GEOPHYSICAL REPORT ON A MAGNETIC AND VLF-EM SURVEY

PICKLE LAKE PROPERTY – A BLOCK

CONNELL TOWNSHIP
PATRICIA MINING DISTRICT, ONTARIO

LATITUDE: 51°30.7'N LONGITUDE: 90°05.3'W
UTM: 702,000E 5,710,700N Zone 15 NAD83
NTS: 52O/8NE

by

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for

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DATE OF WORK: 18 September – 1 October 2004

DATE OF REPORT: 4 November 2004
INTRODUCTION

During the period 18 September to 1 October 2004, Discovery Geophysics Inc. carried out a magnetic and VLF-EM survey on the Pickle Lake property, in the Patricia mining district, Ontario for King's Bay Gold Corp. The Pickle Lake property consists of four claim blocks immediately east and northeast of the town of Pickle Lake and comprises a total of approximately 49 patented and unpatented claims (314 units) covering an area of about 5162 hectares. The magnetic and VLF-EM survey was carried out over two separate blocks of claims, referred to as North C Block and A Block, located about 10 km northeast of Pickle Lake.

This report covers only that portion of the magnetic and VLF-EM survey over the A Block. The A Block consists of 4 unpatented claims (23 units), however the present survey covered only two of the claims: 1244691 and 1244692. The survey was carried out to help map the geologic formations and structures on the property by way of their magnetic and electrical conductor signatures. The survey was also intended to locate conductors that might be caused by zones of gold and/or base metal sulphide mineralization.

The survey was carried out by Tim Kulchyski (manager of central Canada operations of Discovery). The survey grid was established by King's Bay a few days prior to the commencement of the survey. UTM locations of the ends of survey lines and at stations along the baselines were recorded by Discovery during the course of the survey using a hand-held GPS receiver, so that the grid, which was somewhat irregular, could be plotted accurately on the final data maps.

The survey was carried out using an EDA Instruments Inc. (now merged with Scintrex Ltd) Omni Plus magnetometer / VLF-EM system and an Omni IV base station magnetometer. A total of 21.8 km of magnetic and VLF-EM coverage was surveyed on 27 lines and two baselines over a period of 3 days. VLF-EM data were recorded from two separate transmitters: Cutler, Maine (24.0 kHz) and La Moure, North Dakota (25.2 kHz). Data were obtained from these two separate transmitters over the entire survey grid.

This report is a technical description of the surveys, and the data processing and interpretation procedures, followed by a discussion of the results and their implications for the continued mineral exploration program on the property. The total magnetic intensity data are presented on a 1:2,500
scale, topographic base map showing the profiles, contours and colour gridding. VLF-EM data are shown as stacked profiles of the total field, in-phase and quadrature components on 1:2,500 scale topographic base maps. There is a separate map for each VLF transmitter. Interpretations of VLF-EM conductors are made on each VLF profile map, and are then combined onto the magnetic map.

PROPERTY LOCATION, ACCESS, DESCRIPTION AND PHYSIOGRAPHY

The Pickle Lake property is located immediately east and northeast of the town of Pickle Lake in the northwest region of Ontario (Figure 1). The geographical centre of the surveyed grid on the property is 51°30.7'N and 90°05.3'W (UTM NAD83: 702,000E, 5,710,700N, Zone 15) in the northeast corner of NTS map sheet 52O/8. Pickle Lake is a small northern town located at the end of Highway 599. Highway 599 leaves the Trans-Canadian Highway (Highway 17) at Ignace Ontario, about halfway between Thunder Bay and Dryden, and runs about 290 kilometres north to Pickle Lake. Pickle Lake is a small mining town built around the long defunct Central Patricia Mine and more recently the Crow Mine. This town has good accommodations and services, including motels, service stations and a department store.

The survey area is located about 3 kilometres northeast of the Central Patricia and 1.5 km north of the old Crow Mine. Existing trails north from the Crow Mine are impassable during summer months even to ATV, so the survey grid was accessed by boat via the Kawinagans (Crow) River. The boat was launched from the bridge over the river just north of Central Patricia (see Figure 2). Travel time to the grid was about 20 minutes. The river follows the north side of the survey grid, making access to the entire grid relatively straightforward.

