B.C.

12W 6W 00 6E 12E 18E

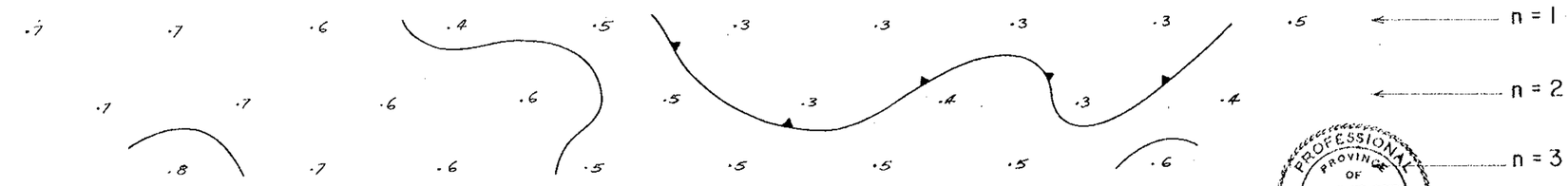
Base Line No. 1 **Line No. 32N**



Apparent Resistivity (ohm feet)



Metal Factor



Frequency Effect (%)

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA T. R. GLEDHILL

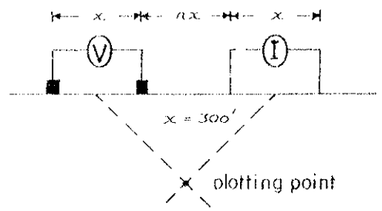
Expiry Date: June 24, 1970

SCALE - 1" = 300'; DATE - 12 May 1970

Contour at logarithmic multiples of —
— 10, 15, 20, 30, 50, 75, 100

Base Line No 1 Line No 32N

Electrode Configuration



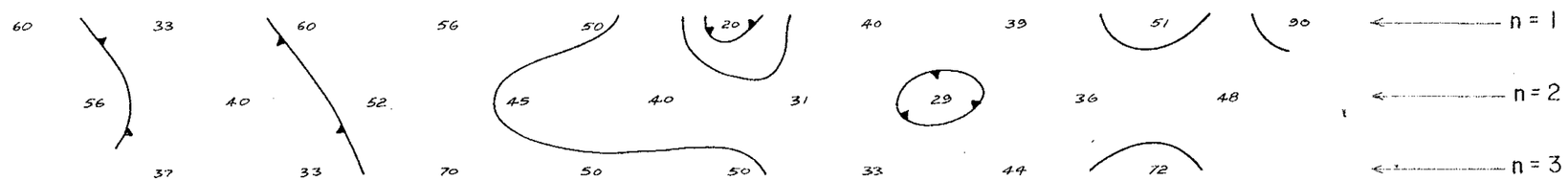
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

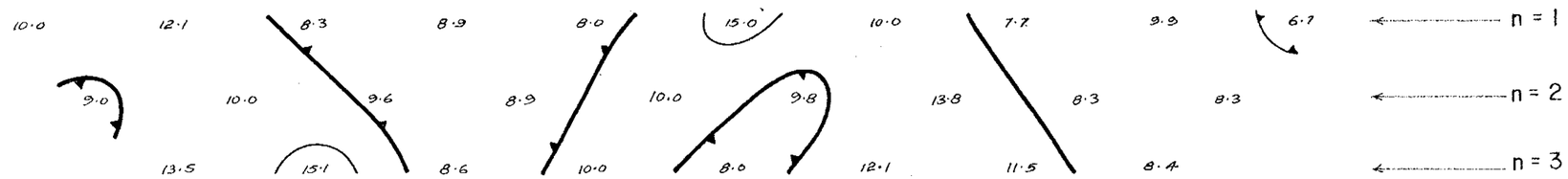
Highland Valley, B.C.

12W 6W 00 6E 12E 18E

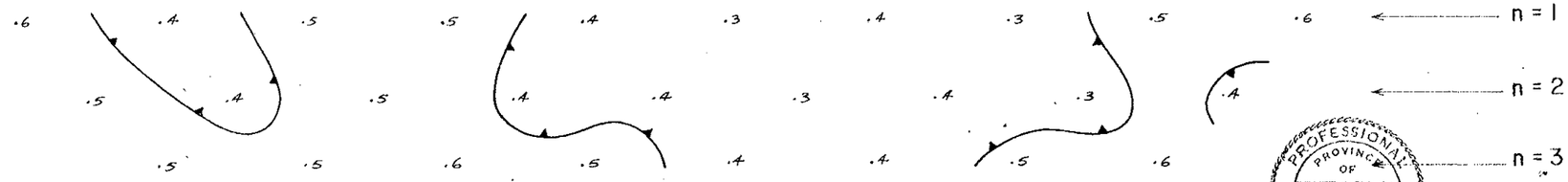
Base Line No. 1 **Line No. 36N**



Apparent Resistivity (ohm feet)



Metal Factor



Frequency Effect (%)

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
T. R. GLEDHILL

Expiry Date: June 24, 1970

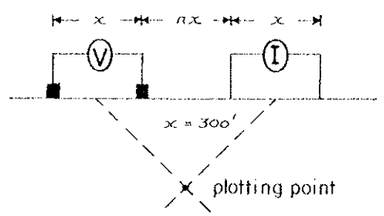
TRG 11/6/70

SCALE- 1" = 300'; DATE - 13 May 1970

Contour at logarithmic multiples of —
— 10, 15, 20, 30, 50, 75, 100

Base Line No 1 Line No 36N

Electrode Configuration



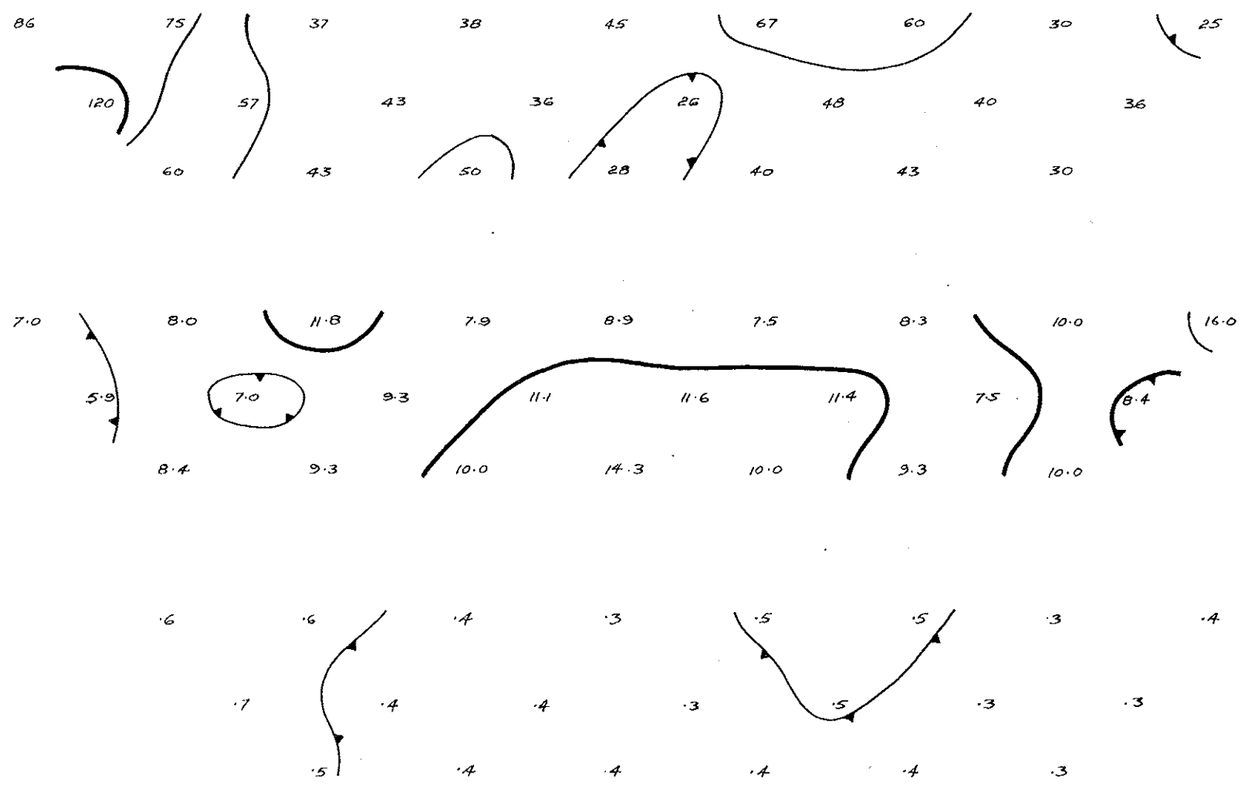
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

