

Office

*I think a MDE card
was started for a
showing on this ground
- add this report as
reference.*

NORTHWEST SYNDICATE
GEOPHYSICAL SURVEY
SPA, SKU, ALTA, SCAT, JEFF, & LARK CLAIMS
KAMLOOPS MINING DIVISION
50° 120' S.W.
15 MILES NORTHWEST OF MERRITT, B.C.
APRIL 21st - MAY 26th, 1968
BY:
ROBERT E. CHAPLIN P. ENG.

*50° 10' 12"
120° 50' 12"
593*

1594

1594

(1)

GEOPHYSICAL SURVEY ON THE
SPA, SKU, ALTA, SCAT, JEFF, & LARK CLAIMS
SITUATED FIFTEEN MILES NORTHWEST
OF MERRITT IN THE KAMLOOPS M.D., 50° 120' S.W.

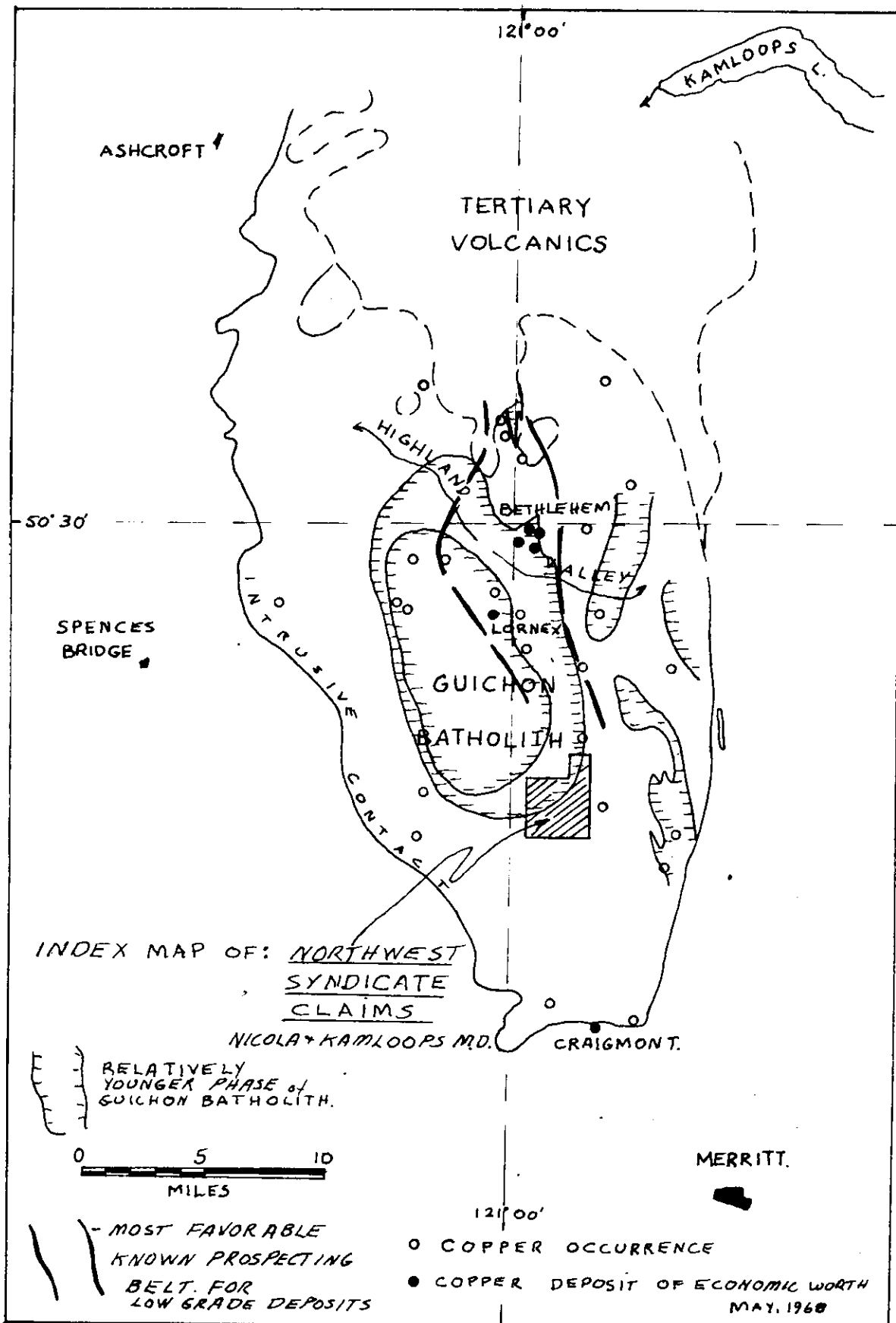
WORK WAS DONE ON THE SPA, SKU, ALTA, SCAT, JEFF, & LARK CLAIMS
IN THE PERIOD APRIL 27, TO MAY 26, 1968

REPORT BY:
R.E. CHAPLIN, P.ENG.

JUNE, 1968

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55N, 47N, 39N, Road Line, 14N, 6N, 2S, 10S, 18S.	



(3)

NORTHWEST SYNDICATE

SPA, SKU, JEFF, ALTA, LARK, & SCAT CLAIMS

921-7

50° 120' S.W.

KAMLOOPS M.D., B.C.

INTRODUCTION

The Northwest Syndicate property totals 88 claims and covers a porphyry copper prospect situated in the Highland Valley mineral district fifteen air miles northwest of Merritt, B.C.

The claims lie in the southern sector of the Guichon batholith, in an area of generally low relief and poor drainage. Bedrock on the property is largely obscured by overburden from five to fifty feet along the flanks of the main stream valleys and up to 300 feet in the valley centers.

The property was staked in early 1968 to cover a favorable geological setting. It is located within a north trending mineral belt that includes the Lornex and Bethlehem copper to the north, the Craigmont copper mine to the south, and the Chataway copper prospect immediately to the east.

Noranda Mines Limited, worked on part of the claims in 1958, looking for a possible Craigmont-type ore body.

Importantly, the prospect lends itself to reconnaissance geophysical prospecting by the Induced Polarization method since bedrock material is largely masked by surficial deposits. For these reasons the claim was selected by Messrs, Chaplin, Graham, Gifford, and Riley under their Prospecting Agreement with the Northwest Syndicate for the application of I.P. techniques based both on their previous prospecting experience and I.P. case history field work in the Highland Valley district.

This report details results of geophysical work in the property with reconnaissance I.P. in the period April 6 - May 31, 1968. Construction of a five-tent base camp was commenced April 6th. Field work on the Induced Polarization survey commenced April 15th. Seven men were employed in the program.

A bulldozer TD-15 was employed for three days, May 12, 13, & 15, to provide access and rehabilitate existing roads. Two vehicular bridges were built over Skuhun Creek to facilitate road access.

