

3634

GEOCHEMICAL AND GEOPHYSICAL REPORT

on the

SMITH CLAIM GROUP

located

10.8 miles northeast of Merritt, B. C.,

50° 120° SE (N.T.S. 92 - I - 2E), Nicola Mining Division

92I/2E

by

R. B. Rowe and W. D. Cowan

for

Pacific Petroleum Ltd.

on behalf of

J. E. Smith, P. O. Box 639, Merritt, B. C., owner

during

November 9 to 11, 1971 and April 10 to 22, 1972.



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

May 18, 1972.

No. 3634 MAP

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SUMMARY AND RECOMMENDATION

The Smith Claim Group features occurrences of copper minerals, a leucocratic granite body intrusive into an older syenodiorite-diorite, two distinct structural directions, and an indicated Cu soil anomaly of considerable extent.

We recommend that further work be done on the property and that this work take the form of a detailed soil sampling survey utilizing the geophysical survey grid with sample stations at 200-foot intervals and extending from 1400 feet south of the main baseline to the north boundary of the property.

Should this detailed soil sampling survey confirm the presence of a significant Cu soil anomaly, we recommend that detailed geological mapping be done followed by an induced polarization survey and/or test drilling.

INTRODUCTION

This report deals with geochemical and geophysical surveys conducted on the Smith Group of mining claims by Pacific Petroleum Ltd. in November, 1971 and April, 1972.

The Smith Group consists of the Old Mine and Payroll claims which were grouped on April 25, 1972.

Pacific has an option to purchase these claims which are owned by Mr. J. E. Smith, P. O. Box 639, Merritt, B.C.

LOCATION, ACCESS, TOPOGRAPHY AND VEGETATION

The Smith Claim Group is about 10.8 miles northeast of the city of Merritt. A dirt road, paralleling an underground pipeline cuts across the property (See Location Map). This road connects with Highway 5 at the settlement of Nicola which is about 6.6 miles northeast of Merritt.

The N.T.S. location is 92-I-2E.

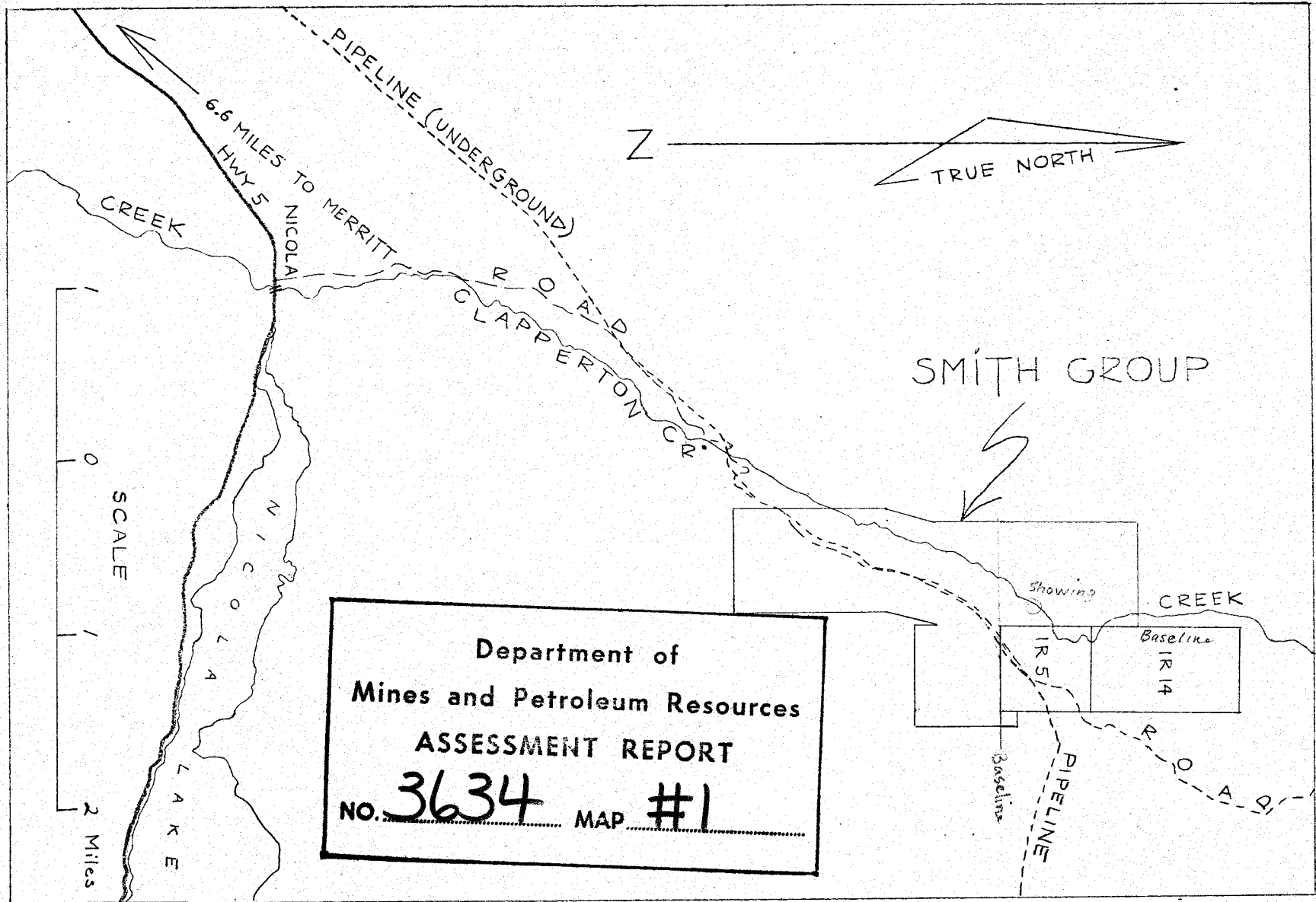
Although the general area is characterized by rolling summits and broad uplands, the valley-canyon of Clapperton Creek is the principal topographic feature of the property. Elevations are from about 2900 feet to 3900 feet above sea-level.