12W 6W 00 6E 12E 18E

Base Line No. 1 **Line No. 40N**



PROFESSIONAL ENGINEER — PROVINCE OF BRITISH COLUMBIA — T. R. GLEDHILL

Expiry Date: June 24, 1970

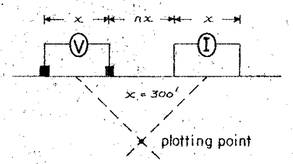
TRG 17/6/70

SCALE- 1" = 300'; DATE - 13 May 1970

Contour at logarithmic multiples of --
-- 10, 15, 20, 30, 50, 75, 100

Base Line No 1 Line No 40N

Electrode Configuration



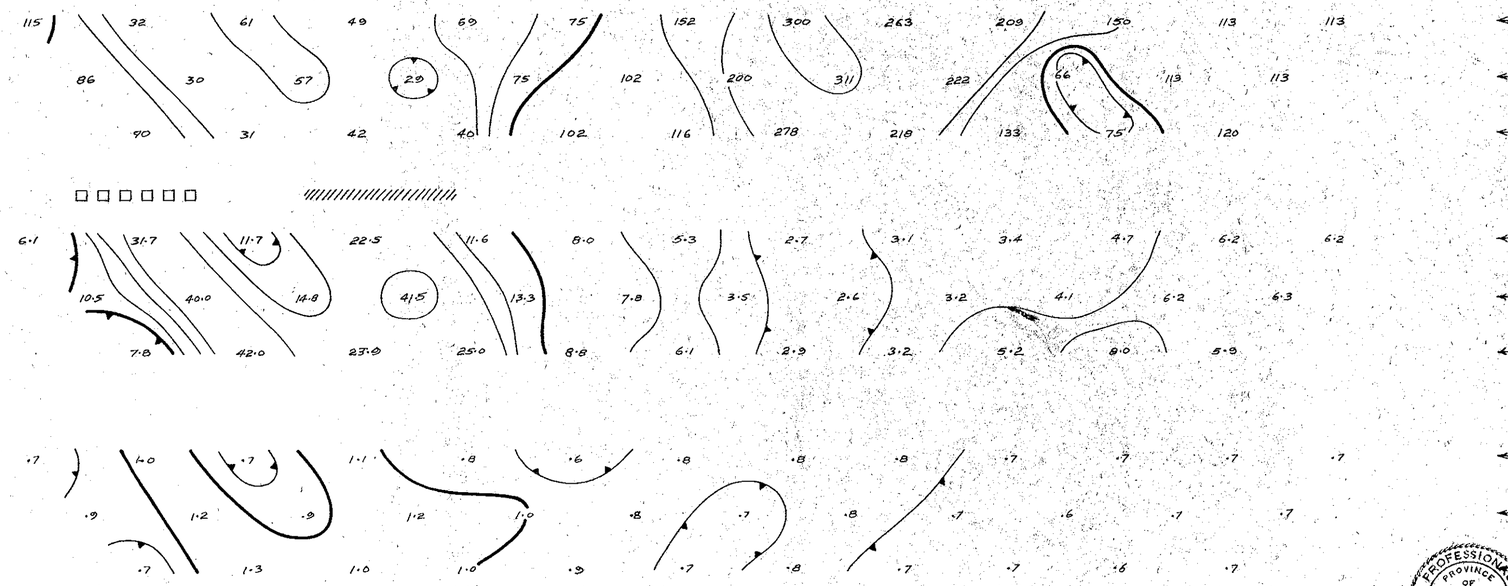
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

36W 30W 24W 18W 12W 6W 00 6E

Base Line No. 2 **Line No. 00**



PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA T. R. GLEDHILL

Expiry Date: June 24, 1970

TRG 17/6/70

SCALE - 1" = 300'; DATE - 18 May 1970

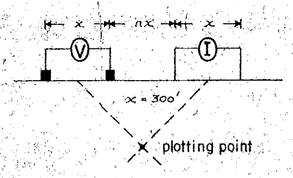
Contour at logarithmic multiples of — — 10, 15, 20, 30, 50, 75, 100

Base Line No 2 Line No 00

INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

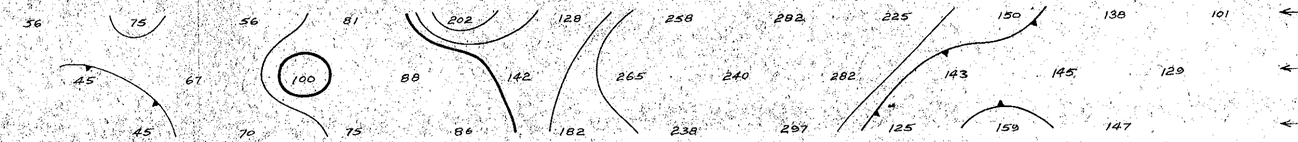
SOUTH SEAS OPTION
Highland Valley, B.C.

Electrode Configuration



Base Line No. 2 **Line No. 4N**

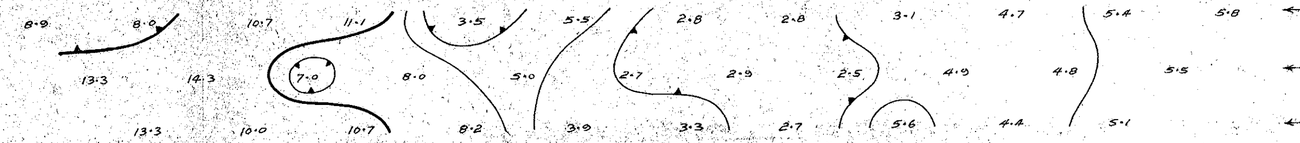
36W 30W 24W 18W 12W 6W 00



n = 1
n = 2
n = 3

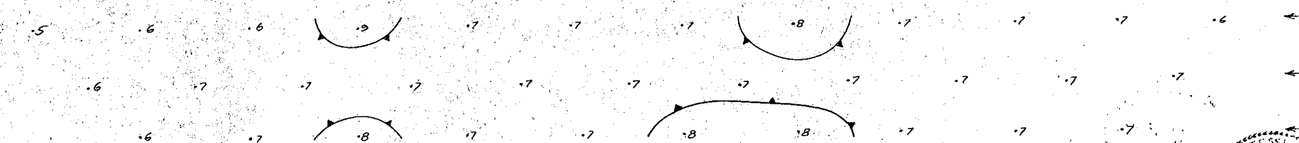
Apparent Resistivity (ohm feet)

Grounded Telephone Wire?



n = 1
n = 2
n = 3

Metal Factor



n = 1
n = 2
n = 3

Frequency Effect (%)

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA T. R. GLEDHILL

Expiry Date: June 24, 19 71

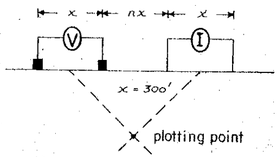
T.R.G. 11/6/70

SCALE- 1" = 300'; DATE – 17 May 1970

Contour at logarithmic multiples of –
– 10, 15, 20, 30, 50, 75, 100

Base Line No 2 Line No 4N

Electrode Configuration



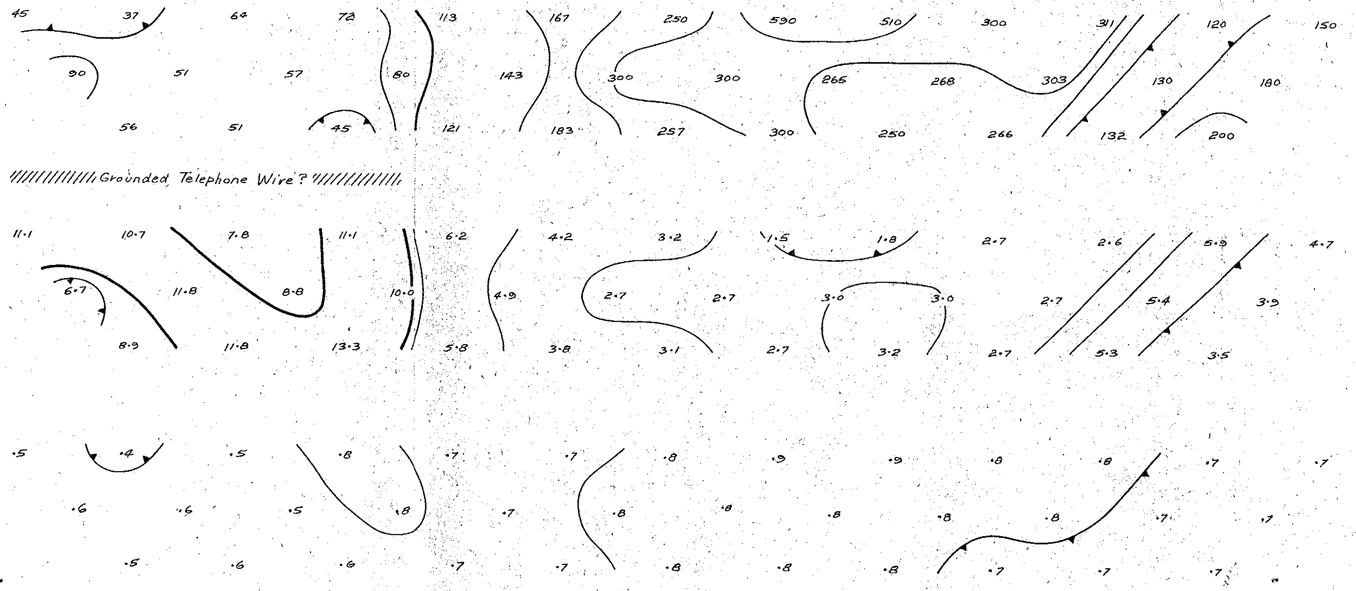
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

Base Line No. 2 **Line No. 8N**

36W 30W 24W 18W 12W 6W 00 6E



n = 1 — Apparent Resistivity (ohm feet)
n = 2
n = 3

n = 1 — Metal Factor
n = 2
n = 3

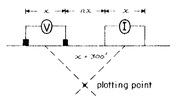
n = 1 — Frequency Effect (%)
n = 2
n = 3

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
T. R. GLEDHILL
Expiry Date: June 24, 1970

SCALE- 1" = 300'; DATE- 17 May 1970
Contour at logarithmic multiples of —
— 10, 15, 20, 30, 50, 75, 100

Base Line No 2 Line No 8N

Electrode Configuration

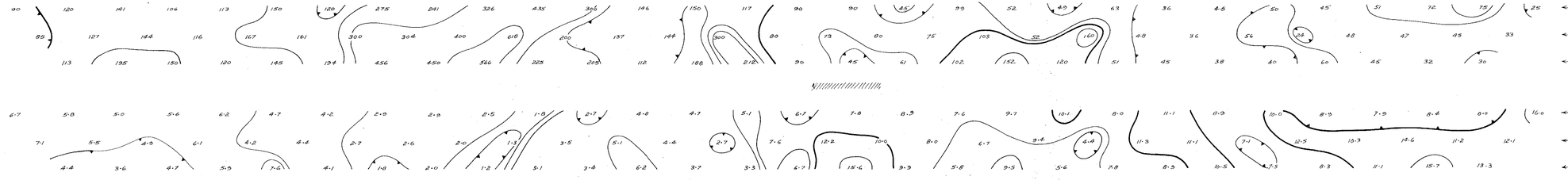


INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION
Highland Valley, B.C.

