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1975 GEOPHYSICAL REPORT ON THE TOPLEY RICHFIELD PROSPECT.

RICHFIELD; REDTOP CLAIMS

DATE: MAY, 1975.

BY: G.M. DEPAOLI, GEOPHYSICIST, B.Sc.

Department of Mines and Petroleum Resources ASSESSMENT REPORT 555 3 MAP NO

1975 GEOPHYSICAL REPORT ON THE TOPLEY RICHFIELD PROSPECT (MINERAL CLAIMS: RICHFIELD #1-4, REDTOP #1, TR #1-36)

located in

NORTH CENTRAL BRITISH COLUMBIA

in the

OMENICA MINING DIVISION

approximately

7 MILES NORTH OF TOPLEY

at cordinates

54°34' N. LAT.; 126°14' W. LONG.

work for

CANADIAN SUPERIOR EXPLORATION LIMITED

work by

MORRISON & DEPAOLI GEOPHYSICAL CONTRACTORS AND CONSULTANTS

work period

MAY 15 TO MAY 20, 1975

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ILLUSTRATIONS

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4 GEOPHYSICAL INTERPRETATION	FIGURE 6	IN POCKET

INTRODUCTION

The Topley Richfield Prospect is located in north central British Columbia and consists of 41 mineral claims owned and under option to Canadian Superior Exploration Limited. The economic viability of known gold occurrences associated with pyritized quartz veining is currently under investigation. During the period May 17 to May 21, 1975 a total of 2.9 line miles of induced polarization / resistivity surveying were completed over the property. The following report describes the instrumentation, field procedure and results obtained from the survey.

The work was executed by MORRISON & DEPAOLI, Geophysical Contractors and Consultants upon the request of Canadian Superior Exploration Limited and under the supervision of J. Baker.

LOCATION AND ACCESS

The property is located in north central B.C. approximately 69 miles southeast of Smithers or 7 miles north of Topley. It lies within the Omenica Mining Division at coordinates $54^{\circ}34'$ N. Latitude, $126^{\circ}14'$ W. Longitude. (See Location Map Figure 1) Road access suitable for 2 wheel drive vehicle exists to the grid area. One would depart highway 16 at Topley and proceed north for 5 miles along the hard surfaced Topley - Granisle Road, then turn northeast on to the old Topley - Topley Landing gravel road and finally turn east again at the power transmission line on to the property access road.

GRID CONTROL

The control grid consists of 3.7 miles of cut, chained and



flagged lines. The central baseline is 2800 feet long and strikes true north. Seven perpendicular cross lines were cut at 400 foot intervals. Lines were emplaced by silva compass.

GENERAL_GEOLOGY

The property is underlain predominantly by Hazelton Group andesite flows and pyroclastics of Lower Jurassic Age. No intrusive rocks have been mapped within the grid area, however a Jurassic granodiorite stock occurs immediately north of the claim group.

The prospect was explored extensively in 1928 for gold and silver. A total of 600 feet of underground drifting was carried out on two levels. A large waste dump and four old buildings remain. The mineralization is found within quartzcarbonate veining (Topleyite) which itself is contained within a shear zone. The shear zone would appear to be part of a larger controlling fault system.

Exploration of the property has been reactivated to test for economic concentrations of gold and silver within the Topleyite Zone.

INDUCED POLARIZATION SURVEY

INTRODUCTION AND THEORY

The quartz veining within the shear zone contains fine grained pyrite in addition to gold and silver. An induced polarization / resistivity survey was initiated to test the intensity and linear extent of the pyrite mineralization which would then serve as a tracer for the Topleyite mineralization. Apparent resistivity data taken concurrently would be useful in inferring overburden depths, mapping the shear zone, defining abrupt lithological changes and assessing the importance of any PFE effects obtained. In addition the quartz veining may be reflected as a resistivity high.

The term induced polarization means the electrical separation (ie. separation of charges) induced by an applied electric field. The cause of this polarization is changes in the mobilities of ions within a rock. At the interfaces between zones of different mobilities, excesses or deficiences of ions occur; the concentration gradients developed oppose the current flow and cause a polarizing effect. When mineral grains block the pore passages of rocks and a current is applied, a concentration of ions builds up at the electrolyte (water) - metal interface while awaiting an electrochemical reaction which must occur before the electric charge can be transferred from an ion in the electrolyte to a free electron in the metal. The forces which oppose the current flow are said to polarize the interface and the added voltage necessary to drive the current across the barrier is known as overvoltage.