PROPERTY AND OWNERSHIP

<u>CLAIM</u>	<u>TAG NO.</u>	<u>RECORD NO.</u>	<u>RECORD DATE</u>	<u>RECORDED OWNER</u>
ALTA 13-32		50992-51011	August 4, 68	Mercury Explorations Ltd.
JEFF 1-14	878460-73	68703-16	April 3, 68	G. Riley
LARK 1-8	878486-93	68846-53	May 6, 68	R. Gifford
SCAT 1-16	878494-509	69097-69112	May 17, 68	J. Graham
SKU 1-10	878458-59 878476-83	68693-68702	April 3, 68	R. Chaplin
SPA 1-18	878440-56	68673-90	April 3, 68	J. Graham

Geophysical work was performed on the above claims in the period April 15th - May 31st 1968. Expiry dates are as follows:

<u>CLAIM</u>	<u>EXPIRY DATE</u>
ALTA 13-25	August 4, 68
ALTA 26-32	August 4, 70
JEFF 1-14	April 3, 73
SPA 1-4	April 3, 73
Spa 5-6	April 3, 71
SPA 7-8	April 3, 70
SPA 9-18	April 3, 69
Lark 1-8	May 6, 69
SCAT 1-16	May 17, 69
SKU 1-10	April 3, 69

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LOCATION AND ACCESS

The property lies mostly north of Farr Lake and northwest of Tyner Lake, 15 air miles northwest of Merritt, B.C. in the Kamloops and Nicola Mining Divisions. It is situated at elevation 4,200 feet, latitude 50° 19' N., 120° 58' W., on claim map 921-7 W. The upper reaches of Skuhun Creek traverse the north sector of the property.

Access is gained via nine miles of secondary road, following Skuhun Creek from the Merritt-Spences Bridge highway. Additional roads and trails provide access to other points within the property boundaries.

GEOLOGY

The Northwest Syndicate claim groups lie in the Highland Valley copper district in the southern sector of the Guochon batholith.

The batholith is concentrically zoned with the youngest intrusive phase in the center and oldest on the periphery. Porphyritic dykes and cataclastic breccia bodies are genetically associated with some of the younger intrusive phases. The batholith intrudes Upper Triassic volcanic rocks and is unconformably overlain by Jurassic marine sediments.

The property is located within the batholith near the southern contact zone between younger phase and older phase rocks. It lies on the southern extension of a mineralized belt containing the economically important Bethlehem and Lornex copper deposits.

Outcrops on the margin of the claim area contain minor amounts of copper, as bornite, associated with a porphyry dyke and east northeast striking zones. No known economic mineral deposits are currently known within the claim area.

INTRODUCTION TO INDUCED POLARIZATION (IP)PRINCIPLES

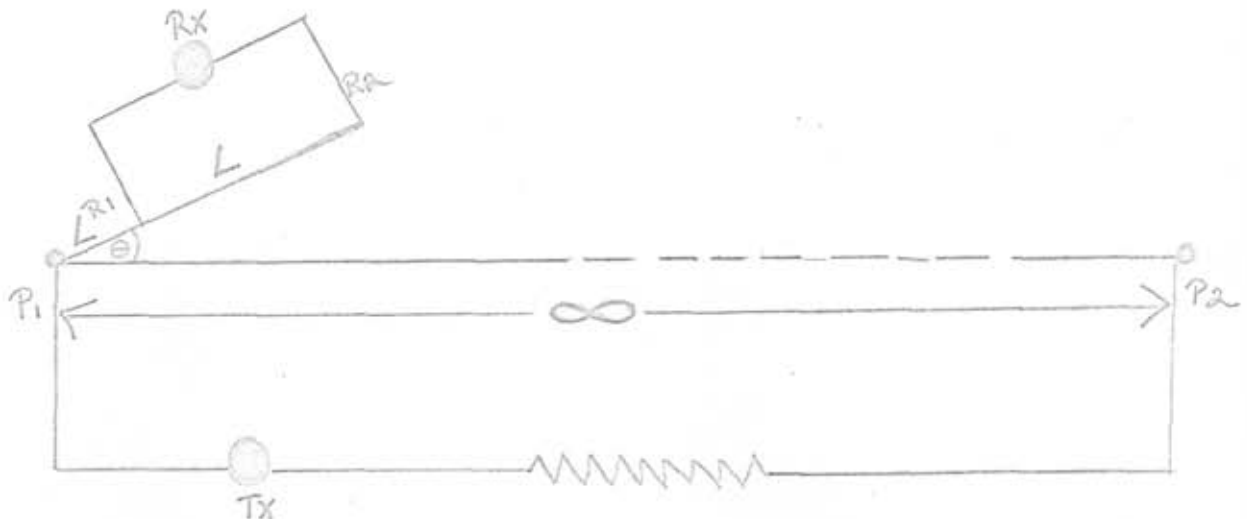
When an electric current is passed through unmineralized ground the current is carried by ions in the pore solutions, the rock-forming silicates being near-insulators. If metallic minerals, mainly sulphide and oxides, are also present then these minerals conduct current by electron flow. In mineralized ground then electric currents are carried both by ions in the pore fluids and by electrons in the metallic minerals. Where a metallic mineral replaces a pore passage (eg. fracture filling) the mode of current conduction changes from ionic to electronic at the interface of the pore fluid and the metallic mineral. A reversible chemical reaction must occur to permit this change. Since not all the ions of the pore fluid participate in the reaction surplus nonreactive ions accumulate at the interfaces and oppose further current flow. The metallic mineral therefore acts as a block to all but a small part of the ion population in the pore fluid. Because of this blocking action, charges of opposite sign develop on either side of the metallic mineral grain. Because this polarization is induced by the passage of the current it is called the IP effect. If the inducing current is now cut off the electro-chemical dipoles set up at each metallic mineral grain decay by means of currents flowing in the reverse direction to the inducing current.

Two main methods of measuring IP effects have been developed. In each the voltage effects of passing a current between two power electrodes are measured between two receiving electrodes. A number of arrangements and spacings of the four electrodes are in use. We use the Variable frequency method.

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practically, that the MCF is the most reliable indicator of the presence of metallic minerals when the MCF is accompanied by anomolous PFE.

Details of IP Survey



Measurements were made using the dual frequency method and an assymetrical array with one energising electrode at infinity. (pole-dipole array)

P1, P2 are power electrodes

R1, R2 are receiving electrodes

$P1-R2 = R1-R2 \gg P1-P2$

$P1-P2 \gg 5L$

In practice a linear array was used ($\theta = 180^\circ$)

$$\mathcal{S} = 4\pi L \frac{VR1-VR2}{I}$$

Frequencies used Low = 0.1 cps.

High = 10.0 cps.

Current range = 0.1 amp.- 1.0 amp.

Electrode spread

(a) 200' = 400' - 600' - 800' as required by resistivity range

RECONNAISSANCE INDUCED POLARIZATION SURVEY

General Procedure

Geoscience Incorporated Frequency-Domain Induced Polarization Equipment model numbers 5170 (tx) 5260 (rx), was used in pole-dipole array as previously described.

