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# VLF EM Survey Over the LUCKY STRIKE PROPERTY Lemieux Area McVittie Township, Ontario





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# 1. SURVEY DETAILS

#### 1.1 PROJECT NAME

This project is known as the Lucky Strike Property.

#### 1.2 CLIENT

Ashley Gold Mines Limited

14579 Government Rd. Larder Lake, Ontario P0K1L0

## **1.3 LOCATION**

The Lucky Strike Property is located approximately 9km north-east of Larder Lake, Ontario. The survey area is located on a portion of mining claim 4225515, located in McVittie Township, within the Larder Lake Mining Division.

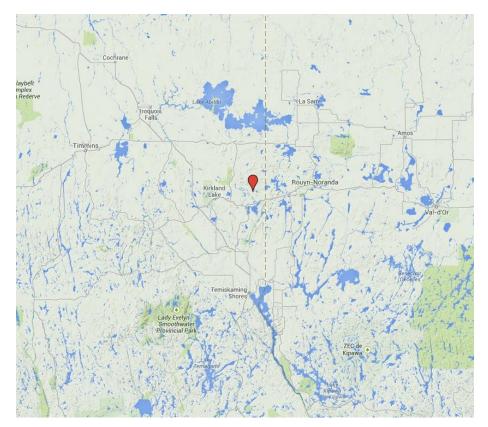


Figure 1: Location of the Lucky Strike Property – Lemieux Area





# 1.4 ACCESS

Access to the property was attained with a 4x4 truck via the Larder Station Road which is located just east of Larder Lake off of provincial highway 66. The Larder Station Road was followed north for approximately 10km to a point at which a trail extends eastward to Lemieux Lake.

# 1.5 SURVEY GRID

The traversed lines were established using a GPS in conjunction with the execution of the survey. The GPS operator would establish sample locations while remaining approximately 12.5m in front of the VLF EM operator. GPS waypoints, VLF EM samples were taken every 12.5m along these controlled traverses. The GPS used was a Garmin GPSMAP 62s with an external antenna for added accuracy.

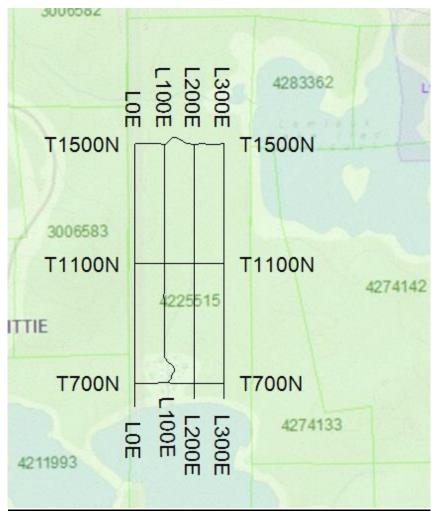


Figure 2: VLF EM Traverses on Claim Map





# 2. SURVEY WORK UNDERTAKEN

## 2.1 SURVEY LOG

Date	Description	Line	Min Extent		Total Sur- vey (km)
May 8, 2016	Locate survey area and con-				
	duct VLF EM survey.	0E	625N	1500N	875
		100E	700N	1500N	800
		200E	650N	1500N	850
		300E	650N	1500N	850
		700N	0E	300E	300
		1100N	0E	300E	300
		1500N	0E	300E	300

# Table 1: Survey Log

# 2.2 PERSONNEL

Bruce Lavalley operated the VLF EM and Claudia Moraga navigated and collecting the GPS waypoints. Both are from Britt, Ontario.

## 2.3 SURVEY SPECIFICATIONS

The survey was conducted with a GSM-19 v7 VLF.

A total of 4.275 line kilometers of VLF EM was read over the Lucky Strike Property on May 8, 2016. This consisted of 342 VLF EM samples taken at a 12.5m sample interval.





# 3. OVERVIEW OF SURVEY RESULTS

## 3.1 SUMMARY

Generally, the survey indicates the presence of some strong VLF EM trends. The four traverse lines allow for various strike orientations, however it would appear the strike direction trends are approximately 80 degrees.

Four strong VLF EM responses appear to strike east-west across the property with a similar response pattern. These occur on line 0E near 1300N through to 1400N on line 300E. A 50-75 meter north offset appears to occur between lines 100E and 200E. A second response can be seen striking across lines 200E and 300E near 1000N. The final two responses parallel each other near 800N across all the survey lines. These appear to parallel the geological units and may indicate the presence of a graphitic or mineralized interflow sediment.

