

# NORTHSTAR GOLD CORP.

RESISTIVITY / INDUCED POLARIZATION SURVEY, IPOWER3D<sup>®</sup> CONFIGURATION & GROUND MAGNETIC INTERPRETATION

# MILLER GOLD PROJECT

CATHARINE & PACAUD TOWNSHIPS, ONTARIO, CANADA

LOGISTICS AND ADVANCED INTERPRETATION REPORT

14N001 APRIL 2014





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#### ABSTRACT

On behalf of Northstar Gold Corp., a **Resistivity / Induced Polarization** survey, using the IPower3D<sup>®</sup> configuration, was conducted on a portion of the **Miller Gold property,** located in the Temiskaming District, of Northeastern Ontario. Ground magnetic data supplied by the client is also included in this report.

During the period of **February 2 to February 11, 2014,** a total of **11.325 km** of Time Domain Resistivity / Induced Polarization surveying was completed using the IPower3D<sup>®</sup> configuration. Survey specifications, instrumentation controls, data acquisition, processing and interpretation were successfully completed within the Abitibi Geophysics quality system framework.

The objectives of this survey were to gain a better understanding of the complex geology of this property, including sub horizontal mineralized veins, faults and porphyry systems.

The IPower3D<sup>®</sup> survey, inversion and ground magnetic survey have identified zones of known mineralization and indicate geometry of the various structures observed on this property.

A follow-up program including prospecting, drilling and a survey extension has been proposed. The recommendations are presented in section 7 of this report.



# 1. THE MANDATE

GEOPHYSICAL OBJECTIVES

| Miller Gold Project<br>(Our reference: 14N001)  |
|---|
| 18 km Southeast of Kirkland Lake, Ontario   |
| Northstar Gold Corp.<br>17 Wellington St. N<br>P.O. Box 2529<br>New Liskeard, ON P0J 1P0<br>Telephone: (705) 676-6476 |
| Mr. George Pollock, P.Geo.<br>President<br>gpollock73@gmail.com   |
| Time Domain Resistivity / Induced Polarization, IPower3D $^{\otimes}$ configuration                                   |
|   |

- To identify new zones amenable to gold mineralization and further define known mineralized areas.
- Identify targets for further exploration.

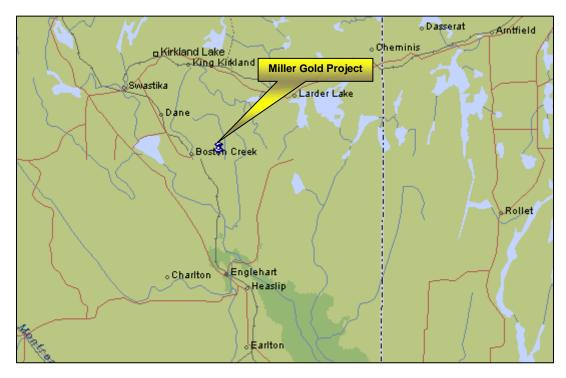


Figure 1. General location of the Miller Gold Project



# 2. THE MILLER GOLD PROJECT

| LOCATION                           | Temiskaming District, Northeastern Ontario, Canada<br>Centred on 48.009015°N and 79.888453°W,<br>UTM NAD83, zone 17N: 582 900 mE, 5 318 000 mN<br>NTS sheet: <b>32D/04</b>  |
|------------------------------------|---|
| NEAREST SETTLEMENT                 | Kirkland Lake: 18 km to the Northwest   |
| Access                             | The Miller Gold property was accessed by the crew daily from<br>the town of Kirkland Lake by taking highway 66 West for 5.5 km,<br>then proceeding south on 112 S for 15.1 km and finally turning<br>east onto 564 for the remaining 5.9 km to the southern end of the<br>grid, from there the grid was accessed by snowmobile.   |
| Geomorphology                      | Topography on the grid ranged from 300 m to 320 m above sea<br>level. A number of creeks and swampy areas are located within<br>the grid. Vegetation consists of spruce, fir, birch and alder. Cover<br>thickness is variable, with outcrop, including mineralized zones<br>noted on the property.  |
| CULTURAL FEATURES                  | Cultural features included 5 old mine shafts and numerous historic drill holes These do not appear to have had a significant impact on the data quality.  |
| MINING LAND TENURE                 | The 2014 IPower3D <sup>®</sup> IP survey was conducted on 13 claims of the Miller property. All claims were 100% in the name of Northstar Gold Corp. The claim numbers encompassed in the present survey are illustrated on page 4.   |
| Survey grid                        | This grid on the Miller property was comprised of two parts. The west grid consisted of 8 lines, 24+00E, 25+00E, 26+00E, 26+50E, 27+00E, 27+50E, 28+00E and 28+80E. These lines extend from 74+00N to 84+00N. The east grid comprises 5 lines, at 100 m intervals from 29+00E to 33+00E The lines extend from 77+30N to 81+80N. The grid was picketed at 25 m intervals, but the IPower3D <sup>®</sup> survey was conducted with 37.5 m electrode spacing. Additional stations were added to accommodate the complete array. In total 11.325 line km were surveyed with IPower3D <sup>®</sup> . |
| ENVIRONMENTAL HEALTH<br>AND SAFETY | As part of the Abitibi Geophysics EHS program crew members<br>received first aid training and are provided with safety equipment<br>and specialized training for the induced polarization technique. In<br>addition, the crew was provided with a satellite telephone for<br>emergency communication.   |
| COORDINATE SYSTEM                  | Projection: Universal Traverse Mercator, zone: 17N<br>Datum: NAD83  |

| NODTHOTAD | COLD |       |
|-----------|------|-------|
| NORTHSTAR | GULD | CORP. |
|           |      |       |

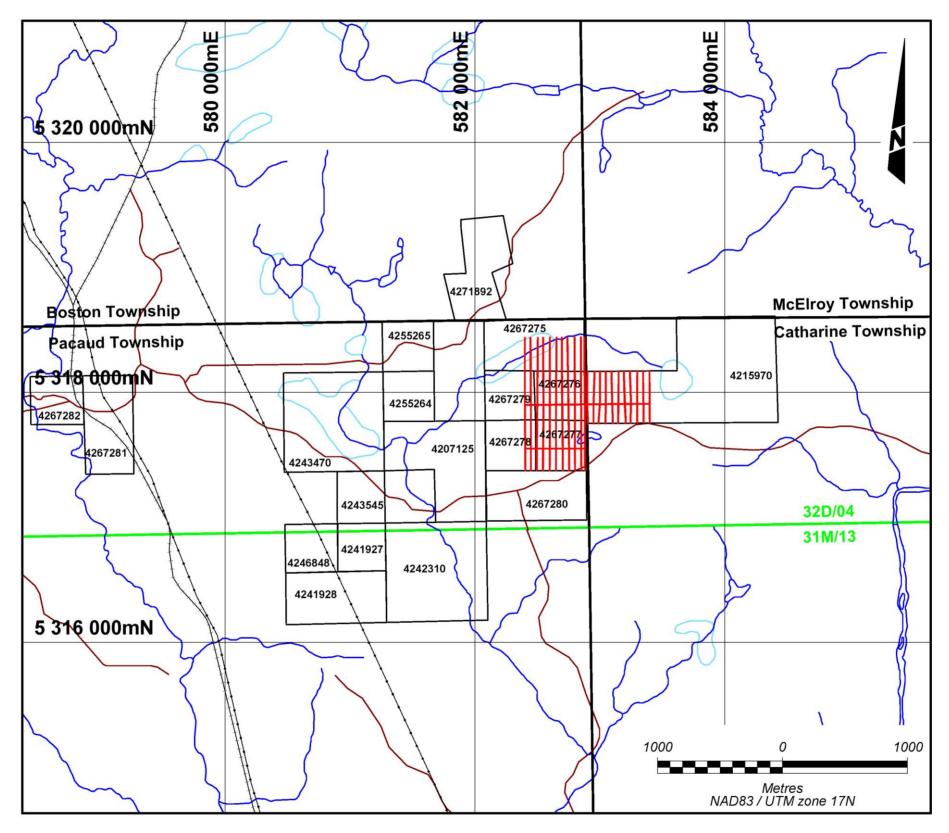


Figure 2. Index of claims covering the Miller Gold Project







# 3. IPOWER RESISTIVITY / INDUCED POLARIZATION SURVEY

| TYPE OF SURVEY      | Time Domain Resistivity / Induced Polarization  |
|---------------------|---|
|                     | IPower3D <sup>®</sup> (5 simultaneous lines)  |
| Dersonnel           | Christian Larochelle,<br>Simon Rioux,,Crew Chief<br>OperatorMichaël Picard-Rousson,<br>AssistantAssistantSamuel Charette,<br>Kevin Lussier,AssistantBruno Tremblay,<br>Carole Picard, Tech.,<br>Thomas Loader, P.Geo.,<br>Chris Brown, P.Eng.,Production of maps<br>Interpretation ReportChris Brown, P.Eng.,Final verification of product conformity |
| SURVEY COVERAGE     | 11.325 km   |
| DATA ACQUISITION    | February 2 to February 11, 2014   |
| <b>TRANSMITTERS</b> | GDD Instruments TxII, s/n 296 & 318Generator:Honda 2000 VAMaximum output:1.8 kW at 10 A at 2 400 VElectrodes:memory-shape alloy rodsResolution:1 mA on output current displayWaveform:Bipolar square wave with 50% duty cyclePulse Duration:1 second+1  |

Figure 3. Signal transmitted across electrodes C1-C2



#### □ RECEIVERS

#### IRIS Elrec-PRO, (10 input channels), s/n 123 & 269 IRIS Switch-PRO 240, s/n 64 Electrodes: Memory-shape alloy rods V<sub>p</sub> Primary voltage measurement:

Input impedance: 100 MΩ

- Resolution: 1 μV
- Typical accuracy: **0.2%**

**M**<sub>A</sub> Apparent chargeability measurement:

- Resolution: 0.01 mV/V
- Typical accuracy: **0.4%**
- Semi-log sampling mode, 20 time windows (M<sub>1</sub> to M<sub>20</sub>).

