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A GEOPHYSICAL REPORT

ON

A TIME DOMAIN INDUCED POLARIZATION SURVEY

ON

THE RAINBOW CLAIM KAMLOOPS MINING DIVISION	
BRITISH COLUMBIA	SUB-RECORDER RECEIVED
	JUL 1 8 1983
FOR	M.R. # \$ VANCOUVER, B.C.

SEADRIFT INTERNATIONAL EXPLORATION LIMITED





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SUMMARY

During the period December 7 to December 16, 1987, Lloyd Geophysics Limited carried out a time domain Induced Polarization (IP) Survey for Seadrift International Exploration Limited on their RAINBOW Claim near Kamloops, British Columbia.

The survey outlined three anomalous zones. Nine vertical drill holes totalling 2,250 feet of drilling have been recommended to test the most interesting zone.





INTRODUCTION 1.

During the period December 7 to December 16, 1987, Lloyd Geophysics Limited of Vancouver, British Columbia carried out a time domain Induced Polarization Survey on the Rainbow Claim near Kamloops, British Columbia for Seadrift International Exploration Limited. A total of 16.4 kilometres of I.P. Surveys were completed. Mobilization and demobilization of the crew and equipment from Vancouver to Kamloops was also accomplished within the above time period.

2. PROPERTY LOCATION AND ACCESS

The property, known as the RAINBOW Claim, is located in the Kamloops Mining Division of British Columbia.

Access to the property is by the Lac La Jeune road, from Kamloops. This road bounded the east side of the survey area.

3. PURPOSE OF THE IP SURVEY

The purpose of the I.P. Survey was to locate zones of sulphide mineralization, most specifically zones of low percentage sulphide mineralization which were expected to occur on the property.



4. INSTRUMENT SPECIFICATIONS

The I.P. system used to carry out this survey was a time domain measuring system manufactured by Huntec Limited of Toronto, Ontario.

The system consisted of a 400 Hz Wagner-Leland alternator driven by a 25 Hp Onan industrial engine, a 7.5 Kw. Mark II Transmitter and two Mark IV microprocessor controlled Receivers.

4.1. The Mark II Transmitter

The Mark II time domain transmitter has a maximum rated power output of 7.5 Kw DC, available at 10 constant voltage settings. Output current for a given voltage tap is determined by the contact resistance at the grounded input electrodes. The transmitter cycle time was 8 seconds (0.125 Hz) with a duty ratio of 0.5.

4.2. The Mark IV Receiver

The Mark IV receiver takes full advantage of the microprocessor's capabilities, featuring automatic calibration, gain setting, SP cancellation, fault diagnosis and filter tuning. When the instrument is turned on, it automatically tests its analogue and digital circuitry. If a fault is detected its nature and location are indicated on the digital display by a coded error message. When the instrument is not receiving a signal it continuously calibrates itself. During measurement the instrument





Mark IV Receiver Measurement Parameters

FIGURE 1



automatically adjusts its own gain and corrects for selfpotential without operator intervention. In high noise areas a 60 Hz rejection filter may be selected through the programming sub-panel. The software automatically corrects for the use of the rejection filter.

The instrument can be used for the detailed measurement of all significant IP and resistivity phenomena or aadjusted to perform single measurements of chargeability (or % F.E.) at reduced bandwidth for high speed reconnaissance surveying. Detailed measurements of selected anomalies at expanded bandwidth can also be performed. Similarly, the delay time T_D , the integrating interval t_p and the total integrating time T_p may also be adjusted to accommodate a wide range of geological conditions.

The instrument has 10 equal chargeability channels, M_0 , M_1 , M_2 , M_3 , M_4 , M_5 , M_6 , M_7 , M_8 and M_9 as shown in Figure 1.

These may be recorded individually, selectively or summed up automatically to obtain the total chargeability. The apparent resistivity (Qa) in ohm-metres is calculated on the field computer. If required, 10 point moving averages of chargeability, resistivity, metal factor and alteration product are similarly calculated.