The Pickle Lake property of King’s Bay Gold Corp. consists of a large grouping of patented (surface rights only) and unpatented mining claims east and northeast of Pickle Lake. The present magnetic and VLF-EM survey was carried out over a portion of the A Block of four unpatented claims, covering an area of approximately 337 hectares as shown in Figure 2 and listed in Table 1. The survey was confined to primarily two claims (1244691 and 1244692), but also overlapped onto surrounding ground.
Figure 1 Location Map
Pickle Lake Properties
King’s Bay Gold Corp.
Figure 2 Property Map
Pickle Lake Properties
King's Bay Gold Corp.
Table 1: Pickle Lake Property – A Block

<table>
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<th>Unit Size</th>
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<td>2003-Apr-04</td>
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<td>2</td>
</tr>
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<td>2004-Nov-08</td>
<td>12</td>
</tr>
<tr>
<td>PA 1244692</td>
<td>2002-Nov-08</td>
<td>2004-Nov-08</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td></td>
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</tr>
</tbody>
</table>

The topography of the region is typical of the Canadian Shield: creeks and swamps in low-lying areas, glacial deposits and occasional rocky outcrops forming higher ground, although no outcrop was noted in the survey area. The boreal forest cover is dominantly black spruce in low areas, and jack pine and popular occurring sporadically in higher ground. Kawinagans River extends across the entire north side of the survey area. Almost the entire survey grid area is composed of black spruce and alder swamp, except for a little higher ground in the southeast corner of the grid.

SURVEY METHODOLOGY

Magnetics

The primary objective of magnetic surveying in mineral exploration is the identification and characterization of spatial changes in the magnetic earth’s field. The spatial variations or anomalies of interest are those that span from a few metres to several thousands of metres. They are typically caused by anomalous variation in the distribution of magnetic minerals in the earth or by buried iron objects or cultural features. The anomalies caused by geologic sources are primarily related to the presence of the most common magnetic mineral: magnetite and related minerals, (e.g. ulvospinel, titanomagnetite, maghemite, etc.), which can be collectively referred to as magnetite - a heavy, hard and resistant mineral. The common rust coloured forms of iron oxide (e.g. hematite, limonite, etc.) are orders of magnitude less magnetic and are rarely the cause of magnetic anomalies. Other magnetic minerals that occur to a lesser extent are pyrrhotite (important in some sulphide deposits), and ilmenite (important in some placer deposits). Most rocks contain magnetite from very small
fractions of a percent up to several percent, and even several tens of percent in the case of magnetite iron ore deposits. It is the distribution of magnetite, and certain characteristics of its magnetic properties, that form the basis of the magnetic method. Buried iron objects and cultural features are also detected during magnetic surveying due to magnetic materials common to most man-made structures (i.e. steel), or due to magnetic fields associated with electrical current in power lines, transformers or other radiating sources.

Anomalies of the earth's magnetic field are caused by two different kinds of magnetism: remnant and induced magnetization. Remnant or permanent magnetization (the former ascribed to rocks, the latter to metals), can be the predominant magnetization (relative to the induced magnetization) in certain rock types. Remnant magnetization is related to the thermal, chemical or mechanical properties and history of a rock, and is independent of the field in which it is measured. Diabase dykes, iron formations, kimberlitic pipes and other geological formations with high concentrations of magnetite often have high values of remnant magnetization.

Induced magnetization refers to the magnetism acquired by a rock by virtue of its presence in an external magnetizing field: i.e. the earth's field. The intensity of induced magnetization is directly proportional to the strength of the ambient field and to the ability of the material to acquire a magnetic field - a property called magnetic susceptibility. The direction of the induced magnetism in a rock is the same as that of the earth's ambient field. The local variation in magnetic field strength observed by a magnetic survey is due to variation in the susceptibility of the underlying rock, which is mostly due, in turn, to variation in the concentration and habit of magnetic minerals - primarily magnetite. Typically, mafic and ultramafic igneous rocks have higher susceptibilities than felsic igneous rocks, which have higher susceptibilities than sedimentary rocks.

**VLF-EM**

Very Low Frequency (VLF) radio transmitters, which provide continuous navigational and communication signals for submarines, are found in various locations around the world. The powerful transmitters radiate electromagnetic (EM) waves in the VLF frequency band (i.e. 15-30 kHz) from arrays of vertical antennas and ground mats. The EM waves propagate radially outward
from the antenna array and are detectable for thousands of kilometres. The propagating VLF-EM field travels as a guided wave between the ionosphere and the ground. The planar EM waves propagate horizontally between these two surfaces with the magnetic component of the EM field being horizontal and oriented perpendicular to the direction to the transmitter station.

If the VLF-EM field is distorted by an electrically conductive structure in the ground, then the field will have an orientation and strength in the vicinity of that structure which is different from the normal field at that location. The distortion is caused by EM induction of eddy currents in the earth and their resultant radiation of secondary EM fields, which sum vectorally with the primary field. The result is a secondary or anomalous EM field that is slightly out of phase with the primary field (normally resolved into an in-phase component and a 90° out of phase or “quadrature” component), and also has a vertical as well as horizontal magnetic component. The magnitude of the summed total field directly over the conductor will also be greater than the ambient primary VLF-EM field.

