

Night Hawk Group

R.T. No's 1-24

S.K. No's 1-2416

Geophysical Report

Induced Polarization Survey.

Night Hawk Group, Tchentlo Lake, Omineca M.D.

55 10' North - 124 50' West.

by J.P. Jemmett, Ph.D. and

H. Veerman, P.Eng. Supervisor.

93 N/2W.

851

851

GEOPHYSICAL REPORT  
INDUCED POLARIZATION SURVEY

J.P. Jemmett, Ph.D. and H. Veerman, P.Eng. Supervisor.

on the

NIGHT HAWK GROUP of CLAIMS

Tchentlo Lake, Omineca M.D.  
55 10' North - 124 50' West

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Report. J.P. Jemmett, Ph.D.

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Okanagan Helicopters Invoices No. 8/352 and 8/581

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INTRODUCTION TO THE GEOPHYSICAL REPORT BY J.F.JEMMETT.  
BY H. VEERMAN, P.Eng.

The field work for the Induced Potential Survey described in the following pages was carried out under the direction of Heinz Veerman, a Registered Professional Engineer (Geological) in the Province of B.C.

The Geophysical Survey covering the S.K. No's 1, 2 and 4 Mineral Claims, and part of the R.T. No 22 Mineral Claim was completed during August 1966. These claims form part of the Night Hawk Group of 39 claims.

The following report was filed with the Mining Recorder for assessment work purposes as Geophysical work.

The claims are registered in the name of David L. Moore acting on behalf of a syndicate called "West Coast Mining & Exploration" in which the J.R. Simplot Company of Boise, Idaho has a 25% interest. Mr. J.F. Jemmett is the geophysicist for the J.R. Simplot Company.

The survey was carried out in the period from August 11, 1966 to August 17th, 1966. The crew was lifted in by helicopter on August 11th, and moved out again on August 18th.

The property is at an elevation of over 4500 feet. A helicopter was essential to lift men and equipment to the area to be surveyed.

The maps included with this report:

1. Claim Map, Nation Copper Property, and
  2. Induced Polarization Survey, Nation Copper Property,
- were prepared by H. Veerman, P. Eng. from tape and compass surveys and from the information contained in the report by J.F. Jemmett.

November 11th, 1966.



REPORT OF GEOPHYSICAL INVESTIGATION

NATION LAKES COPPER

INDUCED POLARIZATION SURVEY

INTRODUCTION

During the period August 11 to August 18, 1966, an induced polarization survey, consisting of 8 traverses, was run over the SK group of mineral claims. The survey was made to delineate and substantiate a copper sulphide zone which had been partially mapped by surface geological and geochemical methods. This report is designed to present the details of that survey and an interpretation which is presented herein in compliance with the "Mineral Act", Chapter 244, Revised Statutes of British Columbia, 1960, setting forth the conditions governing acceptance of geological, geophysical and geochemical surveys as assessment work.

The survey was conducted by Dr. Joe P. Jemmett, a graduate geophysist and geologist, under the direct supervision of Mr. Heinz Veerman, a registered Professional Engineer in the Province of British

Columbia. Mr. John Nordlund served as transmitter operator, Mr. David Moore as potman, and Mr. Bill Botel as chainman.

#### STATEMENT OF QUALIFICATIONS

Joe P. Jemmett graduated in 1953 with a B. S. degree in geology from Idaho State College, received a M. S. degree from the University of Idaho in 1955 with a major in geology and minors in metallurgy and mining, and in 1966 received a Ph. D. degree from The University of Arizona with majors in geophysics and economic geology and minors in structural and petroleum geology. He presently holds the position of Assistant Manager of Exploration for the J. R. Simplot Company.

#### COST OF SURVEY

Six days were spent in actual surveying. This cost is in addition to amortization of men and equipment to the area. The following is a statement of costs:

Amortization	\$ 340.00
Helicopter Rental	1,318.00
Camp Supplies	150.00
Equipment Rental 6 days @ \$100/day	600.00

Salaries & Labor            \$1,650.00

Total Cost                    \$4,058.00

GEOPHYSICAL EQUIPMENT USED

The equipment used consisted of an induced polarization Model Mark IV receiver and transmitter powered by a 400 cycle, 3½ horsepower alternator. The equipment utilizes the frequency domain principle and has repeatable characteristics to within one percent, according to its manufacturer, Hienrichs Geoeexploration Company of Tucson, Arizona.

METHOD OF SURVEY

Parallel lines were run on a bearing of N. 65° E. at 500 foot intervals (Note Figure No. I). The Eltran or dipole-dipole array was used with the electrodes ("A" value) at 200 foot intervals (Note Figures No's. 1 through 8). Successive potential readings were made to the 5th "A" separation on both sides of the traverse center point (Electrode No. 3) and in two instance (Line No's. 7 and 8) a 6th separation was used on the northeast side.

### METHOD OF CALCULATION

Transmission was at two frequencies: 3 C. P. S. (AC) and .05 C. P. S. (DC). The two potential redouts were then used to calculate apparent resistivities ( $\rho/2\pi$  in ohms  $\frac{ft.}{2\pi}$ ) and metal conductivity factors (MCF) which can be interpreted as measurements of polarization due to the presence of metallic conductors (Note Figures No's. 1-A through 8-B).

### METHOD OF ILLUSTRATION

The values thus calculated were then plotted upon interpretational diagrams (Note Figures No's. 1 through 8) and the interpretation shown in terms of the probable configuration and attitude of responsive zones. The traverse lines and the position of responsive elements were then plotted on Figure No. I and shown in lateral correlation.

### CONCLUSIONS

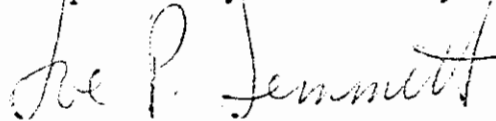
A responsive body is delineated and fixed in position by lines 1, 2, 3, and 4, with its strongest development being crossed by lines 1 and 2. Lines 3 and 4 apparently record only weak remnants of the strong response recorded by lines



1 and 2. The responsive body is from 100 to 200 feet thick and dips steeply westward.

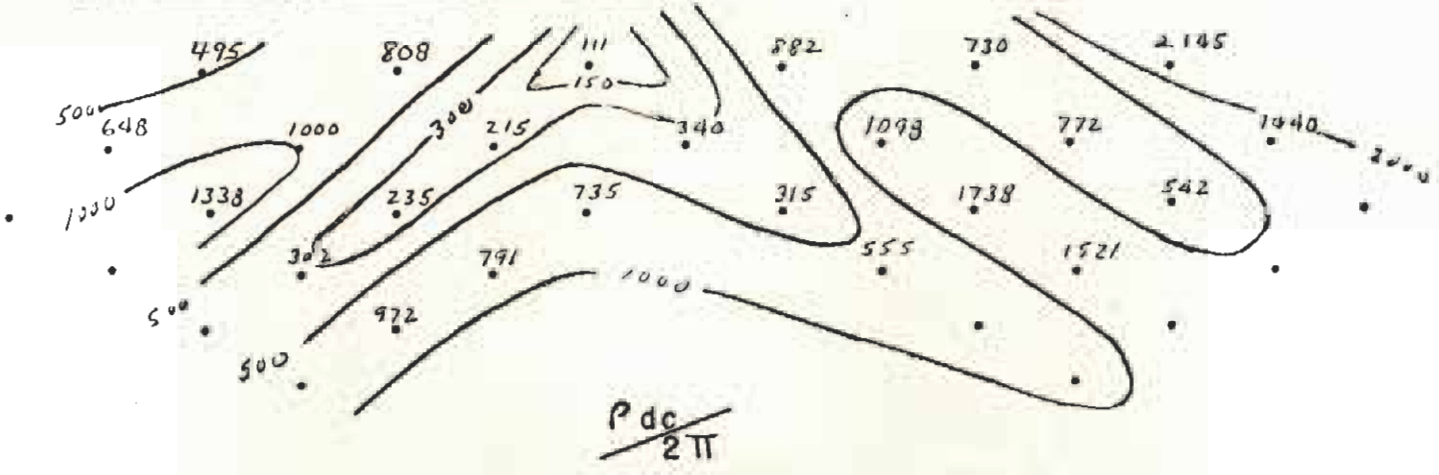
Line 6 showed an additional broad, but weak response which also dips westward, but this responsive area is apparently not correlative with any other response.

Respectfully submitted,

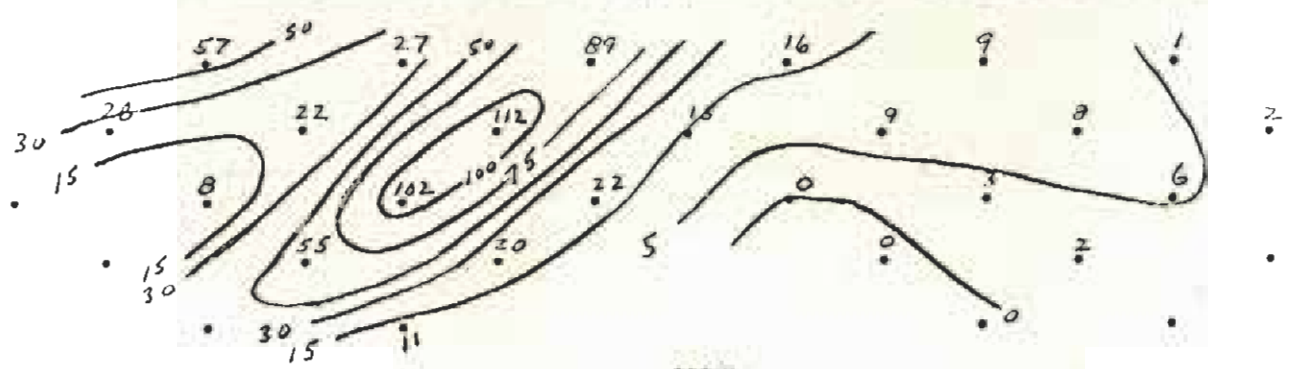
A handwritten signature in cursive script that reads "Joe P. Jemmett". The signature is written in dark ink and is positioned directly below the typed name.

Joe P. Jemmett

10 1 2 3 4 5 6



10 1 2 3 4 5 6



MCF

10 1 2 3 4 5 6

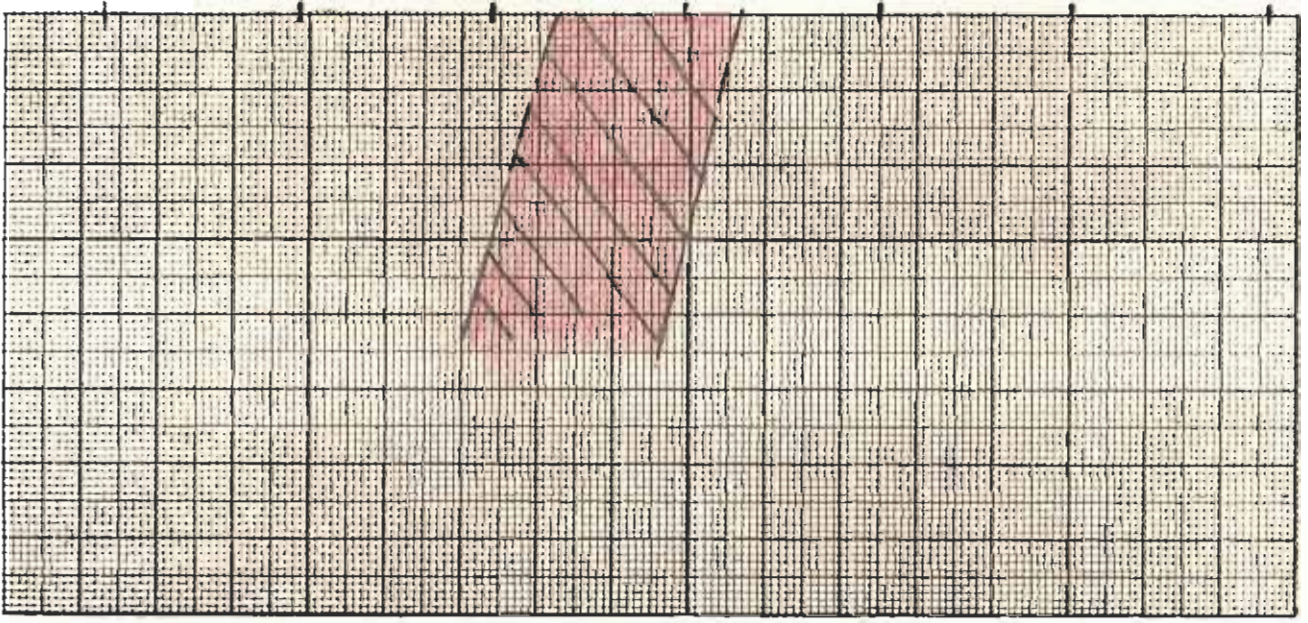


FIGURE NO. 1

SP. - GEOLOGY  
SIMPLOT INDUSTRIES INC.