An expanding array from small (50'-100') to large (400'-800') separations indicated (by means of resistivity break vs electrode separation) that bedrock resistivity in the Highland Valley ranges between 1500 & 5000 ohm-feet. (500-1800 ohm-meters) An optimum electrode separation was judged to be that which maintained the measured resistivity between 500-1000 ohm-feet (150-300 ohm-meters), to insure that sufficient volumes of bedrock were effectively prospected. The smallest electrode separation was 200 feet. Percent Frequency Effects (PFE) were measured over the frequency range of 10.0 - 0.1 cps. A 3.0-0.1 cps. range was used to periodically check for inductive coupling effects, but none were detected.

Small PFEs could be significant in this area, and accordingly all transmitter percent deviations and daily receiver calibration-deviations were noted and used in the calculations to obtain the PFE from the apparent frequency effect measured directly by the receiver console. Transmitter deviations greater than one were not accepted, the station was re-read.

Electrode contact resistances varied between 200 and 4000 ohms. No polarization of the stainless steel electrodes was detected.

IP Survey

The following personnel worked on the survey: R. Gifford P. Eng., R.E. Chaplin P.Eng., J. Graham prospector, F. Riley prospector, E. Birkland

student assistant, G. Riley business administrator, P. LeCouteur PhD candidate.

The Northwest Syndicate completed 18.5 line miles of reconnaissance survey between the dates of April 15th and May 31st 1968. The work required 237 man days at an average skilled labor cost of \$32.50 per man, per day. The cost per mile was approximately \$690.00.

The Following Lines were surveyed:

55N.	-	37E	to	134E	-	9500'
47N	-	30E	to	126E	-	9600'
39N	-	22E	to	124E	-	10,400'
Road Line	-	2E	to	128E	-	12,600'
Road Line Rerun	-	45E	to	95E	-	4,000'
14N	-	23E	to	122E	-	10,000'
6N	-	41E	to	124E	-	3,300'
2S	-	63E	to	133E	-	7,000'
10S	-	30E	to	134E	-	10,400'
18S	-	64E	to	130E	-	6,600'

Total Footage..... 87,400'

IP SURVEY RESULTS

Percent Frequency Effect background values range between 0.5 and 2.5%. Case history studies in the Highland Valley area over known ore zones showed that commercial low grade "porphyry" type copper deposits may contain approximately two percent total sulphides including chalcopyrite, bornite and very minor pyrite. The sulphides commonly occur as small discrete grains and veinlets in an altered and fractured intrusive

rock matrix. PFE's measured on known orebodies with no overburden produce anomalies between 4 & 6 times background ie PFE's range between 6&15 percent. If a similar body were buried, it's PFE measured through surface overburden, would be progressively diluted by volumes of overlying surficial material. Only large buried bodies of disseminated sulphides could be detected at depth with PFE's as low as twice background ~~are-ion~~.

Threshold anomalies between 3.0 & 5.0 PFE (ie 1 1/2 - 2 times background) could be significant in areas of relatively deep overburden.

Overburden may produce PFE's that appear similar to the above described threshold anomalies, and are commonly caused by clay rock interfaces at the edge of existing surface swamps or conductive clay horizons. Detailed dipole-dipole IP studies may sort out the various causative bodies obtained from the pole-dipole reconnaissance survey.

Several threshold anomalies were located by the reconnaissance IP prospecting survey. No near surface (ie less than 100' below surface) orebodies of the Highland Valley type are likely to be discovered within the survey area.

More detailed surveys using the dipole-dipole array with appropriate separations shall be required to resolve the most probable cause of the obtained anomalies. The anomalies are caused either by buried conductive overburden, or by buried sulphide zones of the Highland Valley type.

The following anomalies were located:

(see plan map & IP stacked profiles)

- (1) Line 47N, 99E to 118E - 1.5-2.0 times background PFE.

Resistivity data indicates that overburden is approximately 200 feet deep.

- (2) Line 39N, 99E to 106E - 1.5-2.0 times background.

Resistivity measurements indicate that bedrock is approximately 200

feet below surface.

(3) Road Line 100E-108E - twice background PFE Resistivity data indicates a possible bedrock nose occurs on easterly side of the anomaly and locally the overburden may be 100 feet deep.

RECOMMENDATIONS

Extensive sections of some lines have resistivities on the L=400 foot spread, below 150 ohm-meters.

Larger pole-dipole spreads are required in these areas.

The three pole-dipole anomalies should receive more detailed dipole-dipole surveys at suitable separations.

The pole-dipole reconnaissance survey should be continued at least as far south as the south end of Farr Lake.

APPROXIMATE COST OF RECOMMENDED WORK

(a) Pole-dipole re-run	\$1500.00
(b) Di-pole-dipole follow up	5000.00
(c) 20 miles pole-dipole reconnaissance	14000.00
(d) Contingencies	2000.00

\$23,500.00

STATEMENT OF EXPENDITURES

IP Rental

\$50.00 per day for 36 days	\$1800.00
Truck Rental (4 W.D.) & fuel	450.00
Room and Board	1659.00
Wages	6799.99

Bulldozing	\$650.00
Drafting	60.00
<hr/>	
Total.....	\$11,418.00

PERSONNEL, DRAFTING AND WORKING DATES

(ASSISTANTS)	R. Gifford, P. Eng.	April 15th - May 25th - 35 days @ \$40.00 / day
	R. Chaplin, P. Eng.	" " - May 26th - 36 days @ \$40.00 / day
	J. Graham, Prospector	" " - May 25th - 35 days @ \$24.00 / day
	F. Riley, Prospector	" " - May 24th - 34 days @ \$24.00 / day
	E. Birkland, student	" " - May 26th - 36 days @ \$16.00 / day
	G. Riley	April 25th - April 29th - 5 days @ \$40.00 / day
	P. LeCouteur, Ph.D. candidate	May 7th - May 26th - 20 days @ \$40.00 / day
	A. Wilson, draftsman	@ \$ 3.00 / hour

Respectfully submitted
Robert D. Chaplin P. Eng.
July 4th / 68

Declared before me at the *City*
of *Vancouver*, in the
Province of British Columbia, this *17*
'y of *July 1968*, A.D.

[Signature]
Riley

Julie Turner
A Commissioner for taking Affidavits within British Columbia or
A Notary Public in and for the Province of British Columbia,
Sub-mining Recorder

QUALIFICATIONS OF THE WRITER

I ROBERT E. CHAPLIN, AM A REGISTERED PROFESSIONAL GEOLOGICAL ENGINEER IN THE PROVINCE OF BRITISH COLUMBIA.

THE WRITER HAS OWNED AND OPERATED INDUCED POLARIZATION EQUIPMENT SINCE JUNE, 1966. ON BOTH CONTRACT BASIS AND FOR PERSONAL PROSPECTING, LARGELY UNDER GUIDANCE OF A QUALIFIED CONSULTING GEOPHYSICIST.