The instrument parameters chosen for this survey were as follows:



Cycle Time (T _c)	:	8 seconds
Ratio (Time On) (Time Off)	:	1:1
Delay Time (T _D)	:	120 milliseconds
Window Width (tp)	:	90 milliseconds
Total Integrating Time (T) :	900 milliseconds

5.

5. SURVEY SPECIFICATIONS

The pole-dipole array was used for this survey. With this array one current electrode C_1 and the two potential electrodes P_1 and P_2 are moved in unison along the survey lines. The second current electrode C_2 is grounded an "infinite" distance away, which is at least 10 times the distance between C_1 and P_1 for the largest electrode separation.

The dipole length (x) is the distance between P_1 and P_2 . The electrode separation (nx) is the distance between C_1 and P_1 and is equal to (n = 1) or some multiple (n = 2, 3 or 4) of the distance between P_1 and P_2 . The dipole length (x) determines mainly the sensitivity of the array with respect to the size of the body, whereas the electrode separation (nx) determines mainly the depth of penetration of the array.

For the survey grid on which IP data was collected, the survey lines were 100 metres apart and measurements were taken for x = 75 metres and n = 1, 2, 3 and 4.



6. DATA PROCESSING

The data collected was transferred to diskette for processing in the field, using a Compaq 286 Portable Computer and an Epson Printer.

The software used to contour the data is based on the mathematical solution known as "krigging".

In the office the data was transferred onto mylar. This was done using the Compaq 286 Portable Computer coupled to a DL2400 Fujitsu Printer. This Fujitsu Printer has the capability of printing on mylar.

7. PRESENTATION OF DATA

The data obtained from the survey described in this report are presented on 11 pseudo-section plots and 3 maps as follows:

Pseudo-Section	<u>Dwg. No</u> .
L0+00S	87267-1
Ll+00S	87267-2
L2+00S	87267-3
L3+00S	87267-4
L4+00S	87267-5
L5+00S	87267-6
L6+00S	87267-7
L7+00S	87267-8
L8+00S	87267-9
L9+00S	87267-10
L10+00S	87267-11



Map	Dwg. No.
Chargeability Contour Map for 10 point average	87267-12
Chargeability Contour Map for $n = 2$	87267-13
Resistivity Contour Map for n = 2	87267-14

8. DISCUSSION OF RESULTS

An IP response as measured at the ground surface depends of the following factors:

- 1. The volume content of sulphide minerals.
- 2. The number of pore paths that are blocked by sulphide grains.
- 3. The number of sulphide faces that are available for polarization.
- 4. The absolute size and shape of the sulphide grains and the relationship of their size and shape to the size and shape of the available pore paths.
- 5. The electrode array employed.
- 6. The width, depth, thickness and strike length of the mineralized body and its location relative to the array.
- 7. The resistivity contrast between the mineralized body and the unmineralized host rock.
- The thickness and conductivity of overburden cover, if any.

The sulphide content of the underlying rocks or, since rocks containing magnetite, graphite or clay minerals, frequently give rise to an IP response, an equivalent sulphide content is one of the critical factors that we



would like to determine from field measurements. However, experience has shown that this is both difficult and unreliable, mainly because of the large number of factors, described above, which contribute to an IP response. These factors vary considerably from one geological environment to another. Despite this, some interpreters have developed empirical rules for making rough estimates of the percent sulphides by volume contained within rocks giving anomalous IP responses.

A detailed study has been made of the pseudo-sections which accompany this report. These pseudo-sections are not sections of the electrical properties of the subsurface strata and cannot be treated as such when determining the depth, width and thickness of a zone which produces an anomalous pattern.

From this study the anomalies selected are shown on the individual pseudo-sections and are classified into 3 groups. These are definite, probable and possible anomalies. This classification is based partly on the relative amplitudes of the chargeability and to a lesser degree on the resistivity response. Of equal importance in this classification is the overall anomaly pattern and the degree to which this pattern may be correlated from line to line, provided of course that the correlation is not so extensive along strike so as to represent only the subcrop of a geological formation.

Cultural Features

Man-made objects such as wire fences, power lines, telephone lines (either above or below the ground surface) can often be the source of undesireable IP responses.