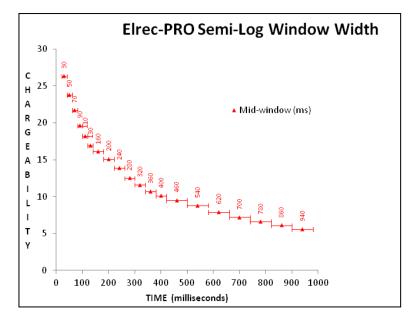


Figure 4. Semi-log windows (1 s pulse)

- All gates are normalized with respect to a standard decay curve for field quality assurance.
- Final chargeability values were normalized to the 2 second pulse Newmont standard.
- APPARENT RESISTIVITY
   CALCULATION

$$\rho_{a} = 2\pi \cdot \frac{V_{p}}{I} \cdot \frac{1}{\left(\frac{1}{C_{1}P_{1}} - \frac{1}{C_{2}P_{1}}\right) - \left(\frac{1}{C_{1}P_{2}} - \frac{1}{C_{2}P_{2}}\right)} \qquad (\Omega \cdot m)$$

Cumulative error: 5% max, mainly due to chaining accuracy.



# QUALITY CONTROL (RECORDS AVAILABLE UPON REQUEST)

#### Before the survey:

- ✓ Transmitters & motor generators were checked for maximum output using calibrated loads.
- ✓ Receivers were checked using the Abitibi Geophysics SIMP™ certified and calibrated V<sub>P</sub> & M<sub>a</sub> signal simulator.

#### During data acquisition:

- ✓ Rx & Tx cable insulation was verified every morning.
- ✓ Proprietary Software ProsysControl<sup>™</sup> allowed a daily thorough monitoring of data quality and survey efficiency.
- ✓ Sufficient pulses were stacked: 8 pulses for every reading.

#### At the Base of Operations:

- ✓ Field quality assurance inspected & validated.
- ✓ Each IP decay curve was analyzed with *ProsysControl*<sup>™</sup>. The few gates that were rejected were not included in the calculation of the plotted M<sub>a</sub>.

#### **QUALITY STATISTICS**

#### Table 1. Quality statistics - IPower3D<sup>®</sup>

| Miller Gold Project<br>IPower3D <sup>®</sup>   |           |
|--|-----------|
| Average contact resistance across $R_X$ dipole (P <sub>1</sub> -P <sub>2</sub> )                 | 17.25 kΩ  |
| Average current applied to $T_X$ dipole ( $C_1$ - $C_2$ )  | 1867 mA   |
| Average $V_p$ measured across $R_x$ dipole (P <sub>1</sub> -P <sub>2</sub> )                     | 1940 mV   |
| Observed windows found to fit a pure electrode polarization relaxation curve                     | 97.2%     |
| Average deviation of the validated, normalized windows with respect to the mean chargeabilities. | 0.28 mV/V |



# 4. GROUND MAGNETIC FIELD SURVEY

| Type of survey     | Measurement of the Total Magnetic Field (TMF) with at 10 m intervals (Catharine grid) and 5 m intervals (Pacaud grid). The plotted values were corrected for diurnal variations using readings from a synchronized MAG base station. |   |  |  |  |  |  |  |
|--------------------|--|---|--|--|--|--|--|--|
| Personnel          | Meegwich Consultants In  | c. Data Acquisition and QC  |  |  |  |  |  |  |
|                    | Carole Picard, Tech.,<br>Tom Loader, P.Geo.,<br>Chris Brown, P.Eng.,   | Plotting<br>Data processing & interpretation<br>Final validation of product conformity                                      |  |  |  |  |  |  |
| FIELD MAGNETOMETER | Resolution:<br>Absolute accuracy:<br>Gradient tolerance:   | s/n 58479<br>etometer with overhauser effect.<br>0.01 nT/1 m<br>0.2 nT<br>>10 000 nT/m<br>at a height of 1.8 m above ground |  |  |  |  |  |  |
| BASE STATION       | Resolution:<br>Absolute accuracy:<br>Cycle time:<br>Pacaud grid:<br>EDA Omni IV base stati   | etometer with Overhauser effect<br>0.01 nT<br>0.2 nT<br><b>15 seconds</b><br>on   |  |  |  |  |  |  |
|                    |  | 0.1 nT<br><b>15 seconds</b>   |  |  |  |  |  |  |
| QUALITY CONTROLS   | Quality controls performe  | d by Meegwich Consultants Inc.  |  |  |  |  |  |  |



# 5. DATA PROCESSING AND DELIVERABLES

□ TOTAL MAGNETIC FIELD CONTOURS
The total magnetic field was gridded using a minimum curvature gridding algorithm with grid cell size of 12.5 m. One pass of a 3 x 3 Hanning filter was applied to the resulting grid, which was then re-gridded with a cell size of 5 m to improve the overall appearance of the final Total Magnetic Field Contour maps. The Geosoft colour table (Clrb64.tbl) was used with linear intervals of 50 nT from 55,000 to 58,200.

#### NORMALIZED DERIVATIVES Conventional filtering:

Using a convolution filter method, the first vertical derivative (vertical gradient) of the *total magnetic field* was calculated (1.4).

#### Special filtering:

Conventional filtering responds primarily to amplitude variations within the dataset and high-amplitude anomalies often mask more subtle anomalies of interest. When rock magnetization is weak, anomalies are subtle and special filtering and enhancement methods are required. The *tilt derivative* (1.5) was found to be one of the most effective techniques, it is designed to emphasise particular characteristics of the magnetic data.

The tilt derivative is defined as the arctangent of the ratio of the vertical gradient with respect to the total horizontal gradient. The gradient tilt angle shows some interesting properties. As a dimensionless ratio, it responds equally well to shallow and deep sources and to a large dynamic range of amplitudes for sources at the same level. The tilt angle (radians) is positive over a source and negative elsewhere, with 0 tracing the edge of the source making interpretation much simpler than other normalized derivatives.

□ *IPOWER3D*<sup>®</sup> *QUALITY CONTROL* The first step in processing IPower3D<sup>®</sup> data is quality control. The IPower3D<sup>®</sup> configuration takes a large number of readings using different electrode orientations to thoroughly investigate the subsurface in 3D. Because of the varying geometry used there are a small number of readings that are not at favourable dipole orientations. IPower3D<sup>®</sup> incorporates a high degree of redundancy, so a moderate percentage of readings can be rejected, without compromising survey coverage.

> To ensure consistent and efficient quality control Abitibi Geophysics has developed *ProSysControl<sup>TM</sup>* This application analyses the normalized decay curve for each reading within the data set. Only readings that successfully pass quality control will be used to calculate the final chargeability. This software also allows the user to view each decay curve for additional manual quality control.



- □ *IPOWER3D<sup>®</sup> QUALITY CONTROL (CONT'D)* Figure 5 is a screen grab from *ProSysControl<sup>™</sup>* showing an alarm for high contact resistance (red box) that has been accepted (green bar) and plotted, showing the decay curve (red) and normalized decay curve (blue) for the selected reading, highlighted in blue.
- □ *IPOWER3D*<sup>®</sup> *INVERSION* Apparent resistivity and chargeability values were inverted using RES3DINV x 64 version 3.04.98 from GEOTOMO (<u>http://www.geoelectrical.com</u>). This software calculates three dimensional patterns of resistivity and chargeability of the subsurface that best explain the values recorded at surface. The software generates a model consisting of rectangular prisms and applies a nonlinear algorithm to minimise the difference between the calculated model and field measurements.
- □ *MAPS PRODUCED* The following colour maps (page 12) are bound or inserted in pouches at the end of this report.

Our Quality System requires every final map to be inspected by at least two qualified persons before being approved and included within a final report.