It takes a finite time to build up overvoltage and one finds that the impedances of the zones (Warburg Impedance) decreases with increasing frequency. In the frequency domain system that was employed the decrease in the Warburg Impedance was measured between current applied a 0.3 hertz to current applied at 5.0 hertz.

INSTRUMENT AND PROCEDURE

A multiple frequency McPhar Induced Polarization System Model P-660, was employed in measuring the polarization and resistivity parameters. The transmitter is a manually variable voltage source. The output current can be selected from both polarities and varies from direct current to automatically alternating output frequencies of 0.05, 0.1, 0.3, 1.25, and 5.0 hertz.

On this survey the low and high frequencies employed were 0.3 and 5.0 hertz. Power was obtained from a $2\frac{1}{2}$ KW - 400 hertz motor generator. The maximum output current for the transmitting system is 5.0 amp. while the maximum output voltage is 690 volts.

The receiver employed was the A.C. P-660 Model. This is a potentiometer type where the amplified and filtered signal is compared with a reference voltage. It is powered by six 9 Volt alkaline transistor batteries and draws 7.5 ma. Total weight including carrying case and batteries is 2.2 kilograms.

A symetrical in line dipole - dipole array was employed in the survey. The dipole length was 200 feet and measurements were taken to 4 separations (N=1,2,3,4). Further resolution was obtained on a segment of Line 28+00 N by resurveying the Line using a 100 foot dipole length. Survey procedure required the preparation of a "set-up" station near the center of each line. The transmitter and its motor generator power supply remained stationary at the set-up position and wires in increasing 200 foot intervals were strung out in both directions. Care was taken to ensure that the wires were well separated to prevent inductive coupling effects. The ends of the wires were connected to 4 foot stainless steel rods which had been hammered into the ground. Where possible the receiving dipole also utilized the stainless steel rods for electrode connections. Once the receiver dipole moved past the last steel rod ground connections were made via porous pots. Radio contact between the receiver and transmitter operators coordinated power "on" and "off" periods.

PRESENTATION OF DATA

The data is plotted in seven pseudosections, Figures 3 a-g after page12. The pseudosections are vertical profile plots displaying apparent resistivities in $\mathcal{H}_{2\pi}$ ohm-feet, calculated metal factors and percent frequency effect values. Contoured plan maps of the second separation (N=2) apparent resistivity and percent frequency effect data have also been prepared in Figures 4 and 5 respectively. An interpretation of the data is presented in Figure 6.

RESULTS AND INTERPRETATION

No induced polarization anomalies were obtained on the grid area. In general below average PFE values (less than 1.0%) were obtained in the central and northwestern portions of the grid. An increase in PFE values to normal background levels is noted on the eastern edge of the map area. (See Figure 5) Examination of the pseudosection plots reveals an anomalous PFE low (less than 0.5%) between 22+00 and 26+00 East which is bounded on the east side by an abrupt increase in apparent resistivities. This PFE low is best portrayed on Line 28+00 N in both the 200 foot and 100 foot dipole data in Figures 3 d and 3 e respectively. Analysis of these pseudosection profiles would indicate that the feature causing the PFE low has a width in the order of 30 - 50 feet and a westerly dip.

Apparent resistivity values are below 50 $\frac{1}{2\pi}$ ohm-feet (95 ohmmeters) throughout most of the grid area. Abrupt increases in the resistivity data occur along the eastern and southwestern portions of the survey area. It is interesting to note that the old workings occur at coordinates 26+20 E, 26+00 N which is coincident with the abrupt resistivity change.

DISCUSSION

The central and western portion of the survey area is characterized by low apparent resistivities coincident with low PFE values. As displayed in Figure 6 this response has been attributed to extensive overburden and glacial till in the order of 75 to 200 feet. The abrupt increase in apparent resistivities on the eastern portion of the lines is interpreted to reflect near surface bedrock. The rapid change in bedrock elevation may be explained by fault movement.

The anomalously low PFE values detailed on Line 28+00 N are interpreted to reflect intense alteration associated with the shear zone. A coincident and expected apparent resistivity low is seen on the detail data in Figure 3 e.

The lack of an induced polarization response from visible pyrite within the quartz veining is somewhat puzzling. The following 2 explanations are theorized:

- 1) The average width of the pyritized quartz veining is relatively narrow (ie. 20 feet) and blind to a 100 foot dipole array.
- 2) The pyrite is completely enveloped by the quartz and is electrically insulated and unpolarizable.