42W 36W 30W 24W 18W 12W 6W 00 6E 12E 18E 24E 30E 36E 42E 48E

Base Line No. 2 Line No. 16N



PROFESSIONAL ENGINEER OF BRITISH COLUMBIA T. R. GLEDHILL

Kamloops, June 24, 1970

SCALE- 1" = 300'; DATE- 15 May 1970

Contour at logarithmic multiples of –
– 10, 15, 20, 30, 50, 75, 100

Base Line No 2 Line No 16N

Electrode Configuration

V — C — C — plotting point

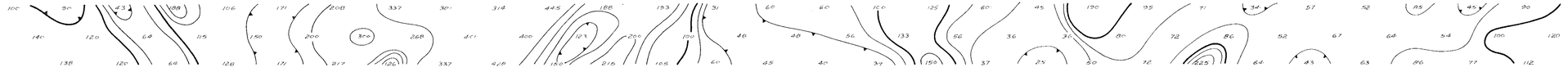
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

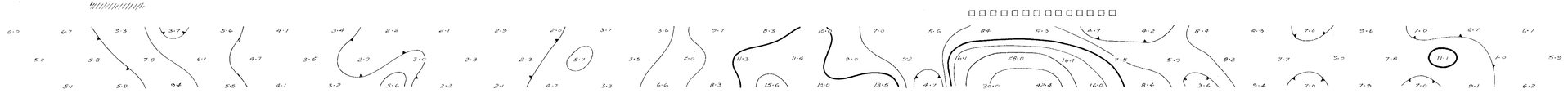
36W 30W 24W 18W 12W 6W 0 6E 12E 18E 24E 30E 36E 42E 48E 54E

Base Line No. 2 Line No. 12N



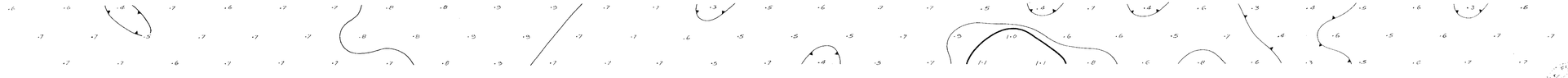
n = 1
n = 2
n = 3

Apparent Resistivity (ohm feet)



n = 1
n = 2
n = 3

Metal Factor



n = 1
n = 2
n = 3

Frequency Effect (%)

SCALE - 1" = 300', DATE - 13 May 1970

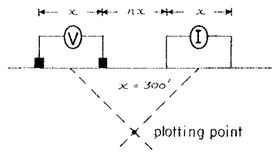
Contour at logarithmic multiples of — 10, 15, 20, 30, 50, 75, 100

Base Line No 2 Line No 12N

INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

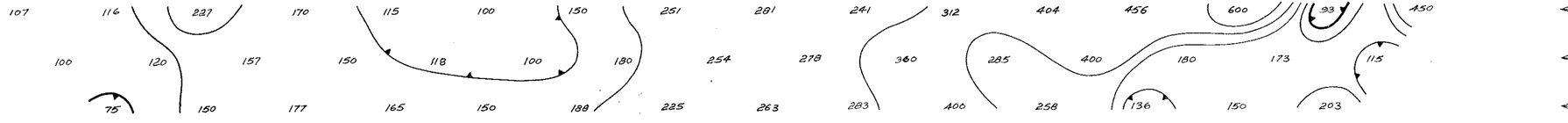
SOUTH SEAS OPTION
Highland Valley, B.C.

Electrode Configuration



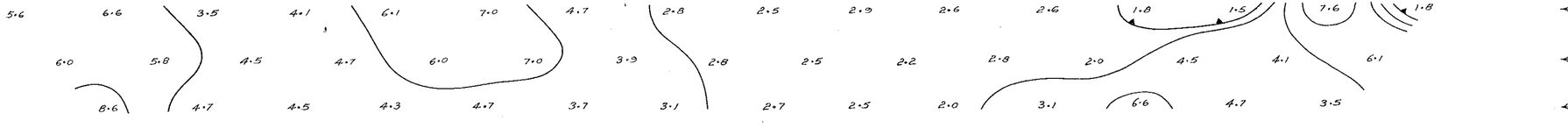
36W 30W 24W 18W 12W 6W 00 6E 12E

Base Line No. 2 **Line No. 20N**



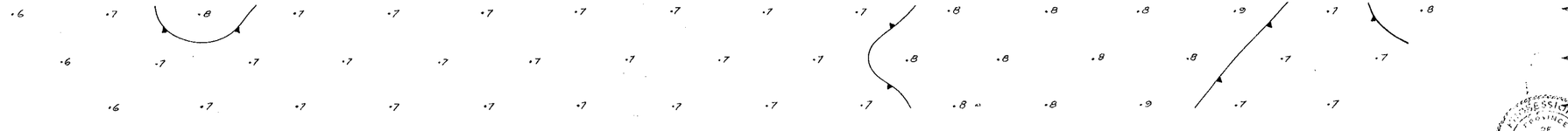
n = 1
n = 2
n = 3

Apparent Resistivity (ohm feet)



n = 1
n = 2
n = 3

Metal Factor



n = 1
n = 2
n = 3

Frequency Effect (%)

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA

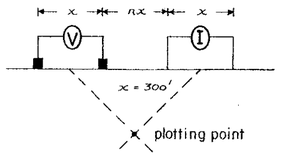
Expiry Date June 24, 1971

SCALE - 1" = 300'; DATE - 19 May 1970

Contour at logarithmic multiples of —
— 10, 15, 20, 30, 50, 75, 100

Base Line No 2 Line No 20N

Electrode Configuration



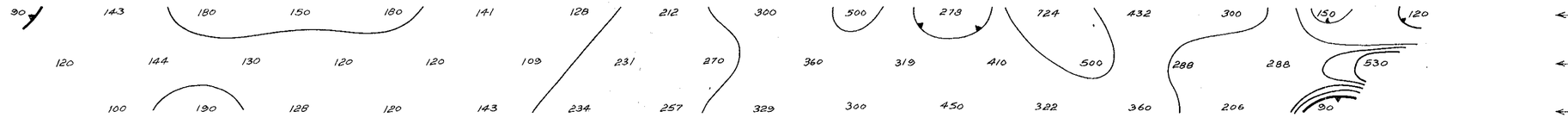
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

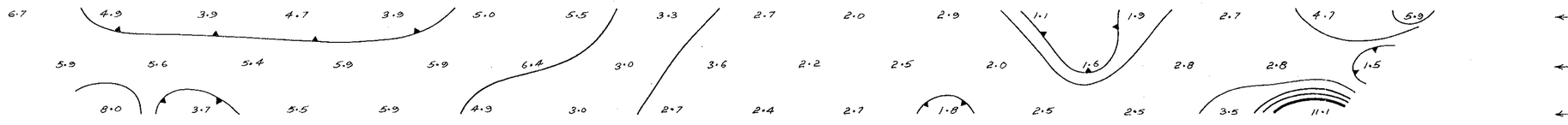
36W 30W 24W 18W 12W 6W 00 6E 12E

Base Line No. 2 **Line No. 24N**



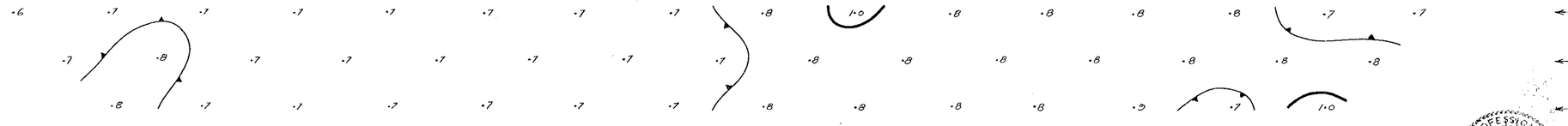
n = 1
n = 2
n = 3

Apparent Resistivity (ohm feet)



n = 1
n = 2
n = 3

Metal Factor



n = 1
n = 2
n = 3

Frequency Effect (%)

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA T. R. GLEDHILL

Expiry Date, June 24, 1970

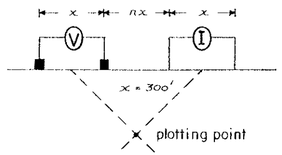
TRG 19/5/70

SCALE- 1" = 300'; DATE- 19 May 1970

Contour at logarithmic multiples of —
— 10, 15, 20, 30, 50, 75, 100

Base Line No 2 Line No 24N

Electrode Configuration



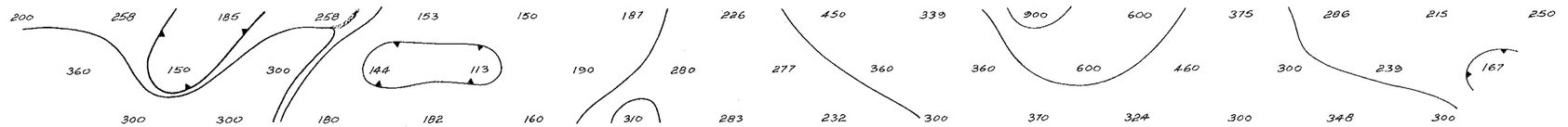
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

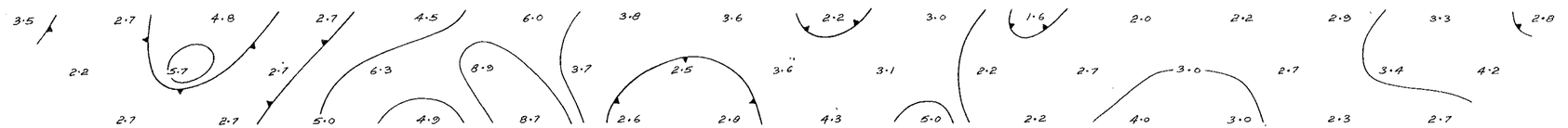
36W 30W 24W 18W 12W 6W 00 6E 12E

Base Line No. 2 **Line No. 28N**



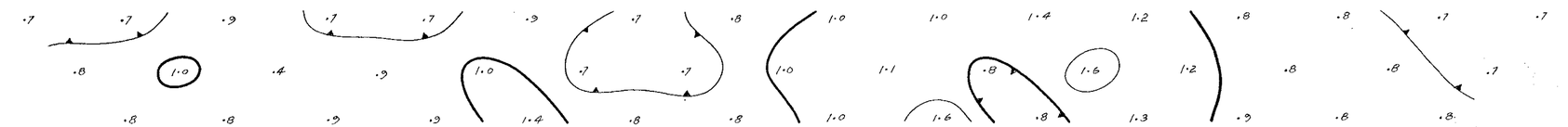
n = 1
n = 2
n = 3

Apparent Resistivity (ohm feet)



n = 1
n = 2
n = 3

Metal Factor



n = 1
n = 2
n = 3

Frequency Effect (%)