| Min (Vp  |            |                          | in (Rho) 1              |              | <ul> <li>MxTolera</li> </ul> |           |              | ▼ MxTolera  |            |           | Thargability   |            |            |            |           |          |           |        |                |           |              |                 |  |                          |   |
|--|------------|--------------------------|-------------------------|--------------|------------------------------|-----------|--------------|-------------|------------|-----------|----------------|------------|------------|------------|-----------|----------|-----------|--------|----------------|-----------|--------------|-----------------|--|--------------------------|---|
| : 🗁 🖢  |            | 🔲 📴   N                  | Javigate Alei           | rts : All Al | erts(2)                      | - 0       | ▶ • •        | ••          | V 🔾        | 🍼 🗍 Dupl  | icates: (c1,c. | 2,p1,p2) 🏅 | 8 22 88    |            |           |          |           |        |                |           |              |                 |  |                          |   |
|  | м          | Valid<br>Window<br>Count | s Standard<br>Deviation |              | IpPower                      | C1-x      | С1-у         | C2-x        | С2-у       | P1-x      | P1-y           | P2-x       | P2-y       | Vp         | In        | Rho      | OriginalM | Dev    | Channel        | Overload  | NbCren       | RsChk           |  |                          | 1ax Min <u>▲</u><br><mark>478</mark> 0.14 |
|  | 4.25       | 19                       | 0.42                    | lh.          |                              | 7575      | 2600         | 7612.5      | 2600       | 7650      | 2400           | 7537.5     | 2400       | 119.06     | 160       | -10045.3 | 3.53      | 0.11   | 0              |           | 8            | 19.49           | In                                       | 474.05 3                 | 500 30.00                                 |
|  | 1.02       | 19                       | 0.35                    | lh.          |                              | 7575      | 2600         | 7612.5      | 2600       | 7537.5    | 2400           | 7687.5     | 2400       | -142.08    | 160       | -10026.4 | 0.91      | 0.16   | 1              |           | 8            | 0.52            |  |                          | <b>564</b> -1.06                          |
|  | 0.58       | 19                       | 0.33                    | Ìh.          |                              | 7575      | 2600         | 7612.5      | 2600       | 7687.5    | 2400           | 7500       | 2400       | 137.41     | 160       | -8333.4  | 0.56      | 0.2    | 2              |           | 8            | 0.44            | IMI                                      | 27.59 7                  | 32.50 0.01                                |
|  | 0.86       | 19                       | 0.33                    | ih.          |                              | 7575      | 2600         | 7612.5      | 2600       | 7500      | 2400           | 7725       | 2400       | -148.47    | 160       | -8553.6  | 0.78      | 0.18   | 3              |           | 8            | 0.39            | Dev                                      | 0.27 6                   | 5.28 0.00                                 |
|  | -0.69      | 19                       | 0.34                    | Ìh.          |                              | 7575      | 2600         | 7612.5      | 2600       | 7725      | 2400           | 7425       | 2400       | 117.21     | 160       | -6481.3  | -0.48     | 0.35   | 4              |           | 8            | 0.35            | RsChk                                    | 74.33 9                  | <mark>38.06</mark> 0.00 🖵                 |
|  | -0.83      | 19                       | 0.34                    | lh.          |                              | 7575      | 2600         | 7612.5      | 2600       | 7425      | 2400           | 7762.5     | 2400       | -121.51    | 160       | -6772    | -0.59     | 0.38   | 5              |           | 8            | 0.65            | Stat                                     |                          | Value                                     |
|  | -7.41      | 18                       | 0.64                    | Ĩh.          |                              | 7575      | 2600         | 7612.5      | 2600       | 7762.5    | 2400           | 7350       | 2400       | 65.91      | 160       | -4019.7  | -5.97     | 1.08   | 6              |           | 8            | 0.05            | Ok Wind                                  | ows                      | 96.27% (213172                            |
|  | -5.68      | 18                       | 0.56                    | - fi         |                              | 7575      | 2600         | 7612.5      | 2600       | 7350      | 2400           | 7837.5     | 2400       | -113.51    | 160       | -7643.3  | -4.58     | 0.85   | 7              |           | 8            | 0.9             | Ok Meas                                  | ures                     | 97.00% (11071/                            |
|  | 0.46       | 19                       | 0.25                    |              |                              | 7575      | 2600         | 7612.5      | 2600       | 7650      | 2500           | 7537.5     | 2500       | 142.2      | 160       | -2048    | 0.44      | 0.08   | 0              |           | 8            | 0.73            | RsChk u                                  | nsolved                  | 2   |
|  | 0.22       | 19                       | 0.28                    | lh.          |                              | 7575      | 2600         | 7612.5      | 2600       | 7537.5    | 2500           | 7687.5     | 2500       | -180.2     | 160       | -2602    | 0.25      | 0.08   | 1              |           | 8            | 0.61            |  |                          | 1 1 1 1                                   |
|  | 0.09       | 19                       | 0.29                    |              |                              | 7575      | 2600         | 7612.5      | 2600       | 7687.5    | 2500           | 7500       | 2500       | 186.49     | 160       | -2699.6  | 0.15      | 0.09   | 2              |           | 8            | 2.07            |  |                          | -80                                       |
|  | 0.05       | 19                       | 0.3                     | - di         |                              | 7575      | 2600         | 7612.5      | 2600       | 7500      | 2500           | 7725       | 2500       | -210.3     | 160       | -3366.7  | 0.11      | 0.08   | 3              |           | 8            | 0.72            |  |                          | ++-                                       |
|  | -2.09      | 19                       | 0.29                    | -af          |                              | 7575      | 2600         | 7612.5      | 2600       | 7725      | 2500           | 7425       | 2500       | 181.85     | 160       | -3685.3  | -1.62     | 0.15   | 4              |           | 8            | 7.54            |  |                          | 60 🖉                                      |
|  | -1.82      | 19                       | 0.33                    | - di         |                              | 7575      | 2600         | 7612.5      | 2600       | 7425      | 2500           | 7762.5     | 2500       | -205.11    | 160       | -4788    | -1.39     | 0.16   | 5              |           | 8            | 8.61            | e la |                          |   |
|  | -27.35     | 20                       | 1.59                    | -di          |                              | 7575      | 2600         | 7612.5      | 2600       | 7762.5    | 2500           | 7350       | 2500       | 75.16      | 160       | -2198.5  | -22.02    | 1.02   | 6              |           | 8            | 20.77           | requ                                     |                          | -40 <sup>2</sup>                          |
|  | -20.29     | 20                       | 1.16                    |              |                              | 7575      | 2600         | 7612.5      | 2600       | 7350      | 2500           | 7837.5     | 2500       | -103.01    | 160       | -4033.6  | -16.34    | 0.84   | 7              |           | 8            | 20.93           |  |                          |   |
|  | 10.38      | 19                       | 0.57                    | j.           |                              | 7575      | 2600         | 7612.5      | 2600       | 7650      | 2600           | 7537.5     | 2600       | 9156.25    | 100       | -21573.9 | 8.47      | 0.01   | 0              |           | 8            | 97.58           |  |                          | 20  |
| Þ  | 10.04      | 20                       | 0.66                    | aí           |                              | 7575      | 2600         | 7612.5      | 2600       | 7537.5    | 2600           | 7687.5     | 2600       | -7847.77   | 100       | -27736.3 | 8.1       | 0.01   | 1              |           | 8            | 130.2           |  |                          |   |
|  | 7.5        | 20                       | 0.21                    | lin.         |                              | 7575      | 2600         | 7612.5      | 2600       | 7687.5    | 2600           | 7500       | 2600       | 2917.5     | 100       | -20622.6 | 6.06      | 0.02   | 2              |           | 8            | 108.03          |  |                          |   |
|  | 8.17       | 20                       | 0.24                    | af           |                              | 7575      | 2600         | 7612.5      | 2600       | 7500      | 2600           | 7725       | 2600       | -2783.28   | 100       | -26231.8 | 6.6       | 0.02   | 3              |           | 8            | 739.26          | 0.94                                     | 66566                    | 8,000                                     |
| 0  | 4.96       | 12                       | 0.57                    | lh.          |                              | 7575      | 2600         | 7612.5      | 2600       | 7725      | 2600           | 7425       | 2600       | 1506.38    | 100       | -26620   | 0.95      | 0.08   | 4              |           | 8            | 672.66          |  | Confidence               | (%)                                       |
|  |            |                          |                         |              |                              |           |              |             |            |           |                |            |            |            |           |          |           |        |                |           |              |                 |  |                          |   |
|  |            | 25                       |                         |              |                              |           |              |             |            |           |                |            |            |            |           |          |           |        |                |           |              |                 | <ul> <li>Toler</li> <li>Norm</li> </ul>  |                          |   |
|  |            | 00                       |                         |              |                              |           |              |             |            |           |                |            |            |            |           |          |           |        |                |           |              |                 | 🗕 Real                                   |                          |   |
|  |            | 20                       |                         |              |                              |           |              |             |            |           |                |            |            |            |           |          |           |        |                |           |              |                 |  | nal Average<br>Offset DI |   |
|  |            | 15                       |                         |              |                              |           |              |             |            |           |                |            |            |            |           |          |           |        |                |           |              |                 | M: 10                                    | ).03852 m\<br>idence: 95 | IN  |
|  | ×          | 13                       |                         |              |                              |           |              | -           |            |           |                |            |            |            |           |          |           |        |                |           |              |                 |  | Windows:                 |   |
|  | 2          | 10                       |                         |              |                              |           |              |             |            |           |                |            |            |            |           |          |           |        |                |           |              |                 | Vp: -                                    | 7847.771                 |   |
|  |            |                          |                         | •            | •                            | •         | •            | •           | •          | •         | •              |            |            |            |           |          |           |        |                |           |              |                 |  |                          |   |
|  |            | 5                        |                         |              |                              |           |              |             |            |           |                |            |            |            |           |          |           | -      | _              | 1         | 1            |                 |  |                          |   |
|  |            |                          |                         |              |                              |           |              |             |            |           |                |            |            |            |           |          |           |        |                |           | •            |                 |  |                          |   |
|  |            | 0                        |                         |              |                              |           |              |             |            |           |                |            |            |            |           |          |           |        |                |           | _            | _               |  |                          |   |
|  |            | 0                        | 1                       | 2            | 3                            | 4         | 5            | 6           | 7          | 8         | 9 1            | 0 11       | 12         | 13         | 14        | 15       | 16        | 17     | 18             | 19        | 20           | 21              |  |                          |   |
| Current I  | File: C:\1 | 1Abitibi\Proie           | cts\14N001              | \IPower3D    | ProSysCon                    | rol\14N00 | 1_all.qualit | y.bin Unsol | ved alarms | : (2/723) |                |            | olor codes | Eliminater | d Automal | tically  |           | Charge | ability Reject | ed Automa | itically Cha | argeabilty Acce | epted By Use                             | r                        |   |
| Current File: C:\1Abitibil\Projects\14N001\IPower3D\ProSysControl\14N001_all.quality.bin Unsolved alarms : (2/723) color codes: Eliminated Automatically Chargeability Rejected Automatically Chargeability Accepted By User |            |                          |                         |              |                              |           |              |             |            |           |                |            |            |            |           |          |           |        |                |           |              |                 |  |                          |   |

Figure 5. Screen grab from *ProSysControl<sup>TM</sup>*, Abitibi Geophysics' Proprietary QC software