The forest cover is park-like with little underbrush except in the valley of the creek.

THE PROPERTY

The mining claims and fractions comprising the Smith Claim Group are as follows:

<u>Claim</u>		<u>Record Number</u>	<u>Recording Date</u>
Payroll	#1	49166	April 26, 1971
"	#2	49167	"
"	#3	49168	"
"	#4	49169	"
"	#5	49170	"
"	#6	49171	"
"	#7	49172	"
"	#8	49173	"
"	#12	49177	"
"	#14	49179	"



LOCATION MAP — SMITH CLAIM GROUP

<u>Claim</u>		<u>Record Number</u>	<u>Recording Date</u>
Old Mine	#1	49434	May 25, 1971
" "	#2	49435	"
" "	#3	49436	"
" "	#4	49437	"
" "	#5	49765	Aug. 9, 1971
" "	#6	49766	"
" "	#7	50070	Sept. 14, 1971
" "	#8	50071	"
" "	#9	50072	"
" "	#10	50073	"
" "	#11	50074	"
" "	#12	50075	"

Fractional Mining Claim

Payroll F.M.C.	#9	49174	Apr. 26, 1971
" "	#10	49175	"
" "	#11	49176	"
" "	#13	49178	"

There is an overlap involving Old Mine #5 and #6 and Old Mine #7, #8, #9 and #10 (See Figure 1, 2 or 3).

GEOLOGY

The general geology of the area is described by W. E. Cockfield in Geology and Mineral Deposits of the Nicola Map-Area, British Columbia: Geological Survey of Canada, Memoir 249, 1948.

According to Map 886A, which accompanies Memoir 249, the Smith Claim Group straddles the contact between the Nicola Group of volcanic and minor sedimentary rocks of Late Triassic age and intrusive rocks of Jurassic and later (?) age.

Outcrops on the Payroll claims consist of syenodiorite-diorite, and a younger leucocratic granite was observed on the walls of the canyon of Clapperton Creek and in outcrops on Old Mine #9 and #10 claims.

Tertiary basalt float was found north of the main baseline.

Copper minerals occur in places on the property. A small (50 foot x 50 foot), but impressive showing of bornite, chalcopyrite, malachite and azurite in white quartz is located in the bed of Clapper-ton Creek at the foot of a waterfall about 200 feet northeast of station 8 + 00 N on survey grid line 8 + 00 W. Minor amounts of disseminated chalcopyrite and, or malachite in syenodiorite-diorite were observed in several outcrops and old trenches on the Payroll claims.

SURVEY SPECIFICATIONS

GEOCHEMICAL SURVEY

Type of Sample: soil

Depth of Sample: 12 inches

Horizon Sampled: sand and clay mixture of unknown origin, A₂, and B horizon. At all stations the sample was taken well below the layer of organic material.

Number of Samples Collected: 121

Location Control: samples were taken at approximately 500 - foot intervals on lines spacing about 1500 feet apart. The lines were run by pace - and - compass, flagged, and tied-in to prominent geographical features. When the grid for the geophysical surveys were constructed, some of the soil sampling stations were tied-in and adjustments made to allow for more accurate plotting.

Samplers: W. D. Cowan, P.Eng.; C. Wilson; H. Adam

Field Survey Period: November 9, 10 and 11, 1971.

Method of Sample Collection: hole dug and sample collected by hand.

Packaging: geochemical sample envelope of Kraft paper.

Drying Procedure: dried for 1 day at 98 degrees Centigrade in cabinet with bottom elements.

Screening Procedure: by hand

Fraction Analyzed: 80 mesh screenings, 0.50 g.

Method of Analysis: atomic absorption with HClO_4 - HNO_3 extraction and Techtron AA₄ and AA₅ detection.

Final Volume: 10 ml.

Analyzed For: Cu, Zn, Mo

Laboratory: Vancouver Geochemical Laboratories Ltd.,
1521 Pemberton Ave., North Vancouver, B.C.
Supervising Chemist: L. J. Nicol

GEOPHYSICAL SURVEYS

Survey Grid

The geophysical surveys were conducted on a well-cut, flagged and picketed grid of survey lines controlled by a 5000 - foot, east - west baseline tied in to the survey monument at the southwest corner of Indian Reserve No. 5 (See Figures 2 and 3). Lines approximately 400 feet apart cover the area of principal interest whereas lines about 800 feet apart cover the remaining area of the claim group. A secondary baseline, 2800 feet in length, was also used for control. This baseline bears north 82 degrees east and is tied to a second survey monument located 4000 feet due south of the first survey monument.

Chained stations are at 200 - foot intervals on the survey lines. The line number and the distance north or south from the north or main baseline are marked on the picket at each station.