The strength of the secondary or anomalous VLF-EM field due to a planer conductor is a function of both conductivity of the conductor relative to the host rock, and the inductive coupling angle between the conductor and the magnetic component of the primary VLF-EM field. EM induction is strongest for conductive structures that are oriented perpendicular to the magnetic component of the primary VLF-EM field. In fact, if a conductor is parallel to the primary field it may not be detectable at all, and is said to be “null-coupled”. Hence, conductors perpendicular to the direction to the VLF transmitter station will not be well resolved by a VLF-EM survey. As a general rule of thumb, coupling angles within 45° of perpendicular are sufficient to produce adequate secondary response to resolve the conductors. The anomalous VLF-EM response from conductors closer to being perpendicular to the primary field direction is enhanced relative to more poorly coupled conductors.

The VLF-EM technique possesses two characteristics that profoundly affect the type of anomalies produced: 1) a relatively high and limited range of operating frequencies (the VLF band is considered to be “very low frequency” for radio transmission, but it is considerably greater than the frequencies used in conventional EM prospecting: i.e. 100 to 10,000 Hz); and 2) a large spatially distributed primary field.
The high and limited frequency range has a number of associated properties:

- The fields are attenuated and phase shifted more than corresponding lower frequency fields.
- A wider range of conductivities will respond to produce anomalies.
- Highly conductive bodies will be at, or near, the inductive limit.
- Conductivity resolution is not possible due to the limited frequency range.

The large spatially distributed primary field has other associated properties:

- Responses from large-scale structures dominate over weaker responses from small-scale structures.
- Galvanic current flow or “current channelling” dominates over simple EM induction.

It should be noted that many of the properties listed above limit the ability to make quantitative interpretations from VLF-EM data and also lead to the generation of a great deal of anomalous response from overburden and topography (i.e. “geologic noise”). However, many geological targets, such as shear zones or disseminated sulphides, which are not good EM targets and cannot be easily detected with any other EM prospecting system, can be quite successfully located with the VLF-EM technique.

**SURVEY PROCEDURES**

**Magnetic/VLF-EM Survey**

The magnetic and VLF-EM survey was carried out simultaneously using an Omni Plus magnetometer/VLF system built by EDA Instruments Inc. (now merged with Scintrex Ltd.). An Omni IV base station magnetometer, set up to the about 40 m north of the main road into the Crow Mine on the Powder House grid at line 1200W at about station 350S (NAD83 UTM coordinates: 702530E, 5708350N) was used to record magnetic diurnal variations at 30 second intervals. VLF-EM data were recorded from two different VLF transmitter stations: Cutler, Maine (24.0 kHz); and La Moure, North Dakota (25.2 kHz).

The Omni Plus instrument contains several microprocessors and associated digital circuitry for measuring, processing and storing both magnetic and VLF-EM data. The instrument digitally records magnetic intensity readings from a proton precession sensor connected to the receiver console, along with the time from an internal quartz clock. Quartz clocks in the Omni Plus and
Omni IV base station magnetometer are synchronized at the start of each day's survey to the nearest second. Base station mode enables the Omni IV to store up to 10,000 sets of readings, which is the equivalent to approximately 55 hours of unattended monitoring at 10 second sampling interval. Through linear interpolation, diurnal corrections are automatically applied to data from the mobile field instruments during data transfer.

The Omni Plus system is capable of recording VLF signals at up to three different frequencies simultaneously with the total magnetic intensity data, thus greatly increasing the efficiency of the magnetic and VLF-EM survey. The ability to obtain data from as many as three VLF transmitter stations in different directions from the survey area allows for complete coverage of conductive structures regardless of their orientation. Three orthogonal sensor coils provide consistently repeatable, high quality, total field and vertical component (both in-phase and quadrature) data, through real-time digital signal processing, even for weak signals from remote transmitters. The operator monitors an error analysis feature built into the display and is able to make an on-the-spot decision whether or not to store the reading or repeat it. Data transfer is achieved by RS232C interface on the Omni to a computer, which writes the data to disk for storage and later processing. (See Appendix A – Instrument Specifications for additional details).

For maximum electromagnetic coupling, a transmitter station should be selected which is in the same direction as the geological strike or the dominant structural trend of the survey area. In the Pickle Lake area, all three VLF stations used in the survey provide roughly the same coupling direction (i.e. to within about 45° of each other): LaMoure - 50°, Seattle - 93°, Cutler - 105°. Hence, for conductors trending east/west to northeast/southwest (the dominant geologic trend in the survey area), the results from all three different transmitters will be about the same. The signal strength does vary because LaMoure is much closer to Pickle Lake than Seattle or Cutler. Therefore, the VLF-EM data from LaMoure displays stronger anomalous response than from Seattle or Cutler. The small differences in coupling angles between the three transmitters will also produce slight difference in their anomalous responses. However, in general, there is little difference in the anomalous responses from the three transmitters, so the results can be combined into a single, final set of interpreted conductors.
To insure consistently high quality magnetic data, the operators made every effort to remove all magnetic materials from their persons. However, certain magnetic items could not be removed, including steel shanks in work boots, and clips and zippers on rain gear. Therefore, in an effort to increase the repeatability of the survey data, tests were carried out at the beginning of each survey day to determine how much of an effect these items have on the recorded magnetic field strength. Successive readings were taken at one location without moving and the repeatability was found to be typically of order 1 to 2 nT, which is therefore the error of the final data set.

