

**STEALTH MINERALS LTD.**

**A GEOPHYSICAL REPORT ON AN INDUCED POLARIZATION AND  
RESISTIVITY TEST SURVEY OVER THE WRICH HILL PROSPECT,  
TOODOGGONE AREA, OMINECA MINING DIVISION, NORTH  
CENTRAL BRITISH COLUMBIA**

**LATITUDE 57° 08' NORTH  
LONGITUDE 126° 46' WEST  
NTS: 094E02**

**By**

**John Lloyd, M.Sc., P.Eng.**

**LLOYD GEOPHYSICS INC.  
VANCOUVER, BRITISH COLUMBIA  
NOVEMBER 2002**

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27160 2 of 5

## **SUMMARY**

During the period September 10 to September 12, 2002, Lloyd Geophysics carried out an induced polarization (IP) and resistivity test survey over the Wrich Hill epithermal precious metals prospect in the Toadoggone area of north central British Columbia, for Stealth Minerals Ltd.

The prospect exhibits a very distinctive IP signature, having both a chargeability and resistivity high. Assay results from trenching the rocks directly beneath this IP signature have revealed some very encouraging precious metal values.

Since the IP survey lines were 400 metres apart, it has been difficult to trace definitively the mineralized zone or zones from line to line. In view of this, it is recommended that prior to any new trenching or drilling IP coverage be extended to lines 50 metres apart.

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## **1.0 INTRODUCTION**

During the period September 10 to September 12, 2002 Lloyd Geophysics Inc. carried out an induced polarization (IP) and resistivity test survey on three E-W lines over the Wrich Hill epithermal precious metals prospect, in the Toadoggone area of north central British Columbia, for Stealth Minerals Ltd.

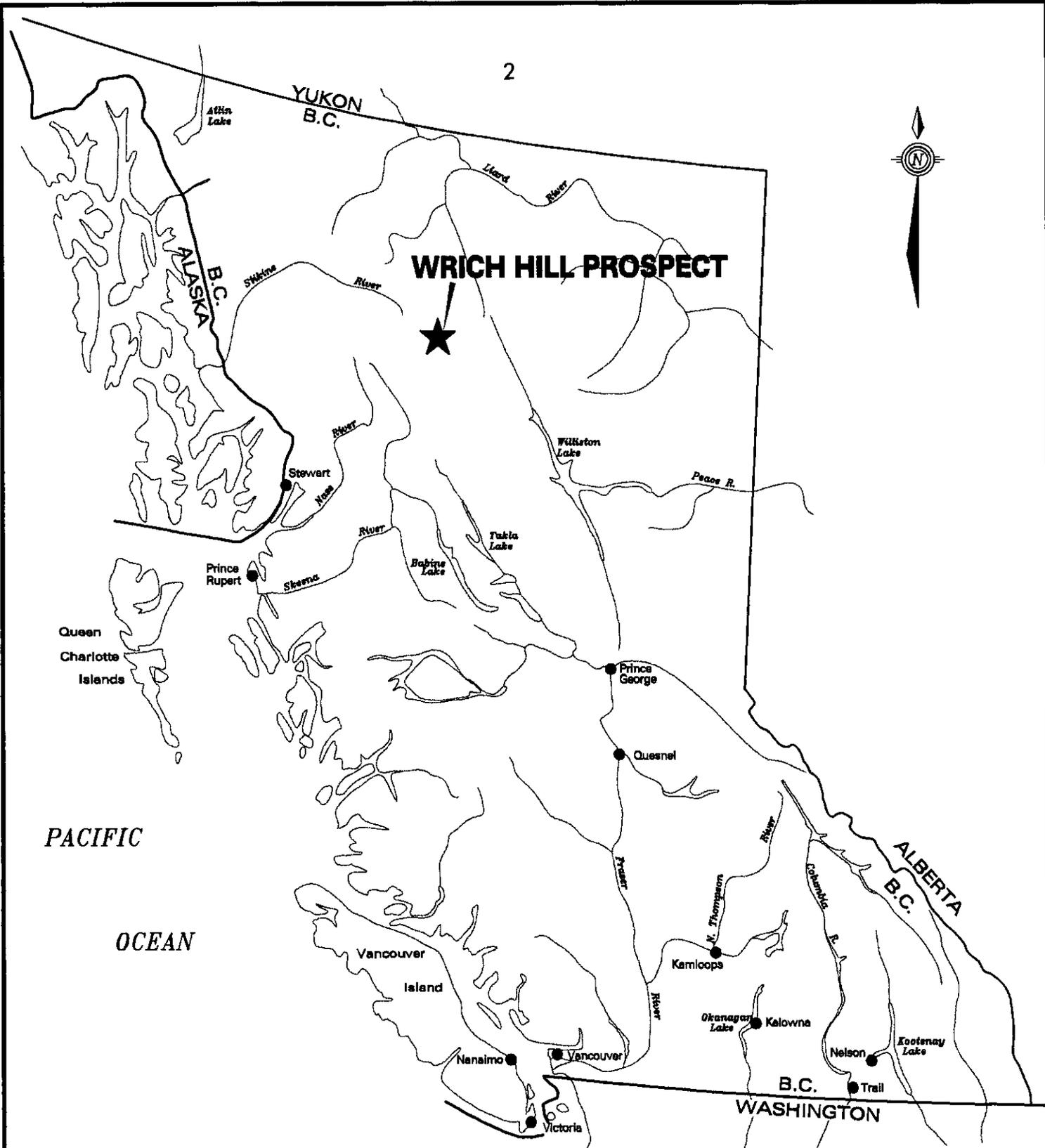
The purpose of this work was to test the IP and resistivity response of the prospect, a high sulphidation prospect, for the presence and distribution of metallic sulphides.