CONCLUSIONS

The controlling structure and shear zone in which the mineralized quartz-carbonate veining occurs is well defined by PFE and apparent resistivity contrasts. The possible strike of the system is shown in Figure 6. Since the pyrite within the quartz veining did not produce a recognizable polarization response the zone of interest in Figure 6 has been interpreted from the position of the known underground workings in relation to the measured PFE and resistivity gradients. Further potential for the prospect would appear to be along strike and at depth if a narrow vertical zone is present.

RECOMMENDATIONS

- A detailed ground magnetometer survey should be undertaken with measurements at 100 foot intervals over the entire grid (3.2 miles) and reduced to 50 feet between 24+00 and 28+00 East. The purpose of this survey would be to further resolve the width of the shear zone and hopefully reveal any magnetic irregularities or intersecting trends along the strike of the system.
- 2. Failing any further refinements to the interpreted geology subsequent to the completion of the magnetic survey, one diamond drill hole is proposed at coordinates 28+00 N, 25+00 E inclined at 45° and striking due east to a depth of 350 feet. This would test the continuity of the old workings, and determine the width and possibly more important the grade of the gold, silver Topelyite mineralization. Any encouragement from this hole would justify further drill stepouts along the zone.

RESPECTFULLY SUBMITTED

G.M. DEPAOLI, GEOPHYSICIST, B.Sc.

MAY 29, 1975 SMITHERS, B.C.

CERTIFICATION

I Garry M. DePaoli, of the city of Burnaby, in the Province of British Columbia, HEREBY CERTIFY AS FOLLOWS:

- 1. That I am a graduate of the University of British Columbia, Vancouver, British Columbia with a Bachelor of Science Degree in Combined Honours Geophysics and Geology. (1969)
- That I have practiced my profession as a Geophysicist continuously for the past 6 years in Northern Ontario, Quebec, Manitoba, Western U.S.A., Yukon Territories, and British Columbia.
- 3. That I am a member in good standing of the Society of Exploration Geophysicists, The Geological Association of Canada, The Canadian Institute of Mining and Metallurgy, and the B.C. Society of Exploration Geophysicists.
- 4. That I have no interest directly or indirectly in the Topley Richfield Prospect nor do I expect to receive any.
- 5. That the information contained herein was compiled under my direction and supervision during the period May 17-21, 1975.

G.M. DEPAOLI, GEOPHYSICIST, B.Sc.

May 29, 1975 Smithers, B.C.

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CERTIFICATION

I Dennis F. Morrison, of the Village of Washage, in the Province of Ontario, HEREBY CERTIFY AS FOLLOWS:

- 1. That I attended the University of Waterloo for two years enrolled in the Faculty of Science.
- That I was employed as an electronic technician with Bell Canada in Ontario during the period 1964 - 1967.
- That I was employed as a Geophysical Induced Polarization Operator with McPhar Geophysics during the period 1967 - 1970.
- 4. That I have operated as an independent Induced Polarization Contractor continuously since 1970 to the present.
- 5. That I have induced polarization surveying experience in Newfoundland, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, British Columbia, Yukon and Northwest Territories, and the Republic of Panama.
- 6. That I have no interest directly or indirectly in the Topley Richfield Prospect nor do I expect to receive any.

May 29, 1975 Smithers, B.C. D.F. MORRISON

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ASSESSMENT DETAILS

WORK SUMMARY

- 1. 3.7 miles of grid line cut, flagged and chained. Dates worked: April 23,24,25.
- 2.9 miles of induced polarization / resistivity surveying. Dates worked: May 17,18,19,20 1975.

PERSONNEL

Gerard Auger Line Cutter Box 1055, Smithers, B.C.

Dennis F. Morrison IP Contractor and Operator Box 418, Gravenhurst, Ontario.

Garry M. DePaoli Geophysicist 5305 E. Georgia, Burnaby 2, B.C.

Blair Taylor Geophysicist 122 West 45 Ave., Vancouver, B.C.

Chris Crowley Geophysical Assistant 312 Carnarvan St., New Westminister.

Mitch McLellan Geophysical Assistant 11274 Kendale View, North Delta, B.C.

John Baker Geologist Box 100, Smithers, B.C.



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MATEMENT in account with

GERARD AUGER

Line Cutting & Staking – Geo. Chem, Mag. & E.M.

P.O. Box 1055, Phone 847-2834

SMITHERS, B.C. Max 9th 197.5

M Canadian Superior Excloration Ltd.