COORDINATES 3

EAST NORTH

PROJ. Nation Lakes  
 LINE /  
 BEARING N 65 E  
 DATE 8/12/66  
 NAME Jennett  
 A 200'

**FIGURE NO. 1-A**

**J. R. SIMPLOT COMPANY  
INDUCED POLARIZATION SURVEY COMPUTATION SHEET**

Project Marion Lake Line 1 A. 200' Data Page 1 Date 8/12/66 Comp. By J.J.

Send	2-3	2-1	3-4	2-3	2-1	4-5	3-4	2-3	2-1	4-5	3-4	2-3	2-1
Receive	4-5	4-5	5-6	5-6	5-6	6-7	6-7	6-7	6-7	7-8	7-8	7-8	7-8
n	1	2	1	2	3	1	2	3	4	2	3	4	5
Kn x 10 <sup>-3</sup>	.6	2.4	.6	2.4	.6	.6	2.4	.6	12	2.4	.6	12	2.1
I (mA)	100												
Range	300	30	300	100	10	1000	100	100	30	100	30	30	—
Vdc (mV)	33.0	25.6	21.0	81.4	9.36	638	57.5	52.0	8.22	107	16.6	22.7	—
Vac (mV)	290	25.3	2.10	77.7	10.30	642	56.4	52.0	8.80	108	16.9	22.8	—
Vac Corr	—	—	—	—	—	—	—	—	—	—	—	—	—
Dc Cal	.560												
Ac-Dc Cal	1.040												
ρ <sub>dc</sub>	882	325	730	1098	315	2145	772	1738	55.5	1440	542	1521	—
ρ <sub>dc</sub> /ρ <sub>ac</sub>	1.140	1.058	1.058	1.095	—	1.030	1.059	1.058	—	1.030	1.030	1.038	—
PFE	14	0	9	10	—	3	6	6	—	3	3	4	—
MCF	16	17	9	9	0	1	8	3	0	2	6	2	—

ACN < .03

$$Ac\ Corr = \sqrt{(Vac)^2 - (Acn \times 2)^2} \quad \rho_{dc} = Vdc \times \frac{Dc\ Cal \times Kn \times 10^3}{I} \quad \frac{\rho_{dc}}{\rho_{ac}} = Vdc \times \frac{Ac-Dc\ Cal}{Vac\ Corr.}$$

Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5
Receive	1-2	1-2	1-10	1-10	1-10	10-11	10-11	10-11	10-11	11-12	11-12	11-12	11-12
n	1	2	1	2	3	1	2	3	4	2	3	4	5
Kn x 10 <sup>-3</sup>	.6	2.4	.6	2.4	.6	.6	2.4	.6	12	2.4	.6	12	2.1
I (mA)	100												
Range	30	30	300	10	30	100	100	10	10	100	30	3	10
Vdc (mV)	33.0	24.9	23.9	15.9	21.8	147.1	74.2	6.99	11.8	49.0	39.6	4.46	8.24
Vac (mV)	31.4	24.9	20.4	13.3	19.7	118.4	63.0	5.84	10.6	42.0	37.0	3.99	7.74
Vac Corr	—	—	—	—	—	—	—	—	—	—	—	—	—
Dc Cal	.560												
Ac-Dc Cal	1.040												
ρ <sub>dc</sub>	111	335	808	215	735	495	1000	235	791	648	1338	302	972
ρ <sub>dc</sub> /ρ <sub>ac</sub>	1.099	1.040	1.220	1.240	1.159	1.282	1.222	1.240	1.160	1.182	1.110	1.162	1.110
PFE	10	4	22	24	16	28	22	24	16	18	11	16	11
MCF	89	12	27	112	22	57	22	102	20	28	8	55	11

ACN < .03

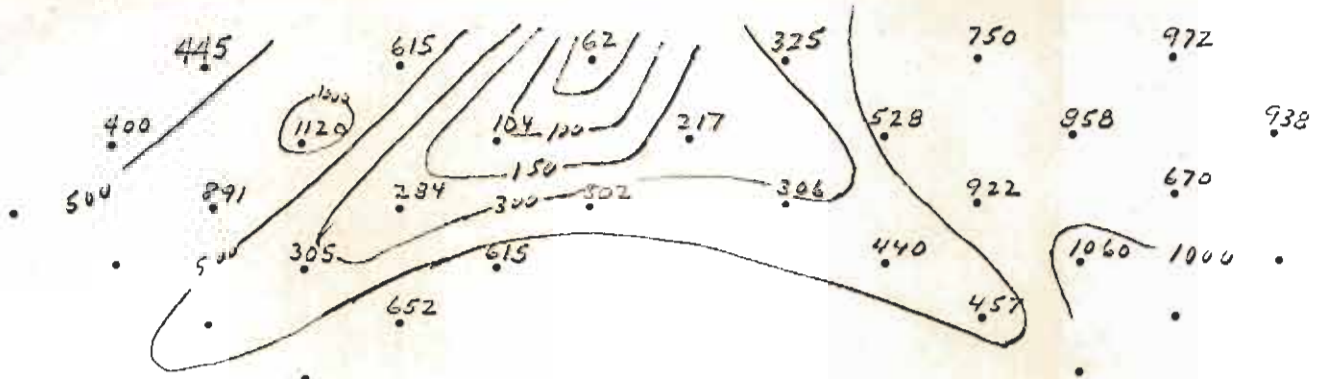
$$Kn \times 10^{-3} = \frac{an(n+1)(n+2) \times 10^{-3}}{2}$$

$$PFE = \frac{\rho_{dc}}{\rho_{ac}} - 1 (10^2)$$

$$MCF = \frac{\rho_{dc}}{\rho_{ac}} - 1 (10^5) / \rho_{dc}$$

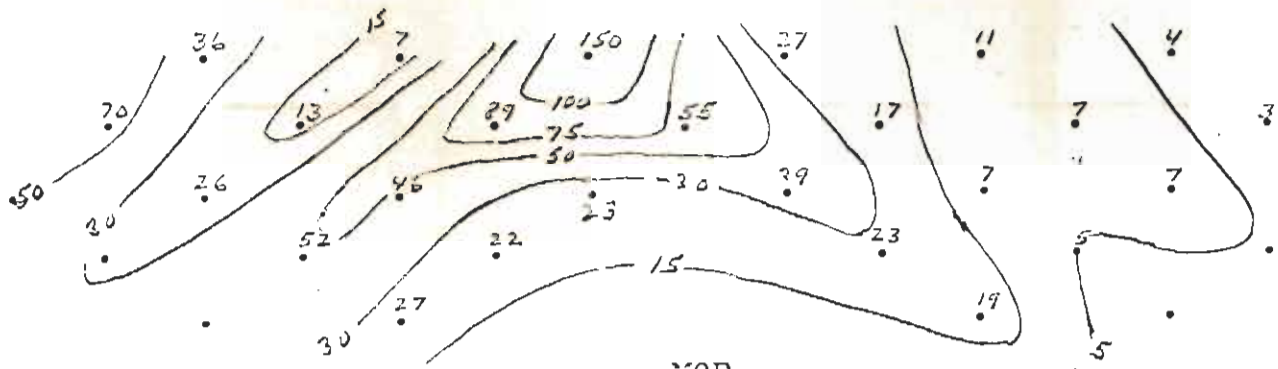


10 1 2 3 4 5 6



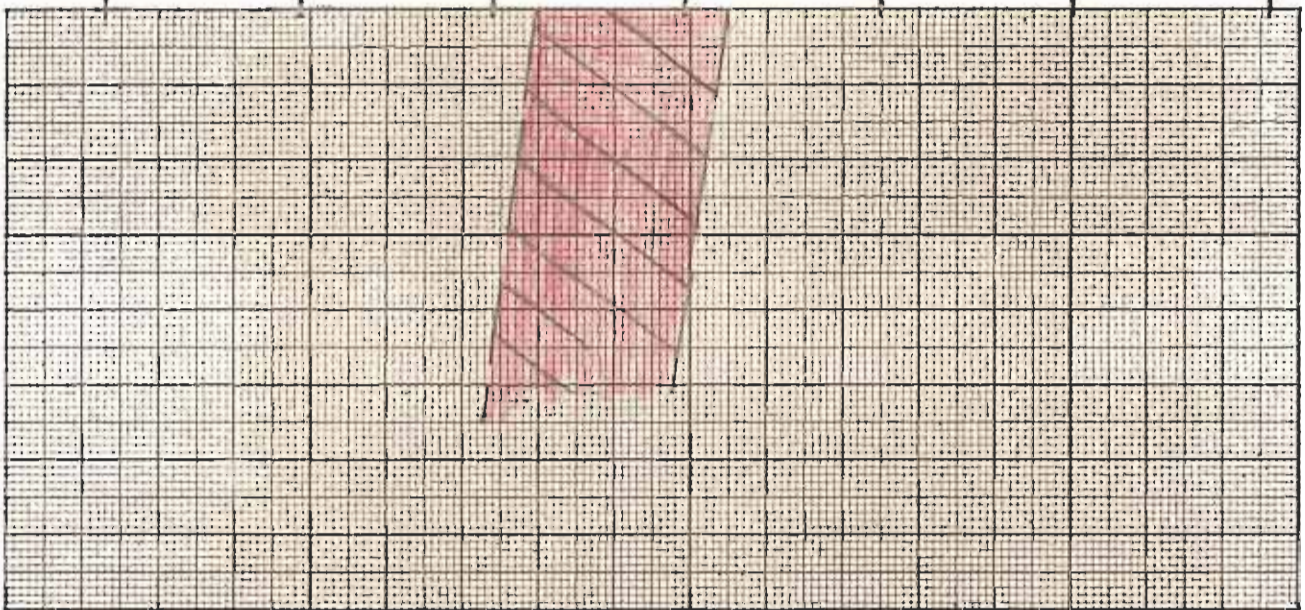
$$\frac{P dc}{2\pi}$$

10 1 2 3 4 5 6



MCF

10 1 2 3 4 5 6



**FIGURE NO. 2**

SP. - GEOLOGY  
 SIMPLOT INDUSTRIES INC.  
 COORDINATES 3  
 EAST NORTH

PROJ. Nation Lakes  
 LINE 2  
 BEARING N. 65 E.  
 DATE 8/13/66  
 NAME Jamnic 7  
 A 200'

**FIGURE NO. 2-A**

J. R. SIMPLOT COMPANY

INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Project W-11-105 Line 2 A. 200' Data Page 1 Date 8/13/66 Comp. By J.R.

Send	2-3	2-1	3-4	2-3	2-1	4-5	3-4	2-3	2-1	4-5	3-4	2-3	2-1
Receive	4-5	4-5	5-6	5-6	5-6	6-7	6-7	6-7	6-7	7-8	7-8	7-8	7-8
n	1	2	1	2	3	1	2	3	4	2	3	4	5
Kn x 10 <sup>-3</sup>	.6	2.4	.6	2.4	6	.6	2.4	6	12	2.4	6	12	21
I (ma)	150	500	150	150	500	150	150	150	500	150	150	150	500
Range	300	100	300	100	30	1000	100	100	30	100	30	30	30
Vdc (mV)	159	92.7	205	63.7	49.0	476	103.4	45.2	35.4	113	32.7	26.0	21.5
Vac mV	152	84.4	332	61.0	45.7	478	101.7	44.2	33.4	114	32.4	25.8	20.6
Vac Corr	—	—	—	—	—	—	—	—	—	—	—	—	—
Dc Cal	.520												
Ac-Dc Cal	1.040												
ρ <sub>dc</sub>	325	232	750	528	306	972	858	922	440	928	670	1060	457
ρ <sub>dc</sub> /ρ <sub>ac</sub>	1.089	1.139	1.082	1.088	1.118	1.038	1.060	1.065	1.102	1.032	1.050	1.049	1.085
PFE	9	14	2	9	12	4	6	7	10	3	5	5	9
MCF	7	60	11	17	39	4	7	7	23	3	7	5	19

ACN < .025

$$Ac\ Corr = \sqrt{(Vac)^2 - (Acn \times 2)^2} \quad \rho_{dc} = Vdc \times \frac{Dc\ Cal \times Kn \times 10^3}{I} \quad \frac{\rho_{dc}}{\rho_{ac}} = Vdc \times \frac{Ac-Dc\ Cal}{Vac\ Corr.}$$

Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5
Receive	1-2	1-2	1-10	1-10	1-10	10-11	10-11	10-11	10-11	11-12	11-12	11-12	11-12
n	1	2	1	2	3	1	2	3	4	2	3	4	5
Kn x 10 <sup>-3</sup>	.6	2.4	.6	2.4	6	.6	2.4	6	12	2.4	6	12	21
I (ma)	150					500	150			500	150		
Range	30	30	300	10	30	1000	100	30	30	300	30	10	10
Vdc (mV)	36.4	24.3	302	12.6	14.9	712	135	13.9	16.5	160	43.7	7.47	9.19
Vac	29.1	23.0	301	12.0	14.4	640	123	12.8	14.9	130	36.9	6.70	8.10
Vac Corr	—	—	—	—	—	—	—	—	—	—	—	—	—
Dc Cal	.520												
Ac-Dc Cal	1.040												
ρ <sub>dc</sub>	62.0	203	615	104	302	445	1120	224	675	400	891	305	652
ρ <sub>dc</sub> /ρ <sub>ac</sub>	1.093	1.099	1.045	1.092	1.070	1.158	1.142	1.130	1.151	1.290	1.235	1.160	1.180
PFE	9	10	5	9	7	16	14	13	15	28	24	16	18
MCF	150	49	7	89	23	36	13	46	22	70	26	52	27

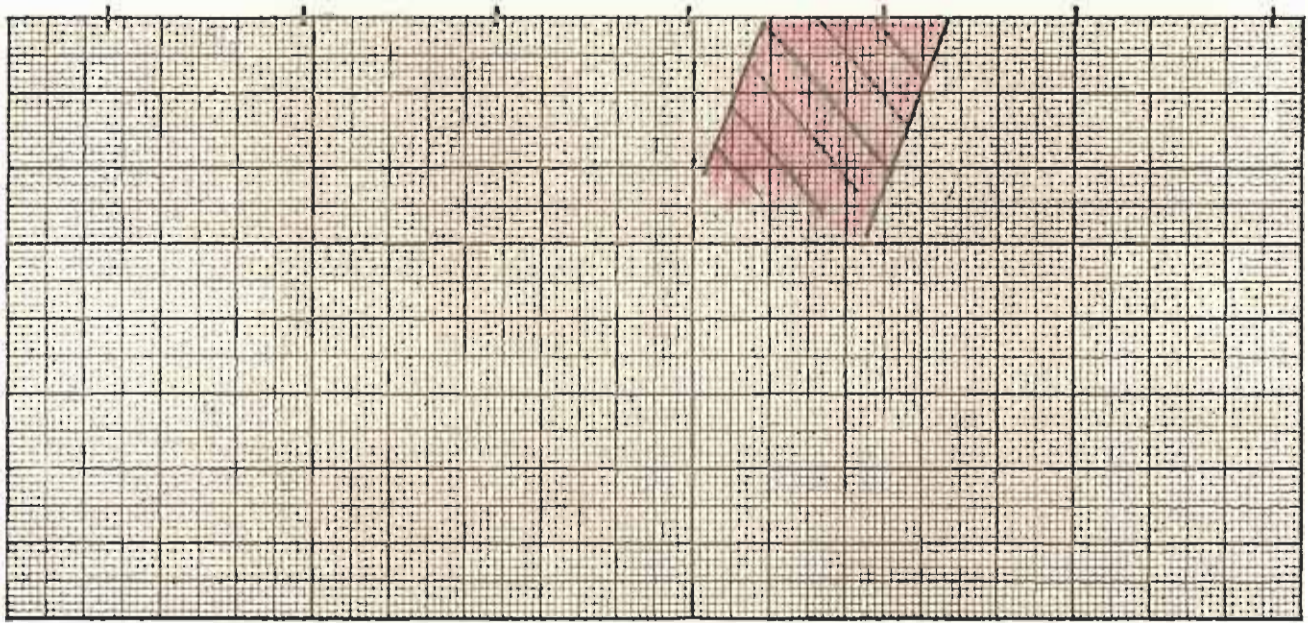
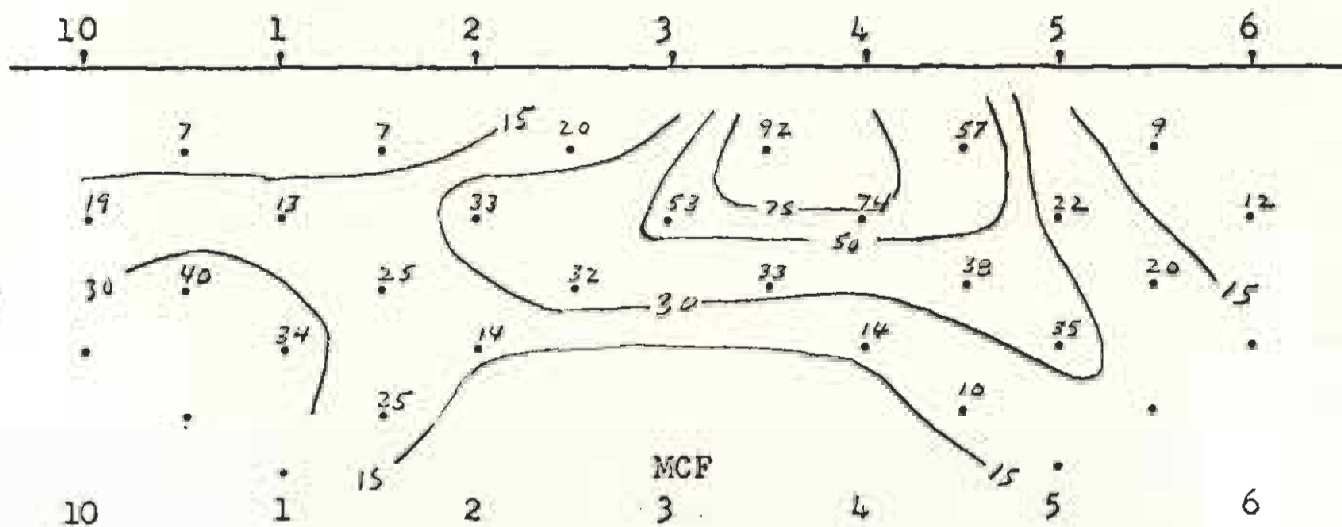
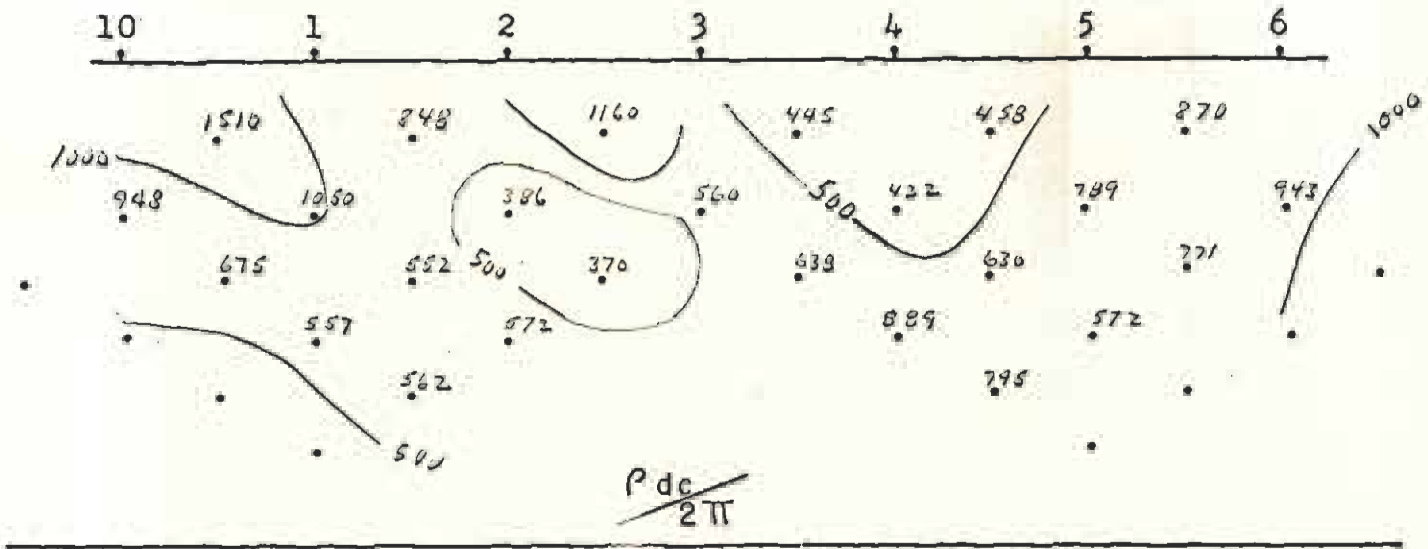
ACN < .025

$$Kn \times 10^{-3} = \frac{an(n+1)(n+2) \times 10^{-3}}{2}$$

$$PFE = \frac{\rho_{dc}}{\rho_{ac}} - 1 \quad (10^2)$$

$$MCF = \frac{\rho_{dc}}{\rho_{ac}} - 1 \quad (10^5) / \rho_{dc}$$





**FIGURE NO. 3**

SP. - GEOLOGY  
 SIMPLOT INDUSTRIES INC.  
COORDINATES 3  
 EAST NORTH

PROJ. Nation Lakes  
 LINE 3  
 BEARING N 65 E  
 DATE 8/14/66  
 NAME Jemmett  
 A 200'

**FIGURE NO. 3-A**

**J. R. SIMPLOT COMPANY  
INDUCED POLARIZATION SURVEY COMPUTATION SHEET**

Project North Line Line 3 A. 200' Data Page 1 Date 8/1/66 Comp. By J. J.

Send	2-3	2-1	3-4	2-3	2-1	4-5	3-4	2-3	2-1	4-5	3-4	2-3	2-1
Receive	4-5	4-5	5-6	5-6	5-6	6-7	6-7	6-7	6-7	7-8	7-8	7-8	7-8
n	1	2	1	2	3	1	2	3	4	2	3	4	5
Kn x 10 <sup>-3</sup>	.6	2.4	.6	2.4	6	.6	2.4	6	12	2.4	6	12	21
I (mA)	90												
Range	100	30	100	30	30	300	100	30	10	100	30	10	10
Vdc (mV)	125	31.5	12.9	29.7	17.2	245	55.4	17.7	12.5	66.1	21.7	2.03	6.44
Vac (mV)	57.4	22.5	103	22.8	15.0	228	49.0	14.4	11.3	60.2	19.0	6.77	6.00
Vac Corr	—	—	—	—	—	—	—	—	—	—	—	—	—
Dc Cal	.532												
Ac-Dc Cal	1.010												
ρ <sub>dc</sub>	465	561	458	422	638	870	789	630	889	943	771	572	795
ρ <sub>dc</sub> /ρ <sub>ac</sub>	1.343	1.333	1.233	1.300	1.210	1.052	1.170	1.240	1.120	1.110	1.153	1.155	1.082
PFE	41	40	26	31	21	8	17	24	12	11	16	20	8
MCF	92	53	57	74	33	9	22	38	14	12	20	35	10

AC 1 < 102

$$Ac\ Corr = \sqrt{(Vac)^2 - (Aen \times 2)^2} \quad \rho_{dc} = Vdc \times \frac{Dc\ Cal \times Kn \times 10^3}{I} \quad \frac{\rho_{dc}}{\rho_{ac}} = Vdc \times \frac{Ac-Dc\ Cal}{Vac\ Corr.}$$

Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5
Receive	1-2	1-2	1-10	1-10	1-10	10-11	10-11	10-11	10-11	11-12	11-12	11-12	11-12
n	1	2	1	2	3	1	2	3	4	2	3	4	5
Kn x 10 <sup>-3</sup>	.6	2.4	.6	2.4	6	.6	2.4	6	12	2.4	6	12	21
I (mA)	90												
Range	300	30	300	30	10	300	100	30	10	100	30	10	3
Vdc (mV)	326	35.2	238	27.2	10.4	424	71.2	15.6	8.01	66.7	19.0	7.84	4.54
Vac (mV)	258	30.6	226	24.4	9.40	392	62.8	13.8	7.60	50.7	15.1	6.64	4.02
Vac Corr	—	—	—	—	—	—	—	—	—	—	—	—	—
Dc Cal	.532												
Ac-Dc Cal	1.010												
ρ <sub>dc</sub>	1160	558	843	386	370	1510	1050	552	572	948	675	557	562
ρ <sub>dc</sub> /ρ <sub>ac</sub>	1.230	1.290	1.062	1.129	1.120	1.098	1.143	1.190	1.080	1.182	1.270	1.190	1.138
PFE	23	29	6	13	12	10	14	14	8	18	27	19	14
MCF	20	52	7	33	32	7	13	25	14	19	40	34	25

AC 1 < 102

$$Kn \times 10^{-3} = \frac{an(n+1)(n+2) \cdot 10^{-3}}{2} \quad PFE = \frac{\rho_{dc}}{\rho_{ac}} - 1 (10^2) \quad MCF = \frac{\rho_{dc}}{\rho_{ac}} - 1 (10^5) / \rho_{dc}$$







**FIGURE NO. 4-A**

**J. R. SIMPLOT COMPANY  
INDUCED POLARIZATION SURVEY COMPUTATION SHEET**

Project Nashua Loop Line 4 A. 200' Data Page 1 Date 8/15/51 Comp. By J.J.