The magnetic and VLF-EM surveys on the Pickle Lake properties were carried out during the period 18 September to 1 October 2004, however the surveys on the A Block were carried out over a period of 3 days: 25 to 27 September 2004. Productivity during the entire period was hampered by exceptionally wet weather, and because the survey lines were being cut and chained immediately prior to the survey. In fact, a standby day had to be taken immediately prior to the survey on A Block due to the wet weather and because the line-cutters did not work that day. Grid lines were somewhat irregular, so the geophysics operator recorded UTM locations during the course of the magnetic and VLF-EM survey using a hand-held GPS receiver, thereby facilitating an accurate mapping of the grid and the data.

A total of 21.8 km of total field magnetics and two-station, 3-component (in-phase, quadrature, total field) VLF-EM data were collected on 27 lines and 2 baseline segments. Lines were spaced 100 m apart on the western half of the survey grid and 50 m apart on the eastern portion, however line spacing and line orientation fluctuated over the grid as displayed on the maps. Magnetic and VLF-EM data were collected at 12.5m station spacing on all lines. Details of the survey coverage are listed below in Table 2 and the survey line locations are shown in Figure 3.
Figure 3: Survey Map
Pickle Lake Project
King’s Bay Gold Corp.

UTM Zone 15 NAD83

Scale 1:10,000

Magnetic Survey Coverage
Table 2: Pickle Lake – A Block Magnetic/VLF-EM Survey Coverage

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<thead>
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Total 21.8 km
DATA PROCESSING AND PRESENTATION

Magnetics

Data processing begins with the reformatting of the EDA data-dump files from each day's survey into standard XYZ data format (i.e. line #, station #, data...). Diurnal corrections are made automatically during the dumping procedure by combining each day's base station data with the data from the mobile field instruments. The exact time of each reading on the mobile instrument is correlated with an interpolated base station reading, and then adding or subtracting from a common base station datum. The diurnal corrected magnetic data from each day are then concatenated into a single survey data file and transferred to digital storage for subsequent processing. The magnetic data are copied onto a computer diskette in Appendix C at the back of this report.

The final processed magnetic data are shown as a combined line profile, contour and colour image plot of the total magnetic intensity on a corrected grid/topographic base map of the survey area at 1:2,500 scale (Appendix C - Map 1). The profile amplitude scales and base levels are indicated on the plot. The magnetic data were gridded using a trend-biased gridding routine by defining a rectangular, 10 x 20 m grid cell size with the long dimension rotated to the average trend direction of 045° azimuth. This appears to be the dominant alignment of the linear magnetic anomalies in the survey area, and is presumably the orientation of the regional structural trend. Trend biasing produces a much cleaner looking magnetic map because magnetic highs and lows connect more smoothly from one line to the next. The grid is contoured and coloured using equal-area colour zoning (i.e. equal amounts of red, yellow, green and blue).

VLF-EM

The VLF-EM data were band-pass filtered to remove long wavelength signal strength variation and short wavelength random noise. VLF-EM anomalies due to geologic conductors typically have wavelengths of order 30 to 500 metres. Therefore, a time-domain convolution operator (i.e. a linear filter), given by Kanasewich (1981, pp 274-277), was applied to each component along every survey line to remove signals with wavelength less than 30 m or greater than 500 m. This operator is equivalent to a zero-phase, band-pass Butterworth filter with more than 48 db/octave attenuation.
roll-off. The filtered VLF-EM data are copied onto a computer diskette at the back of this report.

The VLF-EM data from the three different transmitter stations are depicted as a line profile plots on three separate topographic base maps at 1:2,500 scale in Appendix C (Map 2a - La Moure, Map 2b - Cutler, Map 2c - Seattle). Three separate profiles are shown on the plots: total field strength in red, in-phase amplitude of the vertical component in green, and quadrature phase amplitude of the vertical component in blue, each expressed in percent of the primary field amplitude. The profile amplitude scales are listed on the maps. Interpreted conductors from each data set are also shown on the plots. Finally, all of the interpreted conductors from all three transmitter stations are combined together and shown on the magnetic map.