## **2.0 PROPERTY LOCATION AND ACCESS**

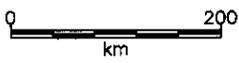
The Wrich Hill prospect lies within a broad region of prospects and mines known as the Toadoggone mining camp in north central British Columbia. The prospect is located about 20 kilometres north of the Kemess South Mine, which in turn is about 500 kilometres north-northwest of Prince George, British Columbia (Figure 1). The prospect is located in the Omineca Mining Division, on NTS map sheet 094E02 at latitude 57° 08' north and longitude 126° 46' west. The Stealth camp is approximately 20 kilometres north-northwest of the Kemess South Mine. Access to the property for this work was by helicopter operating out of the Kemess South mine site.



# WRICH HILL PROSPECT



PACIFIC  
OCEAN



<b>STEALTH MINERALS LTD.</b>	
<b>WRICH HILL PROSPECT</b>	
<b>GENERAL LOCATION MAP</b>	
Date: Nov. 2002	Figure: 1
<b>LLOYD GEOPHYSICS INC.</b>	

### **3.0 CLAIM HOLDINGS**

The following claim information was provided by Stealth Minerals Ltd. at the time of writing this report.

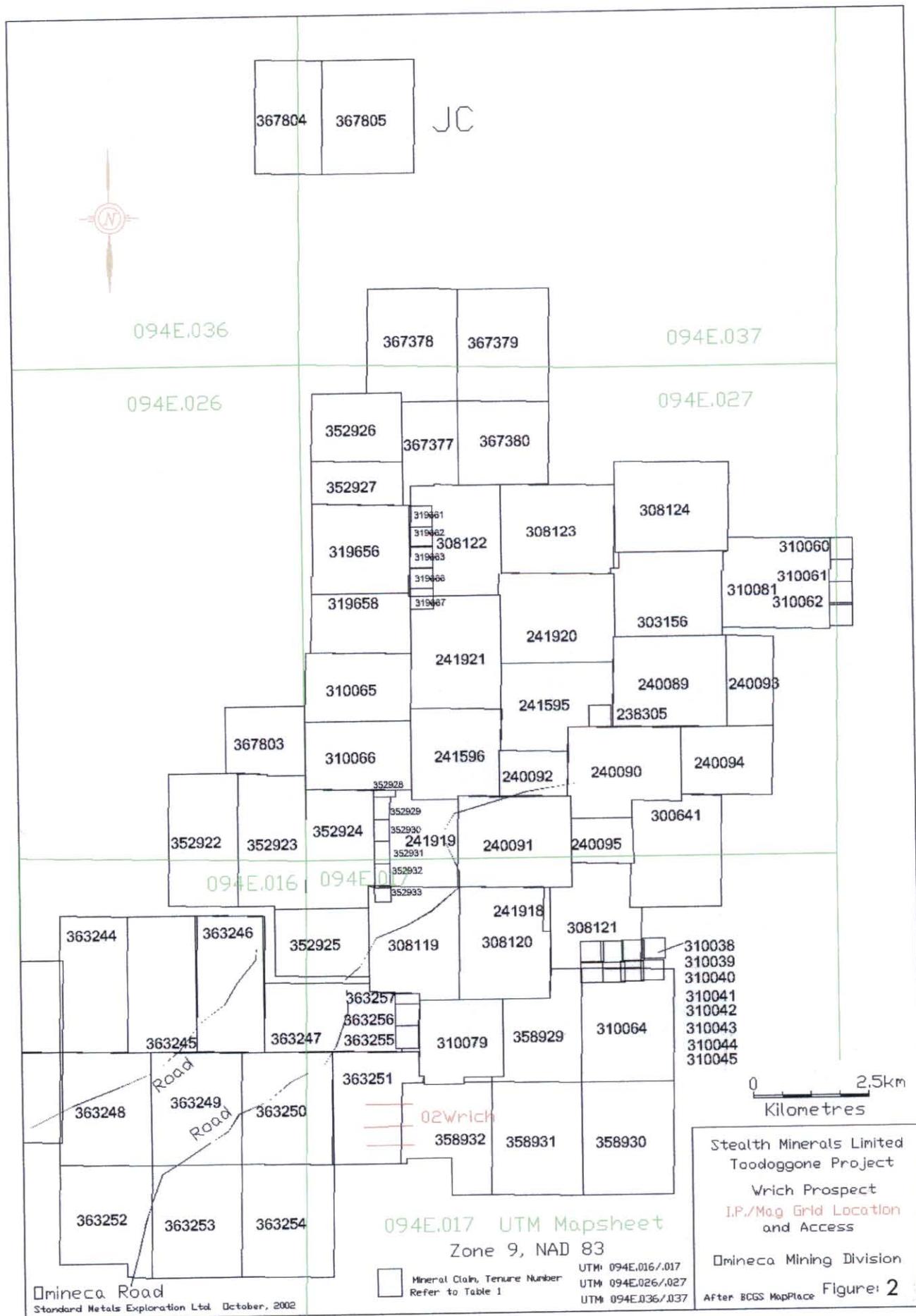
<b>Name</b>	<b>Tenure #</b>	<b>Units</b>	<b>Anniversary Date</b>	<b>Expiry Date</b>	<b>Registered</b>
C-K	363251	20	98/05/26	2003MAR31	107591
Fin 974	358932	20	97/08/30	2004MAR31	107591

The location of the three east-west test lines, with respect to the above mentioned claims, is shown in Figure 2.

### **4.0 GEOLOGY**

The area is underlain by Asitka Group volcanic, siliciclastic and carbonate rocks, Permian in age, Stuhini/Takla Group basalt-andesite, Upper Triassic-Lower Jurassic in age, and Hazelton Group-Toodoggone Formation dacite-andesite volcanoclastic rocks, Lower to Middle Jurassic in age. Granodiorite, monzodiorite to quartz monzonite and locally pyroxene gabbro intrusive rocks of the Omineca/Black Lake plutonic suite, Lower to Middle Jurassic in age, cut previous lithology. Sub-parallel intrusive and volcanic arcs trend northwest and are associated with major deep-seated regional faults; conjugate, dilation faults cross-cut and in part offset these structures, and may impart a secondary control on intrusive, volcanic and hydrothermal activity.

The Toodoggone Formation is comprised of subaerial, calc-alkaline quartz-hornblendefeldspar crystal dacite-andesite pyroclastic rocks deposited within an island arc environment, and appear in part, coeval with the Black Lake quartz monzonite intrusive rocks. These Omineca intrusions host porphyry deposits such as Mt Milligan, Kemess, Pine, Brenda and Pil deposits, and may in part be a source for most of the regions prolific porphyry, skarn, and epithermal gold mineralization.