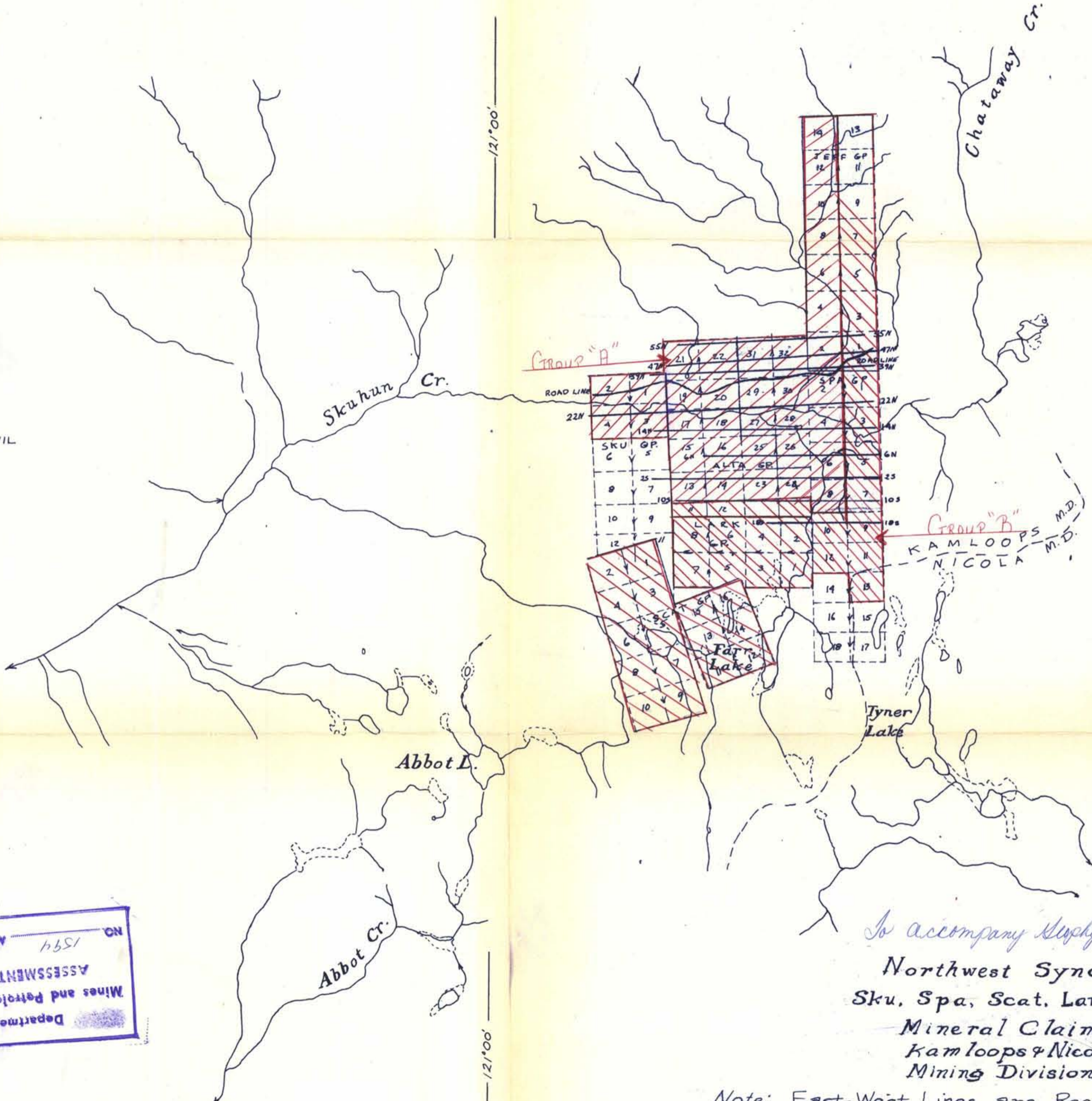
THE WRITER IS A BENEFICIAL OWNER OF PART OF THE NORTHWEST PROSPECTING SYNDICATE.

THE WRITER HAS WORKED AS A GEOLOGIST, PROSPECTOR AND I.P. OPERATOR IN THE B.C. AND YUKON FOR 12 SEASONS.



Robert E. Chaplin, P.Eng.,
July 4th, 1968.

SKWILK WAKWIL
MTN.



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
MAP NO 1594

To accompany Geophysical Report by R. Chaplin P.Eng.
Northwest Syndicate
Sku, Spa, Scat, Lark, & Alta
Mineral Claims
Kamloops & Nicola
Mining Divisions, B.C.
Robert D. Chaplin
July 4th 1968

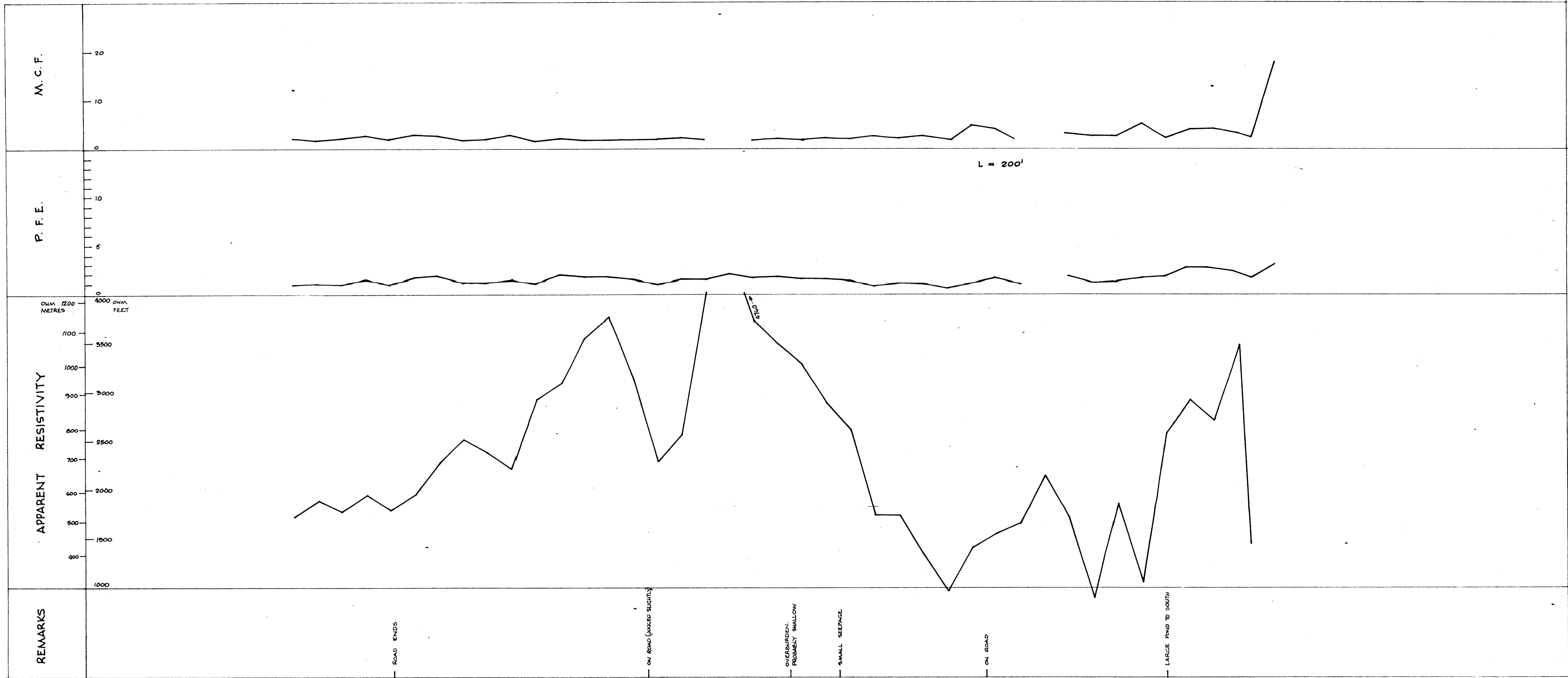
Note: East-West Lines are Reconnaissance
Frequency-Type, Pole-Dipole
Induced Polarization Survey Lines
Scale: 1" = 2640'