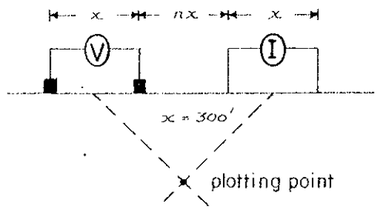
PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA T. R. GLEDHILL

SCALE- 1" = 300'; DATE - 20 May 1970

Contour at logarithmic multiples of –
– 10, 15, 20, 30, 50, 75, 100

Base Line No 2 Line No 28N

Electrode Configuration

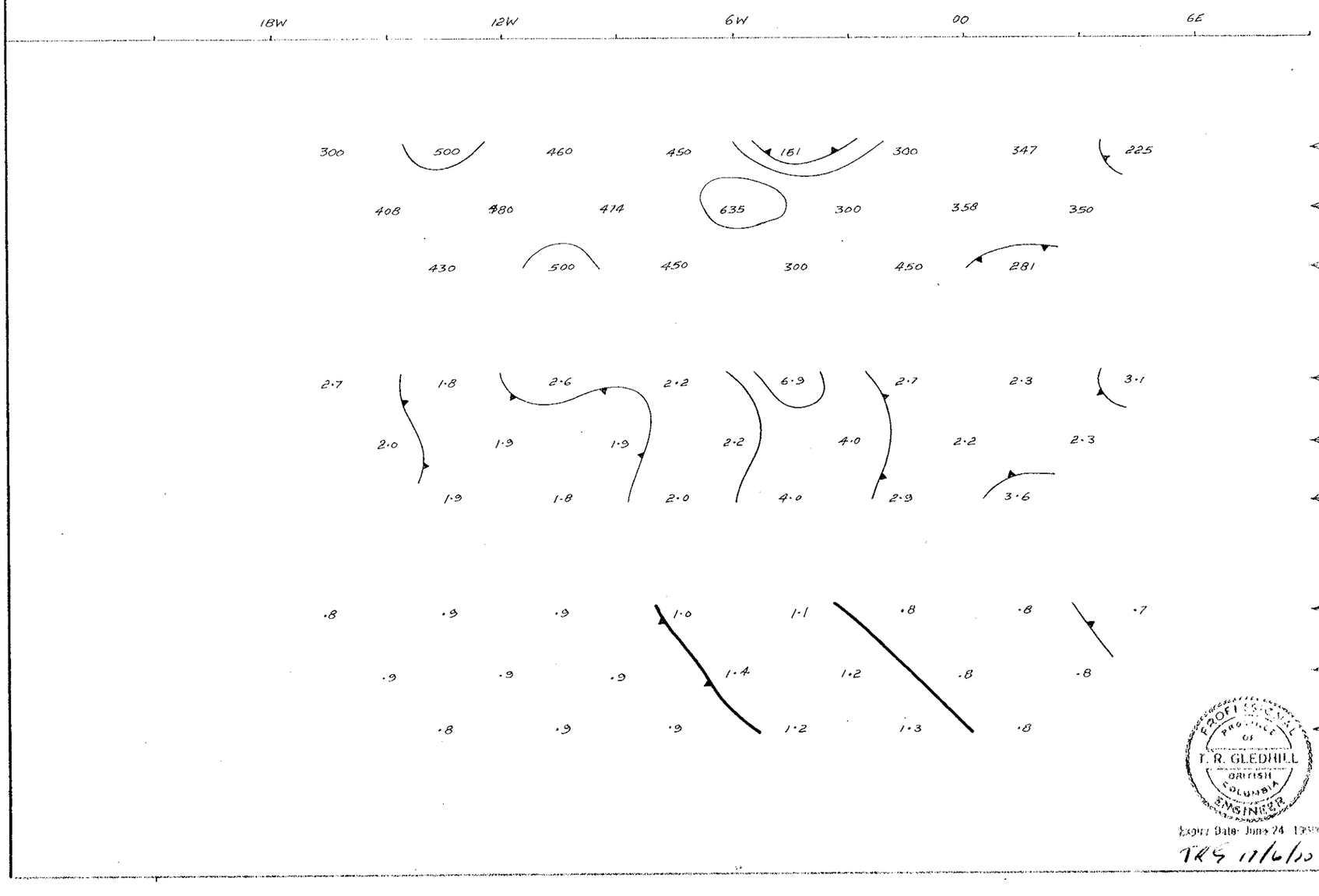


INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

Base Line No. 2 **Line No. 32N**



PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA T. R. GLEDHILL

Expiry Date: June 24 1970

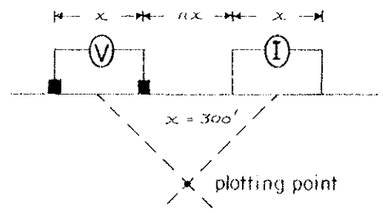
TRG 11/6/70

SCALE - 1" = 300'; DATE - 20 May 1970

Contour at logarithmic multiples of —
— 10, 15, 20, 30, 50, 75, 100

Base Line No2 Line No 32N

Electrode Configuration



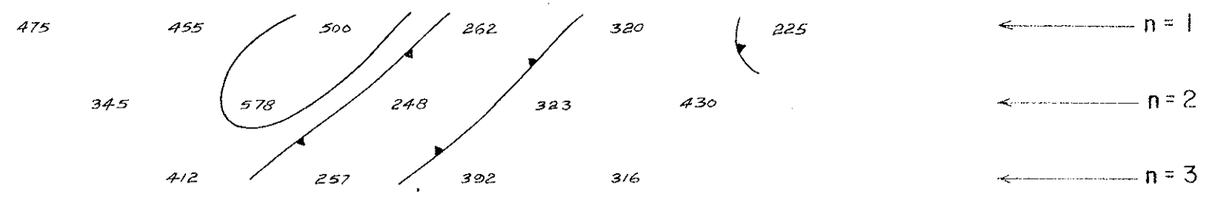
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

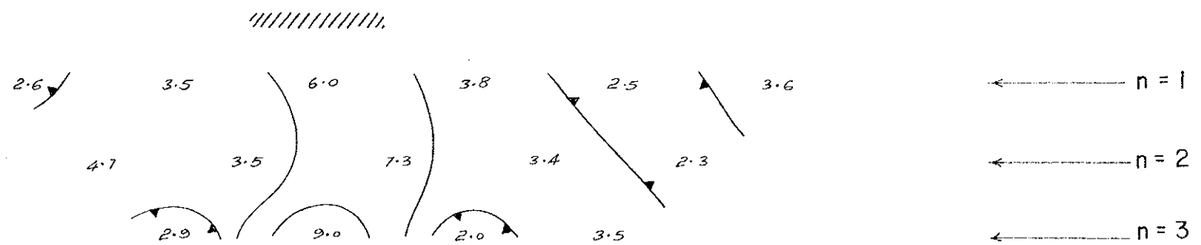
Highland Valley, B.C.

12W 6W 00 6E

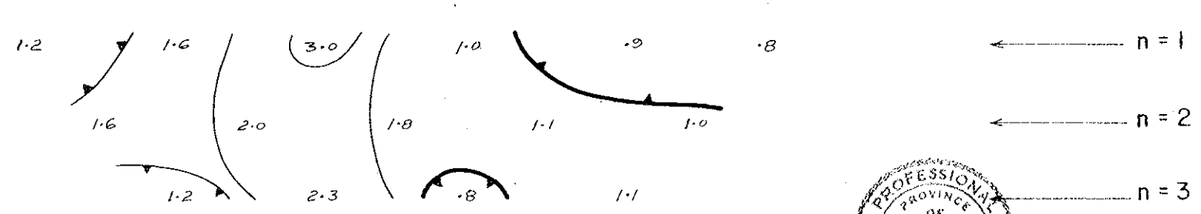
Base Line No. 2 **Line No. 36N**



Apparent Resistivity (ohm feet)



Metal Factor



Frequency Effect (%)

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
F. R. GLEDHILL

Expiry Date: June 24, 1970

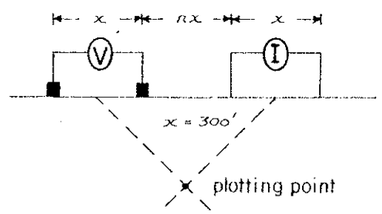
TRG 11/6/70

SCALE - 1" = 300'; DATE - 21 May 1970

Contour at logarithmic multiples of —
— 10, 15, 20, 30, 50, 75, 100

Base Line No 2 Line No 36N

Electrode Configuration



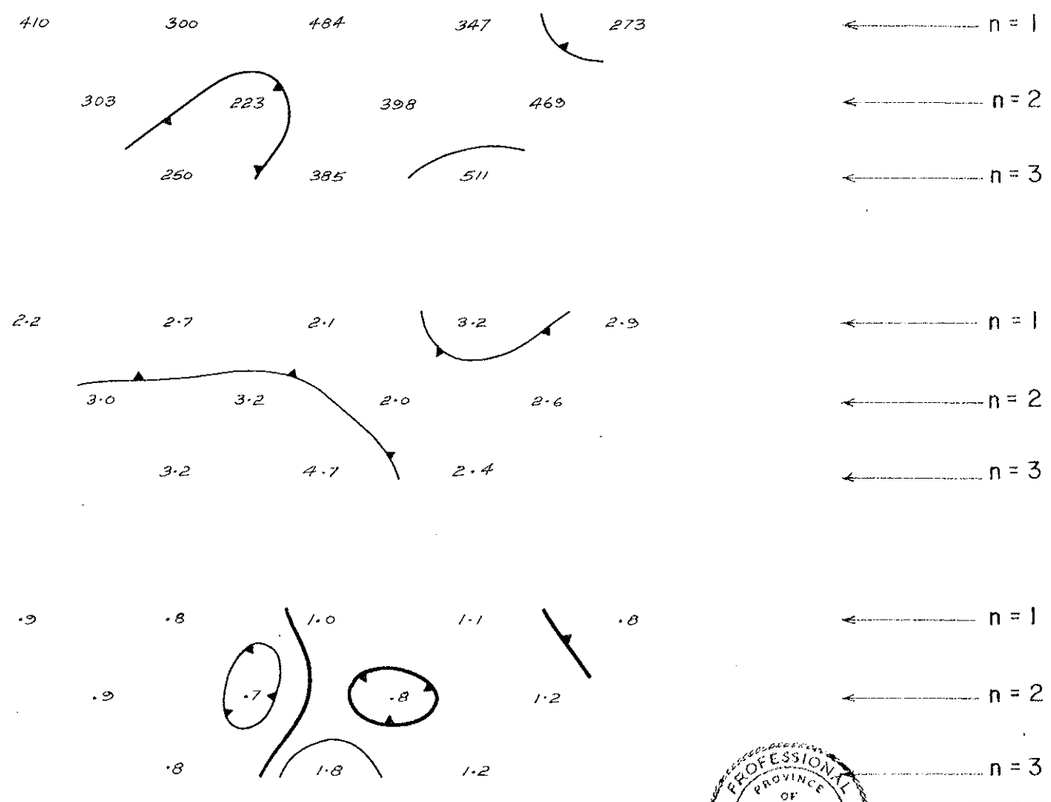
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