Omineca Road  
Standard Metals Exploration Ltd. October, 2002

094E.017 UTM Mapsheet

Zone 9, NAD 83

Mineral Claim, Tenure Number  
Refer to Table 1

UTM: 094E.016/.017  
UTM: 094E.026/.027  
UTM: 094E.036/.037

Stealth Minerals Limited  
Toadoggone Project  
Wrich Prospect  
I.P./Mag Grid Location  
and Access

Omineca Mining Division

After BCSS MapPlace

Figure: 2

The Wrich Hill prospect is underlain by Toodoggone Formation crystal tuff of dacite-andesite composition in proximity to the regional Wrich fault and Takla Group contact to the west. An area of kaolinite, pyrophyllite and iron oxide alteration marks the prospect with dimensions sub-parallel to the Wrich fault of approximately 200 metres in width and a minimum 850 metres in length. Zones of massive to strongly vuggy, porous silicification and quartz-chalcedony breccia contain dominantly pyrite, barite, and possibly tetrahederite with associated gold and silver values, however these minerals are intensely oxidized to goethite, hematite and jarosite on surface. These zones may be in part cut and offset, or controlled by faults containing abundant gouge and clay alteration. Pronounced oxidation occurring in trenches near Line 0, would likely diminish with depth, giving way to primary sulphide mineralization.

To the west, hornblende-actinolite andesite dikes cut Takla Group rocks and zones of structurally controlled quartz-sericite-pyrite, ankerite alteration contain quartz-carbonate veins with pyrite, sphalerite, galena mineralization and associated high gold and silver values.