Send	2-3	2-1	3-4	2-3	2-1	4-5	3-4	2-3	2-1	4-5	3-4	2-3	2-1
Receive	4-5	4-5	5-6	5-6	5-6	6-7	6-7	6-7	6-7	7-8	7-8	7-8	7-8
n	1	2	1	2	3	1	2	3	4	2	3	4	5
Kn x 10 <sup>-3</sup>	.6	2.4	.6	2.4	6	.6	2.4	6	12	2.4	6	12	21
I (ma)	130												
Range	1000	300	1000	300	100	1000	300	100	30	300	100	30	30
Vdc (mV)	550	150	1022	193	78.4	954	230	85.5	29.7	256	94.5	44.2	23.3
Vac (mV)	520	150	994	190	78.0	950	219	83.2	39.0	260	91.0	43.9	23.4
Vac Corr	—	—	—	—	—	—	—	—	—	—	—	—	—
Dc Cal	500												
Ac-Dc Cal	1.050												
ρ <sub>dc</sub>	1275	1435	2780	1820	1820	2170	2102	1950	1800	2350	2152	2040	1860
ρ <sub>dc</sub> /ρ <sub>ac</sub>	1.122	1.052	1.050	1.095	1.042	1.059	1.105	1.075	1.055	1.040	1.050	1.060	1.045
PFE	12	9	8	10	4	6	11	8	6	4	9	6	5
MCF	14	6	3	5	2	3	5	4	3	2	4	3	2

ACN < 0.025

$$Ac\ Corr = \sqrt{(Vac)^2 - (Acn \times 2)^2} \quad \rho_{dc} = Vdc \times \frac{Dc\ Cal \times Kn \times 10^3}{I} \quad \frac{\rho_{dc}}{\rho_{ac}} = Vdc \times \frac{Ac-Dc\ Cal}{Vac\ Corr}$$

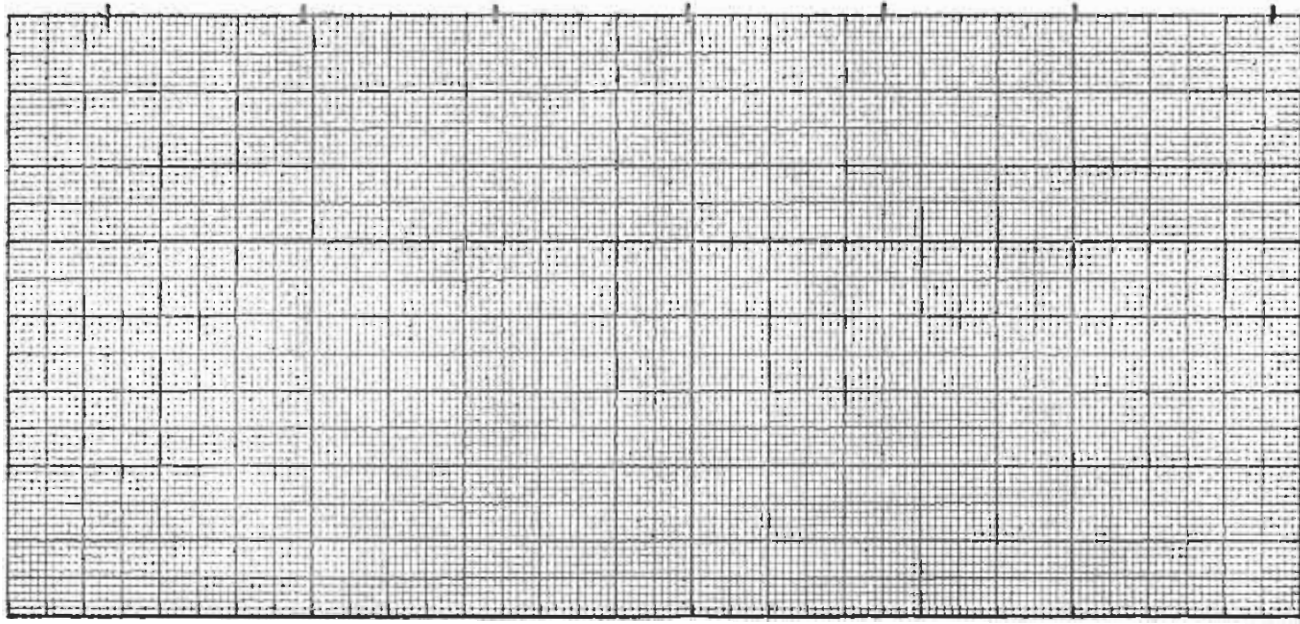
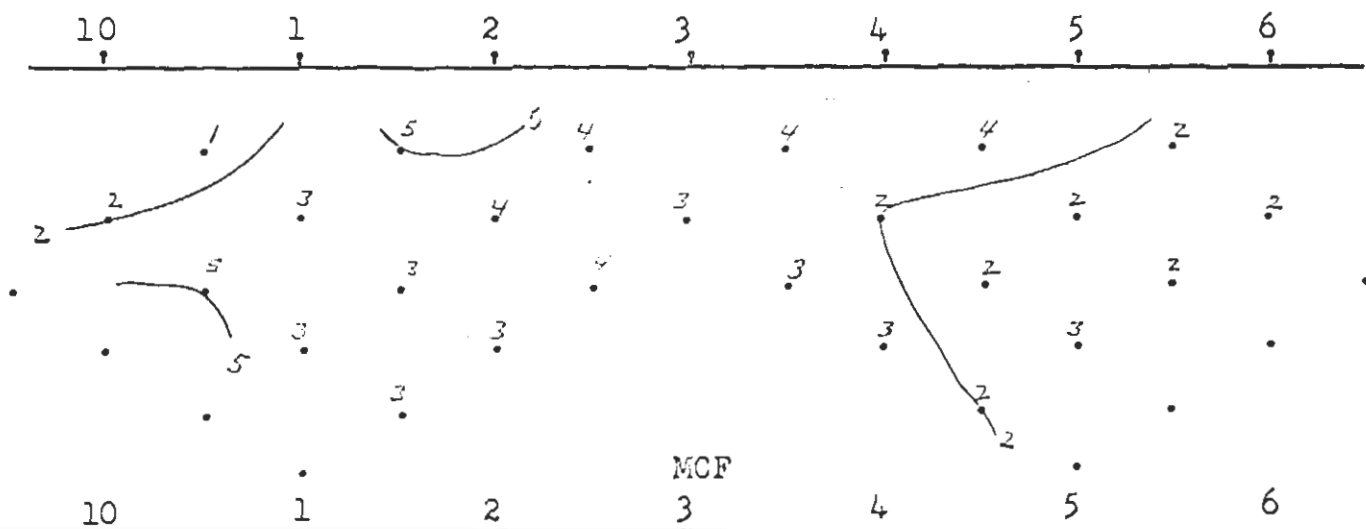
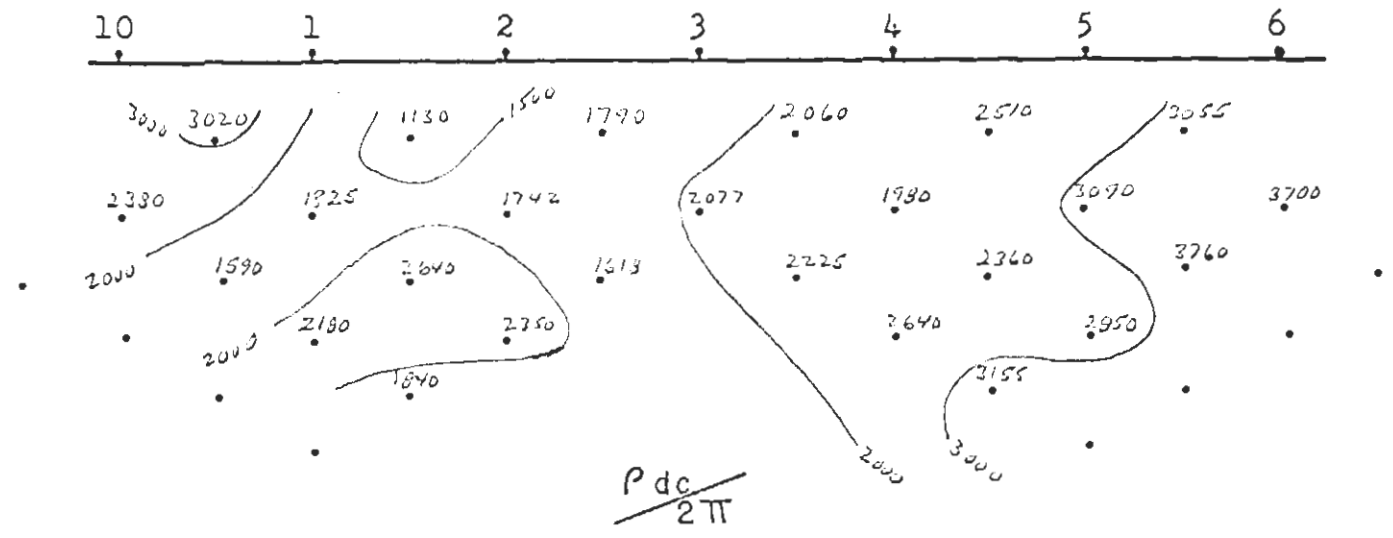
Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5
Receive	1-2	1-2	1-10	1-10	1-10	10-11	10-11	10-11	10-11	11-12	11-12	11-12	11-12
n	1	2	1	2	3	1	2	3	4	2	3	4	5
Kn x 10 <sup>-3</sup>	.6	2.4	.6	2.4	6	.6	2.4	6	12	2.4	6	12	21
I (ma)	130												
Range	300	300	1000	100	100	1000	300	100	30	300	100	30	30
Vdc (mV)													
Vac (mV)													
Vac Corr	—	—	—	—	—	—	—	—	—	—	—	—	—
Dc Cal	500												
Ac-Dc Cal	1.050												
ρ <sub>dc</sub>	925	1425	1635	1150	1419	1840	1293	1018	1190	2500	1757	1350	1460
ρ <sub>dc</sub> /ρ <sub>ac</sub>	1.110	1.082	1.050	1.085	1.082	1.035	1.040	1.111	1.079	1.050	1.050	1.083	1.095
PFE	11	8	5	9	8	4	4	11	8	5	5	8	10
MCF	13	6	3	7	6	2	3	11	7	2	3	6	6

ACN < 0.025

$$Kn \times 10^{-3} = \frac{an(n+1)(n+2) \times 10^{-3}}{3}$$

$$PFE = \frac{\rho_{dc}}{\rho_{ac}} - 1 (10^2)$$

$$MCF = \frac{\rho_{dc}}{\rho_{ac}} - 1 (10^5) / \rho_{dc}$$



SP. - GEOLOGY  
 SIMPLOT INDUSTRIES INC.  
 COORDINATES 3  
 EAST NORTH

PROJ. Nation  
 LINE 5  
 BEARING N 65 E  
 DATE 8/15/66  
 NAME J. J. J.  
 A 2.00'

**FIGURE NO. 5**

BO-Min-3

FIGURE NO. 5-A

J. R. SIMPLOT COMPANY  
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Project Nation Lakes Line 5 A. 200' Data Page 1 Date 8/15/56 Comp. By J.J.