INTERPRETATION PROCEDURES

Magnetics

Areas of anomalous magnetic intensity, displaying both positive and negative anomalies relative to the ambient field strength, are composed of geologic formations with above average magnetite content (e.g. ultramafics, iron formations, etc.). Strong negative anomalies may be caused by reversely polarized or rotated magnetic formations with strong remnant magnetization. Alternatively, large negative anomalies can be associated with positive anomalies due to the dipolar characteristics of anomalous magnetic fields. Narrow, high-amplitude anomalies are due to magnetic features very close to surface - broad magnetic anomalies indicate deeper burial or more uniform magnetization. Areas of lower magnetic intensity than the ambient field, characterized by broad, low-amplitude, negative total intensity anomalies, could be related to hydrothermal alteration of magnetite to hematite. Geologic contacts or possible faulting can also be inferred from the magnetic colour image along pronounced linear gradients and other discontinuities.

VLF-EM

The VLF-EM data are interpreted using primarily the stacked profiles. Conductors are located at total field maxima, and in-phase and quadrature cross-overs or inflections. Broad, large amplitude
responses are usually identified as possible overburden effects, especially if they are coincident with topographic features such as creek valleys, swamps and ponds. Very weak anomalies, close to the noise level of the data, are also identified as possible conductors, although in many cases they are probably caused by bedrock structures. Definite and probable bedrock conductors have definitive total field maxima with coincident in-phase inflection. Small quadrature response can imply a stronger conductor, but this also depends on overburden effects.

The VLF-EM data are interpreted by identifying anomalous responses from the line profiles (i.e. total field maxima, and in-phase and quadrature inflections), resolving the position of conductors on each survey line from these anomalies, and linking these conductor locations between lines based on the form of the anomalies. The most subjective part of this procedure is the line to line correlation of anomalies and the formation of conductor axes of specific orientation. Differences in the character of the anomalous responses, such as their amplitude and wavelength, or the relative amplitude of the quadrature and in-phase components, can be used to help correlate conductors between lines. However, there may be instances where alternative interpretations are possible or even likely.

Linear zones of deep weathering and thick conductive overburden will produce VLF-EM anomalies that resemble anomalies from bedrock conductors. They can sometimes be differentiated because the quadrature component from conductive overburden is commonly large and congruent with the in-phase component, whereas the quadrature component from a bedrock conductor is often weak and sometimes (in the case of a strong conductor beneath conductive cover) reversed with respect to the in-phase component. Topographic ridges will also produce VLF-EM anomalies that resemble the response from bedrock conductors. They can be differentiated by comparing the VLF-EM response to detailed elevation contours: the amplitude and width of the total field profile will tend to mirror the height and width of the ridge.
DISCUSSION OF RESULTS

Magnetics

The magnetic survey results from A Block of the Pickle Lake property display a variety of anomalous magnetic responses: linear magnetic highs; isolated high-amplitude anomalies; broad anomalous zones; and irregular, high-amplitude magnetic areas. Most of the high-amplitude magnetic anomalies have very smooth profiles, which indicates that the causative bodies are buried by non-magnetic material – likely deep overburden (i.e. >30 m). The exception is the area of magnetic highs in the southeast corner of the grid where the anomalous response profiles are much more irregular and hence indicative of near-surface features. Coincidentally, this is the only portion of the survey grid that rises up to higher ground from the low-lying swamplike areas that cover the rest of the grid.

The high magnetic anomalies could be caused by a variety of sources. Linear magnetic highs across the centre of the survey grid are likely due to formational structures such as mafic/ultramafic volcanics or iron formations. Intense, isolated magnetic highs: such as at 250N on line 1200E; at 600N on line 1700E; and in the southwest corner of the grid at 125S on line 00E, may also be caused by isolated sections of these formations, perhaps folded or faulted into discrete magnetic bodies, or they may be caused by isolated mafic/ultramafic intrusives. Broader magnetic highs, observed in the east-central and northern portions of the survey grid, are possibly due to broader intrusive zones; but could also be simply due to more deeply buried magnetic formations.

VLF-EM

The VLF-EM survey detected two, long and continuous formational conductors in the east-central portion of survey the grid, and a variety of other weaker conductors at various other locations around the grid. The two major conductors produce the dominant VLF-EM anomalies in the survey data. These anomalies have relatively broad and smooth profiles that could be mistaken for overburden response, similar to other anomalies to the south, but they are interpreted as being due to bedrock conductors because of their high amplitude and because the magnetic anomalies also display broad, smooth anomalous response.
Other VLF-EM anomalies in the western half of the survey grid are also interpreted as being due to bedrock conductors, however they are not as continuous nor as intense, and hence are probably not caused major formational conductors like the two east-central conductors, although they may be associated with formational conductive zones. Some VLF-EM conductors, such as in the southeast corner of the survey grid, are likely caused by fault structures. Fault and shear structures may also be the cause of some of the weaker bedrock conductors interpreted in the western half of the survey grid.