Vancouver H.C.





LINE 16 N

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5.1 4.8 6.5 12.5 18.6 22 18.8 12.2 18.8 12.2 18.8 12.2 18.8 12.2 18.8 10 12.2 11 12.2 12.2 11 12.2 12.2 12.2 12.2 11 12.2 12.

22.E

51



N=4

F.E.

CANADIAN SUPERIOR EXPLORATION TOPLEY RICHFIELD PROSPECT SMITHERS REGIONAL OFFICE

P-660 FREQUENCY DOMAIN I.P. DIPOLE - DIPOLE ARRAY 0.3 AND 5.0 HERTZ OPERATORS: MORRISON & DEPAOLI

SCALE: 1" = 200' DATE: MAY 19, 1975 LINE 16+00N

FIGURE 3 (a)







LINE 20 N

IOE

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A7 / 10 09 / 07 1 0A AC





0,4 0,4 // 1,4 / 1.7 N=1

0.5 N.R. 1.1 2.1 N=2N.R. N.R. 1.7 N=3N.R. N.R. N.R. N=4 CANADIAN SUPERIOR EXPLORATION TOPLEY RICHFIELD PROSPECT SMITHERS REGIONAL OFFICE

P-660 FREQUENCY DOMAIN I.P. DIPOLE - DIPOLE ARRAY 0.3 AND 5.0 HERTZ OPERATORS: MORRISON & DEPAOLI

SCALE: 1"= 200' DATE: MAY 19, 1975

LINE 20+00 N

FIGURE 3 (b)

F.E.

M.E.





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N=5

N=4

F. E.

CANADIAN SUPERIOR EXPLORATION TOPLEY RICHFIELD PROSPECT SMITHERS REGIONAL OFFICE

P-660 FREQUENCY DOMAIN I.P. DIPOLE - DIPOLE ARRAY 0.3 AND 5.0 HERTZ OPERATORS: MORRISON & DEPACLI

SCALE: 1" = 200' DATE: MAY 17, 1975

FIGURE 3 (c)



LINE 28 N





















CANADIAN SUPERIOR EXPLORATION TOPLEY RICHFIELD PROSPECT CHATHERS REGIONAL OFFICE

P-2-3 FREQUENCY DOMAIN 1.P. DIPOLE - DIPOLE ARRAY 0.3 AND 5.0 HERTE OPERATORS: MORRISON # DEPAOLI

SCALE: 1" = 200' DATE: MAY 17, 1975

LINE 28 +00 N

M.F.

F.E.

FIGURE 3 (d)





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CANADIAN SUPERIOR EXPLORATION TOPLEY RICHFIELD PROSPECT SMITHERS REGIONAL OFFICE

P-660 FREQUENCY DOMAIN I.P. DIPOLE - DIPOLE ARRAY 0.3 AND 5.0 HERTZ OPERATORS: MORRISON & DEPAOLI

1(a)/211

OHM FEET

M.F.

SCALE: 1"= 100" DATE: MAY 20, 1975

LINE 28+00 N DETAIL

FIGURE 3(e)







0.8 0.6 0.6 0.5 1.0 0.8







F.E.

CANADIAN SUPERIOR EXPLORATION TOPLEY RICHFIELD PROSPECT SMITHERS REGIONAL OFFICE

P-660 FREQUENCY DOMAIN I.P. DIPOLE - LAPOLE ARRAY 0.3 AND 5.0 HERTZ OPERATORS: MORKISON & DERAOLI

SCALE: 1"= 200" DATE: MAY 18, 1975

LINE 32 +00 N

FIGURE 3(f)









LINE 36N 12.E 14E 208 IDE \mathbf{O} 28 32 37



22E





CANADIAN SUPERIOR EXPLORATION TOPLEY RICHFIED PROSPECT SMITHERS REGIONAL OFFICE

F-360 FREQUENCY DOMAIN I.P. DIPOLE - DIGOLE ARRAY 0.3 AND 50 HEATZ OFERATORS MORRISON É DEPAQUE

SCALE: 1"=200' DATE: MAY 18, 1975

LINE 36+00 N

M.F.





F.E.