1594

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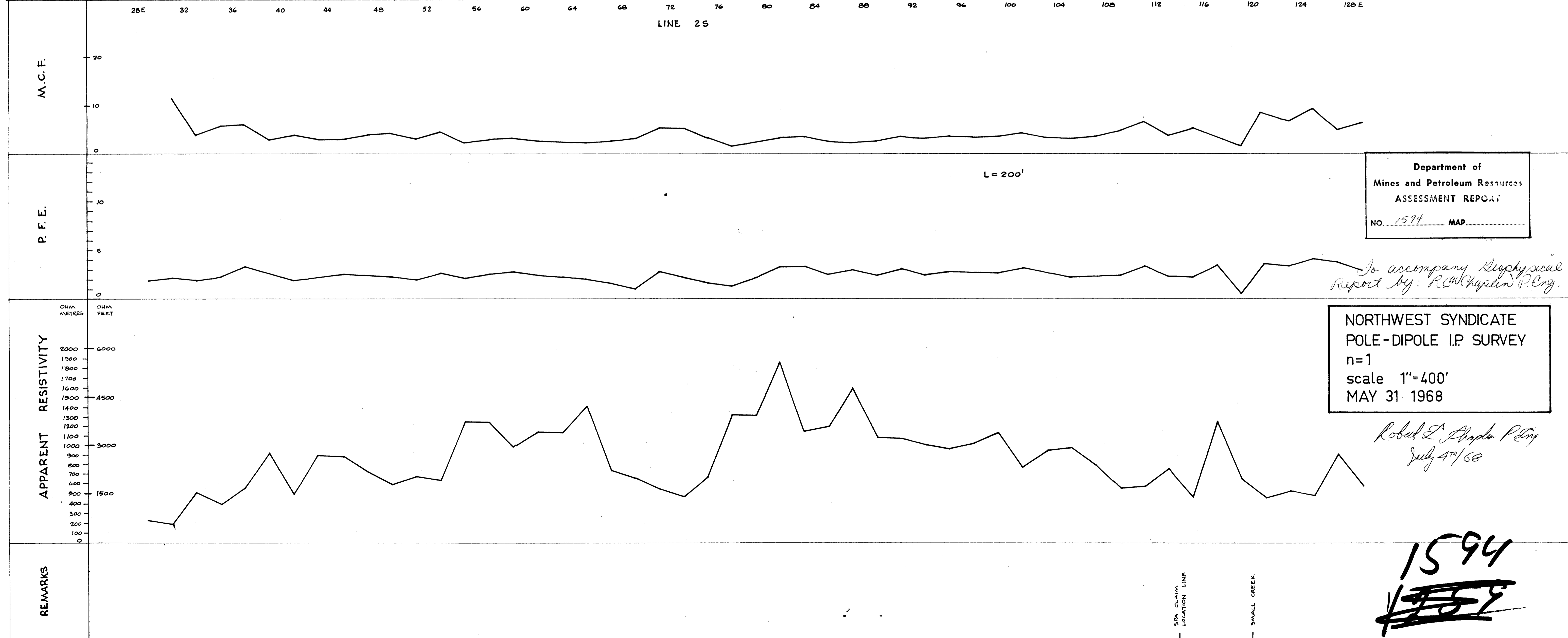
R. Chaplin, P.Eng.
June 1968

LINE 6N



L = 200'

LINE 2S



L = 200'