The location of cultural features has been recorded in the field notes and plotted on the pseudo-sections and maps. In addition to the features plotted on the maps, an array of four radio transmission towers was located a few hundred metres south of the survey grid.

In the course of making the measurements for this survey, a significant amount of random electrical noise was encountered mainly in the southwest quadrant of the survey grid, where the grid lines were in close proximity and nearly parallel to barbed wire fences. It was also encountered to a lesser degree in the extreme southeast corner of the grid. The electrical noise was often of sufficient magnitude to almost totally obscure the electrical signal from the IP transmitter, making it impossible to make meaningful measurements. In those areas where noise was encountered and measurements were made, it is impossible to quantify and thereby separate the effect of local cultural features in the measured chargeability and resistivity values.

The individual anomalies picked from the pseudo-sections have been plotted on the ten point average chargeability map (Dwg. No. 87267-12). Three anomalous zones have been delineated. These zones are rated as follows:

1

Priority Rating Zone

1

Remarks

Moderate to Strong anomaly due to a shallow source, trending NNE to SSW across lines LOS to L4S. The zone is open to the north and is not closed to the east on all lines. The anomaly patterns are fair to good. Resistivities are slightly higher than average overall but with higher resistivities flanking a weak resistivity low within the zone

LLOYD GEOPHYSICS LIMITED

Priority	Rating	Zone	Remarks
:		2	Moderate to Weak anomaly due to a shallow source trending NNE to SSW across lines L6S to L9S into a strong anomaly on L10S. May be an extension of Zone 1, offset approximately 350 m West of the projected trend of Zone 1. The anomaly patterns are poor, except on line L10S, and affected by noisy readings on Lines L8S and L9S. The Strong, well shaped anomaly on L10S indicates two separate sources, the west-most correlating with the location of a powerline and a buried telephone line. Higher chargeabilities gen- erally correlate with slightly higher resistivities.
3		3	Weak anamaly due to shallow source on lines L7S to L9S. Anomaly patterns are poor and affected by noisy readings on line L9S

Additional anomalies, occurring in the southwest quadrant of the survey grid, are marked on the pseudo-sections and the ten point average chargeability map. Because of the presence of cultural noise in the data, no interpretation of these anomalies is attempted.

9. CONCLUSIONS AND RECOMMENDATIONS

From the study of the IP data obtained in the survey described in this report, it has been concluded that the IP survey located 3 anomalous zones, some of which warrant further work. Much of the IP survey data in the southwest quadrant of the survey area is strongly affected by cultural noise. No conclusions can be made based on IP data alone, in this area.

Testing of Zone 1 by drilling is recommended at the following locations:

Priority Rating	Drill Hole	Location	Specifications
l	D ₁	L3+00S at 100E additional drill holes at 25E and 175E	Vertical holes to 250'
2	D ₂	L2+00S at 175E additional drill holes at 100E and 250E	Vertical holes to 250'
3	D ₃	Ll+00S at 100E additional drill holes at 25E and 175E	Vertical holes to 250'

The location of these drill holes has been plotted on the ten point average chargeability map (Dwg. No. 87267-12).

A decision to test Zone 2 by drilling should be based upon results obtained from drilling Zone 1.



The completion of 2,250 feet of drilling recommended on this property will be dependent on the results obtained from the first few holes.

> Respectfully submitted, LLOYD GEOPHYSICS LIMITED

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Jøhn Lloyd, M.Sc., P. Eng. Geophysicist

fefflame

Jeff Warne Geophysicist

December 30, 1987 Vancouver, B.C.