12W 6W 00 6E

Base Line No. 2 **Line No. 40N**



Apparent Resistivity (ohm feet)

Metal Factor

Frequency Effect (%)

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA T. R. GLEDHILL

Expiry Date: June 24, 1970

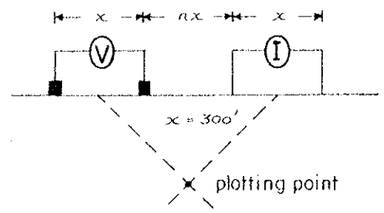
TRG 11/6/70

SCALE - 1" = 300' ; DATE - 21 May 1970

Contour at logarithmic multiples of –
– 10, 15, 20, 30, 50, 75, 100

Base Line No 2 Line No 40N

Electrode Configuration

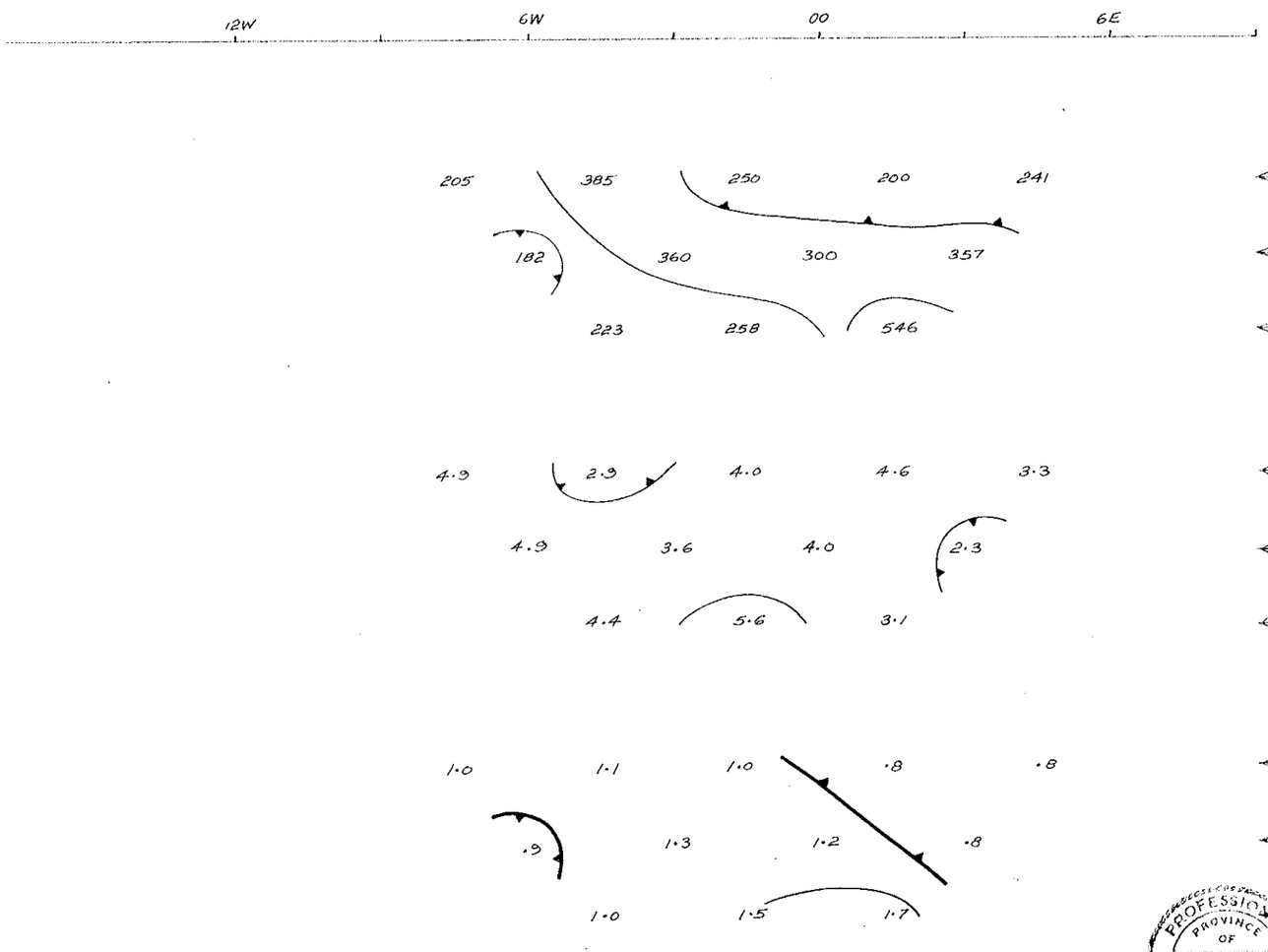


INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

Base Line No. 2 **Line No. 44N**



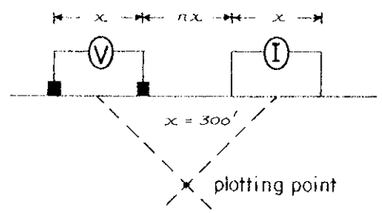
PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA T. R. GLEDHILL

SCALE- 1" = 300'; DATE- 22 May 1970

Contour at logarithmic multiples of --
- 10, 15, 20, 30, 50, 75, 100

Base Line No 2 Line No 44N

Electrode Configuration



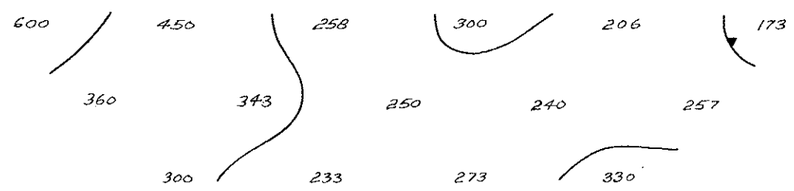
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

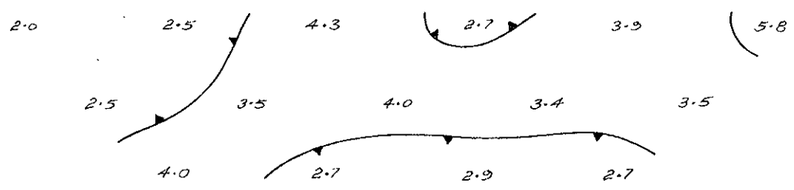
Highland Valley, B.C.

12W 6W 00 6E

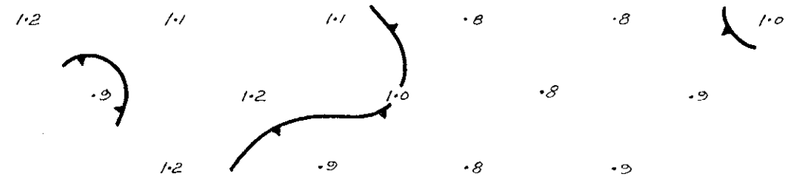
Base Line No. 2 **Line No. 48N**



Apparent Resistivity (ohm feet)



Metal Factor



Frequency Effect (%)

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA T. N. GLEDHILL

Expiry Date June 30, 1970

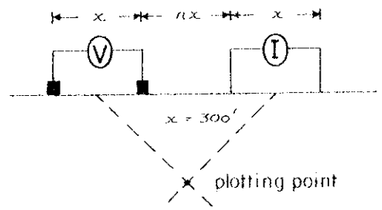
T R 27/6/70

SCALE- 1" = 300'; DATE – 22 May 1970

Contour at logarithmic multiples of –
– 10, 15, 20, 30, 50, 75, 100

Base Line No 2 Line No 48 N

Electrode Configuration



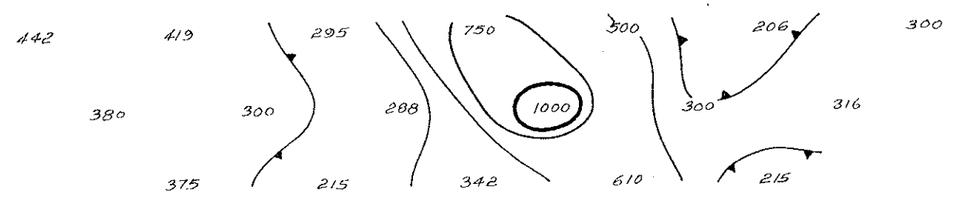
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

