GroundTruth Exploration

2020

2019 OG Ground Geophysics Assessment Report

Very Low Frequency Electromagnetics

on the
OG Property
Dawson City, Yukon

GRANT_NUM	LABEL
YC25491-502	OG 1-12
YC43582-599	OG 13-30
YC44737-742	OG 31-36

NTS: 1:50,000 Mapsheet Number 116B/13 and 116C/16

UTM: 548492 E 7198887 N

NAD83 Zone 7N

Dawson Mining District

Work Performed:
VLF: 09/07/2019

Prepared for Shawn Ryan
By GroundTruth Exploration

Written By: Kaitlyn Crawford and Amir Radjaee
Compilation Date: March 23, 2020

Box 70, DAWSON, YT
Y0B 1G0

Summary

Shawn Ryan commissioned Ground Truth Exploration Inc. to conduct a “Very Low Frequency Electromagnetic” (VLF) survey covering the OG property. The property is located 90 km north-northwest of Dawson City and 75 km west of the Dempster Highway. Access to the property is by helicopter. On September 07, 2019, a 3-person VLF crew was set out to two separate properties. One VLF technician worked on the OG claims. Twelve 500 m lines at 50 m spacing were collected on the OG property totaling 6 line-km.

The OG claims were first staked in 1974 by the Hudson Bay Exploration and Development Company Ltd, Minorco Canada Ltd. and Tombill Mining Ltd. Claims were staked due to a reconnaissance stream sediment geochemical survey and prospecting program. Since being staked, bedrock mapping, geochemical sampling, an induced polarization survey and 24-hole drill program has been carried out on the Monster Occurrence. In 2003, Shawn Ryan staked the first set of OG claims and by 2006 additional claims had been staked on the property.

There are four different rock units occurring on the property. The property lies in the Coal Creek Inlier and the rocks are all of the Wernecke Supergroup, Neoproterozoic to Paleoproterozoic in age. Rock types dominantly consist of dolostones, sandstones and black shales. The prominent mineralization style in the area is Mississippi Valley type, but there are also numerous occurrences in the Wernecke Breccias.

Results of the 2019 VLF+ MAG survey are encouraging in terms of looking for structures underlying the overburden on the property. The results of the survey conducted on the OG property are outlined in this report.

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Introduction

Shawn Ryan commissioned GroundTruth Exploration Inc. to conduct a "Very Low Frequency Electromagnetic" (VLF) survey on the OG property. On September 07, 2019, a 3-person VLF crew was set out to two separate properties. One VLF technician worked on the OG claims. A total of 6 line-km along 12 survey lines tacking 567 readings at about 10 m station spacing was acquired. The collected data was then processed by the GroundTruth Exploration Inc. geophysicist, Amir Radjaee.

Location and Access

The property is located 90 km north northwest of Dawson City and 75 km west of the Dempster Highway. Access to the property is by helicopter. The OG property is located on National Topographic System (NTS) map sheets 116B/13 and 116C/16. Approximately half of the claims are located on each map sheet (Figure 1). The center of the property is located at UTM coordinates 548492 Easting and 7198887 Northing NAD 83 Zone 7N.

Elevation on the property ranges from 1000 m to 1500 m with both low-lying areas and steep cliffs. The property is located at the southern end of the Ogilvie Mountain range.

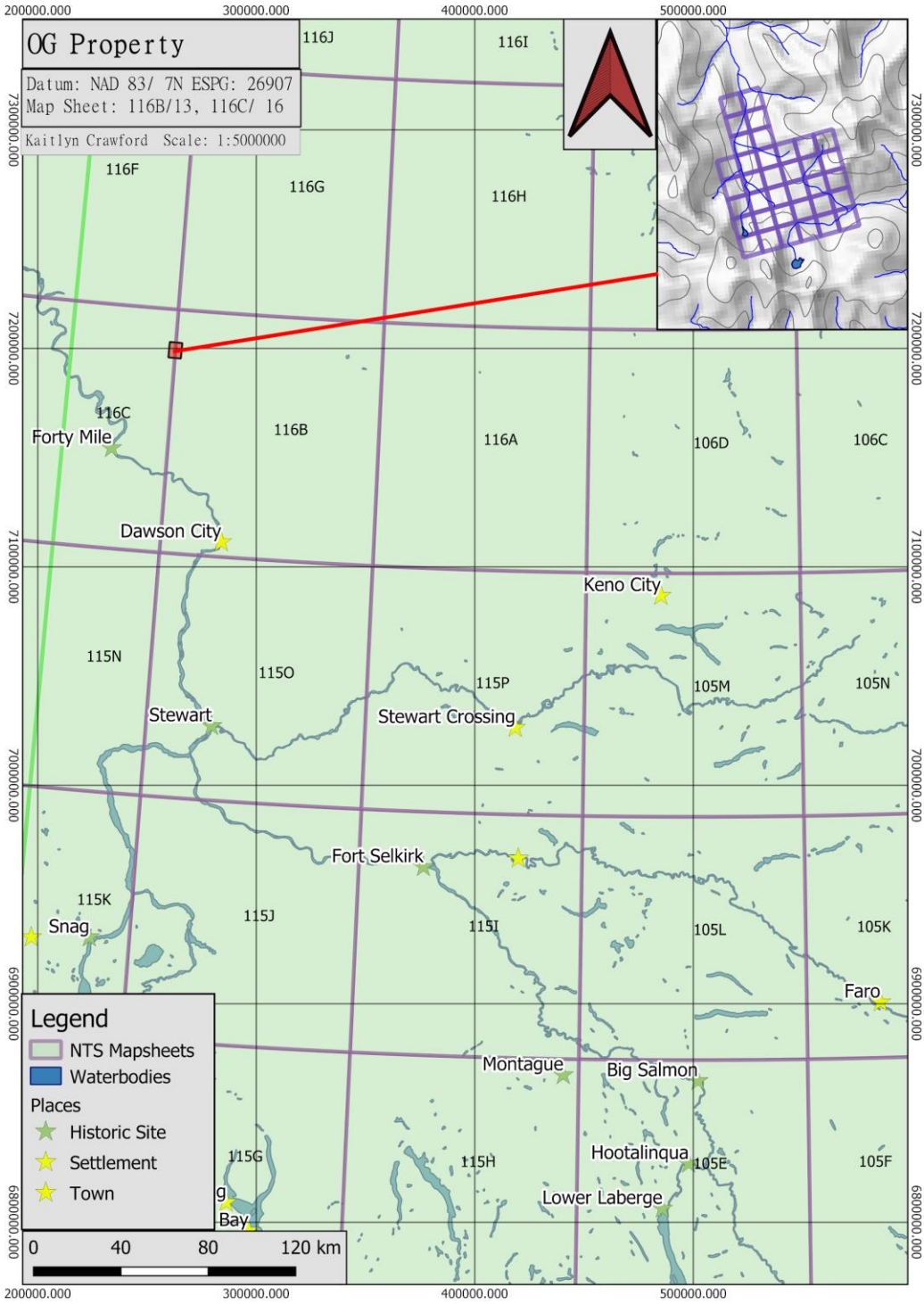

Figure 1: Location of the OG property

Claims

The OG property comprises 36 active quartz claims, 100% owned by Shawn Ryan. The original claims were staked in 2003 with the most recent claims being staked in 2006. A full summary of the claims can be seen in the table below (Table 1) as well as a map of the claim locations (Figure 2). The majority of the VLF+Mag work was done on claim grant numbers YC25492, YC25494, YC25497 and YC25499.