The grid was constructed in April, and May 1972 under the supervision of W. D. Cowan.

Electromagnetic Survey

Instrument: Geonics Ronka VLF - EM - 16 no. 57.

Operating Principle: The Ronka EM - 16 is a VLF radio receiver with two search coils at right angles and utilizes primary fields generated by VLF marine communication transmitters. Where these magnetic fields meet conductive bodies, there are secondary fields radiating from these bodies. A specific transmitting station is selected and the real (in-phase or dip-angle) and imaginary (quadrature) components of the resultant field are measured by an audible null method.

Instrument Specifications:

Primary Field: Horizontal from any selected VLF transmitting station.

Frequency Range: 15 to 25 kilocycles

Station Selection: By plug-in units. One of two stations selected by a switch on front panel.

Measured Field: Vertical field, in phase and quadrature components.

Accuracy of Readings: $\pm 1\%$ resolution.

Range of Measurements: In-phase $\pm 150\%$ or $\pm 90^\circ$; quadrature $\pm 40\%$.

Output Readout: Null-detection by an earphone, real and quadrature components from mechanical dials.

Batteries: 6, size AA penlight cells. Life about 200 hours.

Size: 16 x 5.5 x 3.5 inches

Weight: 2.4 lbs. (1.1 kg)

Survey Procedure:

1. Select VLF transmitting station that gives a primary field approximately at right angle to the strike of the ore bodies or the geological structure of the area.

2. Hold instrument in horizontal position with handle pointing in approximate direction of transmitting station and rotate instrument to locate direction of least noise.

3. Tilt up instrument to vertical plane at right angle to direction of station and twist to position to view dials.

4. Rock instrument back and forth to position of least noise and simultaneously twist quadrature dial to position of least noise.

5. Record readings of dip angle and quadrature dials at position of least noise.

6. Move to next survey station and repeat.

VLF Station Used: NLK/NPG - Jim Creek, Washington (Seattle). 18.6 kc.

Survey Station Interval: 50'

Data Processing: The in-phase or dip-angle readings were filtered according to the method described by D. C. Fraser in Geophysics, v. 34, no. 6, p. 958 - 967, 1969 and in the C.I.M. Bulletin, v. 64, no. 705, p. 39 - 41, 1971. Filtered values were then plotted on a map at (scale of 1 inch = 400 feet) and contoured (See Figure 2). The filter procedure removes the dc, attenuates long spatial wave lengths to increase resolution of local anomalies, and phase shifts the dip-angle data by 90 degrees so that crossovers and inflections will be transformed into peaks to yield contourable quantities.

Operator: R. B. Rowe, P.Eng. - April 10 to 17, 1972

W. D. Cowan, P.Eng.- April 18 to 22, 1972

Contouring and Interpretation: Glen E. White, consulting geophysicist,
Richmond, B.C.

Magnetic Survey

Instrument: McPhar Geophysics Fluxgate Magnetometer, Model M700, Serial No. 6621.

Instrument Specifications:

Vertical Field Measurement

Self Levelling

Maximum Sensitivity: 20 gammas per scale division on 1,000 gamma range.

Readability is $\frac{1}{4}$ scale division or 5 gammas.

Maximum Measurement: zero to \pm 100,000 gammas in five ranges.

Latitude Adjustment: latitude adjustment permits cancelling of the earth's field up to a magnitude of \pm 100,000 gammas.

Orientation Error: set at factory to 25 gammas or less in the presence of a 15,000 gamma horizontal field.

Temperature Drift: less than 50 gammas from -35 to + 55^o Centigrade.

Batteries: 2 internally - mounted 9-volt batteries

Size: 9 $\frac{5}{8}$ x 6 $\frac{7}{8}$ x 3 $\frac{3}{4}$ inches

Weight: Console 6 lbs., Batteries 1 $\frac{1}{4}$ lbs., Carrying case 2 lbs.

Base Station for Survey: Survey Monument at southwest corner of Indian Reserve No. 5 which is 00 + 00 on survey grid baseline.

Survey Procedure:

1. Set latitude adjustment control.
2. Select base station and set reading on meter to arbitrary value (in this survey, 800 gammas was selected).
3. As successive stations are occupied, the instrument is held level and the measurement is taken directly from the meter.

4. Check back at base station every two hours or less to obtain correction for diurnal variation.

Survey Station Interval: 100'

Operator: W. D. Cowan, P.Eng. - April 10 to 22, 1972

Contouring and Interpretation: Glen E. White, consulting geophysicist,
Richmond, B.C.

DISCUSSION OF RESULTS

GEOCHEMICAL SURVEY

The Smith Claim Group is part of a much larger area that was soil sampled on a 1500 foot x 500 foot grid. Samples were analyzed for Mo, Zn and Cu. None of the Zn values and only a few widely-scattered Mo values were anomalous. The cumulative frequency diagram for Cu shows that values above 75 ppm. are anomalous.

Figure 1 (in pocket) illustrates the results of sampling on the Smith Group and immediate vicinity.

The presence of a northwest-trending area of anomalous Cu soils is indicated. It is about 2,300 feet in width and at least 4,000 feet in length. Cu values range to 7,300 ppm. Only one anomalous Mo value was obtained: the sample was collected within the Cu soil anomaly on Old Mine #2 claim.