1110 - 625 HOWE STREET, VANCOUVER, B.C. V6C 2T6 (604) 688-5813 (

To: Seadrift International Exploration Ltd. 600-625 Howe Street Vancouver, B.C. V6C 2T6

Terms: Payable on Receipt

Attn: Mr. Bob Krause

	DESCRIPTION	AMOUNT
	RE: IP SURVEY, KAMLOOPS, B.C., AS PER SURVEY AGREEMENT OF DECEMBER 4, 1987	
RE: Clause		
1.	DATA ACQUISITION CHARGES	
1.1.	Crew & Equipment	
	Dec. 7 : 1 Travel Day @ \$ 850.00/day	\$ 850.00
	Dec. 8-16 : 9 Survey Days @ \$ 1250.00/day	11,250.00
1.2.	Crewcab (4 X 4)	
	Dec. 7-16 : 10 days @ \$ 65.00/day	650.00
1.3.	Travel & Living Expenses	
	As per attached Expense Report of Mr. Jeff Warne	1,775.85
	Plus 10% administration	177.59
2.	OFFICE CHARGES	
2.1.	Pseudo-Sections (Fixed Cost)	1,500.00
2.2.	Interpretation Report (Fixed Cost)	1,200.00
2.3.	Reprographics (Fixed Cost)	300.00
	SUB-TOTAL	17,703.44
	LESS ADVANCE PAYMENT	5,000.00
	TOTAL PAYABLE	\$ 12,703.44
	2% per month charged on overdue accounts	

Date: Dec. 21, 1987

APPENDICES



(i)

Personnel Employed on Survey

Na	me	Occupation	Address	
J.	Lloyd	Geophysicist	Lloyd Geophysics Limited 1110-625 Howe Street Vancouver, B.C. V6C 2T6	Dec. 28-30/87
J.	Warne	Geophysicist	11	Dec. 7-16, 18, 21, 28-30/87
D.	Klit	Junior Geophysicist	11	Dec. 7-16/87
J.	Cornock	Operator	11	Dec. 7-16/87
D.	Gray	Helper	11	Dec. 7-16/87
в.	Couture	Helper	u	Dec. 7-16/87
J.	Zondag	Typist	11	Dec. 30/87



CERTIFICATION

I, John Lloyd, of 1110-625 Howe Street, in the City of Vancouver, in the Province of British Columbia, do hereby certify that:

- I graduated from the University of Liverpool, England 1. in 1960 with a B. Sc. in Physics and Geology, Geophysics Option.
- 2. I obtained the diploma of the Imperial College of Science and Technology (D.I.C.), in Applied Geophysics from the Royal School of Mines, London University in 1961.
- 3. I obtained the degree of M. Sc. in Geophysics from the Royal School of Mines, London University in 1962.
- 4. I am a member in good standing of the Association of Professional Engineers in the Province of British Columbia, the Society of Exploration Geophysicists of America, the European Association of Exploration Geophysicists and the Canadian Institute of Mining and Metallurgy.
- 5. I have been practising my profession for over twenty years.

John Lloyd, P. Eng.

Vancouver, B.C. December, 1987



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N = 3

N = 4



N = 3

N = 4





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1075W 1000W N = 1N = 2 N = 3 N = 4

1075W N = 1

N = 2 N = 3N = 4 Fence 1000%





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SEADRIFT INTERNATIONAL EXPLORATION LIMITED RAINBOW CLAIMS KAMLOOPS MINING DIVISION, B.C.

LINE: L7+00S





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N = 1

N = 2

N = 3

N = 4





825 W 750W N = 1 199. N = 2 N = 3 N == 4 Large Culvert Fence Fonce 825W 750W N = 1 14.5 N = 2N = 3 N = 4 -





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| | 3 + 00 W B.L.0 +00

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LEGEND

·--- FENCE

CONTOURED VALUES ARE 10 pt, AVERAGE OF CHARGEABILITY AT INTERVAL 1.0 msec.

D₁ D₂ D₃ DRILL TARGETS IN PRIORITY ORDER DRILL VERTICAL HOLES TO APPROXIMATELY 250'

X DRILL HOLE LOCATION

RELATIVE STRENGTH OF CONDUCTORS

<u> (883)</u>	STRONG
	MEDIUM
	WEAK

ANOMALOUS ZONES GEOLOGICAL BRANCH ASSESSMENT REPORT LLOYD GEOPHYSICS LTD. SEADRIFT INTERNATIONAL EXPLORATION LTD. RAINBOW CLAIM

KAMLOOPS BC

KAMLOOPS MINING DIVISION SCALE 1: 3000 (1" = 75 M.)-

DEC 87'

BDS / KM

87267-12



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