Table 1: Summary of the OGG claims

GRANT_NUM	STATUS	LABEL	OWNER	STAKE_DATE	EXPIRY_DAT	DISTRICT
YC25491-502	Active	OG 1-12	Shawn	10/1/2003	3/20/2022	Dawson
YC43582-599	Active	OG 13-30	Shawn	3/16/2006	3/20/2022	Dawson
YC44737-742	Active	OG 31-36	Shawn	8/13/2006	3/23/2022	Dawson

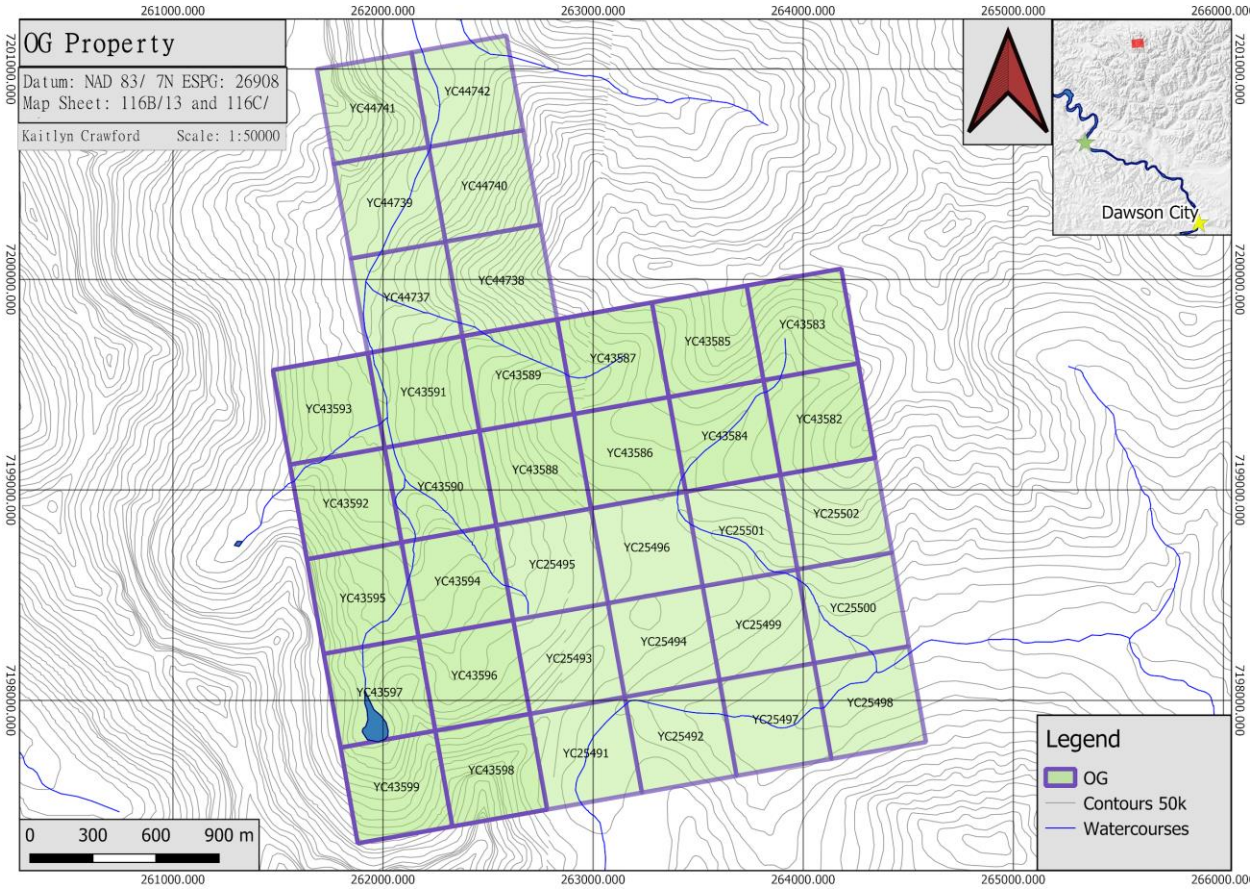

Figure 2: OG claims with grant numbers

History and Previous Work

The OG claims were first staked in 1974 by the Hudson Bay Exploration and Development Company Ltd., Minorco Canada Ltd. and Tombill Mining Ltd. Claims were staked due to a reconnaissance stream

sediment geochemical survey and prospecting program. In 1975, additional bedrock mapping and geochemical sampling took place, as well as an induced polarization survey and a 12-drill hole program (1966.3 m). In 1976, a second 12 hole drill program, (1894.6 m), another induced polarization survey, trenching and further geochemical sampling was conducted.

In 1991, the claims were re-staked by Archer Cathro and Associates (1981) Ltd. In 1996, High Sense Geophysics Ltd. under contract to Equity Engineering Ltd. flew a regional, helicopter borne, magnetic and radiometric survey over most of the Coal Creek Inlier. In 2007, Full Metal Minerals completed surface mapping, soil sampling and a ground gravity geophysical survey over the property. Soil sampling outlined the Raider Zone, a new multielement soil anomaly. The gravity survey was completed over part of the Yankee zone soil anomaly.

In 2003, Shawn Ryan staked his first set of OG claims and by 2006 he had staked the remaining claims that exist in the current claim block.

Geology

Regional Geology

The North American shelf has three erosional inliers in Western Yukon. These are Proterozoic erosional windows of the Northwestern Cordillera. The inliers are unconformably overlain by Cambrian and younger platformal carbonate rocks to the north, west and east. To the south the platformal carbonates are truncated by the Dawson Thrust Fault. The property lies in an area known as the Coal Creek inlier.

The Coal Creek inlier is a mountainous area in West Central Yukon. This inlier is dominantly sedimentary strata from the Wernecke Supergroup, Fifteenmile Group and the Mount Harper Group. The Wernecke Supergroup is the oldest of these units and unconformably underlies the Fifteenmile Group. The Mount Harper Group overlies the Fifteenmile Group and is the youngest (Macdonald and Roots, 2010).

The Wernecke Super Group is comprised of the Fairchild Lake Group, the Quartet Group and the Gillespie Lake Sediments. The Quartet Group and the Gillespie Lake Sediments are found on the OG property. These groups are found in the northern half of the outlier as fault bounded blocks (Kunzmann et. al., 2014). The rocks of these groups are shallow water fine grained clastic and carbonates (Strauss et. al., 2014). The Wernecke Breccias can be found within this unit.

