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Quantec Geoscience Inc.
Geophysical Survey Assessment Report

2.24232

Quantec

Regarding the
IP/RESISTIVITY and
MAGNETIC FIELD SURVEYS
at the NIGHTHAWK LAKE PROPERTY,
Cody, Macklem Twps., ON
on behalf of
KINROSS GOLD CORPORATOIN

QGI QGI QGI QGI QGI

David Eastcott
Daniel Lapointe
G. R. J. Warne
June, 2002
Project QG-231

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

1. INTRODUCTION

- **QGI Project No:** QG-231, (QG-229)
- **Project Name:** Nighthawk Lake Property
- **Survey Period:** QG-229:February 14th to 21st ; 2002
  QG-231: March 6th to 21st, April 14th to 19th, 2002
- **Survey Type**: Induced Polarization and Resistivity, Total Magnetic Field
- **Client:** Kinross Gold Corporation.
- **Client Address** 40 King Street West
  57 floor, Scotia Plaza
  Toronto, ON
  M5H 3Y2

2.24232

- **Representative:** Peter Harvey
- **Objectives:** To map IP, resistivity and total magnetic field signatures over the Nighthawk Lake property in order to assist in mapping lithology, alteration, structure and zones of mineralization potentially hosting gold mineralization similar to the **Hopson** and **Deadman's Island** gold deposits, which occur on the property. The IP and resistivity signatures over the **Hopson** and **Deadman's Island** deposits have been mapped by previous similar surveys (Ref QGI project QG-229, March, 2002). The results of reconnaissance gradient coverage from those surveys have been compiled and presented with the present survey results.
- **Report Type:** Assessment Report

2. GENERAL SURVEY DETAILS

2.1 LOCATION

- **Township:** Cody, Macklem Townships
- **Province/Territory:** Ontario
- **Country:** Canada
- **Nearest Settlement:** Porcupine
- **NTS Reference #:** 42-A/7
- **General Location:** 20 km East of Porcupine, Ontario

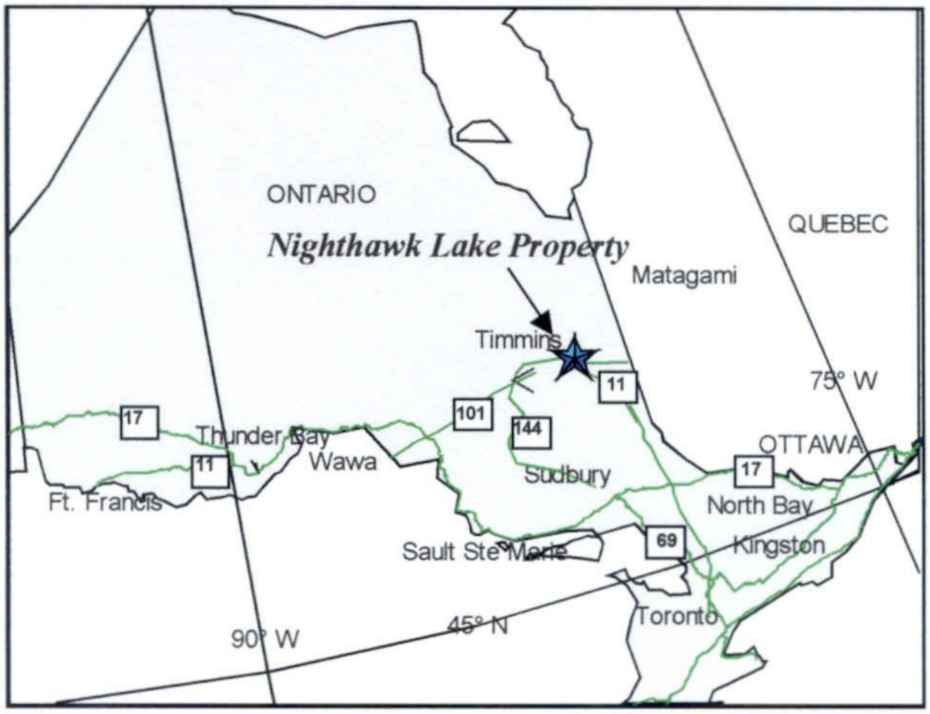


Figure 1: General Location of the Nighthawk Lake Property

2.2 Property Topography and Vegetation

The majority of the survey grid overlies Nighthawk Lake. Nighthawk Lake is known for its shallow water and mud/clay bottom. Water depths in the range from 0-2 meters were encountered.

Approximately 15% of the grid covered land, where overburden was predominantly sandy clay. There is occasional outcrop exposure, particularly at the shoreline of islands and occasional small outcrops, which protrude through the lake sediments. The vegetation present on the areas of land included spruce, cedar, poplar, with some birch and pine in dryer areas.