Send	2-3	2-1	3-4	2-3	2-1	4-5	3-4	2-3	2-1	4-5	3-4	2-3	2-1
Receive	4-5	4-5	5-6	5-6	5-6	6-7	6-7	6-7	6-7	7-8	7-8	7-8	7-8
n	1	2	1	2	3	1	2	3	4	2	3	4	5
Kn x 10 <sup>-3</sup>	.6	2.4	.6	2.4	6	.6	2.4	6	12	2.4	6	12	21
I (ma)	100	300	100	100	300	100	100	100	300	100	100	100	300
Range	1000	1000	1000	300	300	1000	300	100	100	300	100	100	100
Vdc (mV)	673	435	794	155	207	959	241	74.2	123	239	113	44.5	84.6
Vac (mV)	542	513	768	162	208	957	241	76.0	122	238	117	44.2	84.6
Vac Corr													
Dc Cal	.533												>
Ac-Dc Cal	1.073												2
ρ <sub>dc</sub>	2050	2075	2510	1930	2225	3055	3090	2360	2640	3700	3760	2950	3155
ρ <sub>dc</sub> /ρ <sub>ac</sub>	1.073	1.013	1.100	1.040	1.065	1.074	1.074	1.054	1.082	1.078	1.082	1.080	1.074
PFE	7	2	10	4	7	7	7	5	5	8	8	8	7
MCF		1	4	2	3	2	2	2	3	2	2	3	2

AC11 <.015

$$Ac\ Corr = \sqrt{(Vac)^2 - (Acn \times 2)^2} \quad \rho_{dc} = Vdc \times \frac{Dc\ Cal \times Kn \times 10^3}{I} \quad \frac{\rho_{dc}}{\rho_{ac}} = Vdc \times \frac{Ac-Dc\ Cal}{Vac\ Corr}$$

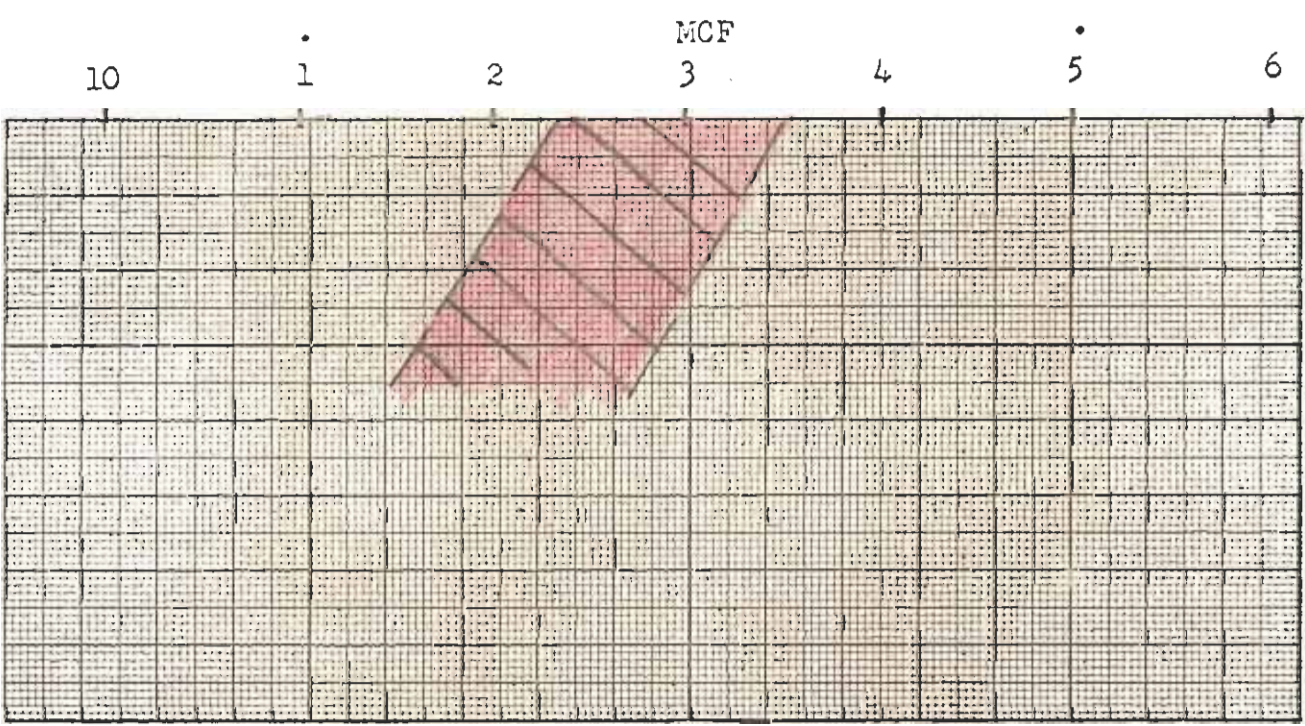
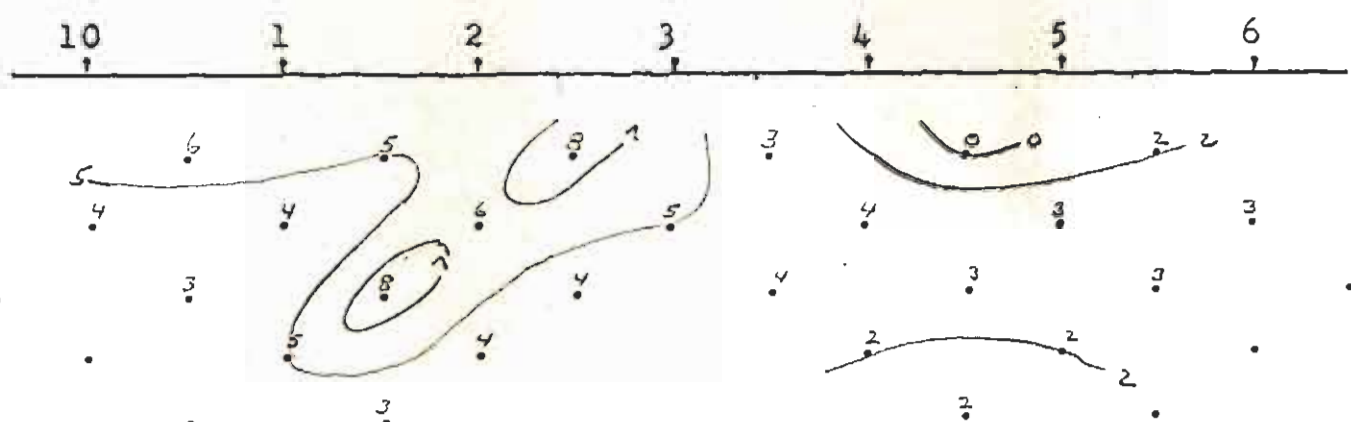
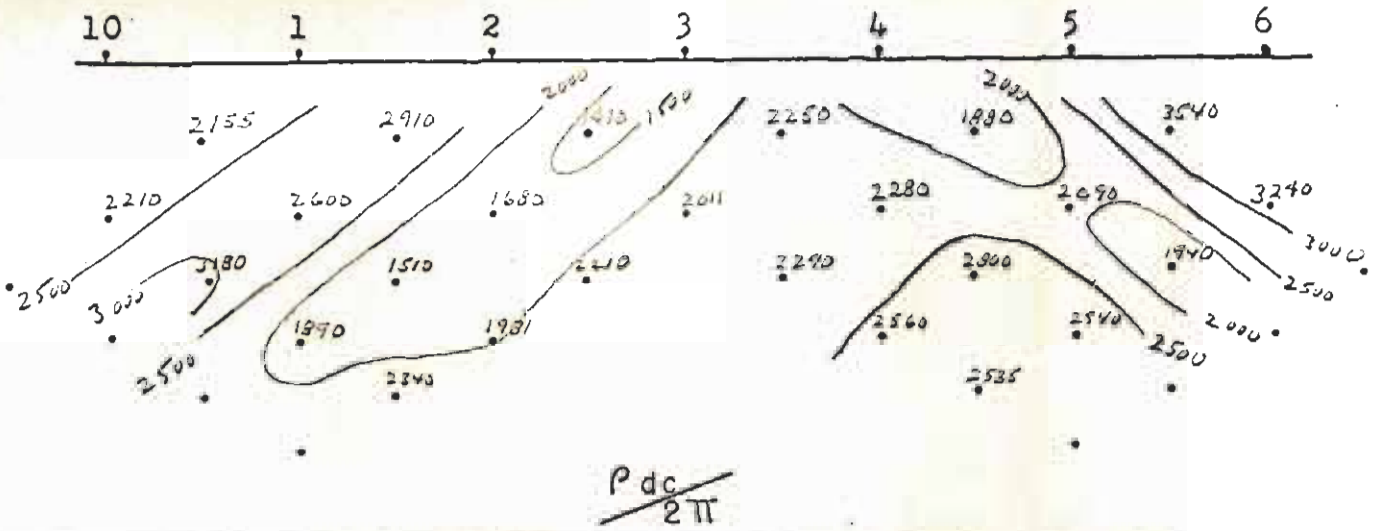
Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5
Receive	1-2	1-2	1-10	1-10	1-10	10-11	10-11	10-11	10-11	11-12	11-12	11-12	11-12
n	1	2	1	2	3	1	2	3	4	2	3	4	5
Kn x 10 <sup>-3</sup>	.6	2.4	.6	2.4	6	.6	2.4	6	12	2.4	6	12	21
I (ma)	100					300	100			300	100		
Range	1000	300	300	300	100	3000	100	100	30	1000	100	30	30
Vdc (mV)	560	164	354	136	50.9	2020	142.5	82.5	36.6	558	49.9	34.1	16.5
Vac (mV)	560	162	353	136	51.6	2020	144.1	81.8	36.8	567	49.4	34.2	16.8
Vac Corr													
Dc Cal	.533												
Ac-Dc Cal	1.074												
ρ <sub>dc</sub>	1790	2500	1130	1742	1618	3020	1825	2640	2350	2380	1590	2180	1840
ρ <sub>dc</sub> /ρ <sub>ac</sub>	1.074	1.092	1.058	1.074	1.058	1.018	1.060	1.082	1.065	1.055	1.081	1.065	1.058
PFE	7	8	6	7	6	2	6	8	7	6	8	7	6
MCF	4	4	5	4	4	1	3	3	3	2	5	3	3

AC11 <.015

$$Kn \times 10^{-3} = \frac{an(n+1)(n+2) \times 10^{-3}}{2}$$

$$PFE = \frac{\rho_{dc}}{\rho_{ac}} - 1 (10^2)$$

$$MCF = \frac{\rho_{dc}}{\rho_{ac}} - 1 (10^5) / \rho_{dc}$$



**FIGURE NO. 6**

SP. - GEOLOGY  
SIMPLOT INDUSTRIES INC.

COORDINATES 3

EAST NORTH

PROJ. Nation Lakes  
 LINE 6  
 BEARING N65°E  
 DATE 8/18/66  
 NAME Wynnatt  
 A 200'



**FIGURE NO. 6-A**

**J. R. SIMPILOT COMPANY  
INDUCED POLARIZATION SURVEY COMPUTATION SHEET**

Project Northon Lakes Line 6 A. 200' Data Page 1 Date 8/16/66 Comp. By J.J.

Send	2-3	2-1	3-4	2-3	2-1	4-5	3-4	2-3	2-1	4-5	3-4	2-3	2-1
Receive	4-5	4-5	5-6	5-6	5-6	6-7	6-7	6-7	6-7	7-8	7-8	7-8	7-8
n	1	2	1	2	3	1	2	3	4	2	3	4	5
Kn x 10 <sup>-3</sup>	.6	2.4	.6	2.4	6	.6	2.4	6	12	2.4	6	12	21
I (ma)	100												>
Range	1000	300	1000	300	100	1000	300	100	30	300	100	30	30
Vdc (mV)	701	167	583	178	71.0	1100	163	87.3	40.0	253	60.2	39.6	22.5
Vac (mV)	704	162	642	176	70.1	1084	165	87.0	41.2	250	60.7	40.2	22.8
Vac Corr	—	—	—	—	—	—	—	—	—	—	—	—	—
Dc Cal	.533												>
Ac-Dc Cal	1.074												>
ρ <sub>dc</sub>	2250	2100	1880	2280	2290	3540	2090	2800	2560	3240	1940	2540	2535
ρ <sub>dc</sub> /ρ <sub>ac</sub>	1.066	1.120	0	1.082	1.080	1.080	1.058	1.078	1.040	1.082	1.064	1.060	1.060
PFE	7	12	0	8	8	8	6	8	4	8	6	6	6
MCF	3	6	0	4	4	2	3	3	2	3	3	2	2

ACN < .030

$$Ac\ Corr = \sqrt{(Vac)^2 - (Acn \times 2)^2} \quad \rho_{dc} = Vdc \times \frac{Dc\ Cal \times Kn \times 10^3}{I} \quad \frac{\rho_{dc}}{\rho_{ac}} = Vdc \times \frac{Ac-Dc\ Cal}{Vac\ Corr}$$