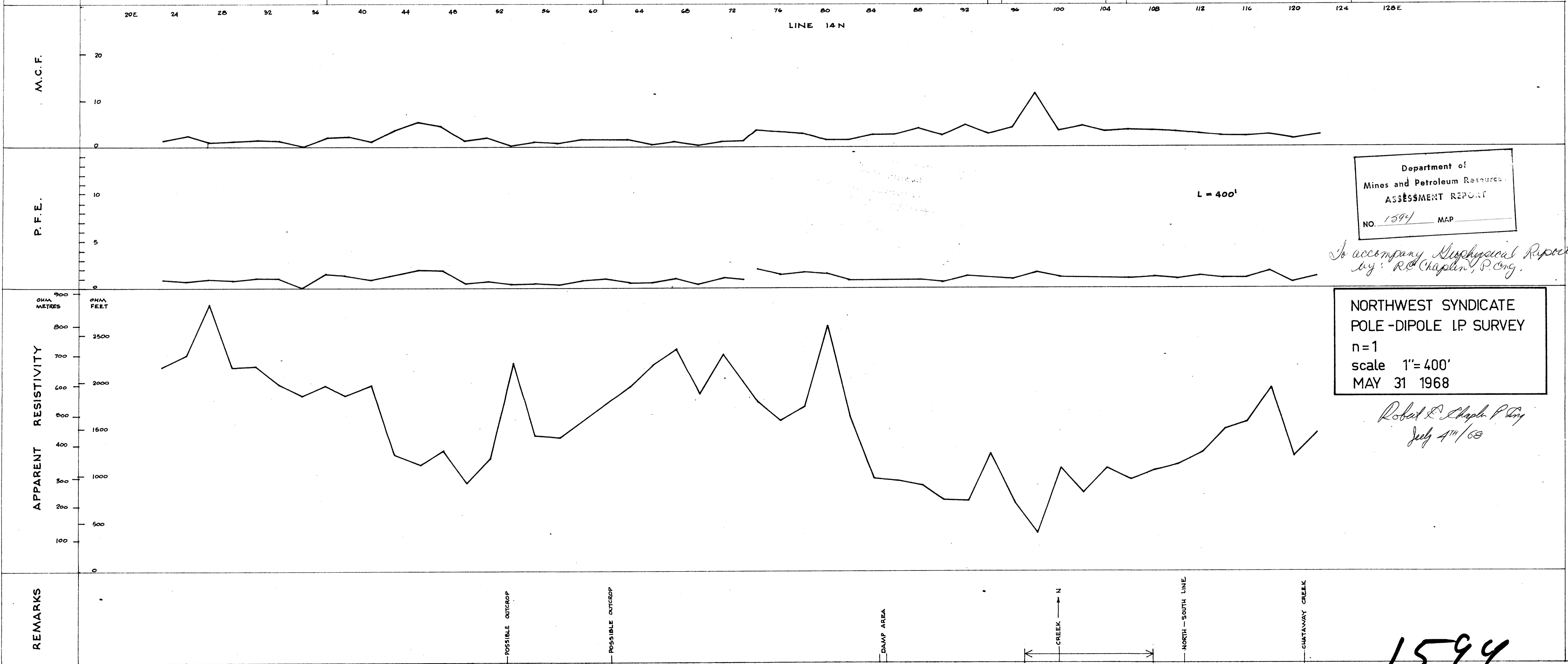
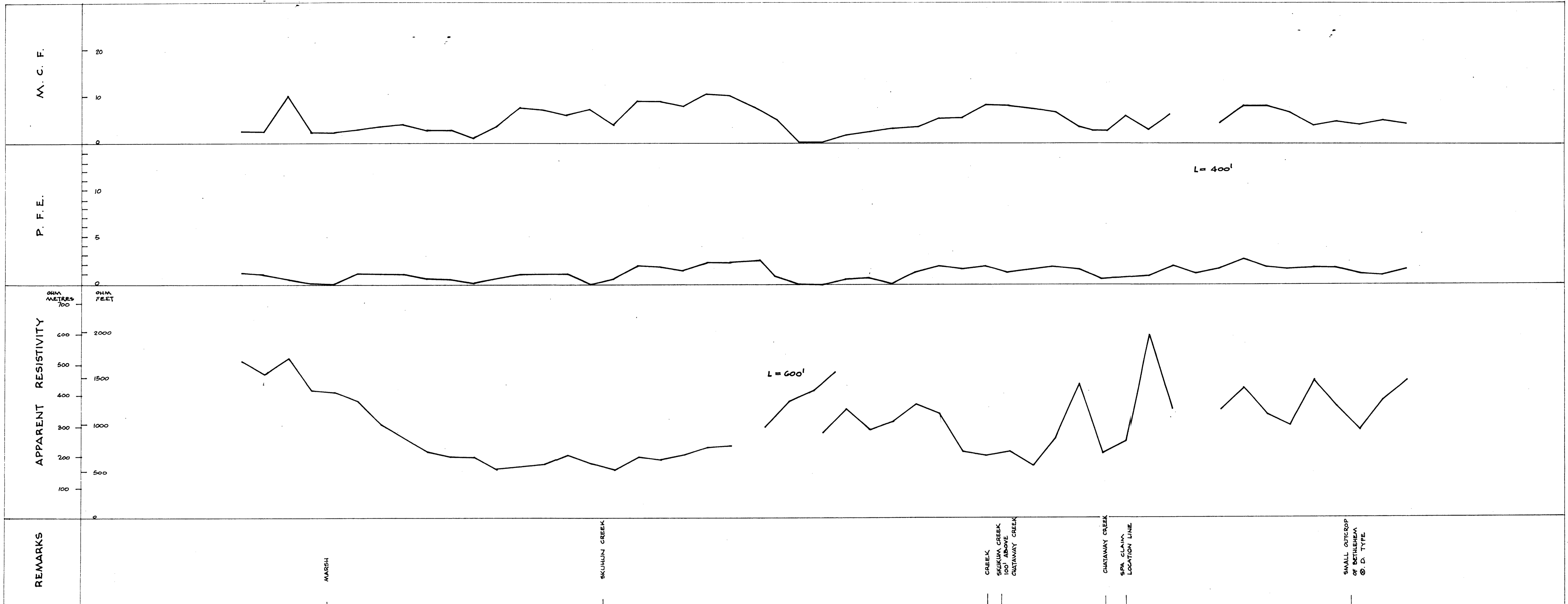
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1594 MAP

*To accompany Geophysical
Report by: R. G. (Kupala) P. Eng.*

NORTHWEST SYNDICATE
POLE-DIPOLE I.P. SURVEY
n=1
scale 1"=400'
MAY 31 1968

*Robert L. Chapter P. Eng.
July 4th 68*

1594
~~1594~~



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1594 MAP

To accompany Geophysical Report
by: R.D. Chaplin, P. Eng.

NORTHWEST SYNDICATE
POLE-DIPOLE I.P. SURVEY
n=1
scale 1"=400'
MAY 31 1968

Robert D. Chaplin P. Eng.
July 4th / 68

1594
~~1258~~

LINE 55 N

M. C. F.

P. F. E.

OHM METRES
OHM FEET
APPARENT RESISTIVITY

REMARKS

M. C. F.

P. F. E.

OHM METRES
OHM FEET
APPARENT RESISTIVITY

REMARKS

20

10

900

800

700

600

500

400

300

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400

300

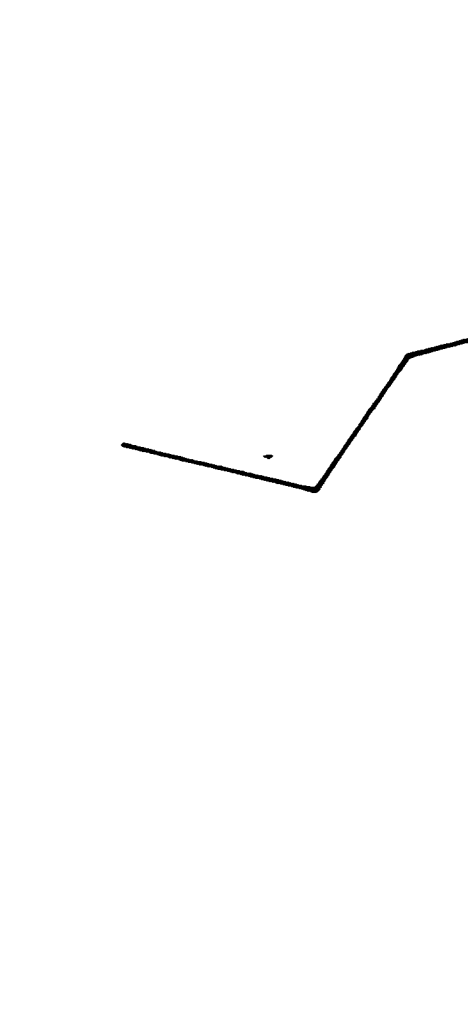
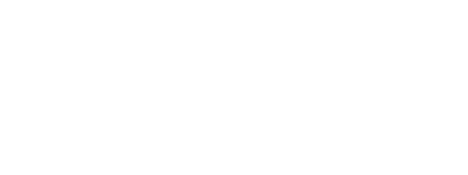
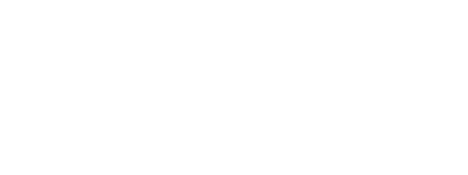
200