The lower Fifteenmile Group is the Gibben Formation and the Chandindue Formation, while the upper succession is the Reef Assemblage and the Craggy Dolostone (Kunzmann et. al., 2014). The Craggy Dolostones are found on the OG property. The Lower section of the Fifteenmile Group are clastic rocks and dolostone. The Gibben formation reflects a shallow marine carbonate environment on tidal flats with a sharp transition into the Chandindue Formation. The Chandindue Formation has more siliciclastic

deposition in a tidal flat environment. The upper portion of the Fifteen Mile Formation is a transgressive-regressive cycle (Macdonald and Roots, 2010).

The Callison Lake dolostones are the oldest group of the Windemere Super Group. Above those are the Mt. Harper Formation sediments. The Callision Lake dolostones unconformably overlie the Fifteenmile Group. Rocks of this succession are light grey to white weathering limestone, dolostones and breccias. The dolomites have stromatalitic characteristics (Macdonald and Roots, 2010). These rocks are Neoproterozoic in age.

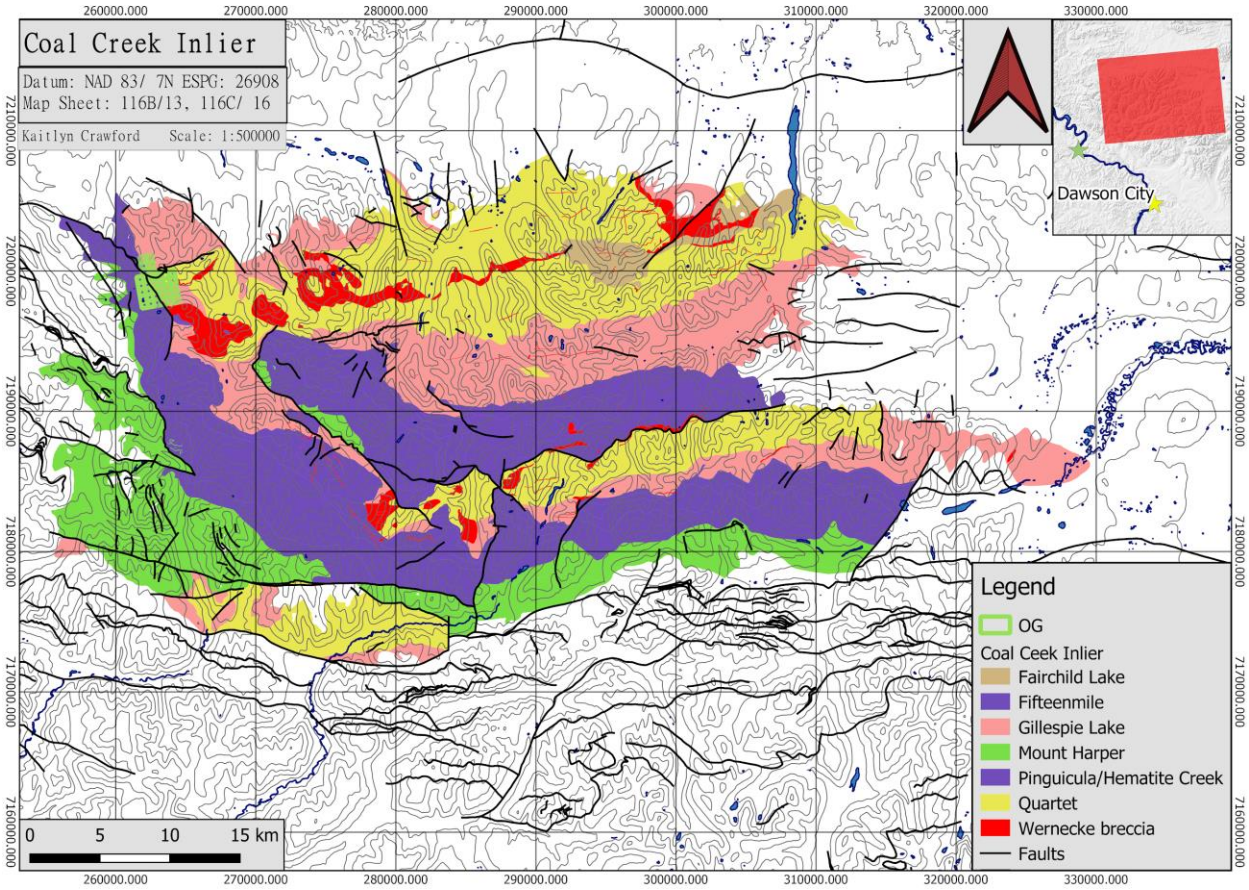

Figure 3: Western Yukon Coal Creek Inlier

Property Geology

There are four different rock units on the property. They are in the the Wernecke Supergroup, Neoproterozoic to Paleoproterozoic in age. The Monster drilled prospect occurs in Quartette Group, while the Ugly showing is in the Gillespie Lake Sediments. The other two units found on the property are the Craggy Dolomites and small intrusions of the Wernecke Breccias.

The oldest unit on the property is the Paleoproterozoic Wernecke Formation of the Gillespie Lake Suite. On the property these rocks are typically orange weathering dolomites, silty carbonates and minor amounts of shale (Thorkelson, 2000). This unit is often seen brecciated, banded or massive with bands ranging from thin to medium banded. The rocks are typically light to dark grey-green brown (Dickinson, 1975).

The second oldest unit is the Quartette Group. This group is Paleoproterozoic in age and a part of the Wernecke Supergroup. It is sandstone with minor amounts of black shale and siltstone. Like most of the Wernecke Supergroup found within the Coal Creek Inlier, the Quartet Group is found to be variably tilted and fault bound (Macdonald, & Roots, 2010).

The Craggy Dolostones conformably cap the transgressive-regressive cycle of the upper Fifteenmile Group. These rocks are Neoproterozoic in age and are also a part of the Wernecke Supergroup. The Craggy Dolostones are predominantly light grey, strongly silicified and recrystallized dolostone with minor amounts of shale. The dolostone consists mostly of microbial laminate, ooid coated-grain pack and grainstone, tabular clast conglomerate, and gravity flow breccia (Kunzmann et. al., 2014).

A very small portion of the property covers the Mesoproterozoic Wernecke Breccias. They are heterolithic with minor amounts of hematite. Clasts include potassic-altered siltstones, dolostones and diorite (Blackstone Resources Inc., 1990). The breccias are locally layered. Many occurrences have been found in these breccias.

South of the property are two major faults, the Dawson Thrust Fault and the Tintina strike slip fault. On the property there are multiple faults that are thought to be thrust faults. They tend to trend northwest to southeast. Mineralization is often found along fault zones in this area.