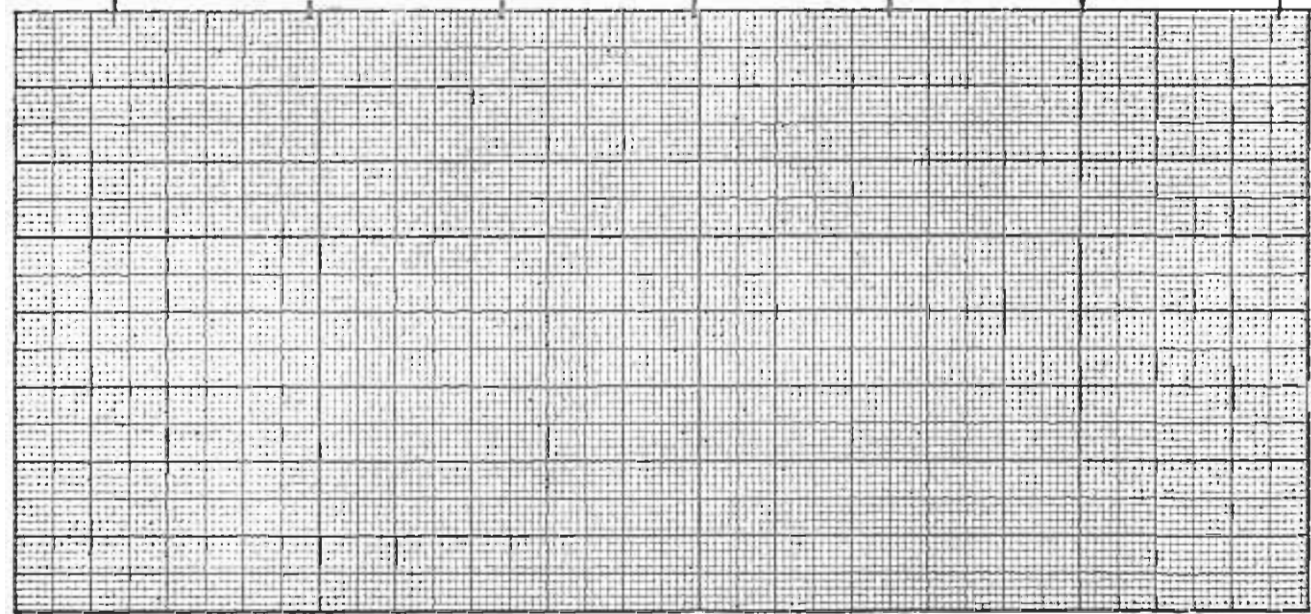
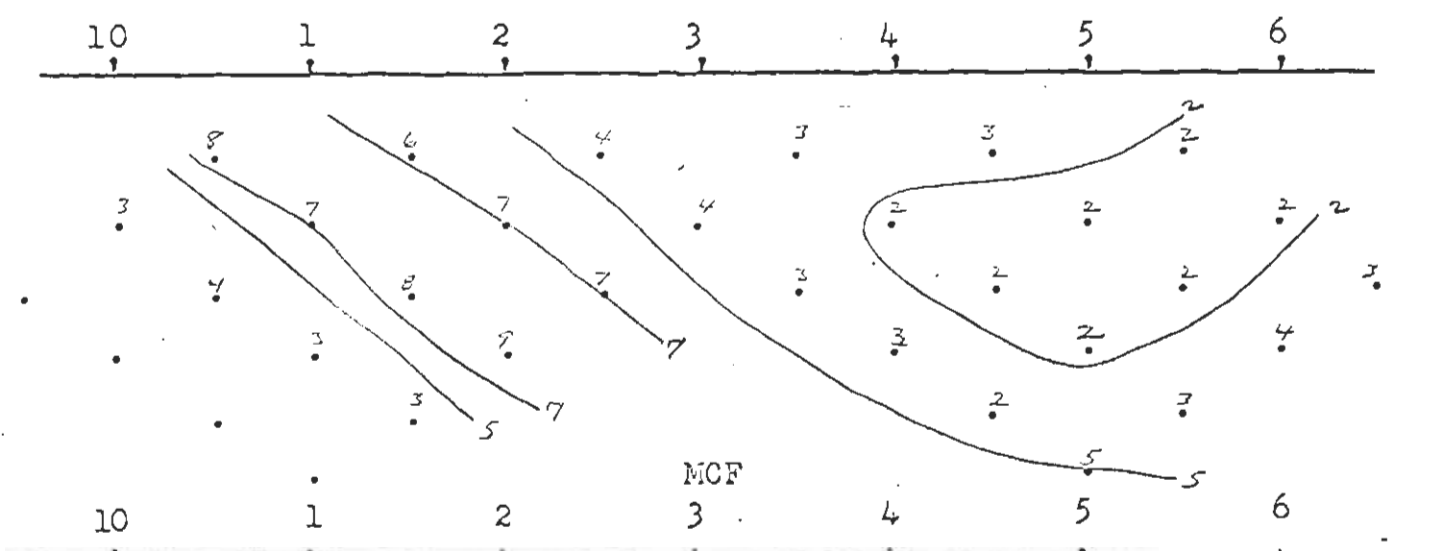
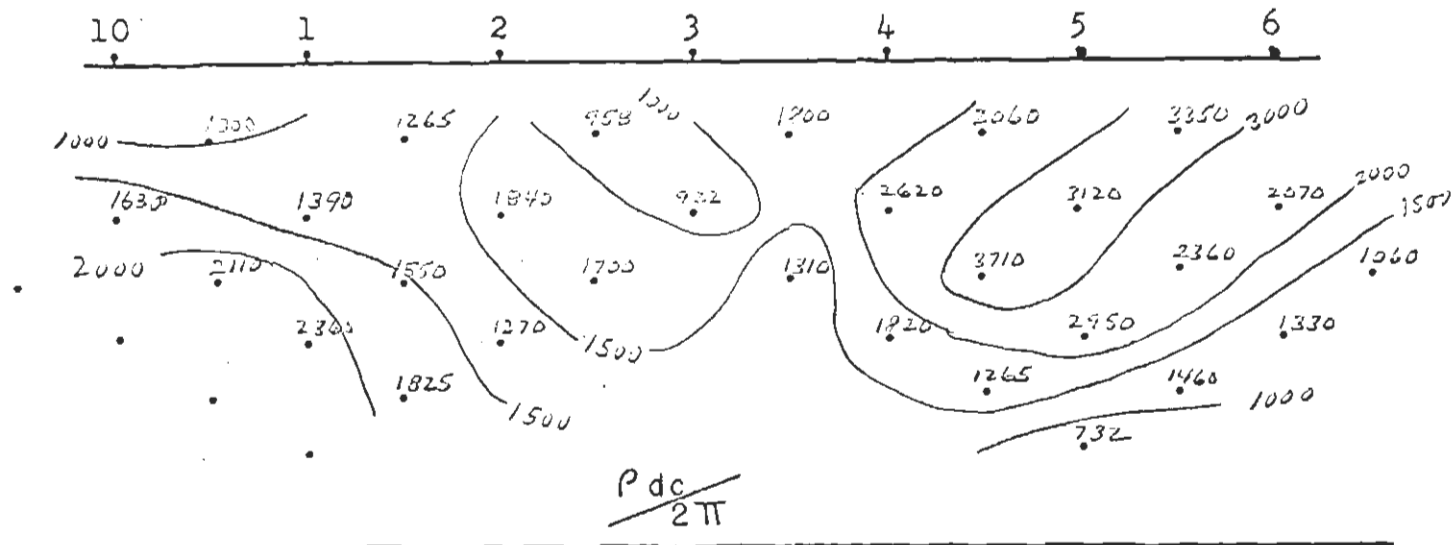
Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5
Receive	1-2	1-2	1-10	1-10	1-10	10-11	10-11	10-11	10-11	11-12	11-12	11-12	11-12
n	1	2	1	2	3	1	2	3	4	2	3	4	5
Kn x 10 <sup>-3</sup>	.6	2.4	.6	2.4	6	.6	2.4	6	12	2.4	6	12	21
I (ma)	100												>
Range	300	300	1000	100	100	1000	300	100	30	300	100	30	30
Vdc (mV)	437	153	909	131	68.8	671	203	47.0	30.9	173	99.6	29.5	20.9
Vac (mV)	420	150	960	128	67.8	642	199	45.2	30.5	170	97.0	29.0	20.8
Vac Corr	—	—	—	—	—	—	—	—	—	—	—	—	—
Dc Cal	.533												>
Ac-Dc Cal	1.074												>
ρ <sub>dc</sub>	1410	1922	2910	1680	2210	2155	2600	1510	1980	2220	3180	1870	2340
ρ <sub>dc</sub> /ρ <sub>ac</sub>	1.118	1.095	1.015	1.100	1.090	1.122	1.095	1.119	1.085	1.090	1.090	1.090	1.079
PFE	12	10	2	10	9	12	10	12	9	9	9	9	9
MCF	8	5	5	6	4	6	4	8	4	4	3	5	3

ACN < .035

$$Kn \times 10^{-3} = \frac{an(n+1)(n+2) \times 10^{-3}}{2}$$

$$PFE = \frac{\rho_{dc}}{\rho_{ac}} - 1 (10^2)$$

$$MCF = \frac{\rho_{dc}}{\rho_{ac}} - 1 (10^5) / \rho_{dc}$$



**FIGURE NO. 7**

SP. - GEOLOGY

SIMPLOT INDUSTRIES INC.

COORDINATES 3

EAST NORTH

PROJ. Nation Lakes

LINE 7

BEARING N. 65 E.

DATE 5/17/66

NAME Simpplot

A 200'

FIGURE NO. 7-A

J. R. SIMPLOT COMPANY  
INDUCED POLARIZATION SURVEY COMPUTATION SHEET

Project Nation Lakes Line 7 A. 200' Data Page 1 Date 8/17/66 Comp. By J.J.

Send	2-3	2-1	3-4	2-3	2-1	4-5	3-4	2-3	2-1	4-5	3-4	2-3	2-1
Receive	4-5	4-5	5-6	5-6	5-6	6-7	6-7	6-7	6-7	7-8	7-8	7-8	7-8
n	1	2	1	2	3	1	2	3	4	2	3	4	5
Kn x 10 <sup>-3</sup>	.6	2.4	.6	2.4	6	.6	2.4	6	12	2.4	6	12	21
I ma	200	200	100	200	200	100	100	200	200	100	100	200	200
Range	1000	100	1000	300	100	1000	300	300	100	300	100	100	30
Vdc (mv)	1200	155.9	685	436	87.5	1116	258	246	61.2	172	78.6	88.1	23.9
Vac (mv)	1184	156.2	678	433	88.4	1096	252	242	61.0	172	78.1	88.0	24.4
Vac Corr	—	—	—	—	—	—	—	—	—	—	—	—	—
Dc Cal	.500	—	—	—	—	—	—	—	—	—	—	—	—
Ac-Dc Cal	1.050	—	—	—	—	—	—	—	—	—	—	—	—
ρ <sub>dc</sub>	1800	935	2060	2620	1310	3350	3120	3710	1820	2070	2360	2950	1265
ρ <sub>dc</sub> /ρ <sub>ac</sub>	1.063	1.040	1.060	1.060	1.035	1.070	1.075	1.070	1.060	1.050	1.052	1.050	1.030
PFE	6	4	6	6	4	7	8	7	6	5	5	5	3
MCF	3	4	3	2	3	2	2	2	3	2	2	2	2
ACN	ACN < 0.02												

$$Ac\ Corr = \sqrt{(Vac)^2 - (Acn \times 2)^2} \quad \rho_{dc} = Vdc \times \frac{Dc\ Cal \times Kn \times 10^3}{I} \quad \frac{\rho_{dc}}{\rho_{ac}} = Vdc \times \frac{Ac-Dc\ Cal}{Vac\ Corr}$$

Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5
Receive	1-2	1-2	1-10	1-10	1-10	10-11	10-11	10-11	10-11	11-12	11-12	11-12	11-12
n	1	2	1	2	3	1	2	3	4	2	3	4	5
Kn x 10 <sup>-3</sup>	.6	2.4	.6	2.4	6	.6	2.4	6	12	2.4	6	12	21
I (ma)	100	100	200	100	100	200	200	100	100	200	200	100	100
Range	300	100	1000	300	100	1000	300	100	30	300	300	30	30
Vdc (mv)	319	75.3	846	153	56.7	669	219	51.7	21.1	271	141	39.2	17.4
Vac (mv)	320	75.8	820	145	53.4	650	210	48.2	20.0	270	140	38.9	17.3
Vac Corr	—	—	—	—	—	—	—	—	—	—	—	—	—
Dc Cal	.500	—	—	—	—	—	—	—	—	—	—	—	—
Ac-Dc Cal	1.050	—	—	—	—	—	—	—	—	—	—	—	—
ρ <sub>dc</sub>	958	910	1265	1840	1700	1000	1319	1550	1270	1630	2110	2360	1825
ρ <sub>dc</sub> /ρ <sub>ac</sub>	1.043	1.042	1.082	1.120	1.115	1.080	1.095	1.125	1.110	1.055	1.085	1.060	1.055
PFE	4	4	8	12	12	8	10	13	11	6	9	6	6
MCF	4	5	6	7	7	8	7	8	9	3	4	3	3
ACN	ACN < 0.02												

$$Kn \times 10^{-3} = \frac{an(n+1)(n+2) \times 10^{-3}}{2}$$

$$PFE = \frac{\rho_{dc}}{\rho_{ac}} - 1 (10^2)$$

$$MCF = \frac{\rho_{dc}}{\rho_{ac}} - 1 (10^5) / \rho_{dc}$$

**FIGURE NO. 7-B**

**J. R. SIMPLOT COMPANY  
INDUCED POLARIZATION SURVEY COMPUTATION SHEET**

Project Nation Lakes Line 7 A. 200' Data Page 2 Date 8/17/66 Comp. By JJ

Send	2-3	2-1	3-4	2-3	2-1	4-5	3-4	2-3	2-1	4-5	3-4	2-3	2-1
Receive	4-5	4-5	5-6	5-6	5-6	6-7	6-7	6-7	6-7	7-8-9	7-8-9	7-8-9	7-8-9
n	1	2	1	2	3	1	2	3	4	23	24	25	26
Kn x 10 <sup>-3</sup>										6	12	21	33.6
I										100	100	200	200
Range										30	30	30	10
Vdc										35.4	22.2	27.9	8.70
Vac										35.8	22.0	28.2	8.82
Vac Corr										—	—	—	—
Dc Cal										.500			
Ac-Dc Cal										1.050			
ρ <sub>dc</sub>										1060	1330	1460	732
ρ <sub>dc</sub> /ρ <sub>ac</sub>										1.035	1.054	1.040	1.039
PFE										4	6	4	4
MCF										3	4	3	5

$$Ac\ Corr = \sqrt{(Vac)^2 - (Acn \times 2)^2} \quad \rho_{dc} = Vdc \times \frac{Dc\ Cal \times Kn \times 10^3}{I} \quad \frac{\rho_{dc}}{\rho_{ac}} = Vdc \times \frac{Ac-Dc\ Cal}{Vac\ Corr.}$$

Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5
Receive	1-2	1-2	1-10	1-10	1-10	10-11	10-11	10-11	10-11	11-12	11-12	11-12	11-12
n	1	2	1	2	3	1	2	3	4	2	3	4	5
Kn x 10 <sup>-3</sup>													
I													
Range													
Vdc													
Vac													
Vac Corr													
Dc Cal													
Ac-Dc Cal													
ρ <sub>dc</sub>													
ρ <sub>dc</sub> /ρ <sub>ac</sub>													
PFE													
MCF													

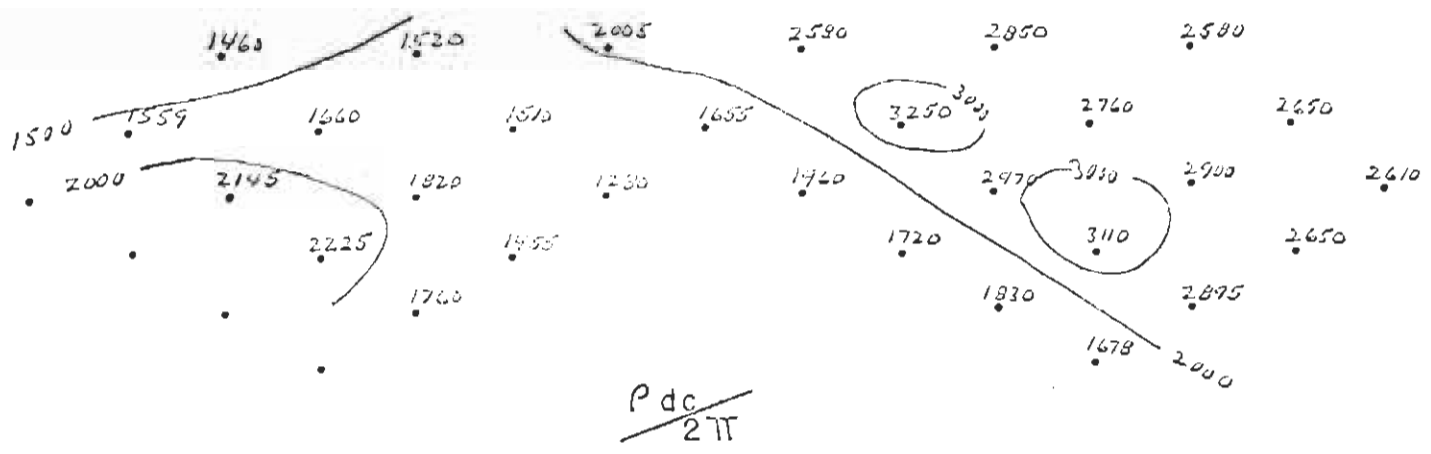
$$Kn \times 10^{-3} = \frac{an(n+1)(n+2) \times 10^{-3}}{2}$$

$$PFE = \frac{\rho_{dc}}{\rho_{ac}} - 1 (10^2)$$

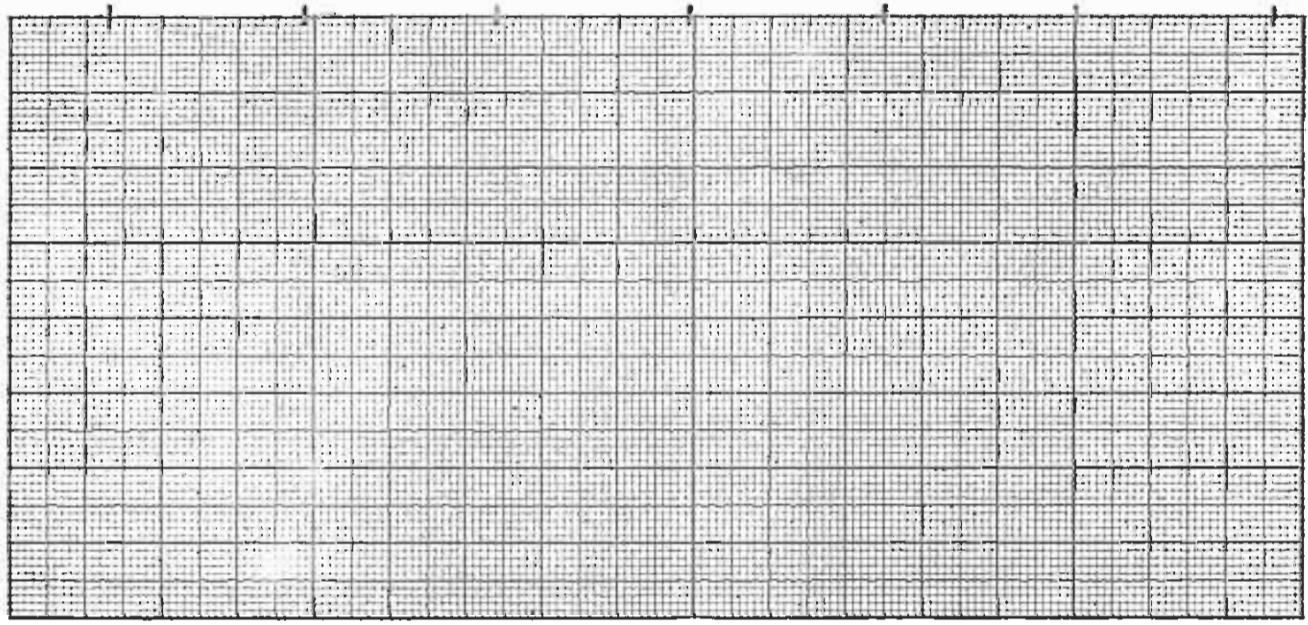
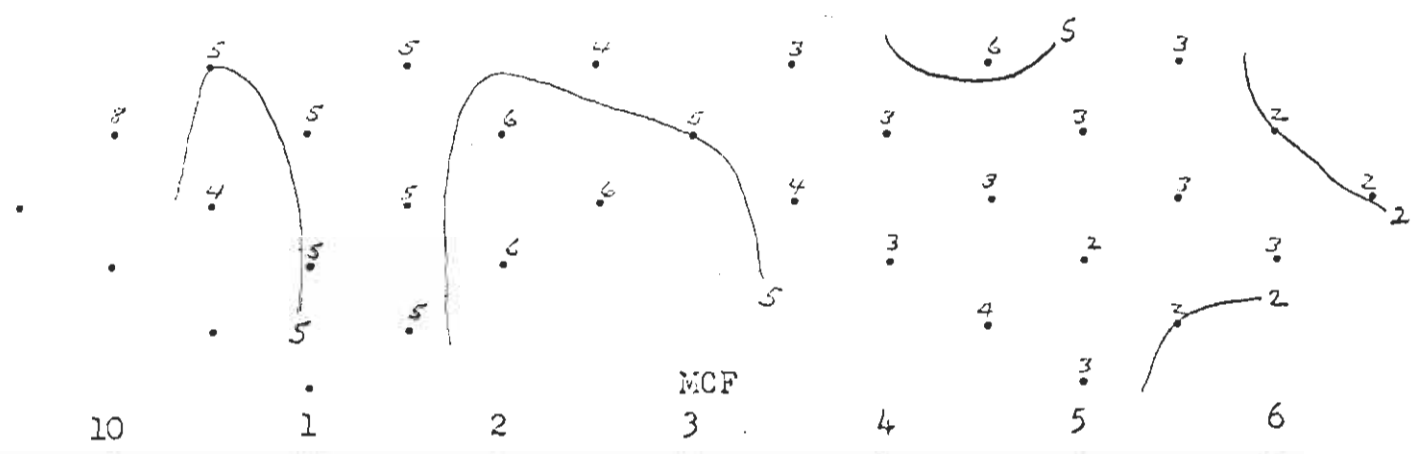
$$MCF = \frac{\rho_{dc}}{\rho_{ac}} - 1 (10^5) / \rho_{dc}$$



10      1      2      3      4      5      6



10      1      2      3      4      5      6



**FIGURE NO. 8**

SP. - GEOLOGY  
SIMPLOT INDUSTRIES INC.

COORDINATES 3

EAST      NORTH

PROJ. Nation Lakes  
 LINE B  
 BEARING 116SE  
 DATE 8/17/66  
 NAME Jones 7+  
 A 200'

**FIGURE NO. 8-A**

**J. R. SIMPLOT COMPANY  
INDUCED POLARIZATION SURVEY COMPUTATION SHEET**

Project Nation Lakes Line 8 A. 200' Data Page 1 Date 8/17/66 Comp. By J.J.

Send	2-3	2-1	3-4	2-3	2-1	4-5	3-4	2-3	2-1	4-5	3-4	2-3	2-1
Receive	4-5	4-5	5-6	5-6	5-6	6-7	6-7	6-7	6-7	7-8	7-8	7-8	7-8
n	1	2	1	2	3	1	2	3	4	2	3	4	5
Kn x 10 <sup>-3</sup>	.6	2.4	.6	2.4	6	.6	2.4	6	12	2.4	6	12	21
I (ma)	120												7
Range	1000	300	1000	300	100	1000	300	100	30	300	100	100	30
Vdc (mv)	993	161	1010	313	75.9	994	267	115	33.2	255	112	60.0	20.1
Vac (mv)	967	157	985	302	73.0	976	260	112	32.9	252	109	59.4	19.9
Vac Corr													
Dc Cal	.540												7
Ac-Dc Cal	1.050												7
ρ <sub>dc</sub>	2580	1670	2950	3250	1960	2580	2760	2970	1720	2450	2900	3110	1830
ρ <sub>dc</sub> /ρ <sub>ac</sub>	1.050	1.078	1.175	1.085	1.085	1.067	1.080	1.080	1.060	1.062	1.079	1.060	1.065
PFE	8	8	18	9	9	7	8	8	6	6	8	6	7
MCF	3	5	6	3	4	3	3	3	3	2	3	2	4

ACN < .025

$$Ac\ Corr = \sqrt{(Vac)^2 - (Acn \times 2)^2} \quad \rho_{dc} = Vdc \times \frac{Dc\ Cal \times Kn \times 10^3}{I} \quad \frac{\rho_{dc}}{\rho_{ac}} = Vdc \times \frac{Ac-Dc\ Cal}{Vac\ Corr.}$$

Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5
Receive	1-2	1-2	1-10	1-10	1-10	10-11	10-11	10-11	10-11	11-12	11-12	11-12	11-12
n	1	2	1	2	3	1	2	3	4	2	3	4	5
Kn x 10 <sup>-3</sup>	.6	2.4	.6	2.4	6	.6	2.4	6	12	2.4	6	12	21
I (ma)	120												7
Range	1000	300	1000	300	100	1000	300	100	30	300	100	30	30
Vdc (mv)	775	158	589	145	49.5	564	160	70.4	23.0	150	82.9	42.5	19.4
Vac (mv)	748	154	574	140	48.1	548	154	67.7	27.2	140	79.4	41.0	18.9
Vac Corr													
Dc Cal	.540												7
Ac-Dc Cal	1.050												7
ρ <sub>dc</sub>	2005	1640	1520	1510	1280	1460	1660	1820	1455	1559	2145	2225	1760
ρ <sub>dc</sub> /ρ <sub>ac</sub>	1.095	1.078	1.075	1.090	1.080	1.080	1.090	1.095	1.052	1.122	1.095	1.090	1.060
PFE	9	8	8	9	8	8	9	10	8	12	10	10	8
MCF	4	5	5	6	6	5	5	5	5	8	4	5	5

ACN < .025

$$Kn \times 10^{-3} = \frac{an(n+1)(n+2) \times 10^{-3}}{2}$$

$$PFE = \frac{\rho_{dc}}{\rho_{ac}} - 1 (10^2)$$

$$MCF = \frac{\rho_{dc}}{\rho_{ac}} - 1 (10^5) / \rho_{dc}$$

**FIGURE NO. 8-B**

**J. R. SIMPLOT COMPANY  
INDUCED POLARIZATION SURVEY COMPUTATION SHEET**

Project Nation Lakes Line 8 A. 200' Data Page 2 Date 8/17/66 Comp. By J.J.