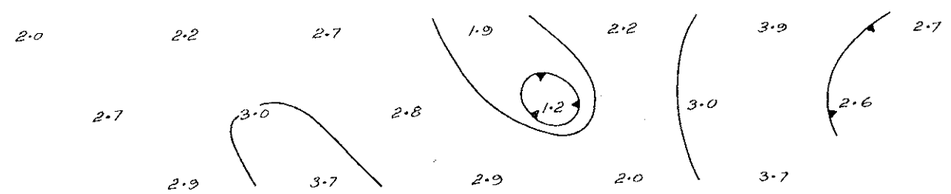
18W 12W 9W 6W 00 6E

Base Line No. 2 **Line No. 52N**



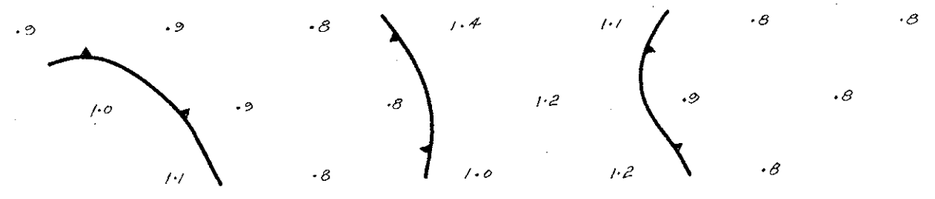
n = 1
n = 2
n = 3

Apparent Resistivity (ohm feet)



n = 1
n = 2
n = 3

Metal Factor



n = 1
n = 2
n = 3

Frequency Effect (%)

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
T. R. GLEDHILL

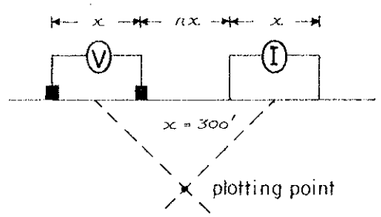
Expiry Date June 30, 1970

SCALE - 1" = 300'; DATE - 22 May 1970

Contour at logarithmic multiples of –
– 10, 15, 20, 30, 50, 75, 100

Base Line No 2 Line No 52N

Electrode Configuration



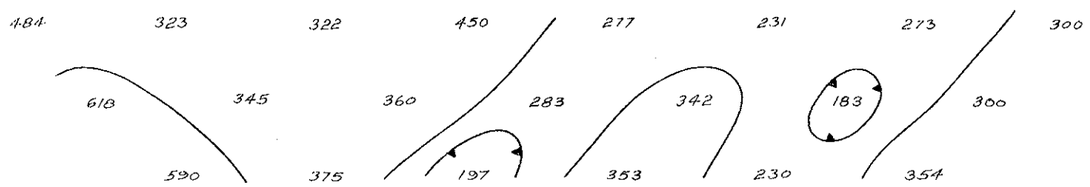
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

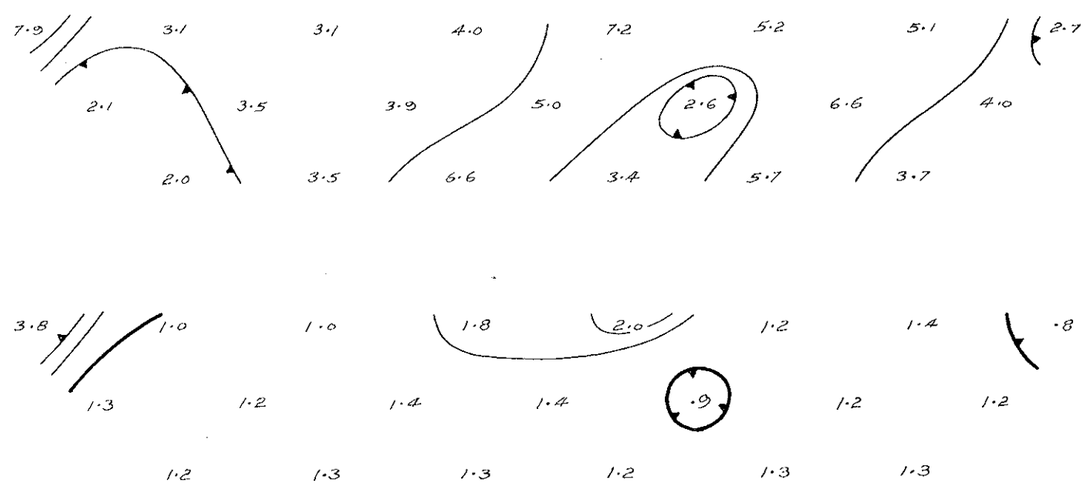
18W 12W 6W 00 6E

Base Line No. 2 **Line No. 56N**



n = 1
n = 2
n = 3

Apparent Resistivity (ohm feet)



n = 1
n = 2
n = 3

Metal Factor

n = 1
n = 2
n = 3

Frequency Effect (%)

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA T. R. GLEDHILL

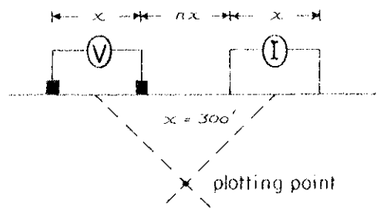
Expires June 30, 1971

SCALE - 1" = 300' ; DATE - 23 May 1970

Contour at logarithmic multiples of –
– 10, 15, 20, 30, 50, 75, 100

Base Line No 2 Line No 56N

Electrode Configuration

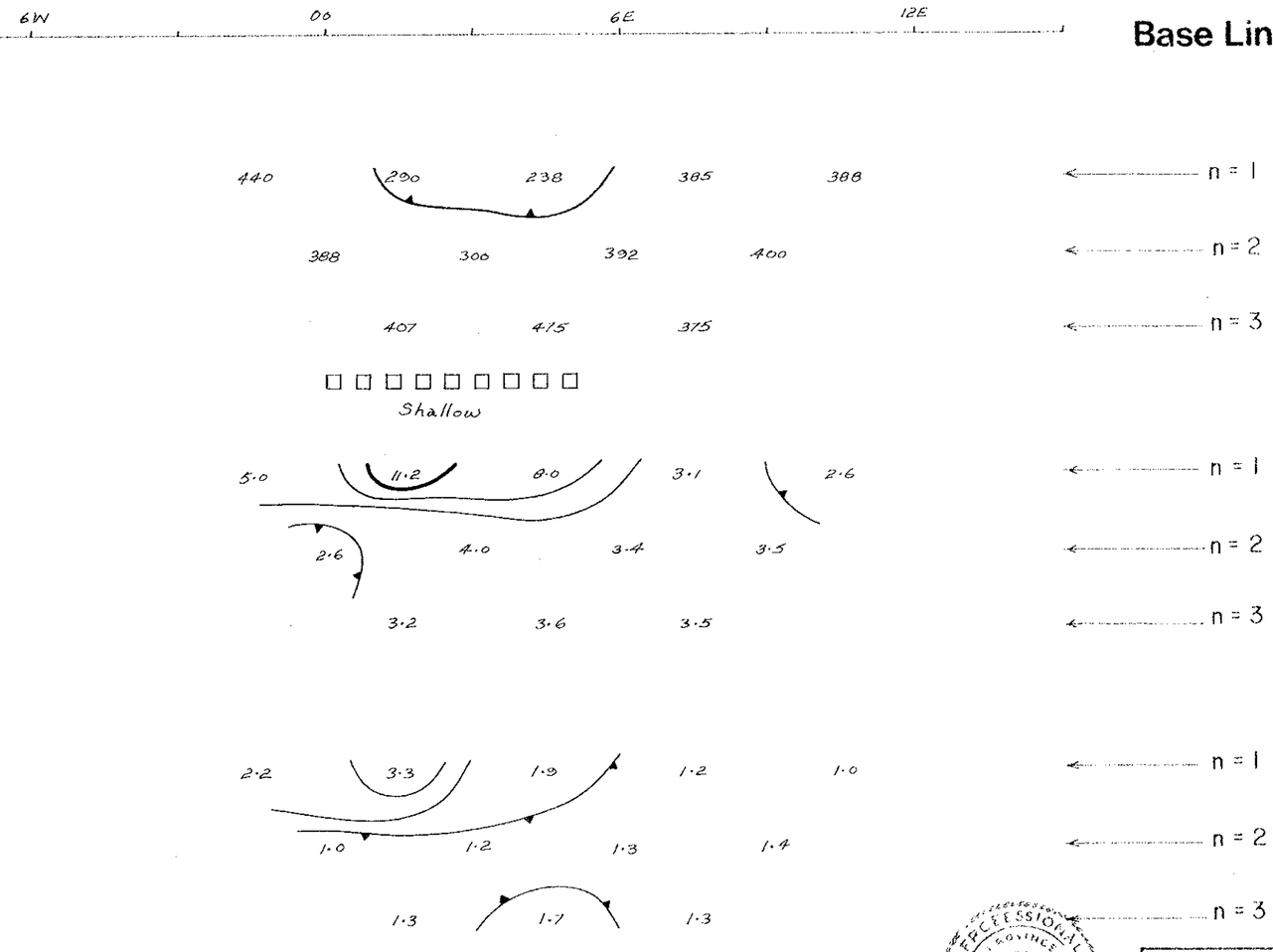


INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

Base Line No. 3 Line No. 4N



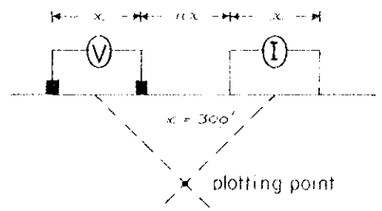
PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA F. R. GLEDHILL

SCALE - 1" = 300'; DATE - 23 May 1970

Contour at logarithmic multiples of — — 10, 15, 20, 30, 50, 75, 100

Base Line NO 3 Line NO 4N

Electrode Configuration



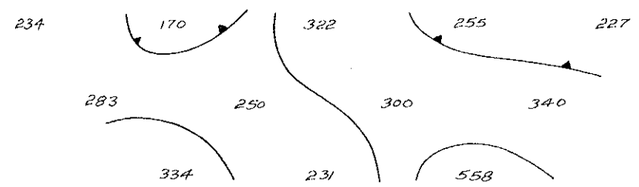
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