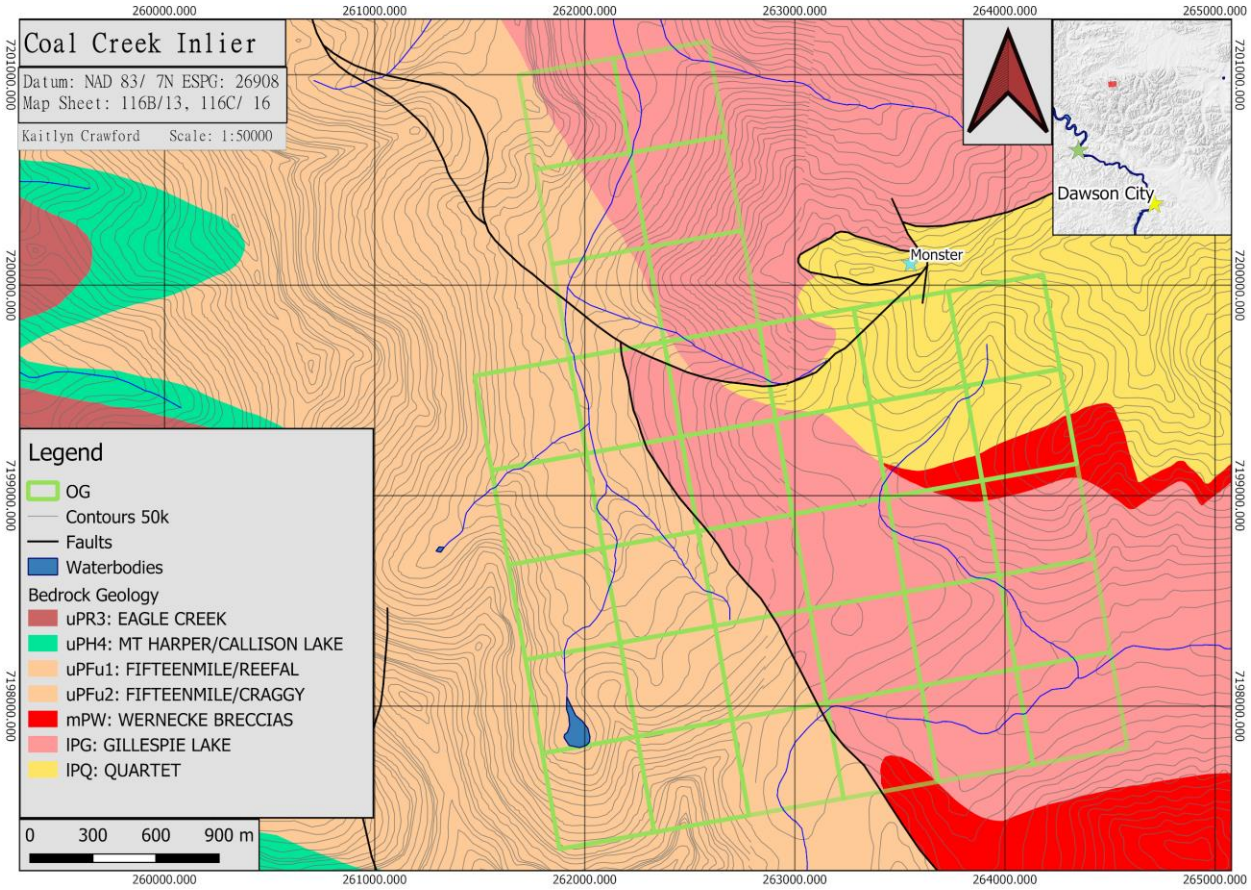

Figure 4: OG property Geology based on Strauss et. al., (2014)

Mineralization

The Monster drilled prospect is within 1 km of the property and the Ugly showing is within 2 km of the property. These are both Mississippi Valley Type (MVT) hosted mineralization. There are many other occurrences in the area found within the Wernecke Breccias. Mineralization in the area is thought to be fault related. The elements associated with the MVT style mineralization are Zn-Pb-Ag. Sphalerite, galena, pyrite and rare chalcopyrite are all associated with the Monster showing. These can be found in fracture zones associated with the breccia as well as along steeply dipping faults.

2019 Exploration Program and Results

VLF+Mag Surveys

During the 2019 field season a 6 line-km VLF+Mag survey was completed. The survey collected 567 readings at approximately 10 m station spacings along 12 survey lines spaced 50m apart. The VLF data was taken over the Gillespie Lake sediments unit, predominantly dolomites.

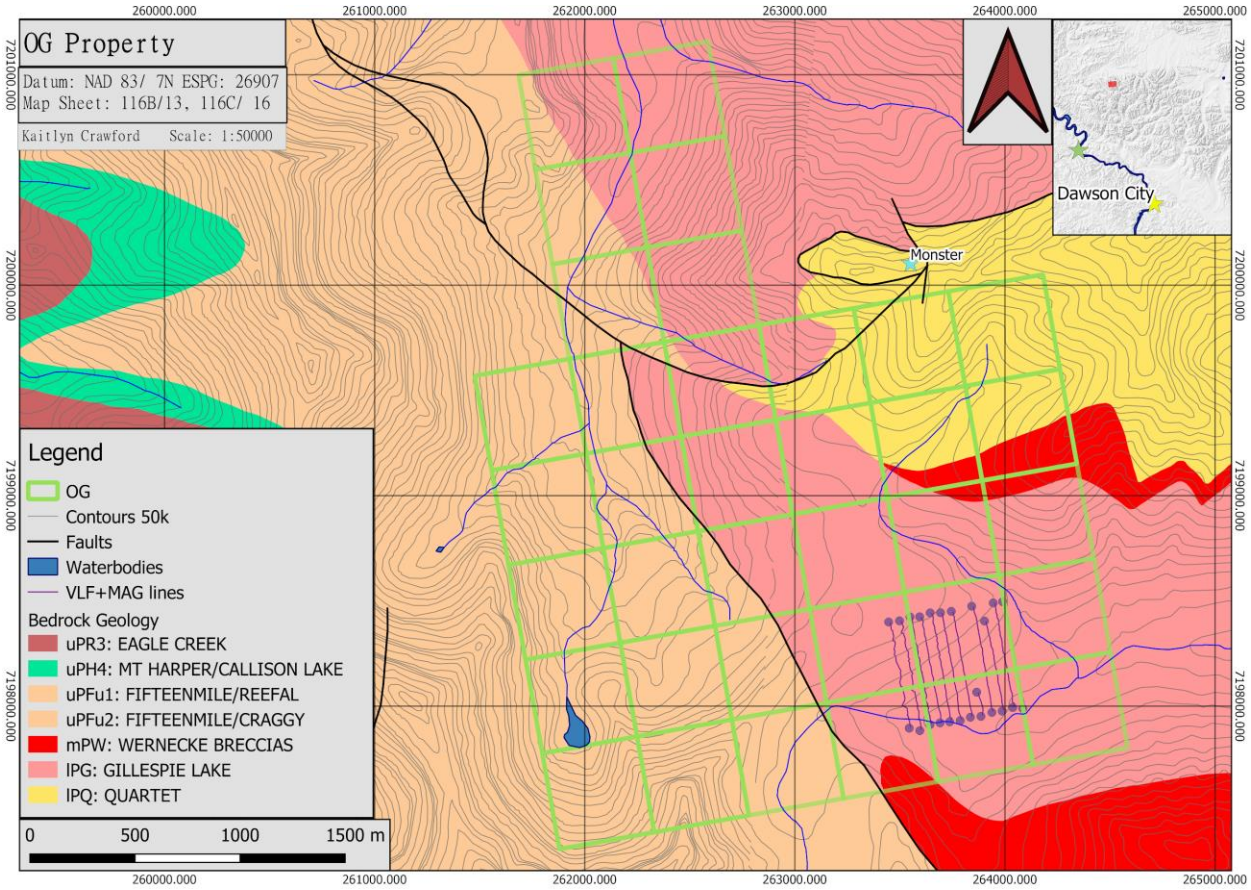

Figure 5: Location of the VLF lines completed during the summer of 2019, over the property Geology