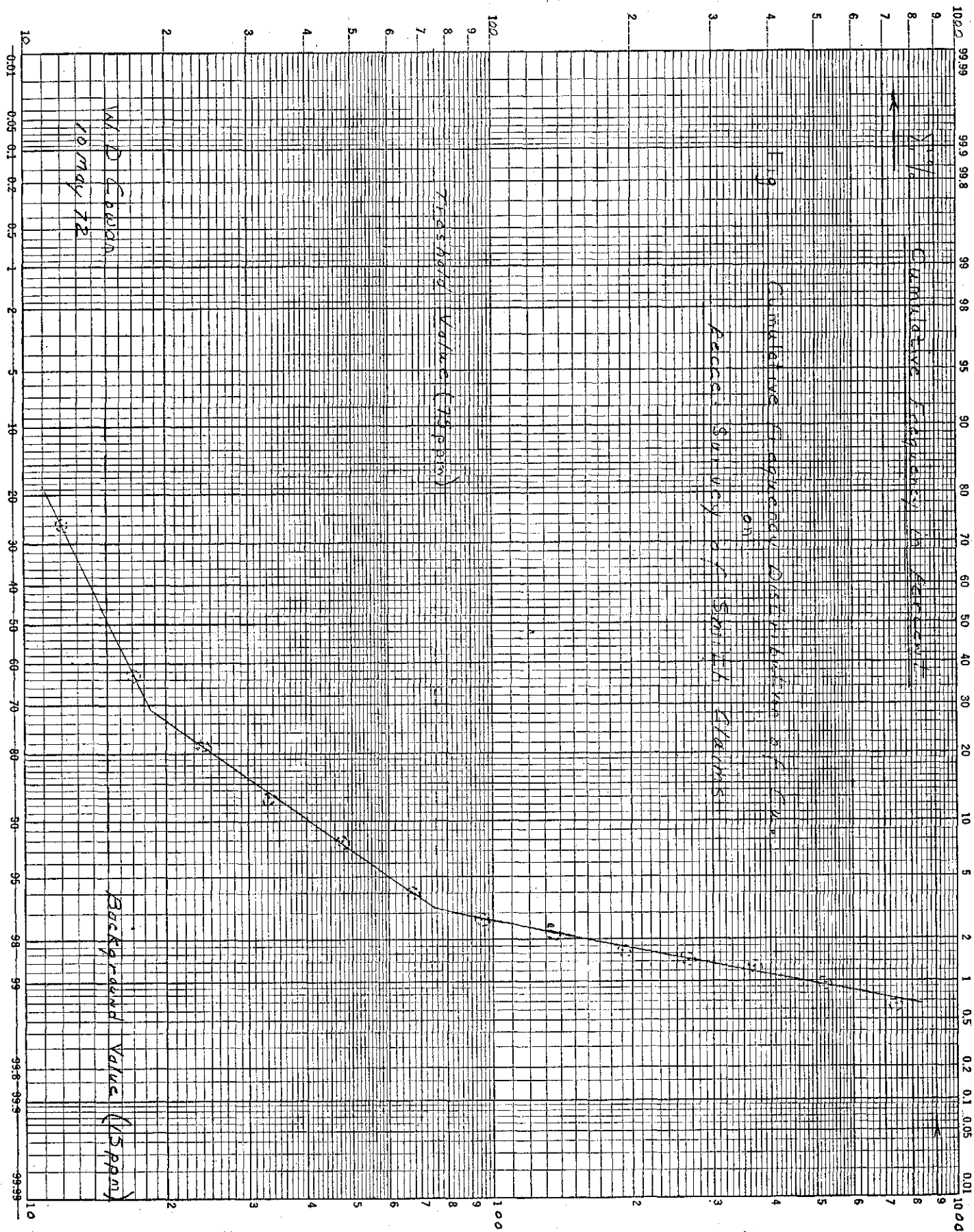
GEOPHYSICAL SURVEYS

Electro Magnetic Survey

Figure 2 (in pocket) illustrates the results of the VLF - EM survey.

Filtered VLF dip angle (in-phase) data have been contoured at levels of +10, +15, +20 and +30 degrees, and several linear anomalies are apparent.

P.P.M Copper



CUMULATIVE FREQUENCY DIAGRAM - Cu Soil Values.

The most prominent trend is northeasterly, however, a northwesterly trend is also apparent.

The strong north - northeasterly anomaly cutting across the property is caused by the underground pipeline.

The other anomalies are probably caused by fractures, faults or shears some of which may contain copper sulphide minerals which have been found in places on the property.

Magnetic Survey

Figure 3 (in pocket) illustrates the results of the ground magnetometer survey. Contours are at intervals of 200 gammas.

The most pronounced feature is a "magnetic low" trending northeasterly through claims Old Mine #8, Old Mine #6, Old Mine #9, and Old Mine #11. Outcrops of leucocratic granite occur in places in this area and it is possible that the low reflects the granite body.

A plateau - like "magnetic high" to the south and east of the low probably reflects bedrock which is mainly diorite and syenodiorite.

An irregular magnetic high occurs north of the magnetic low. No outcrop was found in this area at the time of the magnetic survey, however, much of the ground was covered by as much as 2 feet of snow. Basalt float was observed and this plus the generally higher magnetic values in the northwesterly corner of the property indicate the possible presence of Tertiary basalt capping.