#### Table 2. Maps produced

| Map Number                        | Description  |        |  |  |  |  |  |  |
|-----------------------------------|--|--------|--|--|--|--|--|--|
| L24+00E to L33+00E<br>(19 plates) | IPower3D <sup>®</sup> Induced Polarization Survey – Vertical Sections (1-01 anomalies only)      | 1:5000 |  |  |  |  |  |  |
| L24+00E to L33+00E<br>(19 plates) | IPower3D <sup>®</sup> Induced Polarization Survey – Vertical Sections (excluding 1-01 anomalies) | 1:5000 |  |  |  |  |  |  |
| 1.1                               | Ground Magnetic Field Survey – Total Field Profiles (nT)   | 1:5000 |  |  |  |  |  |  |
| 1.2                               | Ground Magnetic Field Survey – Total Field Contours (nT)   | 1:5000 |  |  |  |  |  |  |
| 1.4                               | Ground Magnetic Field Survey – Vertical Derivative Colour (nT/m)                                 | 1:5000 |  |  |  |  |  |  |
| 1.5                               | Ground Magnetic Field Survey – Tilt Derivative Contours (radians)                                | 1:5000 |  |  |  |  |  |  |
| 8.2_25                            | IPower3D <sup>®</sup> IP Survey - Inverted Resistivity at a depth of 25 m (Oh-m)                 | 1:5000 |  |  |  |  |  |  |
| 8.2_50                            | IPower3D <sup>®</sup> IP Survey - Inverted Resistivity at a depth of 50 m (Oh-m)                 | 1:5000 |  |  |  |  |  |  |
| 8.2_75                            | IPower3D <sup>®</sup> IP Survey - Inverted Resistivity at a depth of 75 m (Oh-m)                 | 1:5000 |  |  |  |  |  |  |
| 8.2_100                           | IPower3D <sup>®</sup> IP Survey - Inverted Resistivity at a depth of 100 m (Oh-m)                | 1:5000 |  |  |  |  |  |  |
| 8.2_150                           | IPower3D <sup>®</sup> IP Survey - Inverted Resistivity at a depth of 150 m (Oh-m)                | 1:5000 |  |  |  |  |  |  |
| 8.3_25                            | IPower3D <sup>®</sup> IP Survey - Inverted Chargeability at a depth of 25 m (mV/V)               | 1:5000 |  |  |  |  |  |  |
| 8.3_50                            | IPower3D <sup>®</sup> IP Survey - Inverted Chargeability at a depth of 50 m (mV/V)               | 1:5000 |  |  |  |  |  |  |
| 8.3_75                            | IPower3D <sup>®</sup> IP Survey - Inverted Chargeability at a depth of 75 m (mV/V)               | 1:5000 |  |  |  |  |  |  |
| 8.3_100                           | IPower3D <sup>®</sup> IP Survey - Inverted Chargeability at a depth of 100 m (mV/V)              | 1:5000 |  |  |  |  |  |  |
| 8.3_150                           | IPower3D <sup>®</sup> IP Survey - Inverted Chargeability at a depth of 150 m (mV/V)              | 1:5000 |  |  |  |  |  |  |
| 8.4_25                            | IPower3D <sup>®</sup> IP Survey – Calculated Metal Factor at a depth of 25 m                     | 1:5000 |  |  |  |  |  |  |
| 8.4_50                            | IPower3D <sup>®</sup> IP Survey - Calculated Metal Factor at a depth of 50 m                     | 1:5000 |  |  |  |  |  |  |
| 8.4_75                            | IPower3D <sup>®</sup> IP Survey - Calculated Metal Factor at a depth of 75 m                     | 1:5000 |  |  |  |  |  |  |
| 8.4_100                           | IPower3D <sup>®</sup> IP Survey - Calculated Metal Factor at a depth of 100 m                    | 1:5000 |  |  |  |  |  |  |
| 8.4_150                           | IPower3D <sup>®</sup> IP Survey - Calculated Metal Factor at a depth of 150 m                    | 1:5000 |  |  |  |  |  |  |
| 8.6_25                            | IPower3D <sup>®</sup> IP Survey – Calculated Gold Index at a depth of 25 m                       | 1:5000 |  |  |  |  |  |  |
| 8.6_50                            | IPower3D <sup>®</sup> IP Survey - Calculated Gold Index at a depth of 50 m                       | 1:5000 |  |  |  |  |  |  |
| 8.6_75                            | IPower3D <sup>®</sup> IP Survey - Calculated Gold Index at a depth of 75 m                       | 1:5000 |  |  |  |  |  |  |
| 8.6_100                           | IPower3D <sup>®</sup> IP Survey - Calculated Gold Index at a depth of 100 m                      | 1:5000 |  |  |  |  |  |  |
| 8.6_150                           | IPower3D <sup>®</sup> IP Survey - Calculated Gold Index at a depth of 150 m                      | 1:5000 |  |  |  |  |  |  |
| 10.1                              | Geophysical Interpretation (I-01 series of chargeability anomalies only)                         | 1:5000 |  |  |  |  |  |  |
| 10.2                              | Geophysical Interpretation (chargeability anomalies excluding I-01 series)                       | 1:5000 |  |  |  |  |  |  |

DIGITAL DATA

The above-described maps are delivered in the Oasis Montaj map file format on DVD-Rom.

A copy of all survey acquisition data (ASCII text format) and processed data (Geosoft Montaj databases) are also delivered on DVD-Rom.



# 6. DISCUSSION

#### □ The IPower3D<sup>®</sup> System

The IPower3D<sup>®</sup> configuration has been designed to maximize the sensitivity of the induced polarization survey and is especially effective under conditions of high conductance overburden (conductance is the product of conductivity and thickness). The values of apparent chargeability measured in the field by the IPower3D<sup>®</sup> configuration can be many times greater than the values measured by a conventional electrode configuration, however the background response is not amplified as it occupies the entire range of sensitivity (both positive and negative). The advantage of the IPower3D<sup>®</sup> configuration is that it is able to detect anomalies that would otherwise be within the noise envelope of conventional IP arrays.

The apparent chargeability anomalies measured in the field have a large range of values; up to 782 mV/V. The inversion results of the IPower3D<sup>®</sup> data show that the calculated chargeabilities are within the range that would be expected with the inversion of data collected using a conventional electrode configuration such as dipole-dipole. The disadvantage of conventional configurations is that sensitivity is often not sufficient to allow the inversion to resolve the source of a polarizable anomaly beneath thick conductive overburden.

A conventional 2D IP survey only collects data in two dimensions, along parallel lines, however, the structures being surveyed are three dimensional. On this property, where the geology is quite complex it is crucial to obtain true 3D data to ensure a reasonable inversion result.

The depth of investigation of IPower3D<sup>®</sup>, or any conventional survey can be limited by a number of factors. On the Miller Gold Property extremely high contrasts in resistivity / conductivity were encountered. Current will preferentially flow through regions with low resistivity while "avoiding" resistive regions. It appears that the resistive zone and underlying conductive zone, interpreted as the #1 quartz vein, and associated clays and fault gouge has acted as a barrier to the induced current. The region above this zone has been well sampled and the inversion results appear to have resolved some complex structures. Below this zone the inversion results appear to be less reliable and structures such as vertical faults are not resolved below this zone. When reviewing the inversion results and planning targets it is important to consider the possible ambiguities of the results at depth.

#### The Miller Gold Project

The Miller Gold Project has a long exploration history which includes several phases of diamond drilling, prospecting and the excavation of exploration shafts. This past exploration endeavour has been focused on mineralization associated with the #1 quartz vein. Previous drilling has shown this vein to be near surface on the southern part of the grid (Miller DDH-2 on line 27+50E, station 76+00N) and dipping gently to the North reaching depth of 150 m or so. Mineralization in the #1 quartz vein includes disseminated sulphide and stringers with associated gold. Beneath the #1 quartz vein lies a layer of clays, fault gouge and broken rock. Anomalous gold is also associated with this zone. The #1 quartz vein correlates well with a resistive layer immediately overlying a highly conductive layer that was detected by the IPower3D<sup>®</sup> survey. The survey results indicate that this zone extends significantly further than the area known from drilling. The results of the chargeability inversion have also shown that the chargeable mineralization forms bands the stretch across the grid, branching and forking.

Previous drilling also located a syenite body on the eastern side of the grid. This appears to be well defined as a high resistivity zone and includes some significant chargeable character.



The Catharine fault zone is a mapped fault that crosses the eastern side of this grid and is clearly visible in both the ground magnetic survey results and in the IPower3D<sup>®</sup> inversion results. The resistivity inversion sections for the eastern block show a conductive zone dipping at about -45 degrees to the South; this is interpreted as the Catharine fault zone. The chargeability inversion results indicate some chargeable mineralization associated with this feature.

In addition to the known sub-horizontal #1 quartz vein there are a number of northwest trending prophyrys crossing the grid. These appear as magnetic highs and are also known to contain anomalous gold. These do not show a strong IP response; however, where they intersect the horizontal zones where the IP responses are increased.



# 7. RESULTS AND RECOMMENDATIONS

Resistivity and chargeability anomalies have been interpreted by studying the 3D inversion models, the true-depth sections and the inverted resistivity and chargeability maps. A total of 9 anomalous trends have been interpreted, the inferred surface projection of the resistivity / chargeability sources are shown along the survey lines on the *Geophysical Interpretation* maps (10.1 and 10.2) and on the true-depth section plates. The anomalies have been correlated from line-to-line and are fully described in appendix A, found at the end of this report.

Because many of the anomalies interpreted on this project are sub-horizontal there are some anomalies that lie above others. When plotted on an interpretation map some of these anomalies overlap. In order to view the anomalies without overlap two interpretation maps and two sets of vertical sections have been produced. *Geophysical Interpretation* maps 10.1 shows only the I-01 series of anomalies while 10.2 shows all other anomalies.

#### □ RESISTIVITY

The inversion results suggest a complex three dimensional pattern of resistivity. Resistive zones on this property are believed to be due to zones of silicification, quartz veining, or porphyry intrusions. On the *Geophysical Interpretation* maps (10.1 & 10.2), the high resistivity zone is defined by values greater than 100 000  $\Omega$ •m, at a depth of 100 m and can been seen in blue. Because of the complex nature of the resistive zones, in particular the high contrasts observed in the vertical direction, in the study area it is important to review all resistivity depth maps and vertical sections.

The inversion results also reveal a number of conductive zones within the survey area. These zones are defined by values less than 8000  $\Omega$ •m, at a depth of 100 m and can been seen in pink on the *Geophysical Interpretation* maps (10.1 and 10.2). This zone highlights conductive regions that are interpreted as fault / shear zones that contain conductive clays and fault gouge. Because of the complex nature of the conductive zones in the study area it is important to review all resistivity depth maps and vertical sections.

An important feature interpreted from the inversion of resistivity data is a sub-horizontal resistive zone that appears to dip slightly to the North. This zone is immediately underlain by a conductive zone. This feature is believed to represent a known sub-horizontal quartz vein (#1 quartz vein). The #1 quartz vein is known from drilling and is host to sulphide +/- gold mineralization. The #1 quartz vein is underlain by a zone of clays, fault gouge and broken rock which is likely responsible for the conductive zone that lies directly beneath the resistive zone. The resistive zone appears to be broken, whereas the conductive zone is reasonably continuous and may provide a more reliable signature for tracing this structure.