I would recommend compiling the historic data in the area, which should help model the responses. I would also recommend additional VLF EM traverse be performed in the north-south orientation along with in an east-west orientation. This would better identify the orientation of the axis that are present.





**APPENDIX A** 

#### **STATEMENT OF QUALIFICATIONS**

I, C. Jason Ploeger, hereby declare that:

- 1. I am a professional geophysicist with residence in Larder Lake, Ontario and am presently employed as a Geophysicist and Geophysical Manager of Canadian Exploration Services Ltd. of Larder Lake, Ontario.
- 2. I am a Practicing Member of the Association of Professional Geoscientists, with membership number 2172.
- 3. I graduated with a Bachelor of Science degree in geophysics from the University of Western Ontario, in London Ontario, in 1999.
- 4. I have practiced my profession continuously since graduation in Africa, Bulgaria, Canada, Mexico and Mongolia.
- 5. I am a member of the Ontario Prospectors Association, a Director of the Northern Prospectors Association and a member of the Society of Exploration Geophysicists.
- 6. I do not have nor expect an interest in the properties and securities of **Ashley Gold Mines Limited.**
- 7. I am responsible for the final processing and validation of the survey results and the compilation of the presentation of this report. The statements made in this report represent my professional opinion based on my consideration of the information available to me at the time of writing this report.



C. Jason Ploeger, P.Geo., B.Sc. Geophysical Manager Canadian Exploration Services Ltd.

> Larder Lake, ON July 7, 2016





## **APPENDIX B**

# THEORETICAL BASIS AND SURVEY PROCEDURES

# VLF EM SURVEY

The frequency domain VLF electromagnetic survey is designed to measure both the vertical and horizontal in-phase (IP) and Quadrature (OP) components of the anomalous field from electrically conductive zones. The sources for VLF EM surveys are several powerful radio transmitters located around the world which generate EM radiation in the low frequency band of 15-25kHZ. The signals created by these long-range communications and navigational systems may be used for surveying up to several thousand kilometres away from the transmitter. The quality of the incoming VLF signal can be monitored using the field strength. A field strength above 5pT will produce excellent quality results. Anything lower indicates a weak signal strength, and possibly lower data quality. A very low signal strength (<1pT) may indicate the radio station is down.

The EM field is planar and horizontal at large distances from the EM source. The two components, electric (E) and magnetic (H), created by the source field are orthogonal to each other. E lies in a vertical plane while H lies at right angles to the direction of propagation in a horizontal plane. In order to ensure good coupling, the strike of possible conductors should lie in the direction of the transmitter to allow the H vector to pass through the anomaly, in turn, creating a secondary EM field.

The VLF EM receiver has two orthogonal aerials which are tuned to the frequency of the transmitting station. The direction of the source station is located by rotating the sensor around a vertical axis until a null position is found. The VLF EM survey procedure consists of taking measurements at stations along each line on the grid. The receiver is rotated about a horizontal axis, right angles to the traverse and the tilt recorded at the null position.

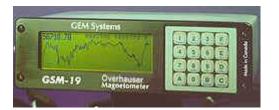


VLF EM Survey Lucky Strike Property - Lemieux Area McVittie Township, Ontario



#### **APPENDIX C**

#### **GSM 19**



# **Specifications**

#### **Overhauser Performance**

Resolution: 0.01 nT Relative Sensitivity: 0.02 nT Absolute Accuracy: 0.2nT Range: 20,000 to 120,000 nT Gradient Tolerance: Over 10,000nT/m Operating Temperature: -40°C to +60°C

## **Operation Modes**

Manual: Coordinates, time, date and reading stored automatically at min. 3 second interval.

Base Station: Time, date and reading stored at 3 to 60 second intervals. Walking Mag: Time, date and reading stored at coordinates of fiducial. Remote Control: Optional remote control using RS-232 interface. Input/Output: RS-232 or analog (optional) output using 6-pin weatherproof connector.

## **Operating Parameters**

Power Consumption: Only 2Ws per reading. Operates continuously for 45 hours on standby.