## **5.0 INSTRUMENT SPECIFICATIONS**

The system used to carry out this survey was a 7.5 kw time domain unit consisting of a 400 hertz Onan/Wagner Leland motor generator set and a Mark II transmitter manufactured by Hunttec Limited, Toronto, Canada and a 6 channel IP-6 receiver manufactured by Iris Instruments, Orleans, France.

The transmitter was operated with a cycle time of 8 seconds and the duty cycle ratio: [(time on)/(time on + time off)] was 0.5 seconds. This means the cycling sequence of the transmitter was 2 seconds current "on" and 2 seconds current "off" with consecutive pulses reversed in polarity.

The IP-6 receiver can measure up to 6 dipoles simultaneously. It is microprocessor controlled, featuring automatic calibration, gain setting, SP cancellation and fault diagnosis. **To accommodate a wide range of geological conditions, the delay time, the window widths and hence the total integration time is programmable via the keypad.** Measurements are calculated automatically every 2 to 4 seconds from the averaged waveform which is accumulated in memory.

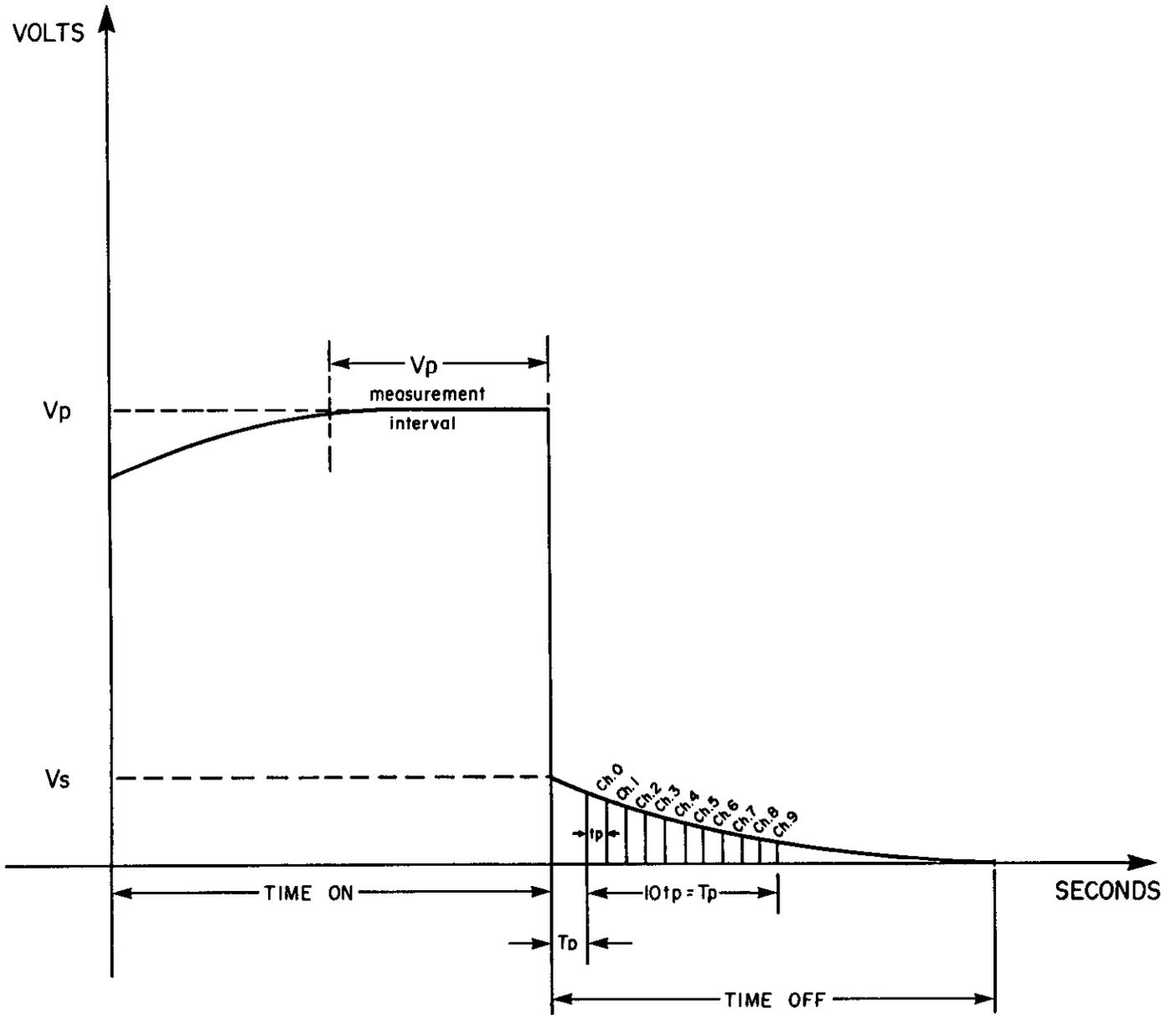
The window widths of the IP-6 receiver can be programmed arithmetically or logarithmically. For this survey the instrument was programmed arithmetically into 10 equal window widths or channels.  $Ch_0, Ch_1, Ch_2, Ch_3, Ch_4, Ch_5, Ch_6, Ch_7, Ch_8, Ch_9$ , (Figure 3). These are recorded individually and summed up automatically to obtain the total chargeability. Similarly, the resistivity (R) in ohm-metres is also calculated automatically.