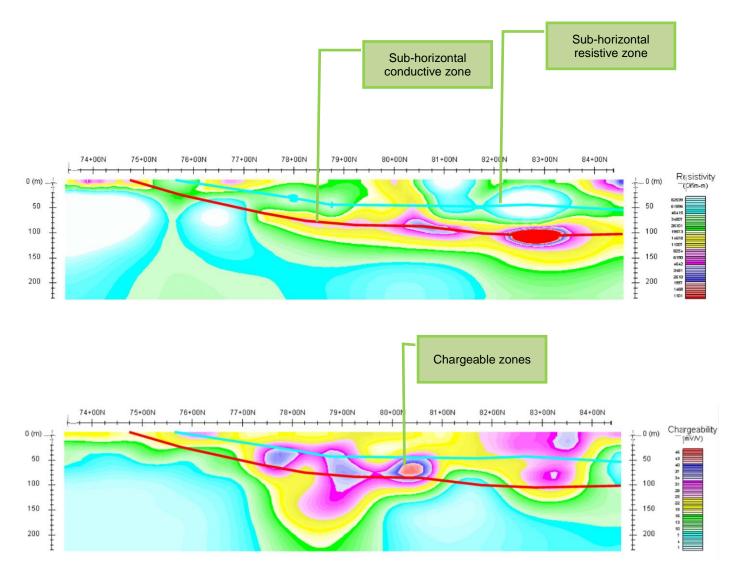


Figure 6. Line 27+00E section showing resistive and conductive zones and associated chargeable zones



A highly resistive, roughly circular feature centered on line 29+50E, station 80+00N is coincident with a known syenite porphyry intrusive. The resistivity anomaly reaches its maximum where it intersects the sub-horizontal resistive zone interpreted as the #1 quartz vein. The chargeability anomaly **I-Of** crosses this feature and broadens in this area.

A North East trending conductive zone crosses the western side of the grid and is interpreted as a fault/shear zone. Where this zone crosses chargeable trends, they generally appear to weaken or become narrower, with the exception of chargeable trend **I-01g**, which reaches its maximum amplitude where it crosses this feature.

#### CHARGEABILITY

The shallow dipping resistive and conductive layers interpreted as the #1 quartz vein appear to be the focus of a number of chargeability anomalies. These anomalies appear to lie between the resistive zone and the conductive zone, suggesting that the mineralization responsible for the chargeability response is found at the contact of the resistive and conductive zones. It should also be noted that the zone of clays and fault gouge beneath the quartz vein may contribute to the chargeability response. Chargeability features associated with this zone are shown as **I-01 a** to **h** on the *Geophysical interpretation* map (10.1) These anomalies are sub-horizontal and appear as a number of bands stretching predominantly East West across the grid.

A number of other chargeability features were also interpreted on this grid, some appear to be close to surface, other are at depth. These are shown on *Geophysical interpretation* map (10.2) and are fully described in appendix A of this report.

#### Gold Index

In addition to resistivity and chargeability, the sections and maps also display the calculated Gold Index, this value is the product of the squared chargeability multiplied by the resistivity ( $M^2 * R$ ). This highlights regions that are both resistive and chargeable, helping to localize the areas with a high potential for hosting gold mineralization associated with quartz veining, or silicified zones. In the case of the Miller Gold property, the Gold Index has highlighted the known syenite porphyry as the strongest response and a number of other trends that are associated with resistive zones.

#### GROUND MAGNETIC SURVEY

The results of the ground magnetic survey conducted by Meegwich Consultants Inc. have been interpreted by studying the *total field pro*file map (1.1), *the total field colour shaded contour* map (1.2) the colour contoured *calculated vertical gradient* map (1.4) and the colour contoured *tilt derivative map* (1.5). Seven magnetic lineaments and two magnetic domains have been identified and plotted on the *Geophysical interpretation* maps (10.1 and 10.2)

The boundary between the two magnetic domains interpreted from these data trace the known location of the Catharine fault. To the South West of this feature the magnetic trends interpreted on this property all follow a distinct northwest trend. These features correlate with known porphyry dykes. It is suspected that iron in the basaltic host rock has been mobilised and oxidized during the emplacement of the porphyry system resulting in the observed magnetic lineaments. Breaks in these lineaments are interpreted as faults/shear zones. To the northeast of the domain boundary the magnetic response is significantly lower, indicating a change in lithology at this boundary.



#### DRILLING RECOMMENDATIONS

Diamond drilling is recommended in order to test the chargeability anomalies detected. The figures of prioritized drilling targets (see below and following pages) and list is shown in table 3 below and in appendix A.

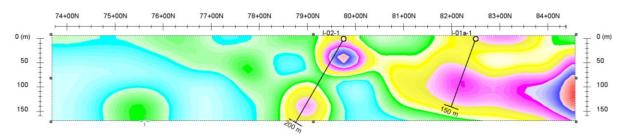
|         |         | DDH Target (not co | ollar)                                 |          |
|---------|---------|--------------------|--|----------|
| Anomaly | Easting | Northing           | Estimated vertical depth to center (m) | Priority |
| I-01a   | 24+50   | 82+15              | 90                                     |          |
| I-01b   | 30+00   | 78+90              | 55                                     |          |
| I-01e   | 25+50   | 84+00              | 90                                     | 1        |
| I-01f   | 30+00   | 81+00              | 50                                     |          |
| I-01g   | 28+00   | 82+90              | 90                                     |          |
| I-01c   | 27+00   | 77+75              | 40                                     |          |
| I-01d   | 33+00   | 77+50 ♥            | 50                                     | 2        |
| I-02    | 24+50   | 79+00              | 140                                    | 2        |
| I-09    | 31+00   | 81+25              | 125                                    |          |
| I-04    | 25+00   | 75+50              | 145                                    | 2        |
| I-07    | 33+00   | 77+50              | 175                                    | 3        |

### Table 3. IPower3D<sup>®</sup> - Diamond drilling targets

♥ Ideally locate hole 50 m to the south if claim boundaries allows it.

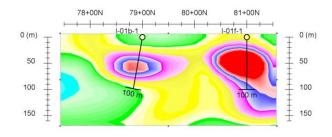
#### PRIORITY 1 TARGETS

#### Diamond drill hole I-01a-1 on line 24+50E

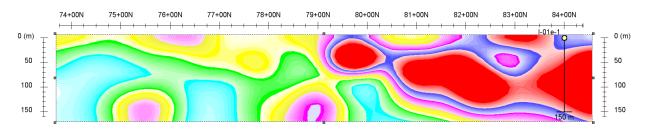




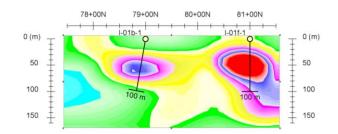
#### Diamond drill hole I-01b-1 on line 30+00E



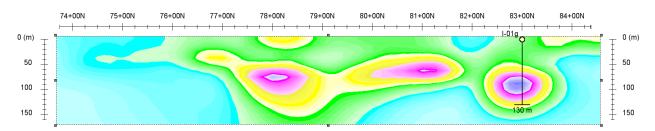
Diamond drill hole I-01e-1 on line 25+50E



Diamond drill hole I-01f-1 on line 30+00E



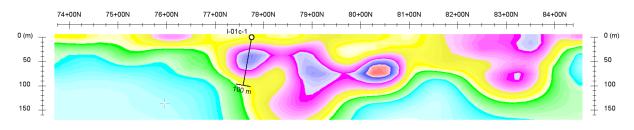
#### Diamond drill hole I-01g-1 on line 28+00E



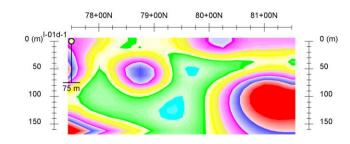


#### PRIORITY 2 TARGETS

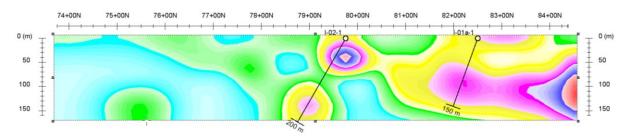
#### Diamond drill hole I-01c-1 on line 27+00E



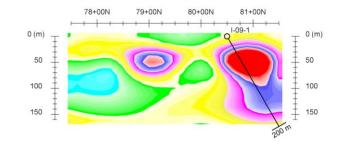
#### Diamond drill hole I-01d-1 on line 33+00E



Diamond drill hole I-02-1 on line 24+50



#### Diamond drill hole I-09-1 on line 31+00





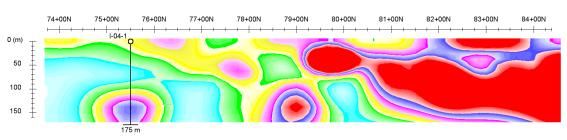
0 (m)

50

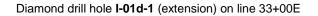
100

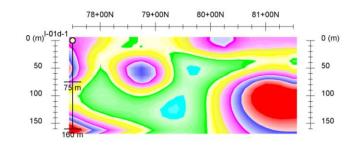
150

#### D PRIORITY 3 TARGETS



Diamond drill hole I-04-1 on line 25+00E





#### □ IP SURVEY EXTENSIONS

The majority of the chargeable trends detected are open to the East and West, with some also open to the South and North. Where claim boundaries permit it, it is recommended to extend the IPower3D<sup>®</sup> IP survey to the North of both the western and eastern grids, to the South of the eastern grid and to the East and West. Priority should be given to a northerly extension to explore the northerly continuation of the sub-horizontal feature that is interpreted as the #1 quartz vein.

#### □ HOLE-TO-HOLE IP SURVEY

The high resistivity contrasts encountered on the horizontal features on this property may have limited the depth of investigation attainable by surface IP surveys. Following a drilling program a Hole-to-Hole IP survey should be considered in order to explore for chargeable targets that have been shielded from surface exploration. This technique may also help to better resolve some of the vertical structures on this property.