CONCLUSION AND RECOMMENDATIONS

The magnetic and VLF-EM survey over the A Block of the Pickle Lake property of King's Bay Gold Corp. detected a variety of anomalous magnetic and conductive formations and isolated structures and bodies. The most significant of these are the two, long and continuous formational conductors in the east-central portion of the survey grid. These conductors are likely due to sedimentary/volcanic stratigraphic formations such as graphitic argillites or iron formations. It is interesting that the southern-most of the two major conductors flanks the magnetic highs in this area, whereas the more northern formational conductor is partially coincident with the magnetic highs. This suggests that the former is due to graphitic sediments while the latter may be caused by iron formation. However, an extra complication is the fact that, from the magnetic response, it appears that the iron formation is not continuous and there may actually be intrusive bodies in this area as well.

The VLF interpreted bedrock conductors in the western half of the survey grid generally flank magnetic highs or are located in magnetic neutral areas. Hence, these conductors are more likely due to graphitic argillites, or are caused by fault or shear structures that are sub-parallel to the stratigraphic trend in the region. The VLF-EM conductors in the southeast corner of the survey grid appear, from their magnetic correlation, to be due to fault structures, as do the irregular conductors in the central area of the grid immediately south of the major conductors. However, these conductors are very close to very intense magnetic highs and hence may warrant higher priority for follow-up work.
VLF-EM conductors that are coincident with magnetic highs should receive highest priority for follow-up investigation. The northern-most of the two major formational conductors in the east central portion of the survey grid should be investigated first. It appears that this area has received at least two previous drill holes, however from the limited resolution available to the author, they appear to have been too far north and too far east of the main target zones. New drill holes are recommended at 600N on line 1700E and at 425N near lines 1300E and 1350E, where the conductor/magnetic correlation is best. Additional holes could be drilled along this conductive formation depending of the results from the first two holes.

Secondary drill targets on the A Block are any of the interpreted bedrock conductors, formational or structure, flanking or close to magnetic highs, particularly the more intense magnetic highs such as at 250N on line 1200E, and from 200N to 325N on lines 200E and 300E. The conductors the extend from 425N on line 700E to 625N on line 1100E, and the southern-most major formational conductor in the east-central portion of the survey grid, are also of interest due to their proximity and possible flanking relationship to magnetic formations. VLF-EM conductors of low priority are those occurring in magnetic neutral areas (e.g. southwest area of the grid) and those that have been interpreted as possibly caused by overburden effects.

Respectfully submitted,

[Signature]

Dennis V. Woods, Ph.D., P.Eng.
Consulting Geophysicist

REFERENCES:

CERTIFICATE OF QUALIFICATIONS:

Dennis V. Woods

I, Dennis V. Woods of the municipality of Surrey, in the province of British Columbia, hereby certify as follows:

1. I am a Consulting Geophysicist with an office at 14342 Greencrest Drive, Surrey, B.C., V4P 1M1.

2. I hold the following university degrees: Bachelor of Science, Applied Geology, Queen's University, 1973; Master of Science, Applied Geophysics, Queen's University, 1975; Doctor of Philosophy, Geophysics, Australian National University, 1979.

3. I am a registered professional engineer with The Association of Professional Engineers and Geoscientists of the Province of British Columbia (registration number 15,745), and of the Province of Newfoundland (registration number 03551).


5. I have practised my profession as a field geologist (1971-1975), a research geoscientist (1974-1986), and a geophysical consultant (1979 to the present).

6. I have no direct interest in King's Bay Gold Corp. or the above described properties and projects, which are the subject of this report, nor do I intend to have any direct interest.

Dated at Surrey, in the Province of British Columbia, this 4th day of November, 2004.

Dennis V. Woods, Ph.D., P.Eng.
Consulting Geophysicist

Discovery Geophysics Inc.
APPENDIX A

Instrument Specifications
OMNI-PLUS MAGNETOMETER/VLF SPECIFICATIONS

Physical Dimensions

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight (kg)</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrument console only</td>
<td>3.8</td>
<td>122 x 246 x 210</td>
</tr>
<tr>
<td>Battery belt</td>
<td>1.8</td>
<td>540 x 100 x 40</td>
</tr>
<tr>
<td>Battery cartridge</td>
<td>1.8</td>
<td>138 x 95 x 75</td>
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</table>

Sensors

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Weight (kg)</th>
<th>Dimensions</th>
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<tbody>
<tr>
<td>Magnetometer remote sensor</td>
<td>1.2</td>
<td>56 dia x 220</td>
</tr>
<tr>
<td>Magnetometer gradient sensor</td>
<td>2.1</td>
<td>56 dia x 790</td>
</tr>
<tr>
<td>VLF sensor module</td>
<td>2.6</td>
<td>280 x 190 x 60</td>
</tr>
</tbody>
</table>

Environment

Electronics
- Operating temperature range: -40°C to +55°C
- Relative humidity: 0% to 100% (weather-proof)

Magnetometer Sensors
- Temperature range: -45°C to +55°C
- Relative humidity: 0% to 100% (weather-proof)

VLF Sensor
- Temperature range: -45°C to +55°C
- Relative humidity: 0% to 100% (weather-proof)

Standard Memory Capacity

<table>
<thead>
<tr>
<th>Memory Type</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field unit</td>
<td>1300 sets</td>
</tr>
<tr>
<td>Tie-line points</td>
<td>100 sets</td>
</tr>
<tr>
<td>Base stations</td>
<td>5500 sets</td>
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</tbody>
</table>

Electronics

RS-232C serial I/O
- 300 to 9600 baud (programmable); 8 data bits, 2 stop bits; no parity

Electronics console
- Enclosure contains electronics and battery pack (if not contained in separate belt). Front panel includes liquid crystal display (LCD), and keypad.