Methods and Procedures

Data was acquired using GEM-19 portable VLF systems supplemented by a high-sensitivity proton magnetometer. The magnetometer has an absolute accuracy of +/- 0.2nT. Along with basic GPS tracking, GEM provides a navigation feature with the real-time coordinate transformation to UTM and the local grid. Operators can define a complete survey on a PC and download points to the magnetometer via RS-232 serial port.

During the survey, a GEM-19 magnetometer was set up as the base station to collect data for correction and removal of unwanted noise arising from solar and atmospheric activity. Total coverage of the survey block amounted to 6 line-km along 12 survey lines taking 567 readings at about 10 m station spacing. The survey lines were oriented SE-NW (344° AZ) with a line spacing of 50 m. The in-phase and out-of-phase (quadrature) signals were measured as the percentage of total field for three frequencies.

The methods and procedure for VLF+Mag surveys are discussed fully in the report "OG GEOPHYSICAL REPORT GROUND VLF AND MAGNETIC SURVEY" by Geophysicist Amir H. Radjaee*, Ph.D., P.Geo* in Appendix I.

Analysis

Once each survey was completed in the field, the data measurements were downloaded and reviewed to ensure the quality of the collected data. This allowed field errors to be addressed before moving the equipment. The VLF+MAG datasets were processed daily by the operator using EarthImager 2D software provided by Advanced Geosciences Inc. Data collected in the field was then processed by a Ground Truth Exploration Inc. geophysicist.

The data is processed for magnetic diurnal correction and the Fraser filter is applied on in-phase and quadrature components of the VLF data. The data can be processed in advanced levels using inversion modelling techniques recently developed for the 2D inversion of the VLF data. The EMTOMO-VLF2Dmf is a software program for the 2D inversion of VLF-EM data based on the finite element (FE) method. This will ensure that geological models respect a consistent structural, stratigraphic, and topological framework in addition to ensuring consistency between different geophysical models.

Results

6-line km of VLF was collected during the 2019 field season. Two of the 12 lines were not fully completed. The data was later processed by Geophysicist Amir H. Radjaee*, Ph.D., P.Geo* and the full report can be found in Appendix I. Fraser lens 214 (Figure 6), Fraser lens 252 (Figure 7), and a TMI filter (Figure 8) were used to process the data.

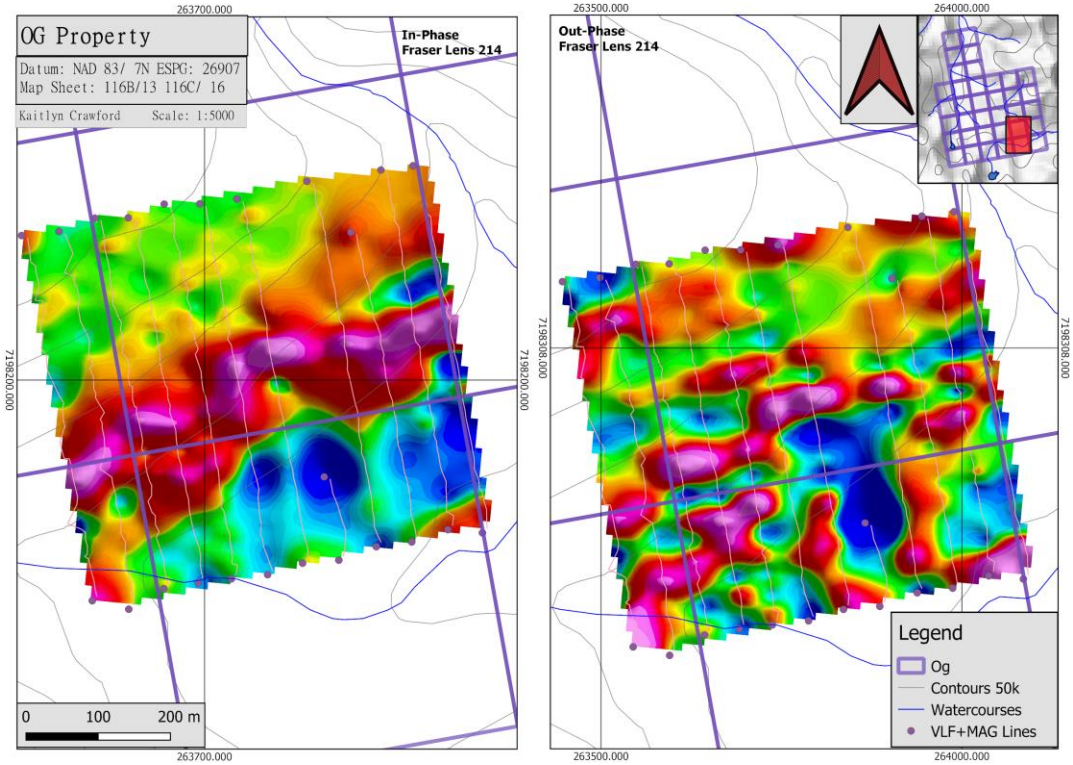

Figure 6: Walking VLF taken during the 2019 field season. A 214 Fraser filter was used to process the data.