The plus 1,000 gamma anomaly on Payroll #7 and #8 is probably caused by an abnormal amount of magnetite in a dyke or lens.

APPENDIX A - STATEMENT OF TIME AND EXPENDITURES

GEOCHEMICAL SURVEY

Samplers:

W. D. Cowan, P.Eng., Suite 48, 1298 Emery Place, North Vancouver, B.C., 2 days @ \$56.00 per day	=	\$ 112.00
Colin Wilson, 2600 East 49th Ave., Vancouver 16, B.C., 2 days @ \$35.00 per day	=	70.00
Harold Adam, P. O. Box 2114, Merritt, B.C., 2 days @ \$35.00 per day	=	70.00

Subsistence:

Cowan and Wilson, 2 days @ \$30.00 per day	=	60.00
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Vehicle:

4-wheel drive Toyota, 2 days @ \$15.00 per day	=	30.00
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Sample Analyses:

82 samples @ \$2.20 per sample	=	180.40
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Plotting Results:

Cowan, 1 day @ \$56.00 per day	=	<u>56.00</u>	\$ 578.40
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GEOPHYSICAL SURVEYS

Survey Grid

Surveying:

W. D. Cowan, P. Eng., 7 days @ \$56.00 per day	=	392.00
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Line-cutters:

Harold Adam, 17 days @ \$35.00 per day	=	595.00
Gordon Kochkowski, General Delivery, Kamloops, B.C., 12 days @ \$35.00 per day	=	420.00
George Adam, P. O. Box 2114, Merritt, B.C., 5 days @ \$35.00 per day	=	175.00

Equipment Rental:

Chain saw, 15 days @ \$5.00 per day	=	75.00
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<u>Subsistence:</u> Cowan, 7 days @ \$20.00 per day	=	<u>140.00</u>	\$1,797.00
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Electromagnetic and Magnetic Surveys

Operators:

R. B. Rowe, P.Eng., Pacific Petroleum Ltd., 8 days @ \$75.00 per day	=	\$ 600.00
W. D. Cowan, P.Eng., 11 days @ \$56.00 per day	=	616.00

Equipment Rental:

Geonics - Ronka EM-16, 3 weeks @ \$75.00 per week	=	225.00
McPhar Fluxgate Magnetometer, 3 weeks @ \$75.00 per week	=	225.00

Subsistence:

Cowan, 11 days @ \$20.00 per day	=	220.00
Rowe, 8 days @ \$20.00 per day	=	<u>160.00</u>
		\$2,046.00

General

Vehicle:

3 weeks @ \$75.00 per week, plus 1,178 miles @ 12¢ per mile plus \$53.60 gas	=	\$ 419.96
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Geophysical Calculations and Plotting:

R. B. Rowe, P.Eng., 4 days @ \$75.00 per day	=	300.00
W. D. Cowan, P.Eng., 3 days @ \$56.00 per day	=	168.00

Contouring and Interpretation:

Glen E. White, consulting geophysicist, 117 - 641 Gilbert Rd., Richmond, B.C. 1 day @ \$75.00 per day	=	75.00
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Aerial Photos:

	=	<u>20.00</u>
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982.96

Total

\$5,404.36

APPENDIX B - STATEMENTS OF QUALIFICATIONS

I, Robert Burton Rowe, do hereby certify:

1. That I am a Professional Engineer registered by The Association of Professional Engineers of the Province of British Columbia.
2. That I am a graduate in geology of the Universities of Western Ontario (B.Sc., 1947), Toronto (M.A., 1948), and Wisconsin (Ph.D., 1951).
3. That I have practised the profession of geology for 21 years.
4. That I am an employee of Pacific Petroleum Ltd., with offices at #408 - 580 Granville Street, Vancouver 2.
5. That this report is based on geochemical and geophysical surveys carried out under my supervision.

Dated this *18th* day of *May*, 1972.

Signed,

RBRowe

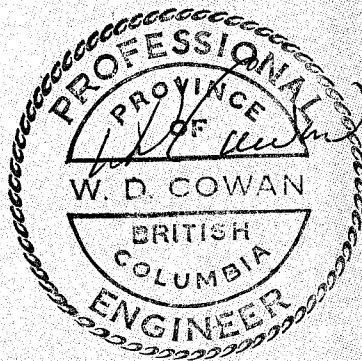
R. B. Rowe
District Exploration Geologist