Power Supply
- Internal battery pack or external battery belt; or 12V car battery (base station).
The OMNI-PLUS is a portable, microprocessor-based magnetometer/VLF system which is capable of measuring changes or contrast detected by two different types of geophysical methods: Magnetic and Electromagnetic (VLF). A measurement from both these methods can be read and stored in only 8 seconds. The data is both sensitive and highly repeatable.

The OMNI-PLUS is a multi-purpose instrument designed to operate in four different magnetometer modes, where VLF measurements are systematically performed:

a. Tie-line magnetometer/VLF (3).
b. Total field magnetometer/VLF (3).
c. Recording base station magnetometer/VLF (4).
d. Gradiometer/VLF (5).

The primary purpose of the system is to:

* measure and store the magnitude of the earth's magnetic field independent of it's direction.

* measure and record the secondary field components of the primary field from up to three VLF transmitting stations.

Measurements are obtained by the use of two sensors; a proton precession sensor carried on a pole to measure the magnetometer total field magnitude and; a three-component sensor worn on the back to measure the magnetic component of the VLF secondary field. In addition, probes attached through the VLF housing are used to measure the electric component of the VLF secondary field. An electronics console is worn on the front of the operator that allows the operator to view and store the collected data in internally protected memory. The data stored is protected by a lithium battery which also powers a real-time clock.

Along with the magnetometer and VLF data, the OMNI-PLUS stores the following information:

- line number
- position number
- date and time
- direction of travel
- statistical error of the magnetometer readings
- signal strength and rate of decay of the magnetometer sensor
- signal strength and operator quality of the VLF sensor
- natural and cultural features
The data can be stored using three different types of storage modes:

- **Spot Record** - which assigns a record number to the readings.
- **Multi Record** - which assigns a line and position value to the reading using the value last stored in memory. This feature allows for multiple readings at one station.
- **Auto Record** - which assigns a line and position value automatically incremented from the last station using the station(position) spacing entered by the operator. This allows the operator to increment or decrement the position without pressing any of the line or position keys.

The standard OMNI-PLUS has the capability of storing up to 1300 readings consisting of a total field and vertical gradient magnetometer reading, three VLF frequencies and the associated information mentioned previously.

Also, for simplicity of operation, the record keys are used to initialize the system and to retrieve the data stored in memory. Any of the three memory keys may be used for these functions.

The OMNI-PLUS, as the OMNI IV, stores only the raw data for both the VLF and magnetometer measurements. Corrections for magnetometer diurnal variations and VLF primary field variations on each of the total field measurements are performed internally using either the tie-line (looping) method or a compatible base station unit. For correcting the magnetometer total field, a PPM-375, PPM-400, OMNI IV or OMNI-PLUS system may be used. However, for correcting the VLF total field, only a OMNI-PLUS can be used.

Further, the raw data is retained until the instrument is re-initialized even after corrected data has been computed.

Data stored in memory is completely protected by a lithium battery. This battery also powers the real time clock.

**Field Measurement Features**

The instrument outputs the data as it is recorded (ie. The direction the operator is walking). The station and line values are stored using +/- designations. However, the data may be later outputted using N,S,E or W signs (see Section 6).
COMPONENT DESCRIPTION

INSTRUMENT CONSOLE  The primary electronics, data acquisition circuit, microprocessor and memories are built into a rectangular, aluminum, weather-proof case with the instrument panel facing upwards. This console is supported in a dual shoulder-type harness and is carried on the chest.

Display  Operator modes, data and information is displayed on a custom-designed, ruggedized liquid crystal display (LCD) which operates in temperatures ranging from -40 C to +55 C. The display includes a six-numeric digit readout, decimal point, mode function readout, battery status monitor, signal decay rate, signal amplitude monitor, VLF signal strength monitors and parameter indicators. The internal heater is activated automatically at -25 C during the survey. The mode selector should be set to OFF overnight and when the unit is not being used to avoid power consumption from the heater at low temperatures.

Operator Keys  The operator keys are grouped into two keypads located on each side and below the LCD. The 12 keys on the left hand side are for programming the instrument. The 10 keys on the right hand side are for taking measurements and recording them, accessing the VLF magnetic and electric parameters and accessing the electronics notebook. The one key below the LCD is the mode selector, where the modes are viewed on the LCD. The key functions are described in Section 4.