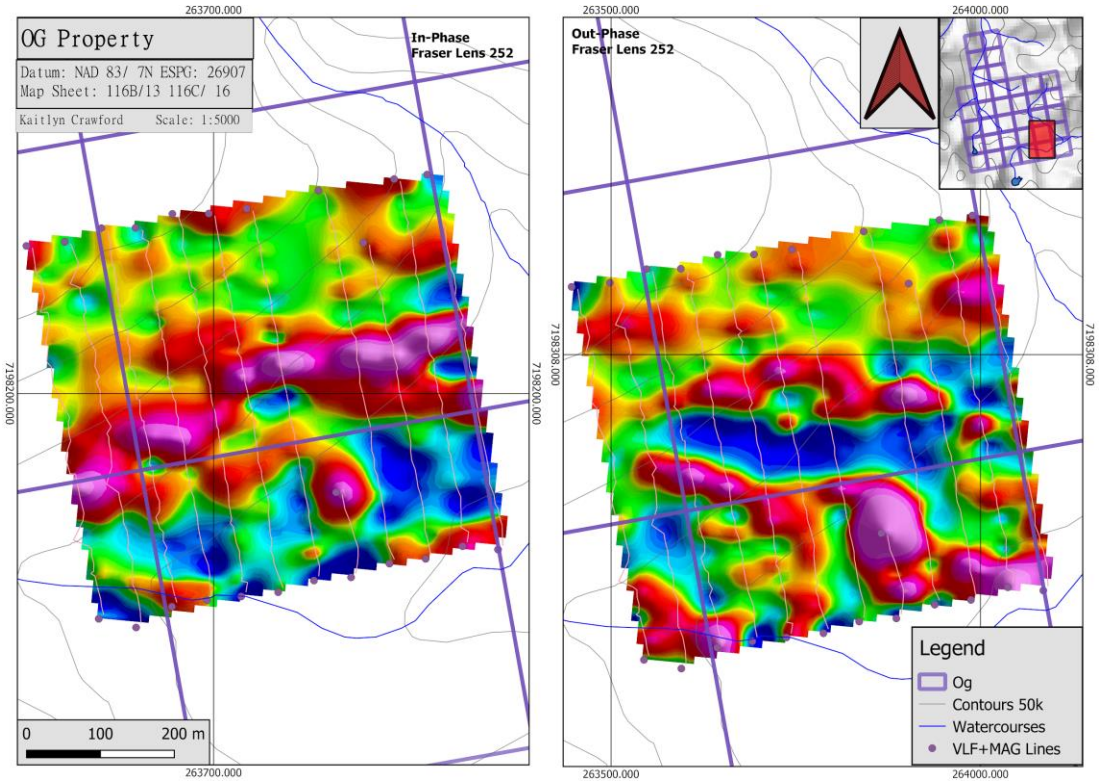

Figure 7: Walking VLF taken during the 2019 field season. A 252 Fraser filter was used to process the data.

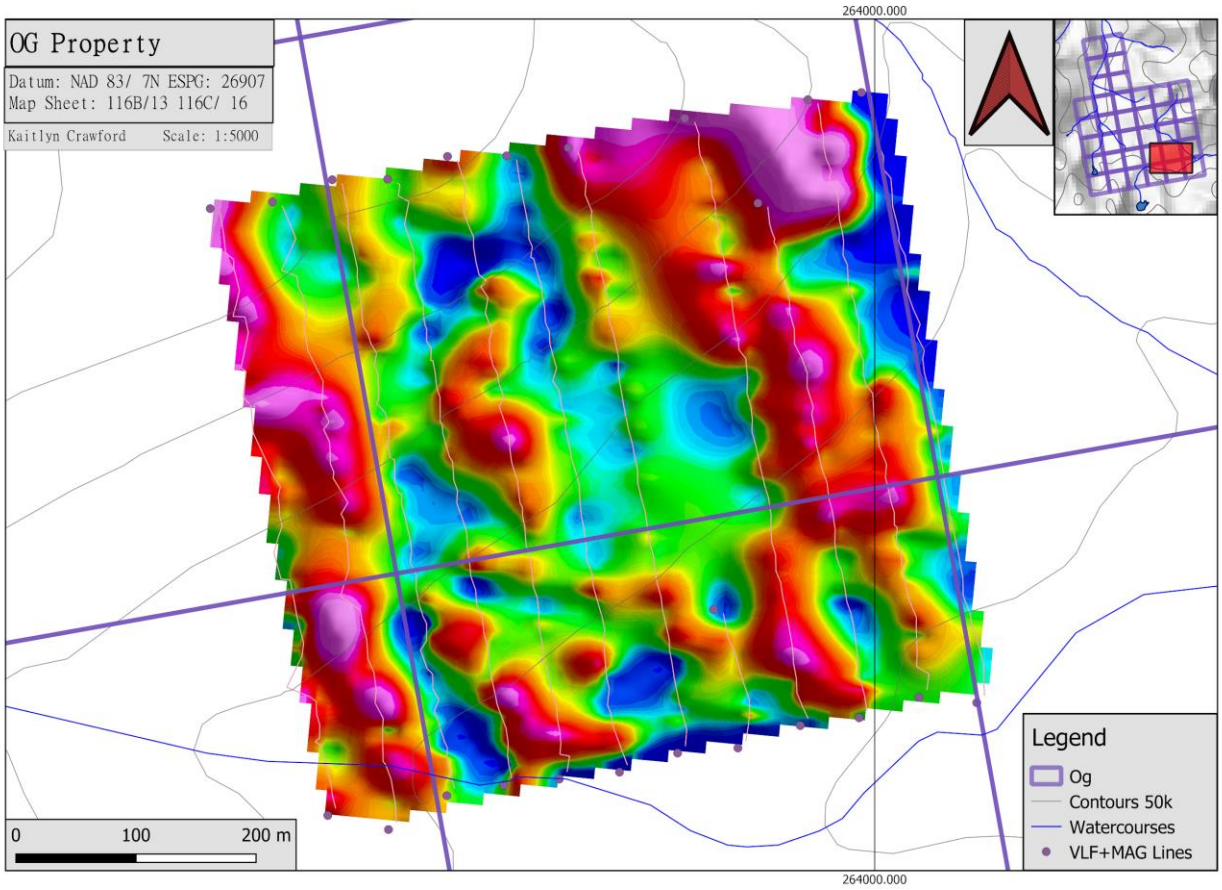

Figure 8: Walking VLF taken during the 2019 field season. A TMI Fraser filter was used to process the data.

Interpretation and Conclusions

In both the Fraser lens 214 and 252, processed data had distinct high stretches horizontally through the center of the grid. This could potentially be a structure hosting veins or MVT style mineralization. The potential structure is not obvious in the TMI processed data.

Recommendations

Follow up on the VLF is recommended to obtain a clearer picture in the TMI processed data. Other occurrences in the area are MVT style mineralization and the VLF taken during the 2019 field season may highlight an area where mineralization may occur. Soil sampling should be done to generate some basic targets. Bedrock mapping and prospecting should be used as follow up to the soil sampling. A bedrock interface probe could be used when overburden is too thick. Additional ground geophysics could be done over the VLF data to further delineate the structure.

References

Blackstone Resources Inc., (1990). Summary Report of Olympic Dam potential in the Yukon and of the Monster Property. *Energy, Mines and Resources Property File Collection*, ARMC006778.

Dean, Peter., (1975). Cyprus Anvil Mining Corporation, Coal Creek Dome Area, Yukon. *Yukon Mining Assessment Report* 090092.

Kunzmann, M., Halverson, G.P, Macdonald, F.A., Hodgskiss, M., Sansjofre, P.D., Schumann, D., and Rainbird, R.H., (2014). The Early Neoproterozoic Chandindu Formation of the Fifteenmile Group in the OGilvie Mountains. *In:* Yukon Exploration and Geology 2013, K.E. MacFarlane, M.G. Nordling, and P.J. Sack (eds.), *Yukon GeolOGical Survey*, p. 93-107.