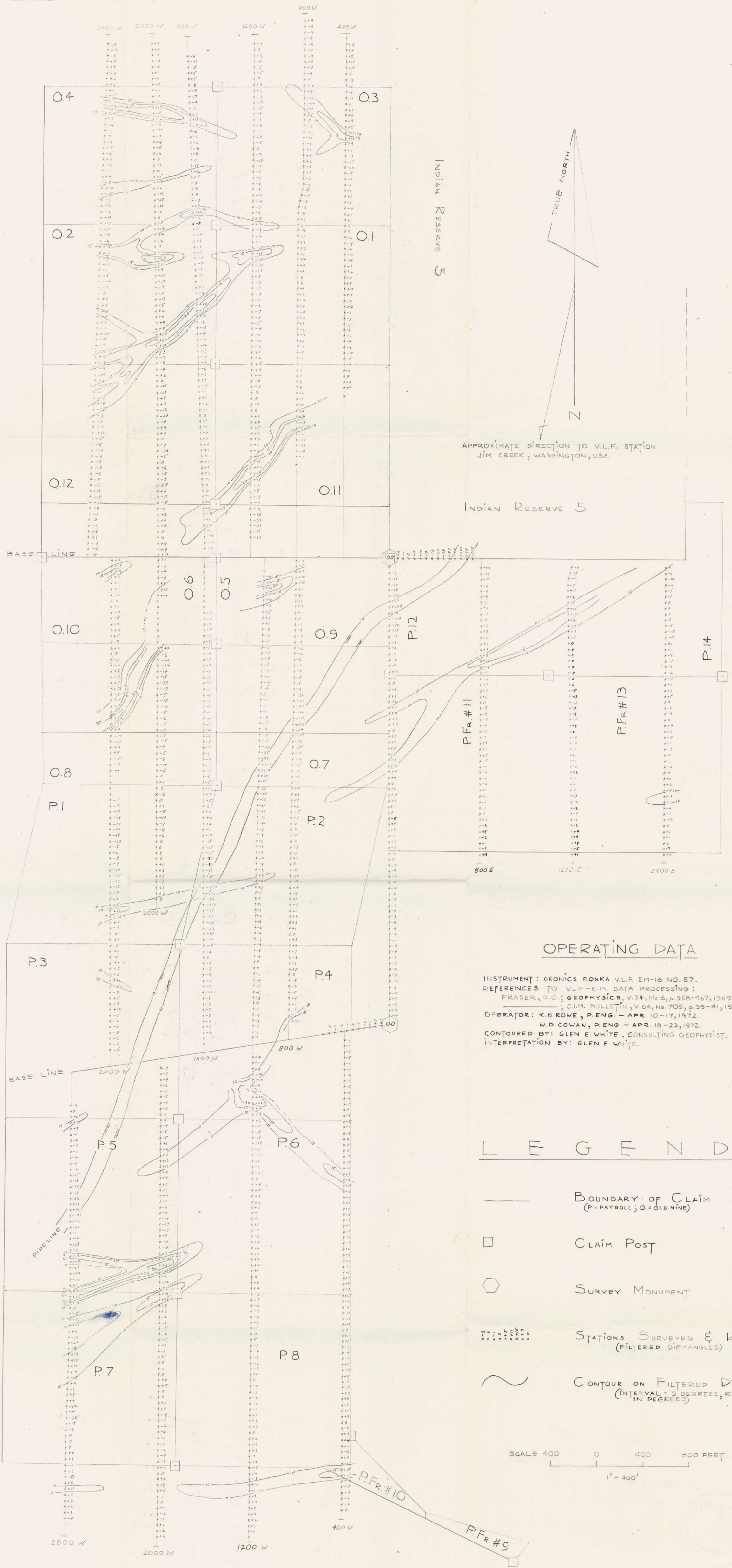
RBRowe
May 18/72

I, William Donovan Cowan, do hereby certify:

1. That I am a Professional Engineer registered by the Association of Professional Engineers of the Province of British Columbia.
2. That I am a graduate in mining engineering of the University of Alberta (B.Sc., 1960), and McGill University (M.Sc., 1969).
3. That I have practised the profession of engineering for 11 years.
4. That I am an employee of Pacific Petroleum Ltd., with offices at #408 - 580 Granville Street, Vancouver 2.
5. That I conducted geophysical and geochemical surveys that are the basis of this report.

Dated this 12th day of May, 1972.





OPERATING DATA

INSTRUMENT: GEONICS RONKA V.L.F. EM-16 NO. 57.
 REFERENCES TO V.L.F.-E.M. DATA PROCESSING:
 FRASER, D.C.; GEOPHYSICS, V.34, No. 6, p. 958-967, 1969.
 C.I.M. BULLETIN, V. 64, No. 705, p. 39-41, 1971.
 OPERATOR: R.B. ROWE, P. ENG - APR. 10-17, 1972.
 W.D. COWAN, P. ENG - APR. 18-22, 1972.
 CONTOURED BY: GLEN E. WHITE, CONSULTING GEOPHYSICIST.
 INTERPRETATION BY: GLEN E. WHITE.