SENSORS  The OMNI-PLUS system consists of two types of sensors; the magnetometer proton precession sensor and the VLF three-component sensor.

Magnetometer Sensor  The sensor consists of two helical coils of copper wire connected in series in a noise-cancelling mode with a least 50 dB attenuation of external noise. The coils are immersed in a hydrocarbon-rich liquid inside a lightweight, leakproof cylinder. The sensor cylinder is mounted inside a thin-wall fiberglass tube. the coils are positioned with their axes parallel to each other. The interconnections are carried through a cable, 3m long and terminated in a connector which interfaces with a connector on the rear of the OMNI-PLUS. This configuration is for a remote sensor to be used when the the system is being operated as a field, tie-line, looping or base station unit.
**Dual Gradient Magnetometer Sensor**  For the gradiometer application, two identical sensors are mounted vertically at the ends of a rigid fiberglass tube. In the standard configuration, the centers of the coils are spaced 0.5m apart. An optional configuration separates the coils by 1.0m. It should be noted that through a patented measuring process, the two coils are read simultaneously, thereby alleviating the need to correct the gradient readings for diurnal variations. The interconnections are the same as those for the remote magnetometer sensor. It should be noted that a gradient sensor may be used when the magnetometer portion of the OMNI-PLUS is configured as a field, tie-line, looping or base station unit.

**Sensor Poles**  The sensor pole consists of a magnetometer sensing head mounted on a pole. The pole consists of four 600mm sections which engage end to end so that the remote magnetometer sensor is approximately 2.5m above the ground. For base station applications, a rope joiner is supplied and is attached between the top section of pole and the magnetometer sensor. Rope is then joined to the four holes and is secured in the same fashion as a tent guy rope.

**VLF Sensor Module**  The VLF sensor module consists of three sections: the VLF sensor; the circuitry; the back-pack frame.

The VLF sensor consists of three orthogonal coils mounted in a cylindrical housing with a pre-amp signal circuitry. The coils consist of copper wire wound on a non-ferrous frame. These coils are mounted with two coils horizontal and one mounted vertically. The sensor housing is made of a ruggedized plastic material.

The VLF circuitry is housed in a ruggedized, rectangular, plastic housing and consists of three circuit boards. The circuit boards contain a microprocessor, CPU circuitry, a tilt correction meter and signal filtering circuitry. For the standard OMNI-PLUS configuration, the circuitry housing has one KPT type connector which allows for interfacing with the OMNI-PLUS console. For the optional VLF resistivity, additional KPT type connectors are installed for connecting with the resistivity probes.

Both the VLF sensor and circuitry housings are attached to a rigid polethelyne frame. To the back of the frame is permanently attached a neoprene foam padding that allows for comfortable field usage. The foam is closed celled a will not absorb water or persperation.
APPENDIX B

Data Plots and Maps
APPENDIX C

Digital Data on Diskette

2.28
# Work Report Summary

**Transaction No:** W0430.01734  
**Status:** APPROVED  
**Recording Date:** 2004-NOV-08  
**Approval Date:** 2004-NOV-17  
**Work Done from:** 2004-SEP-01  
**to:** 2004-SEP-26

**Client(s):** 392766  
**KING'S BAY GOLD CORPORATION**

**Survey Type(s):** LC, MAG, VLF

## Work Report Details:

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<th>Assign Approve</th>
<th>Reserve Approve</th>
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$14,163  $6,400  $0  $7,763

## External Credits:

- Reserve: $0
- Reserve of Work Report#: W0430.01734

$7,763  Total Remaining

Status of claim is based on information currently on record.
Dear Sir or Madam

Submission Number: 2.28728
Transaction Number(s): W0430.01734

Subject: Approval of Assessment Work

We have approved your Assessment Work Submission with the above noted Transaction Number(s). The attached Work Report Summary indicates the results of the approval.

At the discretion of the Ministry, the assessment work performed on the mining lands noted in this work report may be subject to inspection and/or investigation at any time.

Please note that any geophysical submission must include a geophysical map showing all station points, the values of readings taken and the units measured such as gammas, degrees, milliamps, milligals, milliseconds and ohmmeters, and dimensionless units such as per cent and ratios and show basic numerical data and filtered data if available. Although this submission was approved, all future submissions should include the basic numerical data at each station on a map.

If you have any question regarding this correspondence, please contact LUCILLE JEROME by email at lucille.jerome@ndm.gov.on.ca or by phone at (705) 670-5858.

Yours Sincerely,

Ron C. Gashinski
Senior Manager, Mining Lands Section

Cc: Resident Geologist
John Charles Archibald
(Agent)

King’s Bay Gold Corporation
(Claim Holder)

King’s Bay Gold Corporation
(Assessment Office)