Send	2-3	2-1	3-4	2-3	2-1	4-5	3-4	2-3	2-1	4-5	3-4	2-3	2-1
Receive	4-5	4-5	5-6	5-6	5-6	6-7	6-7	6-7	6-7	7-8-9	7-8-9	7-8-9	7-8-9
n	1	2	1	2	3	1	2	3	4	3	4	5	6
Kn x 10 <sup>-3</sup>										6	12	21	33.6
I										120			
Range										100	100	30	30
Vdc										101	53.9	31.7	11.5
Vac										100	52.7	31.7	11.5
Vac Corr													
Dc Cal										.540			
Ac-Dc Cal										10.50			
ρ <sub>dc</sub>										2610	2350	2895	1678
ρ <sub>dc</sub> /ρ <sub>ac</sub>										1.062	1.081	1.050	1.050
PFE										6	8	5	5
MCF										2	3	2	3

$$Ac\ Corr = \sqrt{(Vac)^2 - (Acn \times 2)^2} \quad \rho_{dc} = Vdc \times \frac{Dc\ Cal \times Kn \times 10^3}{I} \quad \frac{\rho_{dc}}{\rho_{ac}} = Vdc \times \frac{Ac-Dc\ Cal}{Vac\ Corr.}$$

Send	3-4	4-5	2-3	3-4	4-5	1-2	2-3	3-4	4-5	1-2	2-3	3-4	4-5
Receive	1-2	1-2	1-10	1-10	1-10	10-11	10-11	10-11	10-11	11-12	11-12	11-12	11-12
n	1	2	1	2	3	1	2	3	4	2	3	4	5
Kn x 10 <sup>-3</sup>													
I													
Range													
Vdc													
Vac													
Vac Corr													
Dc Cal													
Ac-Dc Cal													
ρ <sub>dc</sub>													
ρ <sub>dc</sub> /ρ <sub>ac</sub>													
PFE													
MCF													

$$Kn \times 10^{-3} = \frac{an(n+1)(n+2) \times 10^{-3}}{2}$$

$$PFE = \frac{\rho_{dc}}{\rho_{ac}} - 1 \quad (10^2)$$

$$MCF = \frac{\rho_{dc}}{\rho_{ac}} - 1 \quad (10^5) / \rho_{dc}$$



OKANAGAN HELICOPTERS LTD.  
VANCOUVER AIRPORT, B. C.  
TELEPHONE: 278-5502

TO

West Coast Mining and Exploration,  
1 - 904 Helmcken Street,  
Vancouver 1, B. C.

Date August 31, 1966

Invoice No. 8/581 AR - 556

P.O. No.

Authority

To charter of S-55 helicopter CF-HNG

Flying August 18, 1966 as per report  
attached

3 hours 25 minutes at \$170.00 per hour

\$580.84

Plus adjustment as per tariff rule 53 (d)

.16

\$581.00

DUE AND PAYABLE WITHIN 15 DAYS

*Paid by cheque No 325*

∴ YEAR ROUND BASES THROUGHOUT B.C. ∴

B.C.





OKANAGAN HELICOPTERS LTD.

VANCOUVER AIRPORT, B. C.

TELEPHONE: 278-5502

TO

West Coast Mining & Exploration,  
Suite 1,  
904 Helmcken Street,  
Vancouver 1, B. C.

Date August 23, 1966

Invoice No. 8/352 AR - 556

P.O. No.

Authority

To charter of S-55 helicopter CF-HNG

Flying August 11, 1966 as per report  
attached

4 hours 20 minutes at \$170.00 per hour \$736.66

Plus adjustment as per tariff rule 53 (d) .34

\$737.00

DUE AND PAYABLE WITHIN 15 DAYS

*Paid Cheque No 319*

B.C.

... YEAR ROUND BASES THROUGHOUT B.C. ...



# FLIGHT REPORT

## OKANAGAN HELICOPTERS LTD.

05774

HEAD OFFICE: VANCOUVER AIRPORT, BRITISH COLUMBIA

CHARTERER West Coast University Exploration A/C CF 444  
 ADDRESS 2000 - 201 Johnson Rd. Vancouver DATE May 1st  
 PILOT H. Jones BASE Vancouver

TYPE OF CONTRACT (1)  2A  2B  OTHER

OPERATION	TAKE OFF	LAND	HOURS	MINS.	FUEL & OIL	
					O.N.L.	CUST.
<i>Surrey - Okanagan</i>			<i>1</i>	<i>20</i>		

P.O. No. \_\_\_\_\_

BY THE SIGNING OF THIS FLIGHT REPORT I ACKNOWLEDGE THAT THE TERMS AND CONDITIONS THEREOF AS SET FORTH IN THE TARIFF FILED WITH THE A.T.B. ARE AVAILABLE FOR EXAMINATION AT OKANAGAN HELICOPTERS LTD.

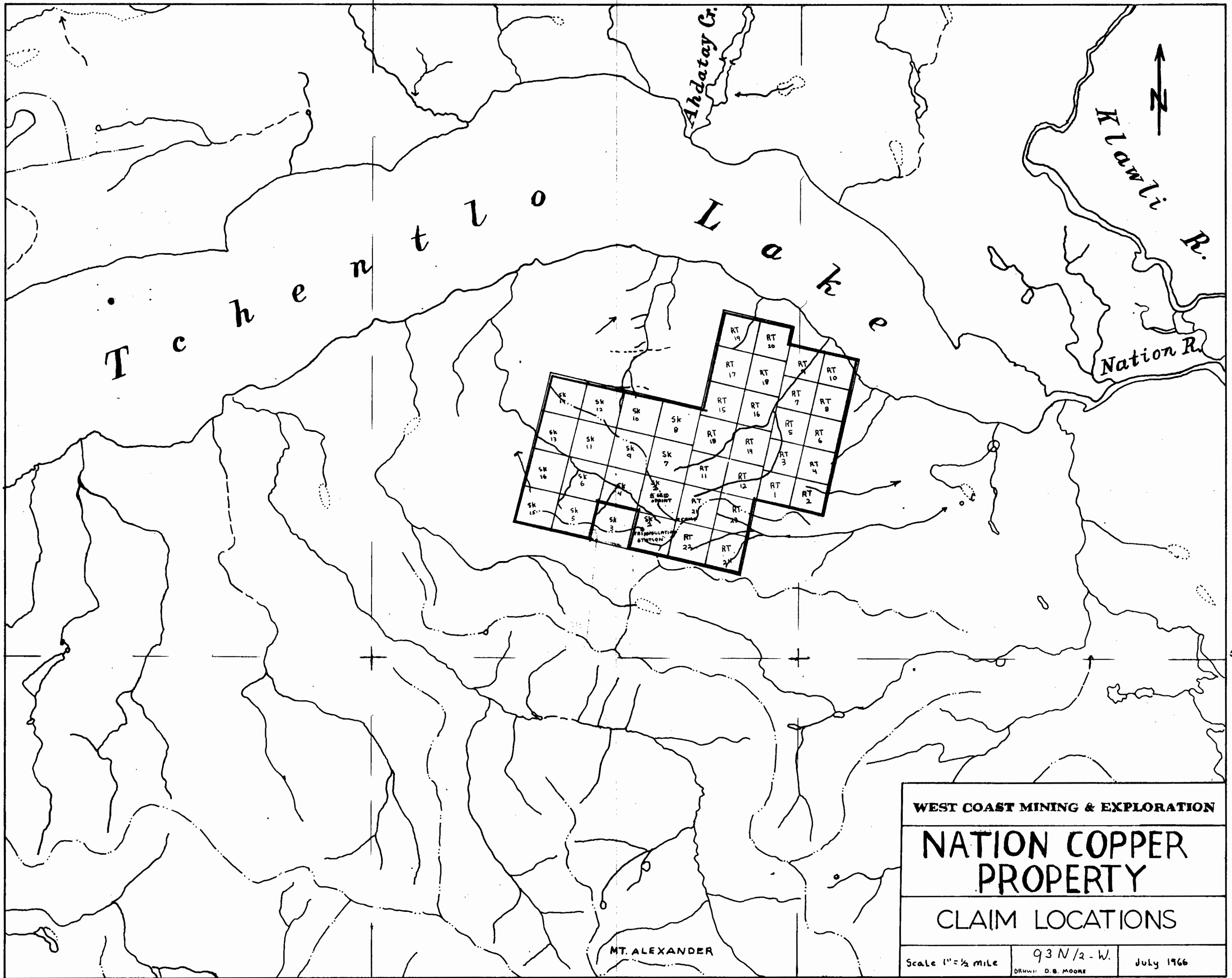
FLIGHT PERFORMED IN PROVINCE OF

SIGNED FOR CHARTERER BY  
[Signature]

SIGNED FOR OKANAGAN HELICOPTERS LTD. BY  
[Signature]

Revenue Hours 1 20  
 N/R Hours \_\_\_\_\_

BC

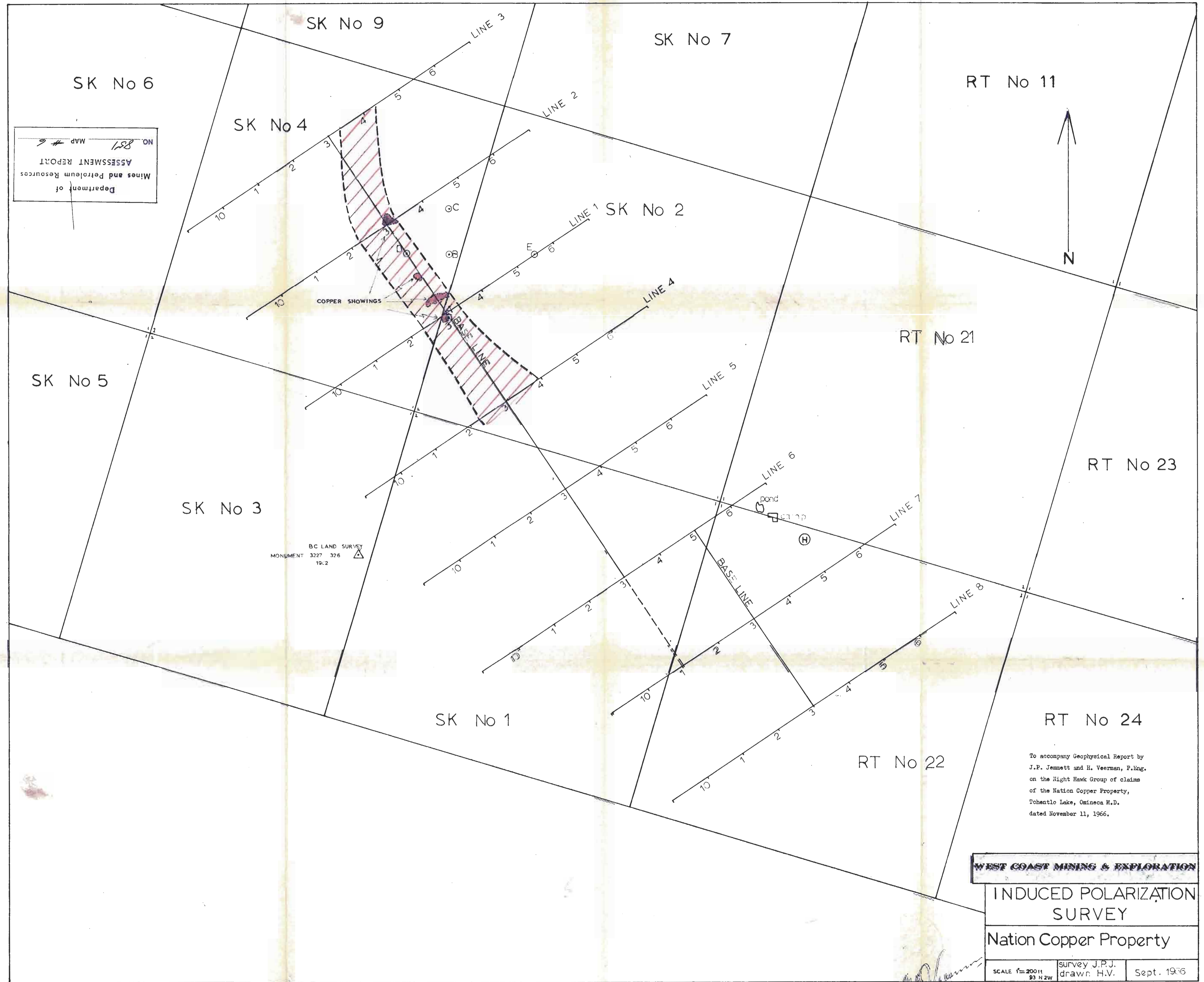


WEST COAST MINING & EXPLORATION		
NATION COPPER PROPERTY		
CLAIM LOCATIONS		
Scale 1" = 1/2 MILE	93 N/2 - W. DRAWN: D. B. MOORE	July 1966

851



Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 128  
MAP # 6



To accompany Geophysical Report by  
J.F. Jemmett and H. Veerman, P.Eng.  
on the Night Hawk Group of claims  
of the Nation Copper Property,  
Tohentic Lake, Omineca H.D.  
dated November 11, 1966.

**WEST COAST MINING & EXPLORATION**  
**INDUCED POLARIZATION**  
**SURVEY**  
**Nation Copper Property**  
SCALE 1"=200ft  
93 N2W  
survey J.P.J.  
drawn H.V.  
Sept. 1966

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