LEGEND

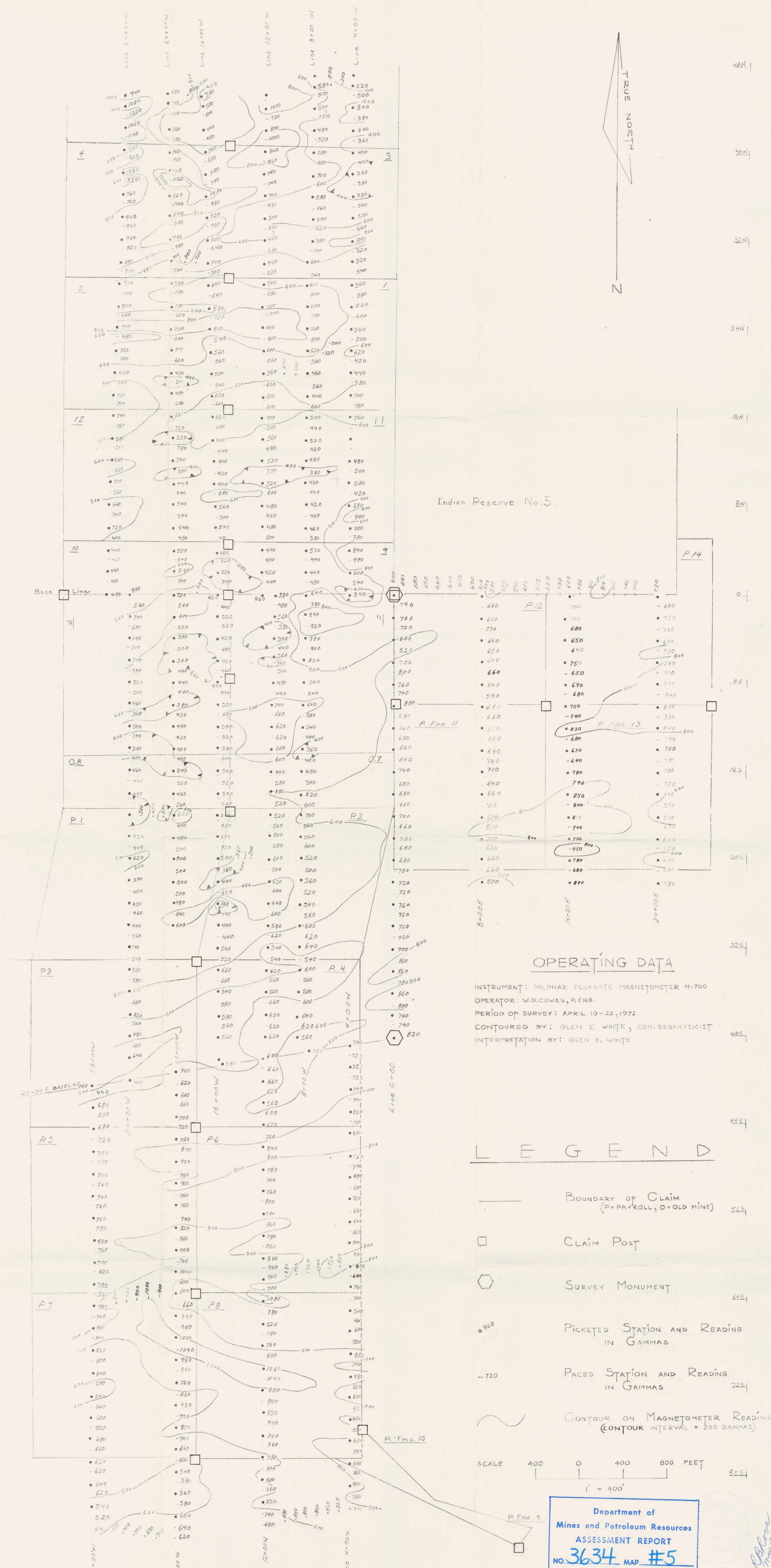
- BOUNDARY OF CLAIM (P = PAYROLL; O = OLD MINE)
- CLAIM POST
- SURVEY MONUMENT
- ⊗ STATIONS SURVEYED & READINGS (FILTERED DIP-ANGLES)
- ~ CONTOUR ON FILTERED DIP-ANGLES (INTERVAL = 5 DEGREES, READINGS IN DEGREES)

SCALE 400 0 400 800 FEET
 1" = 400'

NOTE: TO ACCOMPANY GEOCHEMICAL AND GEOPHYSICAL REPORT ON THE SMITH CLAIM GROUP, 10.8 MILES NORTHEAST OF HERRITT, 50°12' S.E. BY R.B. ROWE AND W.D. COWAN, DATED MAY 18, 1972

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FIGURE 2 - MAP OF SMITH CLAIM GROUP SHOWING CONTOURS ON FILTERED V.L.F.-EM-16 DIP ANGLES



Indian Reserve No. 5.

OPERATING DATA

INSTRUMENT: MCPHAR FLUXGATE MAGNETOMETER M-700
 OPERATOR: W.D. COWAN, P. ENG.
 PERIOD OF SURVEY: APRIL 10-22, 1972
 CONTOURED BY: GLEN E. WHITE, CON. GEOPHYSICIST
 INTERPRETATION BY: GLEN E. WHITE

LEGEND

- BOUNDARY OF CLAIM (P=PAYROLL, O=OLD MINE)
- CLAIM POST
- ⬡ SURVEY MONUMENT
- PICKETED STATION AND READING IN GAMMAS
- PACED STATION AND READING IN GAMMAS
- ~ CONTOUR ON MAGNETOMETER READINGS (CONTOUR INTERVAL = 200 GAMMAS)

SCALE 400 0 400 800 FEET
 1" = 400'

Department of
 Mines and Petroleum Resources
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NOTE: TO ACCOMPANY GEOCHEMICAL AND GEOPHYSICAL REPORT ON THE SMITH CLAIM GROUP, 10.8 MILES NORTHEAST OF MERRITT 50°12' S.E. BY R.B. ROWE AND W.D. COWAN, DATED MAY 18, 1972.