Power Source: 12V 2.6Ah sealed lead acid battery standard, other batteries available

Operating Temperature: -50°C to +60°C

# Storage Capacity

Manual Operation: 29,000 readings standard, with up to 116,000 optional. With 3 VLF stations: 12,000 standard and up to 48,000 optional.

Base Station: 105,000 readings standard, with up to 419,000 optional (88 hours or 14 days uninterrupted operation with 3 sec. intervals)

Gradiometer: 25,000 readings standard, with up to 100,000 optional. With 3 VLF stations: 12,000, with up to 45,000 optional.





Omnidirectional VLF

Performance Parameters: Resolution 0.5% and range to  $\pm 200\%$  of total field. Frequency 15 to 30 kHz.

Measured Parameters: Vertical in-phase & out-of-phase, 2 horizontal components, total field coordinates, date, and time.

Features: Up to 3 stations measured automatically, in-field data review, displays station field strength continuously, and tilt correction for up to  $\pm 10^{\circ}$  tilts.

Dimensions and Weights: 93 x 143 x 150mm and weighs only 1.0kg.

**Dimensions and Weights** 

Dimensions: Console: 223 x 69 x 240mm Sensor: 170 x 71mm diameter cylinder Weight: Console: 2.1kg Sensor and Staff Assembly: 2.0kg

Standard Components

GSM-19 magnetometer console, harness, battery charger, shipping case, sensor with cable, staff, instruction manual, data transfer cable and software.

# Taking Advantage of a "Quirk" of Physics

Overhauser effect magnetometers are essentially proton precession devices except that they produce an order-of magnitude greater sensitivity. These "supercharged" quantum magnetometers also deliver high absolute accuracy, rapid cycling (up to 5 readings / second), and exceptionally low power consumption.

The Overhauser effect occurs when a special liquid (with unpaired electrons) is combined with hydrogen atoms and then exposed to secondary polarization from a radio frequency (RF) magnetic field. The unpaired electrons transfer their stronger polarization to hydrogen atoms, thereby generating a strong precession signal-- that is ideal for very high-sensitivity total field measurement. In comparison with proton precession methods, RF signal generation also keeps power consumption to an absolute minimum and reduces noise (i.e. generating RF frequencies are well out of the bandwidth of the precession signal).

In addition, polarization and signal measurement can occur simultaneously - which enables faster, sequential measurements. This, in turn, facilitates advanced statistical averaging over the sampling period and/or increased cycling rates (i.e. sampling speeds).





• The unique Overhauser unit blends physics, data quality, operational efficiency, system design and options into an instrumentation package that ... exceeds proton precession and matches costlier optically pumped cesium capabilities



VLF EM Survey Lucky Strike Property - Lemieux Area McVittie Township, Ontario



# **APPENDIX C**

# **GARMIN GPS MAP 62S**



Physical & Performance:				
Unit dimensions, WxHxD:	2.4" x 6.3" x 1.4" (6.1 x 16.0 x 3.6 cm)			
Display size, WxH:	1.43" x 2.15" (3.6 x 5.5 cm); 2.6" diag (6.6 cm)			
Display resolution, WxH:	160 x 240 pixels			
Display type:	transflective, 65-K color TFT			
Weight:	9.2 oz (260.1 g) with batteries			
Battery:	2 AA batteries (not included); NiMH or Lithium recom- mended			
Battery life:	20 hours			
Waterproof:	yes (IPX7)			
Floats:	no			
High-sensitivity re- ceiver:	yes			





Interface: high-speed		and NMEA 0183 compatible			
Maps & Memory:					
Basemap:		yes			
Preloaded maps:		no			
Ability to add maps:		yes			
Built-in memory:		1.7 GB			
Accepts data cards:		microSD™ card (not included)			
Waypoints/favorites/loc	ations:	2000			
Routes:		200			
Track log:		10,000 points, 200 saved tracks			
Features & Benefits:					
Automatic routing (turn	by turn routing	yes (with optional mapping for detailed			
on roads):		roads)			
Electronic compass:		yes (tilt-compensated, 3-axis)			
Touchscreen:		no			
Barometric altimeter:		yes			
Camera:		no			
Geocaching-friendly:		yes (paperless)			
Custom maps compatil	<u>ole</u> :	yes			
Photo navigation (navig	gate to ge-	yes			
otagged photos):					
Outdoor GPS games:		no			
Hunt/fish calendar:		yes			
Sun and moon informa	tion:	yes			