2.3 Property Geology

The Nighthawk Lake property overlies the Nighthawk Break, an ENE - WSW trending structural fabric parallel and proximal to a regional, structure related diabase dyke system. The dyke system has been delineated by mapping, or interpreted from airborne magnetic surveys, for several hundred kilometers across NE Ontario and NW Quebec, and crosscuts the Porcupine Destor structural zone approximately 10 kilometers to the ENE, near Reid Lake. The Nighthawk Lake area is further cross cut by faulting paralleling the regional, SSE to NNW striking Montreal River and Englehart River faults. The property hosts a number of precious metals deposits and occurrances, including Nighthawk Lake, Goldhawk and Gold Island, some of which have been developed and mined, most recently by Royal Oak Mines Inc during the 1990's.

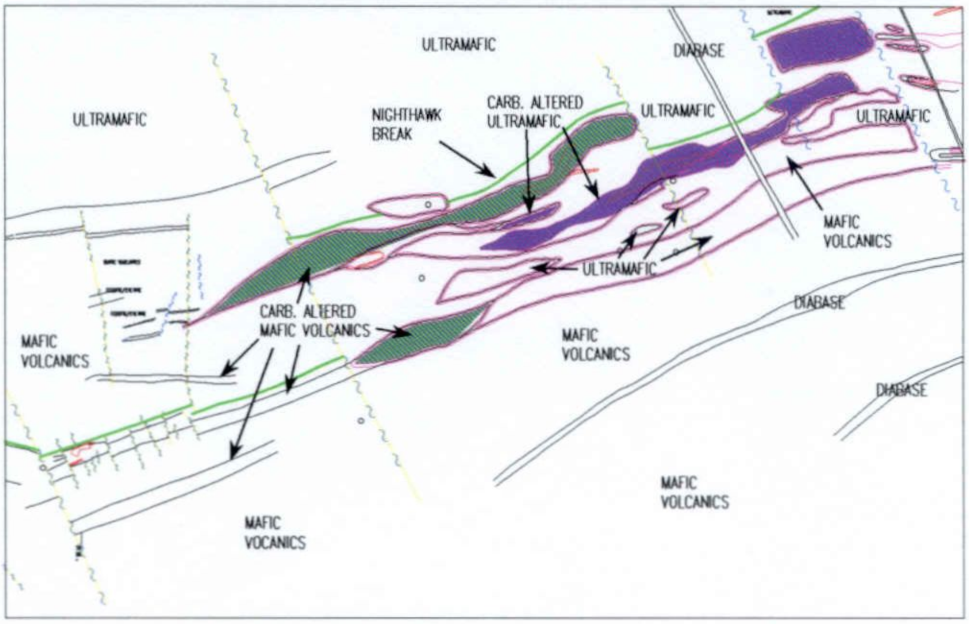


Figure 2: Nighthawk Lake Property Geology

2.4 Access

- **Base of Operations:** Porcupine, Ontario
- **Mode of Access:** The grid was accessed by 4x4 truck

using the Nighthawk Lake Mine road and via snowmobile.

2.5 SURVEY GRID

- **Coordinate Reference System:** Local exploration grid
- **Established:** prior to survey execution
- **Line Direction:** 340°
- **Line Separation:** 200 feet
- **Station Interval:** 50 feet
- **Method of Chaining:** Imperial, Slope-Distance
- **Claims Covered:** P8357, P8356, P15604, P10656, P9421, P9334, P9422, LO 931 Parcel C, LO 3244 Parcel D, P1188861, P546627, HR1, 12509, P546625, P552624, P546623, P546619, P546620, P546621, P546622, LO 3244 Parcel E, 12579, 12679, P1129803.

3. SURVEY WORK UNDERTAKEN

3.1 GENERALITIES

3.1.1 IP/Resistivity

- **Survey Dates:** February 14th to 21st, 2002
  March 6th to 21st, April 14th to 19th, 2002
- **Survey Period:** 29.5 days
- **Survey Days (read time):** 21.5 days
- **Breakdown Days:** 5 days
- **Weather/Standby Days:** 0.5 days (telluric noise)
- **Survey Coverage:** 122,400 line feet

3.1.2 Total Magnetic Field

- **Survey Dates:** April 17th to 18th, 2002
- **Survey Period:** 2 days
- **Survey Days (read time):** 2 days
- **Survey Coverage:** 50,050 line feet

3.2 PERSONNEL

- **Project Manager:** Jeffrey Warne, South Porcupine, ON
  David Eastcott, Porcupine, ON
- **Geophysical Technicians:** David MacGillivray, Matachewan, ON
- **Field Assistants:** Brodie Johnston, Orillia, ON
  Alain Dufour, Gatineau, QC
  Eric Hotvedt, Ramour, ON
  Bobbie Gerrie, Timmins, ON