The instrument parameters chosen for this survey were as follows:

Cycle Time ( $T_c$ )	= 8 secs.	Delay Time ( $T_D$ )	= 120 msec
Ratio ( $\frac{\text{Time On}}{\text{Time Off}}$ )	= 1:1	Window Width ( $t_p$ )	= 90 msec
Duty Cycle Ratio $\frac{\text{Time On}}{\text{Time On} + \text{Time Off}}$	= 0.5	Total Integration Time ( $T_p$ )	= 900 msec

## **6.0 SURVEY SPECIFICATIONS**

The pole-dipole array was used for this survey, with the dipole length (x) equal to 25 metres, and measurements were recorded for  $n=1$  through 6. On all three E-W lines the current electrode ( $C_1$ ) was always located to the **east** of the potential measuring dipole ( $P_1P_2$ ) as depicted on each individual pseudo-section drawing.



**IP-6 RECEIVER PARAMETERS**

**Figure 3**

## **7.0 DATA PROCESSING AND PRESENTATION**

The IP data was processed at the end of each survey day using a Pentium laptop computer and a Fujitsu printer. In the Vancouver office, the data was transferred to a high-speed desktop computer coupled to an HP DesignJet colour plotter to make the final pseudo-sections. The numerical value obtained from a 21 point triangular filter applied consecutively at every station on each line is also plotted on the pseudo-sections.

The IP data are presented as pseudo-sections on 3 drawings which are located in the map pocket at the end of this report:

### **Pseudo-Sections**

<b>Line No</b>	<b>Drawing. No.</b>
0	02454 - W1
400N	02454 - W2
800N	02454 - W3

## **8.0 DISCUSSION OF RESULTS**

An IP response depends largely on the following factors:

- The volume content of sulphide minerals.
- The number of pore paths that are blocked by sulphide grains.
- The number of sulphide faces that are available for polarization.
- 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.
- The electrode array employed.

- The width, depth, thickness and strike length of the sulphide body and its location relative to the array.
- The resistivity contrast between the sulphide body and the barren host rock.

There are several critical factors that we would like to determine from IP field measurements made over a sulphide body. These are the sulphide content and the width, length, depth of burial and thickness of the body. Experience has shown that this is both difficult and unreliable because of the large number of variables, described above, which contribute to an IP response. The problem is further complicated by the fact that rocks containing magnetite, graphite, clay minerals and variably altered rocks produce IP responses of varying amplitudes.