VLF EM Survey Lucky Strike Property - Lemieux Area McVittie Township, Ontario



Tide tables:	yes
Area calculation:	yes
Custom POIs (ability to add additional points of interest):	yes
Unit-to-unit transfer (shares data wire- lessly with similar units):	yes
Picture viewer:	yes
Garmin Connect <sup>™</sup> compatible (online community where you analyze, catego- rize and share data):	yes

• Specifications obtained from www.garmin.com





**APPENDIX D** 

LIST OF MAPS (IN MAP POCKET)

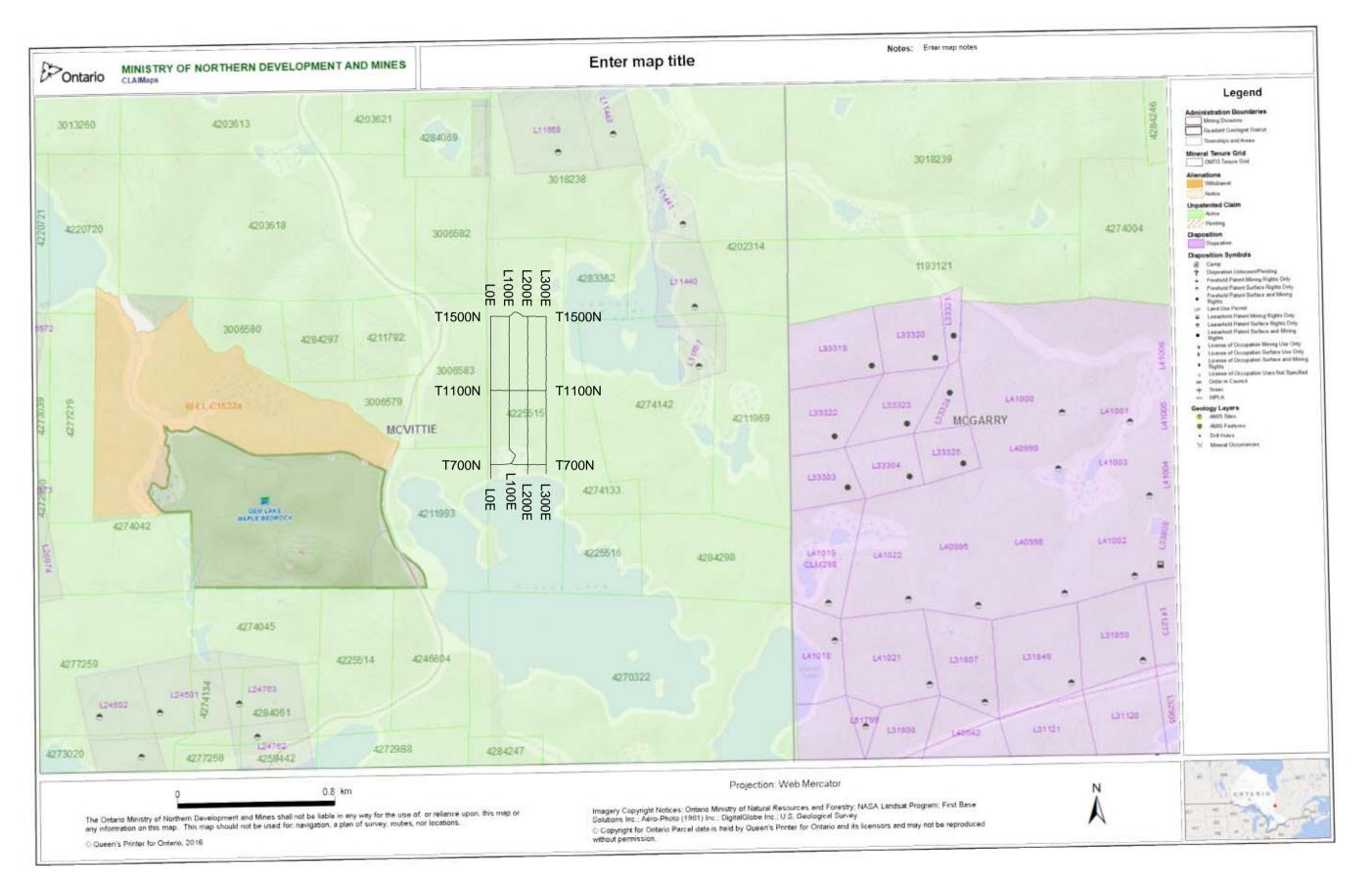
Posted profiled VLF plan map (1:2500)