The interpretation of the geophysical data embodied in this report is essentially a geophysical appraisal of the Miller Gold Project. As such, it incorporates only as much geoscientific information as the author had on hand at the time. Geologists thoroughly familiar with the area may be in a better position to evaluate the geological significance of the various geophysical signatures. Moreover, as time passes and data provided by follow-up programs are compiled, the priority and significance of exploration targets reported in this study may be downgraded or upgraded.

Respectfully submitted, Abitibi Geophysics Inc.



Pierre Bérubé, P.Eng., PEO # 100173563 Senior Geophysicist

TL/mw

Thomas Loader

Thomas Loader, P.Geo., Project Geophysicist



|         |  | Location |        | Cont   | rast               | Magnetic    | Strike               |   | Recommendations  |          |
|---------|--|----------|--------|--------|--------------------|-------------|----------------------|---|--|----------|
| Anomaly | Line   | From     | То     | Charg. | Res.               | Association | Length & Orientation | Comments  | P: Prospecting<br>DDH: Drilling<br>X: Survey extension | Priority |
|         | 24+00E   | 81+25N   | 84+50N | 4      | (C)                | -           |                      | I-01a is part of the I-01 series of anomalies that appear to be |  |          |
|         | 24+50E   | 81+50N   | 84+50N | 4      | (C)                | M-01a       |                      | associated with a northerly<br>extension of the #1 quartz       | DDH: <b>I-01a-1</b>                                    |          |
| I-01a   | 25+00E   | 80+75N   | 84+50N | 4      | (C)                | M-01a       | 250 m                | vein and associated conductive zone. Drilling to                | Line: 24+50E<br>Station: 82+50N                        | 1        |
| 1-01a   | 25+50E   | 81+00N   | 82+25N | 4      |                    | -           | East                 | the south east has intersected mineralization associated with   | Azimuth: 180<br>Dip: -70                               | ľ        |
|         | 26+00E   | 80+75N   | 82+50N | 4      |                    | -           |                      | the #1 quartz vein.<br>Drilling on the <b>I-01a</b> trend is    | Depth: 150 m   |          |
|         | 26+50E   | 81+50N   | 82+00N | 4      |                    | -           |                      | strongly recommended.   |  |          |
|         | 24+00E   | 79+50N   | 80+00N | 4      | (R)                | -           |                      |   |  |          |
|         | 24+50E   | 79+50N   | 80+00N | 4      | $\uparrow\uparrow$ | -           |                      |   |  |          |
|         | 25+00E 79+50N 80+00N 4 ↑↑ - I-01b is part of the I-01 series |          |        |        |                    |             |                      |   |  |          |
|         | 25+50E   | 79+50N   | 80+00N | 4      | $\uparrow\uparrow$ | -           |                      | of anomalies that appear to be                                  |  |          |
|         | 26+00E   | 79+50N   | 80+00N | 4      | -                  | -           |                      | associated with the #1 quartz vein and associated               |  |          |
|         | 26+50E   | 79+00N   | 79+50N | 3      | (C)                | M-01b-      |                      | conductive zone. Holes <b>N-87-</b>                             |  |          |
|         | 27+00E   | 79+00N   | 79+25N | 3      | (C)                | M-01b-      |                      | 6 and N-87-2 intersected high                                   |  |          |
|         | 27+50E   | 77+75N   | 78+75N | 4      | -                  | M-01b-      | 900 m                | grade ore within and adjacent to this trend.                    | DDH: <b>I-01b-1</b>                                    |          |
|         | 28+00E   | 77+75N   | 78+75N | 4      | -                  | M-01b-      | East, south          |   | Line: 30+00E   |          |
| l-01b   | 28+50E   | 78+00N   | 78+25N | 4      | -                  | -           | east where           | Between lines 26+00E and  | Station: 79+00N<br>Azimuth: 180                        | 1        |
|         | 29+00E   | 78+25N   | 78+75N | 4      | -                  | -           | parallel to<br>M-01b | 27+50E this trend turns to the south east and runs adjacent     | Dip: -080  |          |
|         | 29+50E   | 78+50N   | 79+25N | 4      | 1                  | -           | in orig              | to magnetic trend <b>M-01b</b>                                  | Depth: 100 m   |          |
|         | 30+00E   | 78+50N   | 79+50N | 4      | $\uparrow$         | M-03b       |                      | which traces a known syenite                                    |  |          |
|         | 30+50E   | 78+50N   | 79+50N | 4      | $\uparrow$         | M-03b       |                      | dyke and associated mineralized zone at surface.                |  |          |
|         | 31+00E   | 78+75N   | 79+25N | 4      | -                  | M-03b       |                      |   |  |          |
|         | 31+50E   | 78+75N   | 79+25N | 4      | -                  | M-03b       |                      | Further drilling along this trend                               |  |          |
|         | 32+00E   | 78+75N   | 79+25N | 4      | -                  | -           |                      | is recommended.   |  |          |
|         | 32+50E   | 78+75N   | 79+25N | 3      | -                  | -           |                      |   |  |          |
|         | 33+00E   | 78+50N   | 79+00N | 3      | -                  | -           |                      |   |  |          |

NORTHSTAR GOLD CORP.



|         |        | Location |        | Cont   | rast | Magnetic    | Strike                  |   | Recommendations  |          |
|---------|--------|----------|--------|--------|------|-------------|-------------------------|---|--|----------|
| Anomaly | Line   | From     | То     | Charg. | Res. | Association | Length &<br>Orientation | Comments  | P: Prospecting<br>DDH: Drilling<br>X: Survey extension | Priority |
|         | 24+00E | 77+50N   | 78+00N | 4      | -    | -           |                         | I-01c appears to be a southern branch of the I-01b  |  |          |
|         | 24+50E | 77+50N   | 78+00N | 3      | -    | -           |                         | trend and is part of the <b>I-01</b><br>series of anomalies that                          |  |          |
|         | 25+00E | 77+50N   | 78+00N | 3      | (C)  | M-06a       |                         | appear to be associated with sub-horizontal resistive zone                                | DDH: <b>I-01c-1</b>                                    |          |
| I-01c   | 25+50E | 77+50N   | 78+00N | 2      | (C)  | -           | 350 m                   | that is underlain by a conductive zone. The resistive zone is known from past             | Line: 27+00E<br>Station: 77+85N                        | 2        |
| 1-010   | 26+00E | 77+75N   | 78+00N | 2      | (C)  | -           | East                    | drilling to be a sub-horizontal<br>quartz vein and is known to                            | Azimuth: 180<br>Dip: -080                              | 2        |
|         | 26+50E | 77+75N   | 78+00N | 3      | (C)  | M-05b       |                         | contain significant<br>mineralization.  | Depth: 75 m  |          |
|         | 27+00E | 77+50N   | 78+00N | 3      |      | -           |                         | There is no historical drilling   |  |          |
|         | 27+50E | 77+75N   | 78+75N | 4      | -    | -           |                         | on the <b>I-01c</b> trend. Drilling on <b>I-01c</b> is recommended.                       |  |          |
|         | 24+00E | 76+50N   | 76+75N | 3      | -    | -           |                         | I-01d appears to be part of the I-01 series of anomalies that                             |  |          |
|         | 24+50E | 76+12N   | 76+37N | 3      | -    | -           |                         | appear to be associated with sub-horizontal resistive zone                                | P: West of<br>28+00E                                   |          |
|         | 25+00E | 76+25N   | 76+50N | 3      |      | -           |                         | that is underlain by a conductive zone. The resistive                                     | DDH: <b>I-01d-1</b>                                    |          |
| I-01d   | 25+50E | 76+00N   | 76+50N | 3      |      | -           | 900 m                   | zone is known from past<br>drilling to be a sub-horizontal<br>quartz vein and is known to | Line: 33+00E<br>Station: 77+50E<br>Dip: -90            | 2        |
| 1-010   | 26+00E | 76+00N   | 76+50N | 3      |      | -           | East                    | contain significant mineralization.   | Dip: -90<br>Azimuth: 0<br>Depth: 75 m                  | 2        |
|         | 26+50E | 75+75N   | 76+25N | 3      |      |             |                         | Holes <b>DDH-02</b> , <b>DDH-03, N-</b><br>87-17 and <b>GW-88-5</b> have                  | Ideally drill 50 m to the                              |          |
|         | 27+00E | 76+00N   | 76+50N | 3      |      | -           |                         | intersected mineralization along this trend. West of                                      | south if land to the south is acquired                 |          |
|         | 27+50E | 76+00N   | 76+50N | 2      | -    | -           |                         | 28+00E this trend appears to be at, or near surface.                                      |  |          |



|                   |        | Location |        | Cont   | rast         | Magnetic                                   | Strike  |  | Recommendations  |            |  |
|-------------------|--------|----------|--------|--------|--------------|--|---|--|--|------------|--|
| Anomaly           | Line   | From     | То     | Charg. | Res.         | Association                                | Length & Orientation                            | Comments   | P: Prospecting<br>DDH: Drilling<br>X: Survey extension | Priority   |  |
|                   | 28+00E | 76+50N   | 77+00N | 3      | -            | -  |   |  |  |            |  |
|                   | 28+50E | 76+75N   | 77+00N | 3      | $\downarrow$ | -  |   | the easterly extension of this   |  |            |  |
| l-01d<br>(cont'd) | 31+00E | 77+75N   | 78+00N | 4      | -            | -  | 900 m<br>East                                   |  |  | 2          |  |
|                   | 31+50E | 77+50N   | 78+00N | 2      | -            | -  |   | recommended.   |  |            |  |
|                   | 32+00E | 77+50N   | 77+75N | 2      | -            | -  |   |  |  |            |  |
|                   | 25+00E | 80+75N   | 84+50N | 4      | (C)          | -  |   | I-01e is part of the I-01 series<br>of anomalies that appear to be<br>associated with sub-horizontal<br>resistive zone that is underlain |  |            |  |
| l-01e             | 25+50E | 83+75N   | 84+50N | 4      |              | -  | 150 m   | by a conductive zone. The<br>resistive zone is known from<br>past drilling to be a sub-<br>horizontal quartz vein and is                 | DDH: <b>I-01e-1</b><br>Line: 25+50E<br>Station: 84+00N | 1          |  |
| Pore              | 26+00E | 83+75N   | 84+50N | 4      |              | mineralization. Azimuth: 0<br>Depth: 150 m | mineralization.<br>I-01b does not appear to hav | mineralization. Azimuth: 0   |  | Azimuth: 0 |  |
|                   | 26+50E | 83+75N   | 84+50N | 3      |              | -  |   | been drilled previously.<br>Drilling of this trend is<br>recommended.  |  |            |  |