During the 1990's, various research workers developed special inversion software capable of generating realistic chargeability and resistivity models. While such models are often a good representation of the geological cross-section of a sulphide body, **they do not provide a unique solution, but rather a probable solution.** These models appear to be most useful over bodies of large lateral extent, for example porphyry deposits, and somewhat less useful over smaller, more confined deposits, for example massive sulphide deposits.

### **Line 0**

On this line, there is a well defined chargeability and resistivity anomaly approximately 200 metres wide, centred at about 150W. This anomaly has two distinctive, but not unique, characteristics:

- a saucer shaped chargeability response of about 10 milliseconds over a background of less than 5 milliseconds.
- a similar saucer shaped resistivity anomaly, which closely mimics the shape of the chargeability anomaly, with resistivity readings of up to 19,000 ohm-metres over a background which never reaches much more than 200 ohm-metres.

Strong, pervasive silification and vuggy chalcedony vein breccia material are believed to be the main cause of the very strong resistivity anomaly, whereas the fairly moderate chargeability response is most probably caused by minor amounts of metallic sulphides.

Two northeast-southwest trenches T1 and T2 have been cut directly across this anomaly. Trench T1 cuts the anomaly at about 100W and trench T2 at about 200W. Two additional trenches T3 and T4 were also cut. Trench T3 lies about 50 metres southeast of trench T1, whereas trench T4 lies about 100 metres northwest of trench T2. Assay results from this trenching are shown below:

<b>WEST ZONE</b>			
<b>Trench</b>	<b>Width * (m)</b>	<b>Gold (g/t)</b>	<b>Silver (g/t)</b>
T1	32	1.87	7.0
T2	32	2.04	10.4
T3	24	0.87	6.8
T4	26	0.35	15.6

<b>EAST ZONE</b>			
<b>Trench</b>	<b>Width * (m)</b>	<b>Gold (g/t)</b>	<b>Silver (g/t)</b>
T1	10	0.38	12.7
T2	24	0.67	20.3
T3	20	1.28	10.6
T4	9	0.14	8.1

\* Estimated true width.

In 1997, extensive IP surveying in two Central American countries, by our company geophysicists, revealed two chargeability/resistivity anomalies almost identical to the anomaly described above, on Line 0. In one case, extensive drilling of an almost identical anomaly led to the discovery of a 38 million ton deposit containing 1 million ozs

of recoverable gold. This deposit was put into production in 2000 at a cost of \$28US million and in 2003 is on target to produce 125,000 ozs. of gold at a projected cash cost of \$105US per oz. In another case, a very similar anomaly is now receiving its second phase of drilling and an updated feasibility study is imminent.

### **Line 400N**

On this line, there is a less well defined chargeability anomaly, approximately 100 metres wide, centred at about 275W. The resistivity anomaly associated with this chargeability high is extremely weak and although there is little or no evidence that the rocks at this location are oxidized, they are, in fact, still well silicified.

There is a second chargeability and resistivity anomaly, less than 50 metres wide, at about 425W.

The increase in chargeability at the west end of this line, between 750W and 800W, is most probably caused by the presence of about 10% pyrite, which may indicate the edge of a porphyry sulphide system.

### **Line 800N**

The geophysical pattern on this line is very similar to that found on line 400N.

*A relatively weak chargeability anomaly, approximately 50 metres wide, centred at about 175W, has no resistivity response, whereas a second chargeability anomaly, approximately 100 metres wide, centred at about 350W is associated with a moderate resistivity high.*

Finally, a coincident chargeability/resistivity high, approximately 100 metres wide, centred at about 900W completes the geophysical picture on this line.

## **9.0 CONCLUSIONS AND RECOMMENDATIONS**

From a study of the induced polarization data, over the Wrich Hill prospect, described in this report, it has been concluded that:

- On line 0, there is a characteristically distinct IP signature over the prospect, where trenches T1 and T2 have been cut, sampled and produced some very encouraging results.
- Although somewhat diminished in intensity there is also a distinct IP response on both lines 400N and 800N.
- Since the lines are 400 metres apart, there is insufficient IP coverage to positively correlate the exact location of the mineralized zone or zones from line to line.

It is recommended that prior to selecting targets for either trenching or drilling, lines 50 metres apart should be established between lines 0 and 800N and between lines 0 and 400S and surveyed with IP methods using  $x = 25$  metres and  $n = 1$  to 6.