Macdonald, F.A. and Roots, C.F., (2010). Upper Fifteenmile Group in the OGilvie Mountains and Correlations of Early Neoproterozoic Strata in the Northern Cordillera. *In*: Yukon Exploration and Geology 2009, K.E. MacFarlane, L.H. Weston and L.R. Blackburn (eds.), *Yukon GeolOGical Survey,* p. 237-252.

Mortensen, J.K., Nesbitt, B.E., and Rushton, R., (1992). Preliminary Observations the Geology and Geochemistry of Quartz Veins in the Klondike District, West-Central Yukon. In: *Yukon Geology Volume 3, T.J. Bremner (ed.), Exploration & GeolOGical Services Division, Indian & Northern Affairs Canada*, p. 260-270.

Strauss, J.V., Roots, C.F., MacDonald, F.A., Halverson, G.P., Eyster, A. and Colpron, M., (2014). Geological map of the Coal Creek Inlier, OGilvie Mountains (NTS 116B/10-15 and 116C/9, 16). *Yukon Geological Survey*, Open File 2014-15, scale 1:100,000.

Thorkelson, D., (2000). Geology and Mineral Occurrences of the Slats Creek, Fairchild Lake and Dolores Creek Areas, Wernecke Mountains (106D/16, 106C/13, 106C/14), *Yukon Territory*, Bulletin 10.

Statement of Expenditures

VLF+MAG - 6.0 line km, 1 man day + Mobe/Demobe	
Labour (1 operator) and Equipment Rental	$ 590.00
Transnorth Helicopters (0.6 hour @ $1525/hr)	$ 900.00
Data Processing and Assessment Report 8 hr @ $50/hr	$ 400.00
Total Expenditures	$ 1,890.00

Statement of Qualifications

I, Kaitlyn Crawford, do hereby declare that:

1. I am currently assisting with end of season report writing for GroundTruth Exploration Inc. of Dawson City, Yukon.
2. I graduated from Brandon University in 2018 with a B.Sc. degree in Geology.
3. I have worked as a geologist or geological assistant on and off since 2015.
4. I am not aware of any material, fact or material change with respect to the subject matter of this report, the omission to disclose which makes this report misleading.

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Dated:

March 30, 2020

Appendices

GEOPHYSICAL REPORT
GROUND VLF AND MAGNETIC SURVEY

OG (OGG) Project

YT, Canada

Work Performed On: September 07, 2019

FOR:

Shawn Ryan
Dawson City, YT

Report# SRP-GVLF19-OGG / Rev. 01

Prepared By:
GroundTruth Exploration Inc.
BOX 70, Dawson City, YT

Author: Amir H. Radjaee, *Ph.D., P.Geo*

March 2020

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1.0 Introduction

This report describes data acquisition and preliminary data processing results of the 2019 ground VLF and magnetic survey. The GroundTruth Exploration was commissioned by Shawn Ryan, Dawson City, YT to run the survey and process the data.

On September 7, 2019, ground VLF (GVLF) and ground magnetic (GMAG) surveys were completed over the OG claims (OGG) located in the Yukon Territory. This survey is a part of a comprehensive survey completed in order to target future exploration on the property. All data, grids and maps are delivered in NAD83 UTM Zone 7N.

2.0 Purpose and Scope

The primary purpose of completing ground VLF and magnetic geophysical surveys is to determine the spatial distribution of subsurface electrical and magnetic properties of rocks. This, in turn, will allow the characterization of geophysical signatures for zones of mineralization and support geological models and structural mapping.

3.0 Survey Description

Data were acquired using GEM-19 portable VLF systems supplemented by a high-sensitivity proton magnetometer. The magnetometer has an absolute accuracy of +/- 0.2nT. Along with basic GPS tracking, GEM provides a navigation feature with the real-time coordinate transformation to UTM and the local grid. Operators can define a complete survey on PC and download points to the magnetometer via RS-232 serial port.

During the survey, a GEM-19 magnetometer was set up as the base station to collect data for correction and removing of unwanted noise arising from solar and atmospheric activity.

Total coverage of the survey block amounted to 6.0 line-km along 12 survey lines tacking 567 readings at about 10m station spacing. The survey lines are in an azimuthal direction of SE-NW (NE 344°) with line spacing of. The in-phase and out-of-phase (quadrature) signals were measured as percentage of total field for three frequencies. The VLF transmitter frequencies used for this survey are presented in Table 1. The outline of survey areas and layout of flight lines are shown in Figure-1.

Table 1: The parameters of VLF Tx stations.

VLF Tx Station	Frequency (kHz)	Latitude	Longitude
NML, ND	25.2	46.365987°N	98.335667°W
NSS, MD	21.4	38.977778°N	76.453333°W