|         |        | Location |        | Cont   | rast                | Magnetic    | Strike                      |  | Recommendations   |          |
|---------|--------|----------|--------|--------|---------------------|-------------|-----------------------------|--|---|----------|
| Anomaly | Line   | From     | То     | Charg. | Res.                | Association | Length & Orientation        | Comments   | P: Prospecting<br>DDH: Drilling<br>X: Survey extension  | Priority |
|         | 26+00E | 80+75N   | 82+50N | 4      | -                   | -           |                             | I-01f is part of the I-01 series   |   |          |
|         | 26+50E | 80+75N   | 81+25N | 4      | (C)                 | -           |                             | of anomalies that appear to be<br>associated with sub-horizontal<br>resistive zone that is underlain |   |          |
|         | 27+00E | 80+25N   | 80+75N | 4      |                     | -           |                             | by a conductive zone. The resistive zone is known from   |   |          |
|         | 27+50E | 80+00N   | 80+50N | 4      |                     | -           |                             | past drilling to be a sub-<br>horizontal quartz vein and is<br>known to contain significant          |   |          |
|         | 28+00E | 80+25N   | 81+50N | 4      | -                   | MD-03b      |                             | mineralization.  |   |          |
|         | 28+50E | 79+75N   | 81+25N | 4      | $\uparrow \uparrow$ | MD-03b      |                             | I-01f also appears to cross a highly resistive zone located  | DDH: <b>I-01f-1</b><br>Line: 30+00E   |          |
|         | 29+00E | 79+75N   | 81+50N | 4      | $\uparrow \uparrow$ | MD-03b      |                             | 30+50E. This resistive zone  | Station: 81+00N<br>Azimuth: 0<br>Dip: -90<br>Depth: 100 m<br>Station: 81+00N<br>Azimuth: 0<br>Dip: -90<br>Depth: 100 m<br>Station: 81+00N<br>Azimuth: 0<br>Dip: -90<br>Depth: 100 m | 1        |
| I-01f   | 29+50E | 80+25N   | 81+50N | 4      | $\uparrow \uparrow$ | -           | 700 m<br>East south<br>east | intrusive that is known to exist at this location. Hole <b>N-87-5</b>                                |   |          |
|         | 30+00E | 80+50N   | 81+75N | 4      | $\uparrow \uparrow$ |             |                             | intersected high grade ore<br>within this trend. Additional<br>drilling of this trend is             |   |          |
|         | 30+50E | 80+25N   | 81+50N | 4      | $\uparrow \uparrow$ | MD-02b      |                             | recommended.   | through the periphery<br>of <b>I-09</b>   |          |
|         | 31+00E | 80+25N   | 81+50N | 4      | ↑                   | MD-02b      |                             | This trend also appears to cross the Catharine fault at  |   |          |
|         | 31+50E | 80+50N   | 81+50N | 4      | -                   | -           |                             | depth. The chargeability<br>anomaly appears to deepen<br>where it meets the fault,                   | pen<br>Irine<br>J as a<br>n.  |          |
|         | 32+00E | 80+75N   | 81+25N | 4      | -                   | -           |                             | indicating that the Catharine fault zone may be acting as a  |   |          |
|         | 32+50E | 80+75N   | 81+50N | 4      | ↑                   | -           |                             | conduit for mineralization.<br>Drilling on this intersection is                                      |   |          |
|         | 33+00E | 80+75N   | 81+75N | 4      | ↑                   | -           |                             | suggested.   |   |          |



|         |        | Location |        | Cont   | rast               | Magnetic    | Strike   |  | Recommendations  |          |
|---------|--------|----------|--------|--------|--------------------|-------------|--|--|--|----------|
| Anomaly | Line   | From     | То     | Charg. | Res.               | Association | Length & Orientation   | Comments   | P: Prospecting<br>DDH: Drilling<br>X: Survey extension   | Priority |
|         | 27+00E | 83+25N   | 83+50N | 3      | (C)                | -           |  | <b>I-01g</b> is part of the <b>I-01</b> series<br>of anomalies that appear to be<br>associated with sub-horizontal<br>resistive zone that is underlain<br>by a conductive zone. The<br>resistive zone is known from  |  |          |
| I-01g   | 27+50E | 82+75N   | 83+25N | 4      | (C)                | -           | - horizontal quartz vein and is<br>known to contain significant<br>mineralization.<br>- <b>I-01g</b> is located on the<br>intersection of two<br>East south geophysically inferred | known to contain significant<br>mineralization.Li<br>Li<br>StI-01g is located on the<br>intersection of two<br>geophysically inferred<br>faults/shear zones and the<br>horizontal quartz vein. It is<br>also bounded to the north east<br>by a conductive zone and<br>magnetic domain boundary<br>that is interpreted as the<br>Catharine fault. Although thisDi<br>Li<br>St | DDH: <b>I-01g-1</b><br>Line: 28+00E<br>Station: 82+90N<br>Azimuth: 0<br>Dip: -90<br>Depth: 130 m | 1        |
|         | 28+00E | 82+50N   | 83+25N | 4      |                    | M-02a       |  |  | X: Survey<br>extension to<br>the east is<br>also<br>recommended                                  |          |
|         | 28+50E | 82+50N   | 83+00N | 4      |                    | M-02a       |  | structural associations make it<br>a favorable target.<br>Drilling of this feature is  |  |          |
| l-01h   | 29+00E | 79+75N   | 81+50N | 4      | $\uparrow\uparrow$ | M-03b       | 100 m  | <b>I-01h</b> is a small branch of <b>I-01f</b> . Located in the resistive zone that is interpreted as a  |  | 4        |
| 1-0111  | 29+50E | 79+50N   | 80+00N | 4      | $\uparrow\uparrow$ | M-03b       | South east   | syenite porphyry. It may<br>indicate a link between <b>I-01f</b><br>and <b>I-01b</b> .   |  | 4        |



|         |        | Location |        | Cont   | rast | Magnetic    | Strike                  |  | Recommendations  |          |
|---------|--------|----------|--------|--------|------|-------------|-------------------------|--|--|----------|
| Anomaly | Line   | From     | То     | Charg. | Res. | Association | Length &<br>Orientation | Comments   | P: Prospecting<br>DDH: Drilling<br>X: Survey extension | Priority |
|         | 24+00E | 78+75N   | 79+25N | 4      |      | M-06a       |                         | I-02 is located at a depth of  |  |          |
|         | 24+50E | 78+75N   | 79+25N | 4      |      | M-06a       |                         | about 150 m and does not<br>appear to be related to the<br>sub-horizontal quartz vein,     | DDH: <b>I-02-1</b>                                     |          |
|         | 25+00E | 78+75N   | 79+25N | 4      |      | -           |                         | although it could represent a section that has been dropped                                | Line: 24+50E<br>Station: 80+00N                        |          |
| I-02    | 25+50E | 78+50N   | 79+00N | 3      |      | -           | 300 m<br>East           | down by faulting. It is at the<br>edge of a zone where the<br>inversion results are        | Azimuth: 180<br>Dip: 70<br>Depth: 150 m                | 2        |
|         | 26+00E | 78+50N   | 79+00N | 3      |      | -           |                         | somewhat questionable.<br>Because this target appears                                      | This hole also tests                                   |          |
|         | 26+50E | 78+50N   | 79+00N | 3      | (C)  | -           |                         | significantly chargeable and<br>may be a previously un<br>explored target, drilling should | anomaly <b>I-01b</b>                                   |          |
|         | 27+00E | 78+75N   | 79+00N | 2      |      | -           |                         | explored target, drilling should be considered.  |  |          |
|         | 24+00E | 82+50N   | 83+50N | 4      | (C)  | -           |                         |  |  |          |
|         | 24+50E | 82+75N   | 83+50N | 4      | (C)  | -           |                         |  |  |          |
|         | 25+00E | 82+50N   | 83+75N | 4      | (C)  | M-03a       |                         |  |  |          |
|         | 25+50E | 82+75N   | 83+50N | 4      | (C)  | M-03a       |                         | The <b>I-03a</b> and <b>b</b> trends are very shallow and appear open                      |  |          |
| I-03a   | 26+00E | 82+75N   | 83+25N | 4      | (C)  | M-03a       | 500 m                   | to the surface. They may   |  | 2        |
| 1-038   | 26+50E | 82+25N   | 83+50N | 3      | (C)  | M-03a       | East north<br>east      | represent areas of upward<br>migration of mineralization                                   | P: Prospecting   | 2        |
|         | 27+00E | 83+25N   | 83+75N | 3      | (C)  | -           |                         | from sources below.  | along the trends                                       |          |
|         | 27+50E | 83+50N   | 84+00N | 3      | (C)  | -           |                         | Prospecting and trenching  |  |          |
|         | 28+00E | 83+50N   | 83+75N | 3      | (C)  | -           |                         | should be considered in these trends.  |  |          |
|         | 28+50E | 83+50N   | 83+75N | 3      | -    | -           |                         |  |  |          |
| Look    | 27+00E | 82+37N   | 82+62N | 2      | (C)  | -           | 50 m                    |  |  | 2        |
| I-03b   | 27+50E | 82+50N   | 82+75N | 3      | (C)  | -           | North east              |  |  | 3        |