Respectfully submitted,

**LLOYD GEOPHYSICS INC.**



**John Lloyd, M.Sc., P.Eng.**

Senior Geophysicist

APPENDICES

**APPENDIX A**

**COST OF SURVEY**

Lloyd Geophysics contracted the acquisition of the IP data on a per diem basis. Data processing, computer plotting, consumables, reprographics, interpretation and report writing were additional costs:

• IP Survey Data Acquisition	\$4,500.00
• Data Processing and Computer Plotting	446.25
• Consumables and Reprographics	177.93
• Interpretation and Report Writing	1,500.00
Sub Total	6,624.18
GST 7%	463.69
<b>TOTAL COST</b>	<b>\$7,087.87</b>

**APPENDIX B**

**CERTIFICATION OF THE AUTHOR**

I, John Lloyd of 805 – 4438 West 10<sup>th</sup> Avenue, in the City of Vancouver, in the Province of British Columbia, do hereby certify that:

I graduated from the University of Liverpool, England in 1960 with a B.Sc. in Physics and Geology, Geophysics Option.

I obtained the diploma of the Imperial College of Science, Technology and Medicine (D.I.C.) in Applied Geophysics from the Royal School of Mines, London University in 1961.

I obtained the degree of M.Sc. in Geophysics from the Royal School of Mines, London University in 1962.

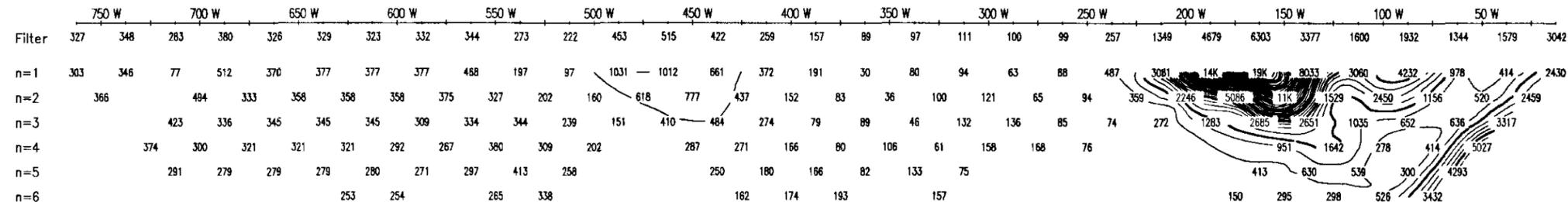
I am a member in good standing of the Association of Professional Engineers in the Province of British Columbia, the Society of Exploration Geophysicists of America, the European Association of Exploration Geophysicists and the Canadian Institute of Mining and Metallurgy.

I have been practicing my profession for over thirty-five years.

Vancouver, B.C.

November 2002

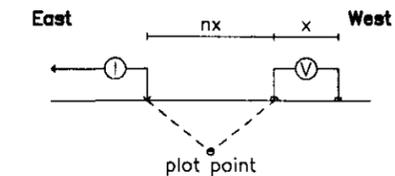
RESISTIVITY  
(ohm-m)



RESISTIVITY  
(ohm-m)

LINE: 0

Pole-Dipole Array



x = 25 M n = 1 - 6

Current electrode east  
of potential dipole

Filter

\*  
\* \*  
\* \* \*  
\* \* \* \*  
\* \* \* \* \*  
\* \* \* \* \* \*

CONTOUR INTERVALS

RESISTIVITY: 500 (ohm-m)

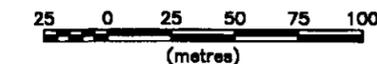
CHARGEABILITY: 1.0 (msec)

Surveyed : September, 2002

TX : Huntec Mk II Model 7500

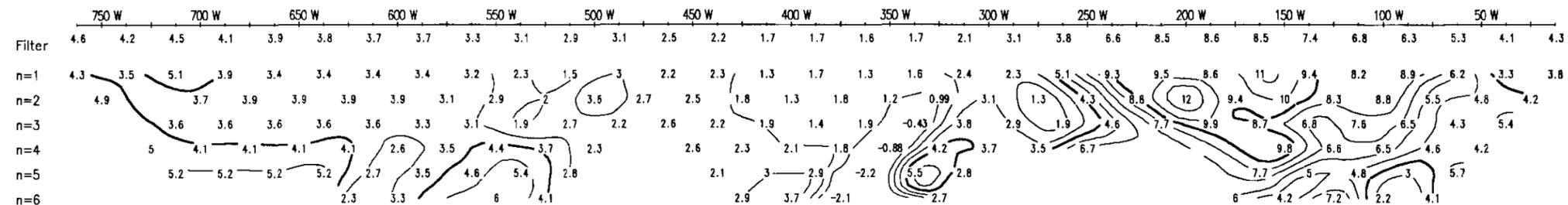
RX : Iris Instruments ELREC-6

Scale 1:2500



(MI)