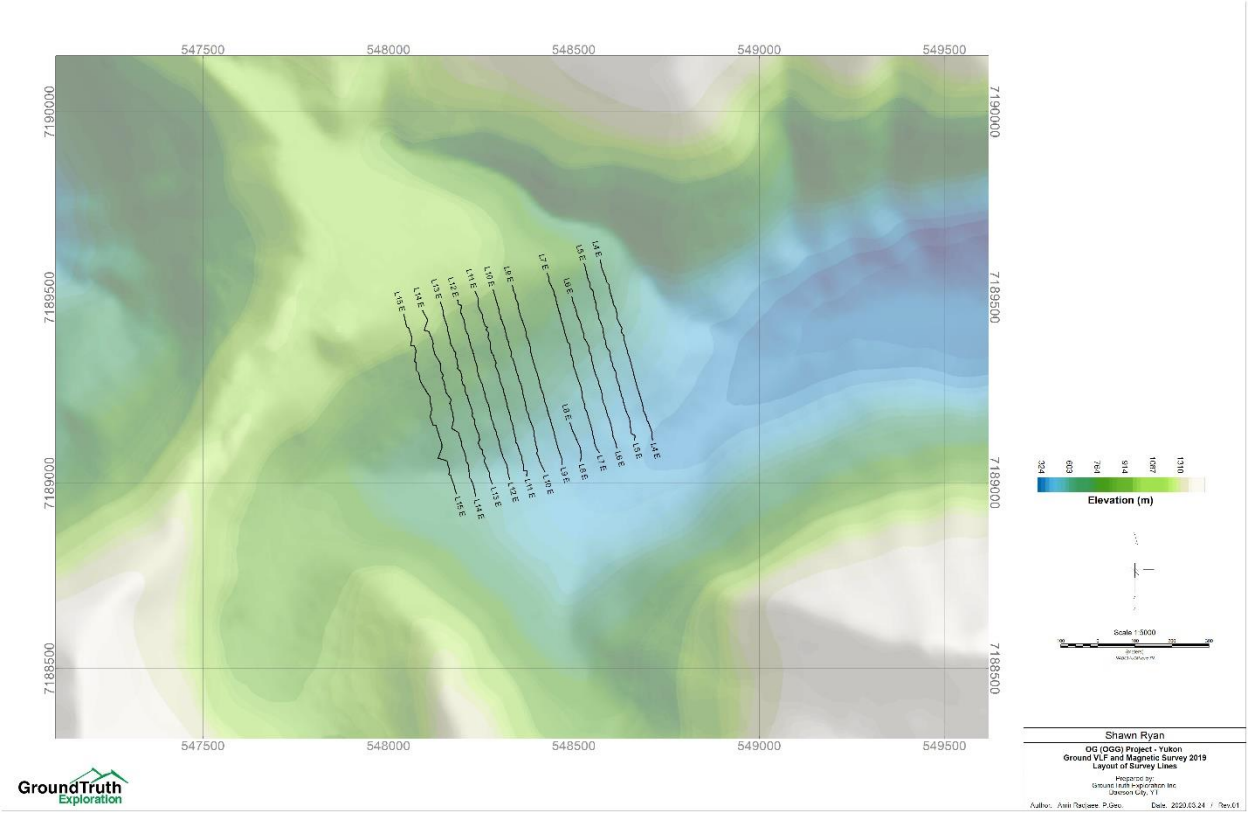

Figure 1: Location map of ground VLF/Mag survey 2019 on OG (OGG) property, YT.

4.0 Survey Theory

4.1 Very Low Frequency (VLF) survey

Very Low Frequency Electromagnetics (VLF) is a geophysical ground probing technology that uses powerful remote radio transmitters set up in different parts of the world for the military submarine comminucation. In radio communications terminology, VLF means very low frequency, about 15 to 25 kHz, while relative to

frequencies generally used in geophysical exploration, these are very high frequencies. The radiated field from a remote VLF transmitter, propagating over a uniform or horizontally layered earth and measured on the earth's surface, consists of a vertical electric field component and a horizontal magnetic field component each perpendicular to the direction of propagation.

These radio transmitters are very powerful and induce electric currents in conductive bodies thousands of kilometres away. Under normal conditions, the fields produced are relatively uniform in the far-field at a significant distance (hundreds of kilometres) from the transmitters. The induced currents produce secondary magnetic fields that can be detected at the surface through the deviation of the normal radiated field (Figure 2).

VLF is used in many applications, including mineral exploration, water exploration and more. In mineral exploration, VLF data are used to map geologic structure, including the apparent dip of the fault and shear zones. The data can be interpreted to identify the dip of these structures for reliable drilling. Data are also used to identify conductive ground which might correspond to sulphide or clay rich concentrations. A third application is to map overburden in preparation for drilling and further sampling. All of these features have electrical contrasts with surrounding rocks, tending to be more electrically conductive or resistive and are reasonable targets.

The depth of investigation is controlled by the electrical “Skin-Depth” of the local geology. It varies from shallow to in some cases >100m depending upon the overall background resistivity of the subsurface. Typically, 20-75 meters can be expected. Conductive overburden suppresses signals, and depth penetration may be severely limited at times. VLF works best where rocks are resistive and overburden is minimal or is highly resistive.

The data include in-phase and out-of-phase signals as a percentage of the total field, horizontal component (x), horizontal component (y), and field strength in pT. The electrical conductivity of rocks can be modelled by the inversion of VLF data.

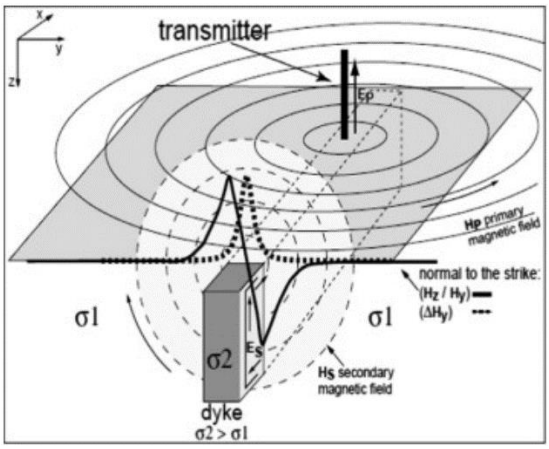

Figure 2: EM field distribution for the VLF method in E-polarization with theoretical signals over a vertical conductive dike (after Bosch and Müller, 2001).

4.2 Magnetic surveys

Magnetic is the most commonly used geophysical method for gold, diamond, platinum group metals and base metal exploration. Measurements of the magnetic field contain information about subsurface variations in magnetic susceptibility. Data can be acquired in the air (planes, satellites), on the ground (stationary, moving platforms, marine) and underground (boreholes, tunnels). The measurements record the sum of Earth's field and fields induced in magnetic materials. More magnetic (i.e. susceptible) materials have stronger induced fields. Removing Earth's field from the observations yields anomalous fields that can be interpreted in terms of where magnetic material lies and also its susceptibility and shape. Processed data are presented as maps or profiles, and advanced processing, involving inversion, yields parametric structures or 3D models of the subsurface susceptibility distribution.

Magnetic surveying is extremely versatile and can be applied in many areas in the geosciences including geologic mapping and mineral exploration. In gold exploration, magnetics helps in direct detection of associated mineralization and for mapping large- and local-scale structure (faults, dikes, and shear zones).

To a first approximation, Earth's magnetic field resembles a large dipolar source with a negative pole in the northern hemisphere and a positive pole in the southern hemisphere. The dipole is offset from the center of the earth and also tilted. The north magnetic pole at the surface of the earth is approximately at Melville Island.

The field at any location on the Earth is generally described in terms described of magnitude $|B|$, declination D and inclination I as illustrated in Figure 3.

When the magnetic source field is applied to earth materials it causes the material to become magnetized. Magnetization is dipole moment per unit volume. This is a vector quantity because a dipole has a strength and a direction. Because Earth's field is different at different locations on the earth, then the same object gets magnetized differently depending on where it is situated. As a consequence, magnetic data from a steel drum buried at the north pole will be very different from that from a drum buried at the equator.

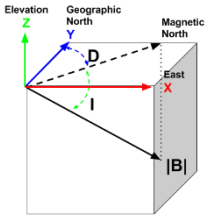

Figure 3: Earth's magnetic field, declination (D) and inclination angles (2018, GeoSci Developers).

5.0 Results and recommendations

The data are processed for magnetic diurnal correction and the Fraser filter are applied on in-phase and quadrature components of VLF data. The data can be processed in advanced levels using inversion modelling techniques recently developed for the 2D inversion of VLF data. The EMTOMO-VLF2Dmf which is a software program for the 2D inversion of VLF-EM data based on the finite element (FE) method. This will ensure that geological models respect a consistent structural, stratigraphic, and topological framework in addition to ensuring consistency between different geophysical models.

The combination of geophysical models and geological and drilling information allows some general correlations to be made. The interpretations of VLF results can better identify lithological and structures features, as well as, the fracture zones.

6.0 Deliverables

Summary report in .pdf format

Database in Geosoft .dbf and .xyz formats

Fraser filter Grids in Geosoft and Tiff format

Magnetic Grids in Geosoft and Tiff format

Location Maps in .pdf and .jpg formats

Survey lines in Arcview shapefile format