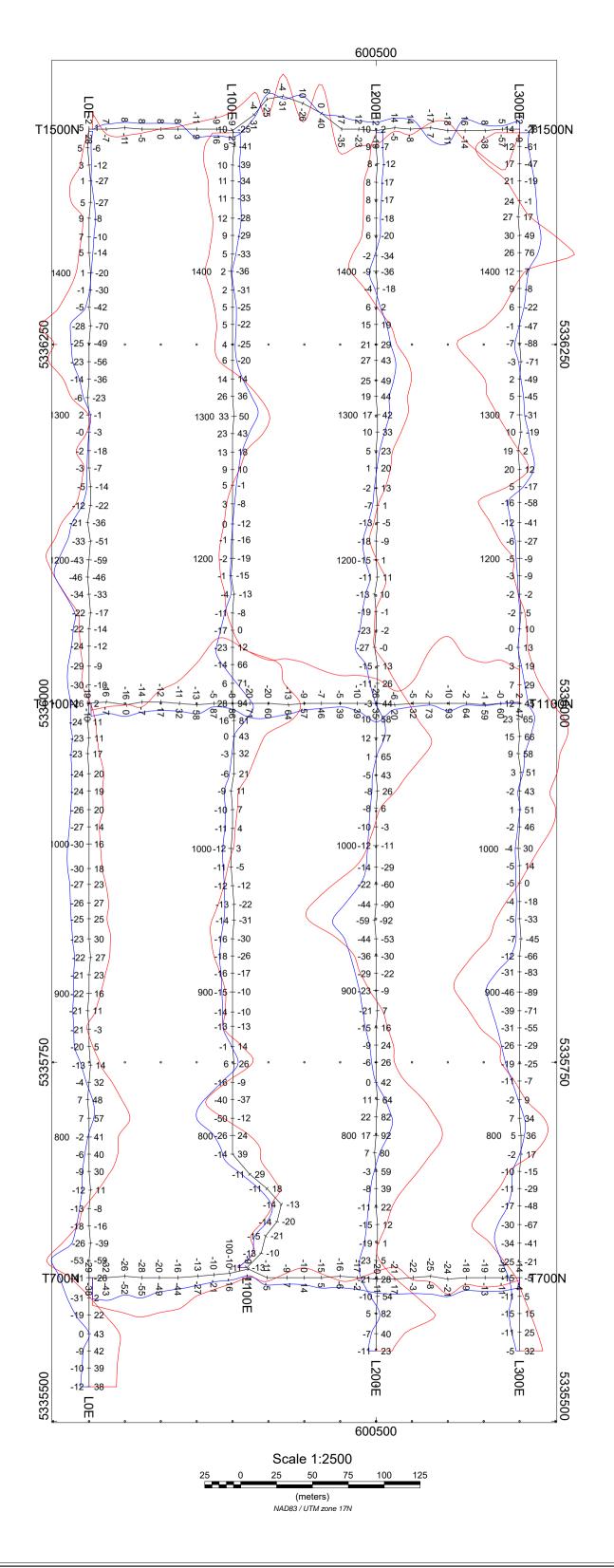
1) Q2192-ASHLEY-LUCKY STRIKE-LEMIEUX-VLF-NAA

Grid Sketch on Claim Map (1:20000)

2) Q2192-ASHLEY-LUCKY STRIKE-LEMIEUX-TRAVERSE

TOTAL MAPS=2







# LUCKY STRIKE PROPERTY LEMIEUX LAKE AREA McVittieTownship, Ontario

VLF IN PHASE/OUT PHASE PROFILE 24.0kHz NML - CUTLER USA

In Phase: Posted Right/Bottom (Red) Out Phase: Posted Left/Top (Blue)

Vertical Profile Scales: 5 %/mm

Station Seperation: 12.5 meters Posting Level: 0

GSM-19 VLF v7

Receiver Operated By: Bruce Lavalley GPS Operated By: Claudia Moraga Processed by: Jason Ploeger Map Drawn By: C Jason Ploeger, B.Sc. July 2016



Drawing: Q2192-ASHLEY-LUCKY STRIKE-LEMIEUX-VLF-NAA