100

0



20 RESISTIVE N-NW TRENCHING QUARTZ-EYE DYKE, MINOR GRANITE IN FRACTURES



IN GULLY AT LINE

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46

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112

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124

128

132

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140

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160

164

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LINE 105

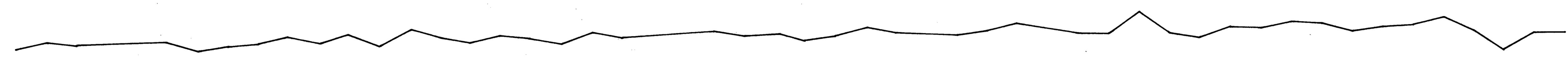
M. C. F.

20
10
0



P. F. E.

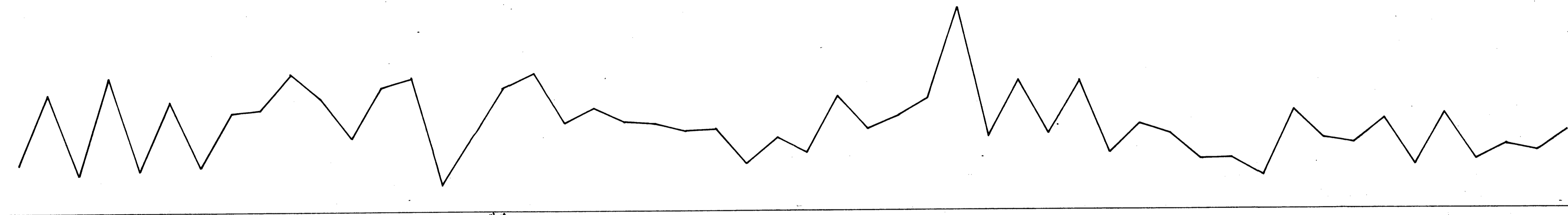
10
5
0



L = 200'

APPARENT RESISTIVITY

OHM METRES OHM FEET
1500 5000
1000 4000
500 3000
200 2000
100 1000
0



REMARKS

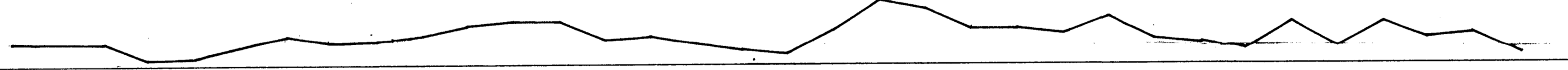
SPA CLAIM LOCATION LINE
POND, 200' NORTH OF LINE
OUTCROP
POND
OUTCROP WITH MINOR BURNITE AND MALACHITE IN WEAK FRACTURES
POSSIBLE OUTCROP
SWAMP AND ROAD

30E 34 38 42 46 50 54 58 62 66 70 74 78 82 86 90 94 98 102 106 110 114 118 122 126 130 134E

LINE 105

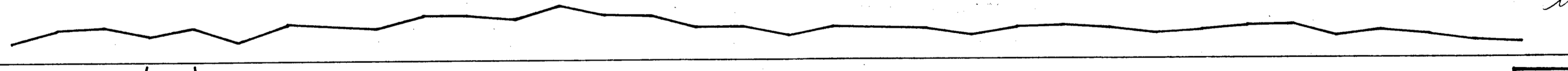
M. C. F.

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P. F. E.

10
5
0



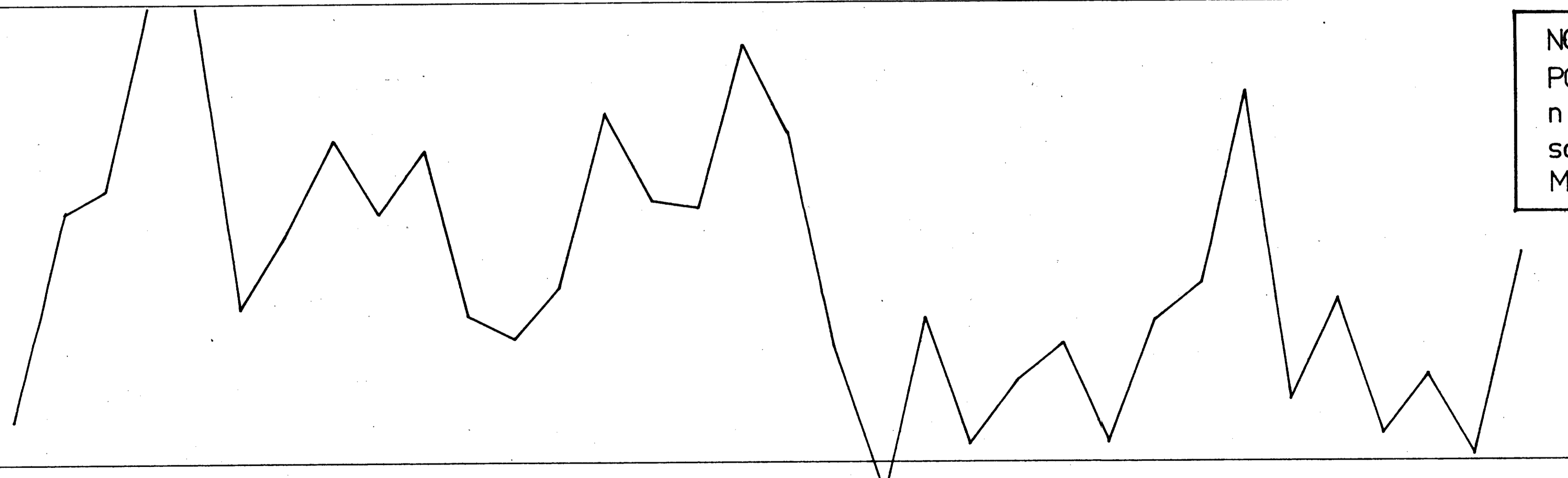
L = 200'

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1584 MAP

To accompany Assessment Report
by: R.E. Chaplin, P.Eng.