|         |        | Location |        | Cont   | rast | Magnetic   | Strike   |  | Recom  | mendations                   |          |
|---------|--------|----------|--------|--------|------|--|--|--|--|------------------------------|----------|
| Anomaly | Line   | From     | То     | Charg. | Res. | Association  | Length & Orientation   | Comments   | P: Prospecting<br>DDH: Drilling<br>X: Survey extension |                              | Priority |
|         | 24+00E | 75+25N   | 75+75N | 3      | (R)  | -  | The <b>I-04</b> trend is located at a depth of about 150 m in the                    |  |  |                              |          |
|         | 24+50E | 75+25N   | 75+75N | 3      |      | Inversion results in this zone are questionable. DDH: I-04-1 | are questionable.  |  |  |                              |          |
| I-04    | 25+00E | 75+25N   | 75+75N | 4      |      | -  | 200 m<br>East  | Additional IPower3D <sup>®</sup> survey lines to the west may help to better define this zone. | Line:<br>Station:<br>Azimuth:<br>Dip:                  | 25+00E<br>75+50N<br>0<br>-90 | 3        |
|         | 25+50E | 75+25N   | 75+75N | 3      | (C)  | -  | This target is suggested for<br>drilling, however the<br>questionable nature of this |  | 175 m  |                              |          |
|         | 26+00E | 75+25N   | 75+75N | 3      | (C)  | -  |  | anomaly should be considered when prioritizing.  |  |                              |          |
|         | 27+50E | 74+25N   | 74+75N | 2      | (R)  | -  | M-06b- East north and the  |  |  |                              |          |
| I-05    | 28+00E | 74+50N   | 75+00N | 2      |      | M-06b-   |  | and trenching along the  |  | 2                            |          |
|         | 28+50E | 74+75N   | 75+00N | 2      |      | M-06b-   |  | other trends, its possible<br>association with the sub-<br>horizontal quartz vein is           |  |                              |          |



|         |        | Location |        | Cont   | rast | Magnetic    | Strike  |   | Recom   | mendations              |          |
|---------|--------|----------|--------|--------|------|-------------|---|---|---|-------------------------|----------|
| Anomaly | Line   | From     | То     | Charg. | Res. | Association | Length & Orientation                          | Comments  | P: Prospecting<br>DDH: Drilling<br>X: Survey extension  |                         | Priority |
|         | 28+00E | 78+12N   | 78+37N | 4      |      | -           |   |   |   |                         |          |
|         | 28+50E | 78+00N   | 78+25N | 4      |      | -           |   | I-06 lies directly above I-01b  | P:  | Prospecting             |          |
| I-06    | 29+00E | 77+75N   | 78+25N | 4      |      | M-01c       | 200 m<br>East                                 | and may be the result of some upward migration of <b>I-01b</b>  |   | and trenching along the | 3        |
|         | 29+50E | 78+00N   | 78+25N | 4      |      | -           |   | mineralization.   |   | trend                   |          |
|         | 30+00E | 77+87N   | 78+12N | 3      |      | -           |   |   |   |                         |          |
|         | 31+00E | 77+50N   | 78+25N | 4      | -    | -           |   | The <b>I-07</b> trend is located at a depth of about 150 m in the south western part of the grid.                 |   |                         |          |
|         | 31+50E | 77+50N   | 78+25N | 4      | -    | -           |   | Inversion results in this zone are questionable.  | DDH:         I-07-1           Line:         33+00E           Station:         75+50N           Azimuth:         0           Dip:         -90           Depth:         175 m | 33+00E                  |          |
| I-07    | 32+00E | 77+50N   | 78+25N | 4      | -    | -           | 250 m<br>East, open<br>to the east<br>& south | Additional IPower3D <sup>®</sup> survey<br>lines to the west and south<br>may help to better define this<br>zone. |   | 0<br>-90                | 3        |
|         | 32+50E | 77+50N   | 78+25N | 4      | -    | -           |   | This target is suggested for drilling, however the  | Dr This is an extension of <b>I-01d-1</b>   |                         |          |
|         | 33+00E | 77+50N   | 78+25N | 4      | -    | -           |   | questionable nature of this<br>anomaly should be<br>considered when prioritizing.                                 |   |                         |          |
|         | 32+00E | 80+00N   | 80+50N | 3      | -    | -           |   | <b>I-08</b> is a short, near surface chargeability anomaly  |   |                         |          |
| I-08    | 32+50E | 80+00N   | 80+50N | 2      | -    | (R)         | 100 m<br>East                                 | extending from surface to a<br>depth of about 25 m. This<br>feature is likely at, or near                         | P: Along trend  | Along trend             | 3        |
|         | 33+00E | 80+00N   | 80+50N | 3      | -    | (R)         |   | surface and should be<br>investigated by prospecting or<br>trenching.   |   |                         |          |



|         |        | Location |        | Cont   | rast | Magnetic    |                        | Recommendations   |  |          |  |
|---------|--------|----------|--------|--------|------|-------------|------------------------|---|--|----------|--|
| Anomaly | Line   | From     | То     | Charg. | Res. | Association | Length & Orientation   | Comments  | P: Prospecting<br>DDH: Drilling<br>X: Survey extension | Priority |  |
|         | 29+50E | 81+25N   | 81+75N | 4      |      | -           |                        | <b>I-09</b> is a chargeable trend that appears to be related to the   |  |          |  |
|         | 30+00E | 81+00N   | 81+75N | 4      |      | -           |                        | Catharine fault, although the<br>chargeable zone does extend<br>into the more resistive<br>material on each side of the | chargeable zone does extend                            |          |  |
| I-09    | 30+50E | 79+75N   | 81+75N | 4      | (R)  | M-02b       | 230 m                  |   | Line: 31+00E<br>Station: 80+50N                        | 2        |  |
| 1-03    | 31+00E | 80+50N   | 81+75N | 4      |      | M-02b       | East                   | fault. This trend may also be<br>linked to <b>I-07</b> anomaly;<br>however, the inversion at this                       | Azimuth: 0<br>Dip: -70                                 | 2        |  |
|         | 31+50E | 80+75N   | 81+75N | 4      |      | -           | depth is questionable. | Depth: 200 m  |  |          |  |
|         | 32+00E | 80+75N   | 81+50N | 4      |      | -           |                        | Drilling of this target is recommended.   |  |          |  |

|               | Legend    |   |  |  |  |  |  |  |  |  |  |
|---------------|-----------|---|--|--|--|--|--|--|--|--|--|
| Chargeability | Increase: | ? = Marginal<br>1 = Weak<br>2 = Moderate<br>3 = High<br>4 = Very High   |  |  |  |  |  |  |  |  |  |
|               | Increase: | <ul> <li>↑ = Resistive</li> <li>↑↑ = Very Resistive</li> <li>(R) = Wide Resistive Zone</li> </ul>   |  |  |  |  |  |  |  |  |  |
| Resistivity   | Decrease: | $\begin{array}{l} \downarrow = \text{Conductive} \\ \downarrow \downarrow = \text{Very Conductive} \\ (\text{C}) = \text{Wide Conductive zone} \end{array}$ |  |  |  |  |  |  |  |  |  |



### DAILY REPORT OF THE GEOPHYSICAL SURVEY PERFORMED ON THE MILLER GOLD PROJECT

| Date                  | 14N001, Northstar Gold Corp., Miller Gold Project<br>IPower3D <sup>®</sup> IP Survey   |               | Invoicing    |                    |                    |  |  |  |  |  |
|-----------------------|--|---------------|--------------|--------------------|--------------------|--|--|--|--|--|
| (yyyy-mm-dd)          | Comments   | Mob/<br>demob | Stand<br>-by | ATV/<br>Snowmobile | Production<br>(km) |  |  |  |  |  |
| Project geophysicist: | Thomas Loader  |               |              |                    |                    |  |  |  |  |  |
| Crew chief:           | Christian Larochelle   |               |              |                    |                    |  |  |  |  |  |
| Assistants:           | Simon Rioux, Michaël Picard-Rousson, Samuel Charette, Kevin Lussier, Christian Larochelle  |               |              |                    |                    |  |  |  |  |  |
| 2014-01-31            | Briefing & preparation.  |               |              |                    |                    |  |  |  |  |  |
| 2014-02-02            | Val-d'Or -> Kirkland Lake. Find grid access.   | 1             |              | 2                  |                    |  |  |  |  |  |
| 2014-02-03            | Safety meeting - Installation of first IPower3D <sup>®</sup> array.  |               |              | 3                  |                    |  |  |  |  |  |
| 2014-02-04            | Installation of first IPower3D <sup>®</sup> array.   |               |              | 3                  |                    |  |  |  |  |  |
| 2014-02-05            | Testing of first IPower3D <sup>®</sup> array – Start data acquisition Lines 25+00E, 25+00E, 26+00E, 26+50E & 27+00E, 73+50N to 75+75N. |               |              | 3                  | 1.125              |  |  |  |  |  |
| 2014-02-06            | Survey 25+00E, 25+00E, 26+00E, 26+50E & 27+00E.  |               |              | 3                  | 2.625              |  |  |  |  |  |
| 2014 02 07            | Survey 25+00E, 25+00E, 26+00E, 26+50E & 27+00E.  |               |              | 3                  | 1.6875             |  |  |  |  |  |
| 2014-02-07            | Survey 26+50E, 27+00E, 27+50E, 28+00E & 28+80E.  |               |              | 3                  | 0.5625             |  |  |  |  |  |
| 2014-02-08            | Survey 26+50E, 27+00E, 27+50E, 28+00E & 28+80E.  |               |              | 3                  | 1.6875             |  |  |  |  |  |
| 2014-02-09            | Survey 26+50E, 27+00E, 27+50E, 28+00E & 28+80E.  |               |              | 3                  | 1.0125             |  |  |  |  |  |
| 2014-02-10            | Survey 29+00E, 30+00E, 31+00E 32+00E & 33+00E.   |               |              | 3                  | 2.625              |  |  |  |  |  |
| 2014-02-11            | Pick up equipment and demobilization.  | 1             |              | 3                  | 0                  |  |  |  |  |  |
|                       | TOTAL  | 2             | 0            | 32                 | 11.325             |  |  |  |  |  |



# **APPENDIX C**

### INDUCED POLARIZATION SURVEY – VERTICAL SECTION IPOWER3D®

NORTHSTAR GOLD CORP.