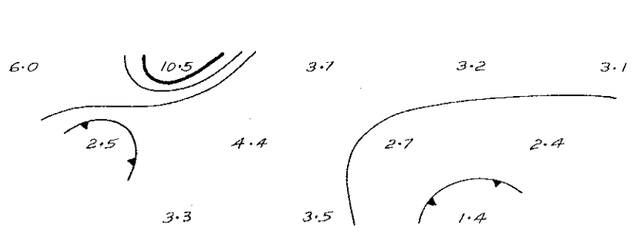
6W 00 6E 12E

Base Line No. 3 **Line No. 8N**



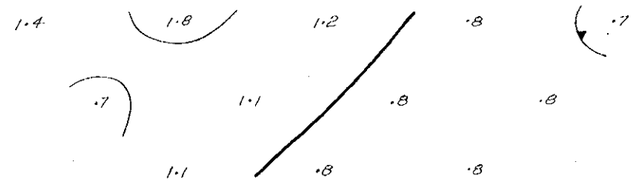
n = 1
n = 2
n = 3

Apparent Resistivity (ohm feet)



n = 1
n = 2
n = 3

Metal Factor



n = 1
n = 2
n = 3

Frequency Effect (%)

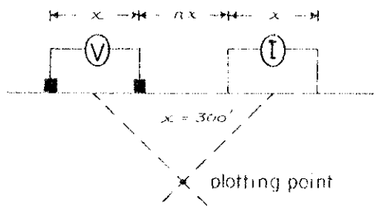
PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA

SCALE – 1" = 300'; DATE – 24 May 1970

Contour at logarithmic multiples of –
– 10, 15, 20, 30, 50, 75, 100

Base Line NO 3 Line NO 8N

Electrode Configuration

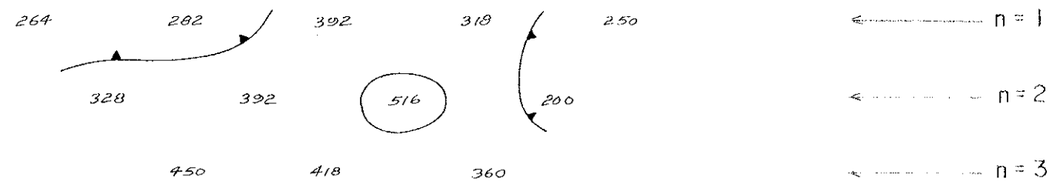


INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

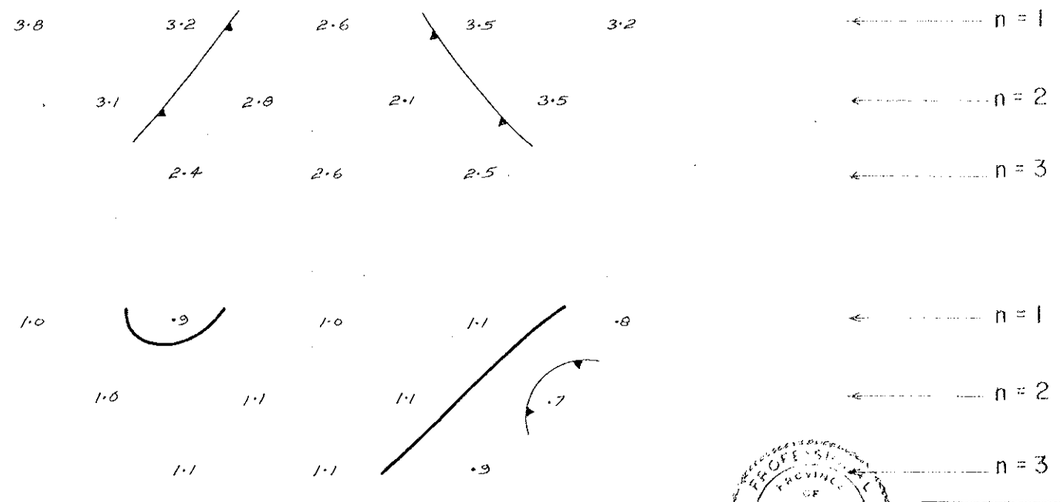
SOUTH SEAS OPTION

Highland Valley, B.C.

Base Line No. 3 **Line No. 12 N**



Apparent Resistivity (ohm feet)



Metal Factor

Frequency Effect (%)

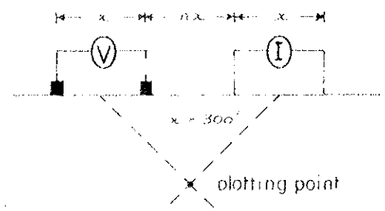
PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA J. R. GLEDHILL

SCALE- 1" = 300'; DATE -- 24 May 1970

Contour at logarithmic multiples of --
-- 10, 15, 20, 30, 50, 75, 100

Base Line No 3 Line No 12N

Electrode Configuration



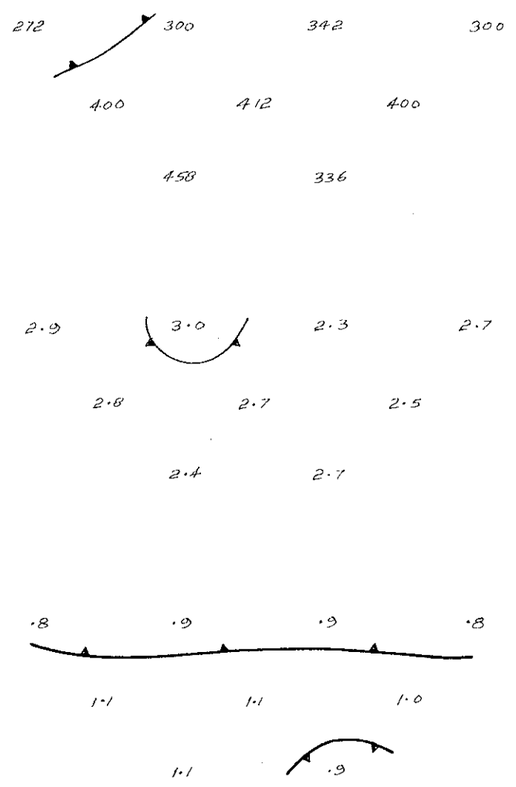
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

6W 00 6E

Base Line No. 3 **Line No. 16N**



n = 1
n = 2
n = 3

Apparent Resistivity (ohm feet)

n = 1
n = 2
n = 3

Metal Factor

n = 1
n = 2
n = 3

Frequency Effect (%)

PROFESSIONAL ENGINEER OF T. R. GLEDHILL BRITISH COLUMBIA ENGINEER

Expiry Date June 21 1970

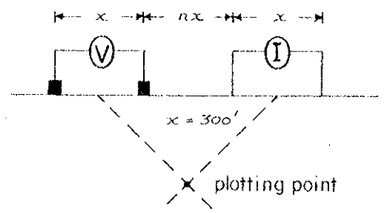
TK 11/6/70

SCALE - 1" = 300' ; DATE - 24 May 1970

Contour at logarithmic multiples of --
-- 10, 15, 20, 30, 50, 75, 100

Base Line No 3 Line No 18N

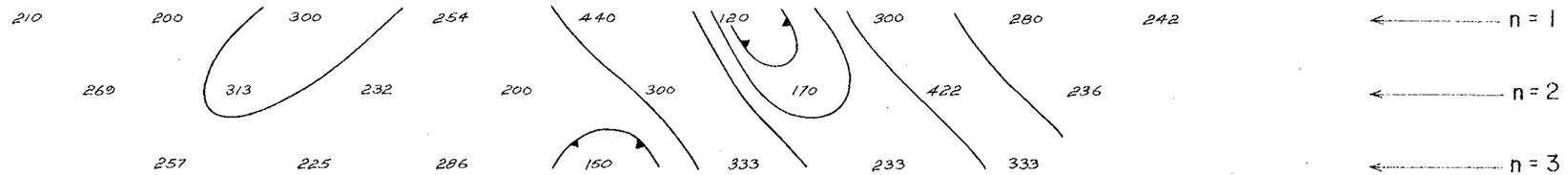
Electrode Configuration



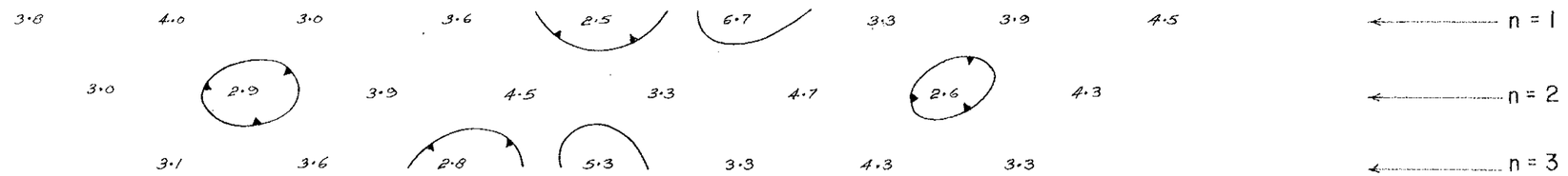
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION
Highland Valley, B.C.

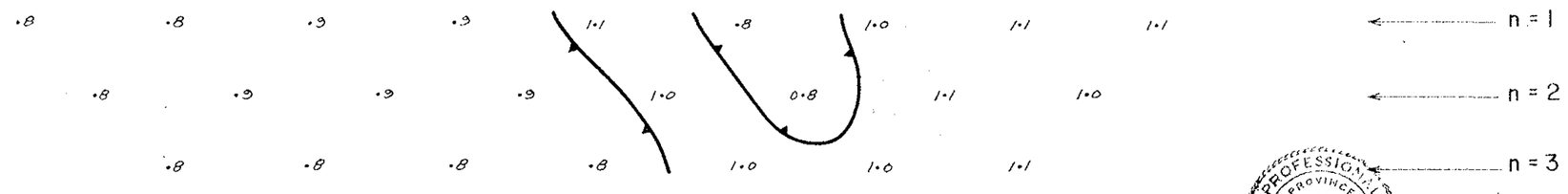
Base Line No. 1 **Line No. 16S**



Apparent Resistivity (ohm feet)



Metal Factor



Frequency Effect (%)