FIGURE 3 — MAP OF SMITH CLAIM GROUP SHOWING CONTOURS ON MAGNETIC READINGS

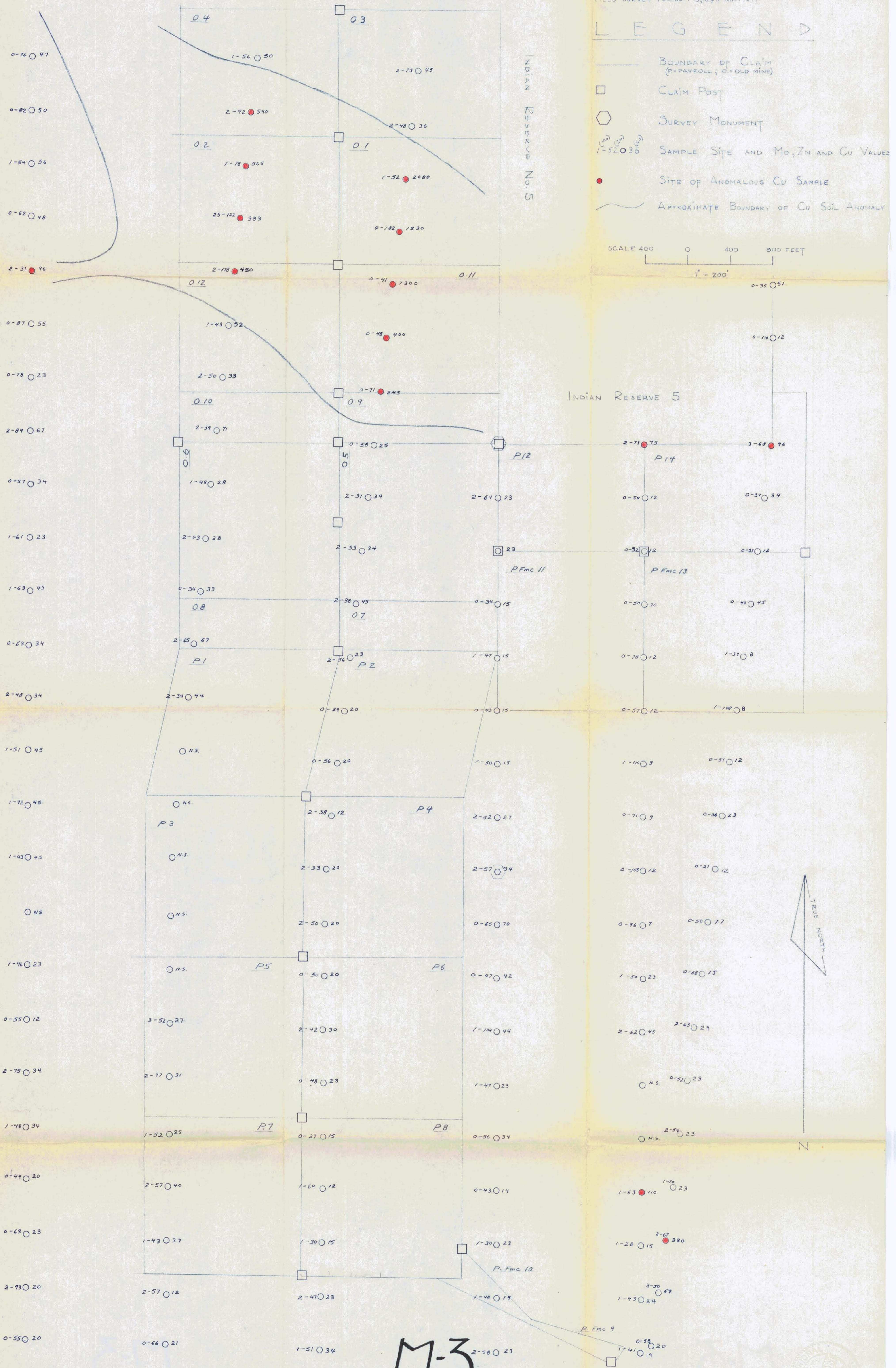
OPERATING DATA

SOIL TYPE AND HORIZON SAMPLED: PODZOL, A₂, UPPER B.
 DEPTH OF SAMPLE: 12 INCHES.
 SAMPLERS: W.D. COWAN, P. ENG.; C. WILSON; H. ADAM.
 STATION INTERVAL: 500'.
 METHOD OF SAMPLING: MANUAL.
 SAMPLE CONTAINER: GEOCHEMICAL ENVELOPES OF KRAFT PAPER.
 ANALYSES BY: VANCOUVER GEOCHEMICAL LABORATORIES LTD.
 1521 PEMBERTON AVE., NORTH VANCOUVER.
 FIELD SURVEY PERIOD: 9, 10 & 11 NOV. 1971.

LEGEND

- BOUNDARY OF CLAIM (P=PAYROLL; O=OLD MINE)
- CLAIM POST
- SURVEY MONUMENT
- (with numbers) SAMPLE SITE AND MO, ZN AND CU VALUES
- SITE OF ANOMALOUS CU SAMPLE
- ~ APPROXIMATE BOUNDARY OF CU SOIL ANOMALY

SCALE 400 0 400 800 FEET
 1" = 200'



M-3

3634

Department of
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 NO. 3634 MAP #3

NOTE: TO ACCOMPANY GEOCHEMICAL AND
 GEOPHYSICAL REPORT ON THE SMITH CLAIM
 GROUP, 100 MILES NORTHEAST OF MERRITT,
 50° 120' S.E. BY R.B. ROWE AND W.D. COWAN,
 DATED MAY 18, 1972.

R.B. Rowe
 May 15, 1972

FIGURE 1 — MAP OF SMITH CLAIM GROUP SHOWING RESULTS OF SOIL SAMPLE SURVEY