CHARGEABILITY  
(msec)



CHARGEABILITY  
(msec)

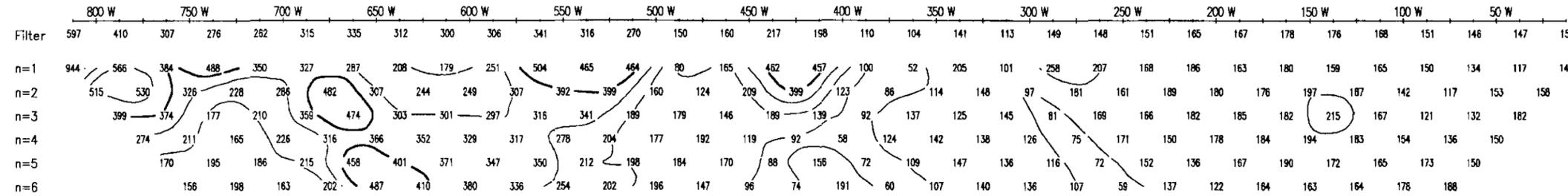
STEALTH MINERALS LTD.

Toodoggone Project - Wrich Grid  
Omineca Mining Division

INDUCED POLARIZATION PSEUDOSECTION

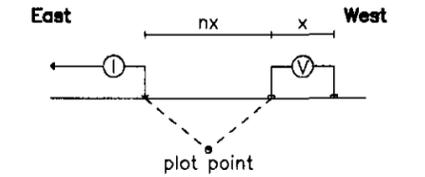
LLOYD GEOPHYSICS INC.  
DRAWING NUMBER : 02454-W1

RESISTIVITY  
(ohm-m)



RESISTIVITY  
(ohm-m)

LINE: 400 N  
Pole-Dipole Array



x = 25 M      n = 1 - 6

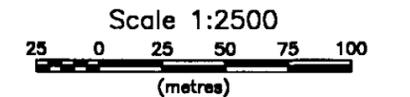
Current electrode east  
of potential dipole

Filter  
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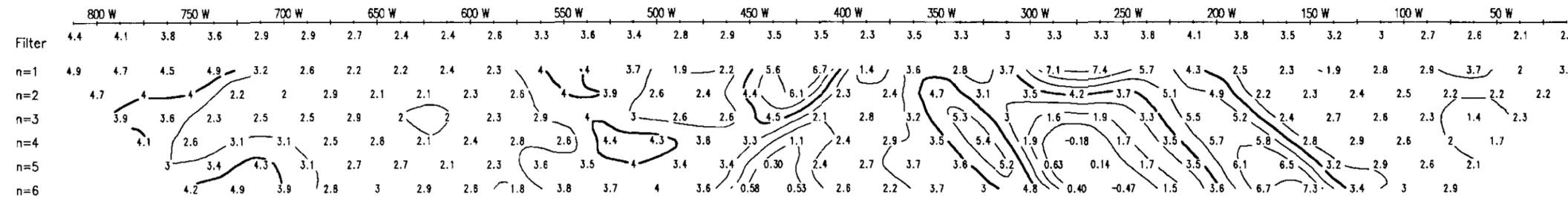
CONTOUR INTERVALS

RESISTIVITY: 100 (ohm-m)  
CHARGEABILITY: 1.0 (msec)  
Surveyed: September, 2002

TX: Huntec Mk II Model 7500  
RX: Iris Instruments ELREC-6



CHARGEABILITY  
(msec)



CHARGEABILITY  
(msec)

STEALTH MINERALS LTD.

Toodoggone Project - Wrich Grid  
Omineca Mining Division

INDUCED POLARIZATION PSEUDOSECTION

LLOYD GEOPHYSICS INC.  
DRAWING NUMBER: 02454-W2