APPARENT RESISTIVITY

OHM METRES OHM FEET
1000 5000
900 4000
800 3000
700 2500
600 2000
500 1500
400
300



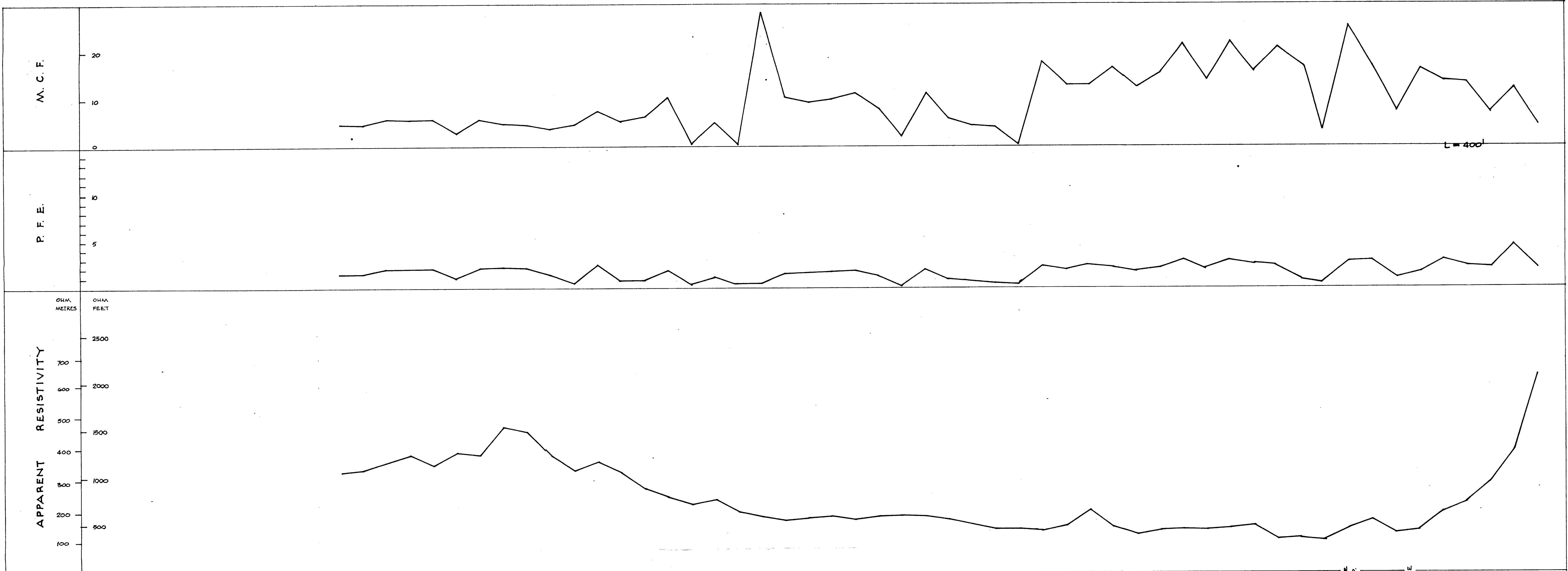
NORTHWEST SYNDICATE
POLE-DIPOLE I.P. SURVEY
n = 1
scale 1" = 400'
MAY 31 1968

Robert E. Chaplin, P.Eng.
July 4th / 68

REMARKS

MARSHY AREA
SPA CLAIM LOCATION LINE

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REMARKS

NORTH-SOUTH CUT LINE

CREEK

CLAIM LOCATION LINE JEFF, 450' NORTH OF LP

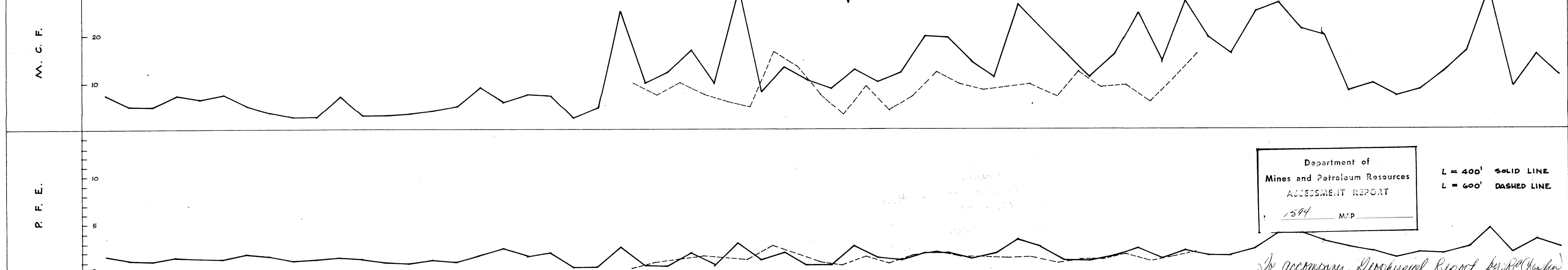
SKUHUN CREEK NORTH-SOUTH CUT LINE

ROAD LINE

4E 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64 68 72 76 80 84 88 92 96 100 104 108 112 116 120 124E

ROAD LINE

72E



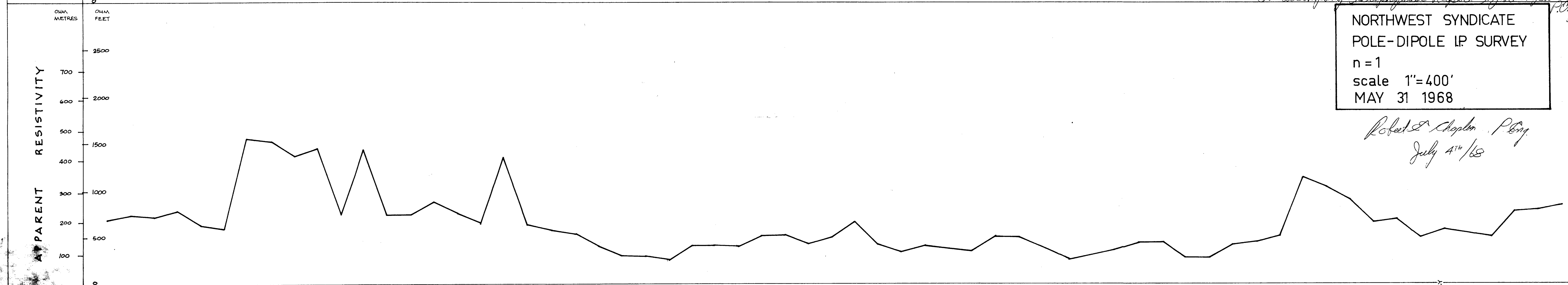
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
1594 M/P

L = 400' SOLID LINE
L = 600' DASHED LINE

In accompany Dispatch Report by R. M. (Name)

NORTHWEST SYNDICATE
POLE-DIPOLE IP SURVEY
n = 1
scale 1" = 400'
MAY 31 1968

*Robert S. Chaplin, P. Eng.
July 4th /68*



REMARKS

SKU CLAIM LINE

CREEK

SKUHUN CREEK

57A CLAIM LINE

LINE 39N - 17E

OVERBURDEN, PROBABLY 300' + DEEP

1594