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P-660 FREQUENCY DOMAIN I.P. DIPOLE - DIPOLE ARRAY

0.3 AND 5.0 HERTZ OPERATORS : MORRISON & DEPAOLI

SCALE: 1" = 200' DATE: MAY 19, 1975

LINE 16+00 N

FIGURE 3 (a)





26E 2.8E 30E 32E 34E N=1

N=4

TOPLEY RICHFIELD PROSPECT SMITHERS REGIONAL OFFICE

> P-660 FREQUENCY DOMAIN I.P. DIPOLE - DIPOLE ARRAY 0.3 AND 5.0 HERTZ OPERATORS: MORRISON & DEPAOLI

SCALE: 1= 200' DATE: MAY 19, 1975

FIGURE 3 (b)

5553 F16.36



LINE 24N

20E 22E 24E IDE 12E 14E 16E 18E









CANADIAN SUPERIOR EXPLORATION TOPLEY RICHFIELD PROSPECT SMITHERS REGIONAL OFFICE

P-660 FREQUENCY DOMAIN I.P. DIPOLE - DIPOLE ARRAY 0.3 AND 5.0 HERTZ OPERATORS : MORRISON & DEPAOLI

SCALE: 1"= 200' DATE: MAY 17. 1975

LINE 24+00 N

FIGURE 3 (c)



28E

26E

30E

N=2 Sas/27T N=3 OHM FEET

N=4

N=5

N=1

N=2

N=4

N=5

N=3 M.F.

34E

N=1

32.E





LINE 28 N IDE 16E 18E 20E 22E 24E 12E 14E CREEK S ROAD d. 1.3 1.2





N=4

OHM FEET

M.F.

CANADIAN SUPERIOR EXPLORATION TOPLEY RICHFIELD PROSPECT SMITHERS REGIONAL OFFICE

P-660 FREQUENCY DOMAIN I.P. DIPOLE - DIPOLE ARRAY 0.3 AND 5.0 HERTZ OPERATORS: MORRISON & DEPAOLI

SCALE : 1" = 200' DATE: MAY 17, 1975

LINE 28 +00 N

FIGURE 3 (d)



LINE 28 N 20E 26E 25E 27E 28E 24E 23E 22E 21E DETAIL

29E 30E 3/E 32E

Pras/211 OHM FEET

M.F.

F.E.

CANADIAN SUPERIOR EXPLORATION TOPLEY RICHFIELD PROSPECT SMITHERS REGIONAL OFFICE

P-660 FREQUENCY DOMAIN I.P. DIPOLE - DIPOLE ARRAY 0.3 AND 5.0 HERTZ OPERATORS: MORRISON & DEPAOLI

SCALE: 1"= 100 DATE: MAY 20, 1975

LINE 28+00 N DETAIL

FIGURE 3(e)

5553 F16.3e









CANADIAN SUPERIOR EXPLORATION TOPLEY RICHFIELD PROSPECT SMITHERS REGIONAL OFFICE

P-660 FREQUENCY DOMAIN I.P. DIPOLE - DIPOLE ARRAY 0.3 AND 5.0 HERTZ OPERATORS : MORRISON & DEPAOLI

SCALE: 1"= 200' DATE: MAY 18, 1975

LINE 32 +00 N

FIGURE 3(F)

34 E

N=1

N=4

N=2 M.F. N=3





-n=2 $P(\alpha)/2\pi$ OHM FEET

CANADIAN SUPERIOR EXPLORATION TOPLEY RICHFIED PROSPECT SMITHERS REGIONAL OFFICE

P-660 FREQUENCY DOMAIN I.P. DIPOLE - DIPOLE ARRAY 0.3 AND 5.0 HERTZ OPERATORS: MORRISON & DEPAOLI

- n=1	
- <i>m</i> =2	M. F.
- n= 3	
- n = 4	

SCALE: 1 = 200' DATE: MAY 18, 1975

LINE 36+00 N

FIGURE 3 (g)





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LEGEND

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CUT LINE ROAD POSSIBLE FAULT AXIS INTERPRETED APPARENT RESISTIVITY CHANGE PROJECTED TO SURFACE INTERPRETED ZONE OF INTEREST PROJECTED TO SURFACE PROPOSED D.D.H.

Department of Mines and Petroleum Resources ASSESSMENT REPORT

W 34

400

100 200

NO. 5553 MAP 4.

FIGURE 6

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CANADIAN SUPERIOR EXPLORATION LIMITED SMITHERS REGIONAL OFFICE

TOPLEY RICHFIELD PROSPECT

DRAUGHTSMAN GMD DATE MAY 1975 SCALE 1"= 200"

TO ACCOMPANY

GEOPHYSICAL INTERPRETATION

5553 MAP4