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
T. R. GLEDHILL

Expiry Date. June 24, 1970

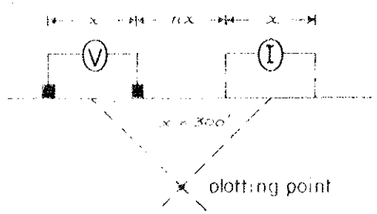
TRG 11/6/70

SCALE- 1" = 300'; DATE- 5 May 1970

Contour at logarithmic multiples of —
— 10, 15, 20, 30, 50, 75, 100

Base Line No 1 Line No 16S

Electrode Configuration



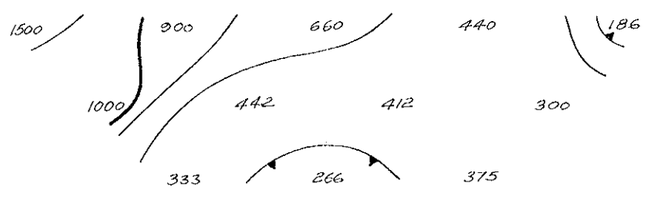
INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

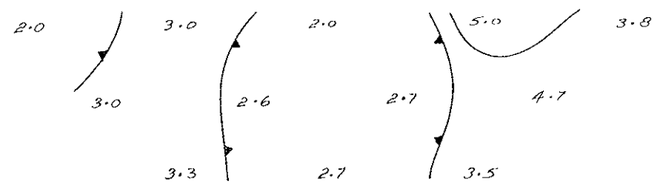
12W 6W 00 3E 6E

Base Line No. 3 **Line No. 20N**



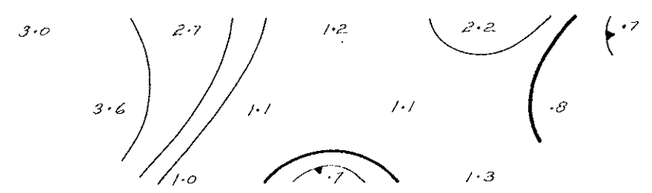
n = 1
n = 2
n = 3

Apparent Resistivity (ohm feet)



n = 1
n = 2
n = 3

Metal Factor



n = 1
n = 2
n = 3

Frequency Effect (%)

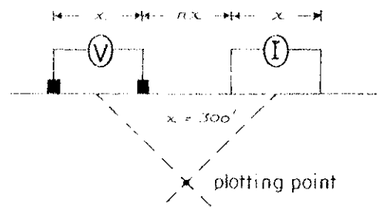
PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA E. R. GLEDHILL

Base Line No 3 Line No 20N

SCALE - 1" = 300'; DATE - 25 May 1970

Contour at logarithmic multiples of -- - 10, 15, 20, 30, 50, 75, 100

Electrode Configuration

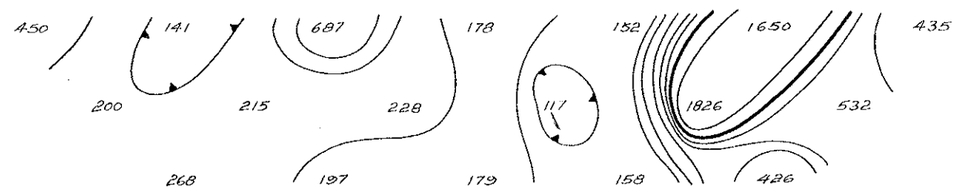


INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

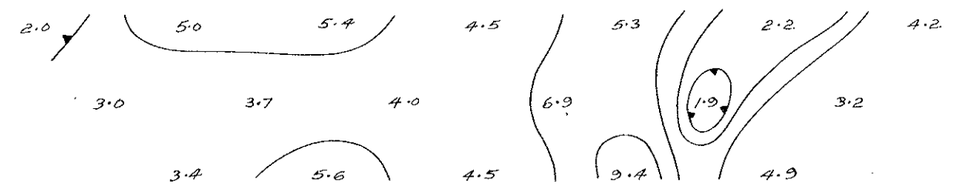
Highland Valley, B.C.

Base Line No. 3 **Line No. 24N**



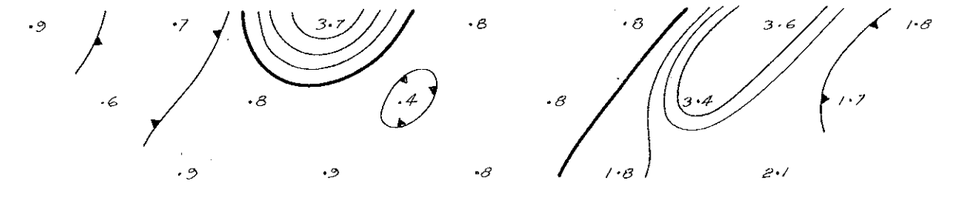
n = 1
n = 2
n = 3

Apparent Resistivity (ohm feet)



n = 1
n = 2
n = 3

Metal Factor



n = 1
n = 2
n = 3

Frequency Effect (%)

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
T. R. GLEDHILL

Topo. Data June 21 1970

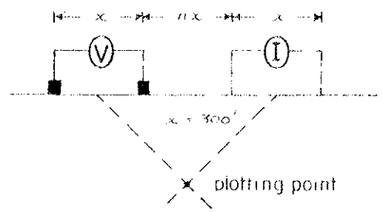
TRG 11/6/70

SCALE - 1" = 300' ; DATE - May 1970

Contour at logarithmic multiples of —
— 10, 15, 20, 30, 50, 75, 100

Base Line No 3 Line No 24N

Electrode Configuration

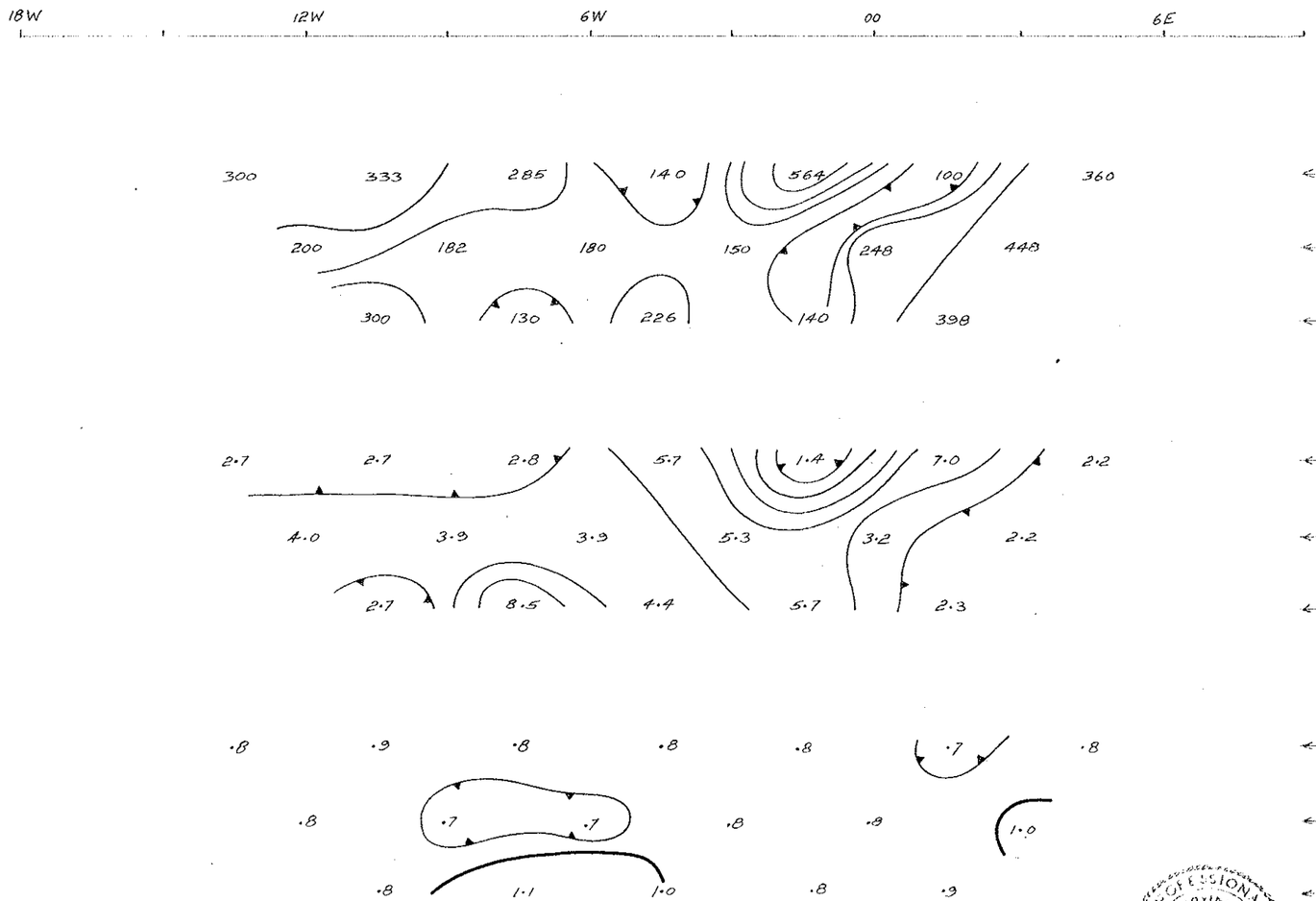


INDUCED POLARIZATION AND RESISTIVITY SURVEY for PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

Base Line No. 3 **Line No. 28N**



PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
T.R GLEDHILL

Expiry Date June 24

SCALE - 1" = 300'; DATE - 26 May 1970

Contour at logarithmic multiples of —
— 10, 15, 20, 30, 50, 75, 100

Base Line No 3 Line No 28N

INDUCED POLARIZATION
AND
RESISTIVITY SURVEY
for
PECHINEY DEVELOPMENT LTD.

SOUTH SEAS OPTION

Highland Valley, B.C.

500' 0 500' 1000' 1500'

Scale 1"=500'

Base line 3
28 N
24N
20N
16 N
12N
8N
4N
00
56N
52N
48N
44N
40N
36N
32N
28N
24N
20N
16N
12N
8N
4N
00
Transvaal Shaft
Highland Shaft
Base line 2
Trojan Creek
Salmo Lake
5336'
6185'
6165'
South Seas camp
Shaft
Base line 1
40N
36N
32N
28N
24N
20N
5930'
16N
12N
8N
4N
00
4S
8S
12S
16S
20S

N

LEGEND

Truck road
Trail
Creek
Top of hill
Property boundary
Claim post

Surface Projections of Anomalous Zones
Definite
Probable
Possible

2788

M-16