3.3 SURVEY SPECIFICATIONS

3.3.1 IP/Resistivity

- **Array:** Gradient (see Figure 2)
- **AB (Transmit dipoles)** 6000 feet, Lines 8600W, 6600W, 4600W, 4200W, 2200W

- **MN (Rx dipole spacing):** 50 feet
- **Sampling Interval:** 50 feet
- **Total Blocks:** 5
- **Approximate Arial Coverage:** 19,360,000 feet^2

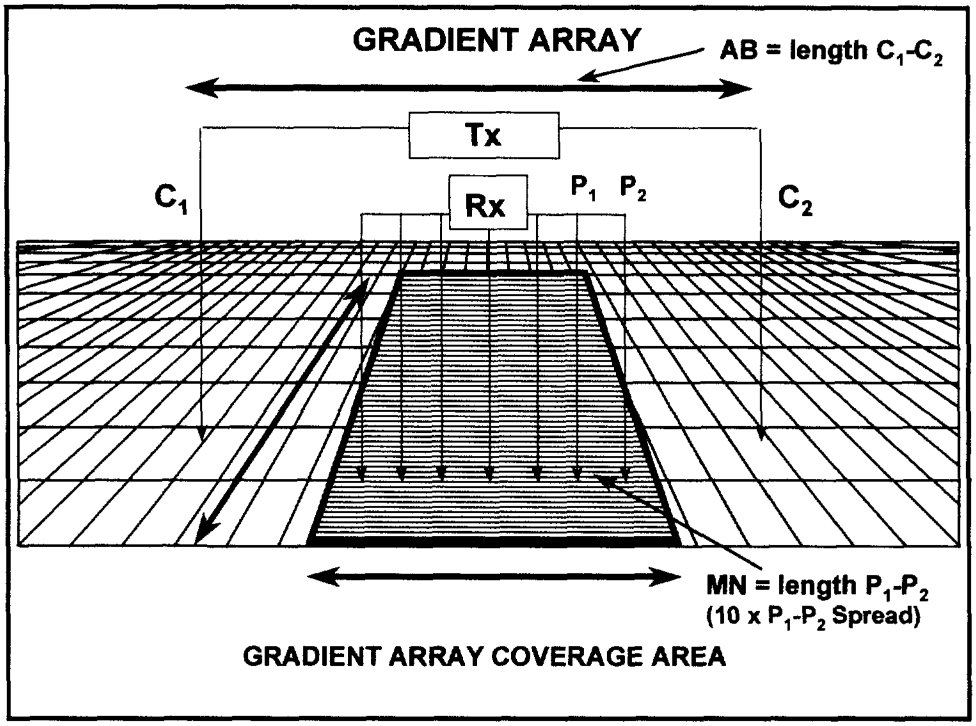


Figure 3: Gradient Array Layout

3.3.2 Total Magnetic Field

- **Diurnal Drift Correction:** Time synchronized base station magnetometer.
- **Base Station Location:** Line 9800W, 900N.
- **Base Station Magnetic Field:** 56,921 nT
- **Reference Field (Datum):** 57,000 nT
- **Base Station Sampling:** 3 seconds
- **Sampling Interval:** 2 second "Walking Mag" continuous profiling interpolated between 50 feet station reference.
- **Approximate Arial Coverage:** ~9,000,000 feet^2

3.4 SURVEY COVERAGE

- **Reconnaissance Gradient IP:** 122,400 line feet (see Table I)

LINE	MINIMUM EXTENT	MAXIMUM EXTENT	TOTAL (Feet)
Deadman Zone			
10000W	2700S	200S	2500
9800W	2800S	200N	3000
9600W	2800S	200N	3000
Block A			
9600 W (overlap)	1200 S	200 S	1000
9400 W	2500 S	0 N	2500
9200 W	2500 S	0 N	2500
9000 W	2500 S	0 N	2500
8800 W	2500 S	100 S	2400
8600 W	2500 S	0 N	2500
8400 W	2500 S	0 N	2500
8200 W	2500 S	0 N	2500
8000 W	2500 S	0 N	2500
7800 W	2500 S	0 N	2500
7600 W	2500 S	0 N	2500
Block B			
7600 W (overlap)	1500 S	500 S	1000
7400 W	2500 S	0 N	2500
7200 W	2500 S	0 N	2500
7000 W	2500 S	0 N	2500
6800 W	2500 S	0 N	2500
6600 W	2500 S	0 N	2500
6400 W	2500 S	0 N	2500
6200 W	2500 S	0 N	2500
6000 W	2500 S	0 N	2500
5800 W	2500 S	0 N	2500
5600 W	2500 S	0 N	2500
5400 W	2500 S	0 N	2500
Block C			
5400 W (overlap)	1500 S	500 S	1000
5200 W	2500 S	0 N	2500
5000 W	2500 S	0 N	2500
4800 W	2500 S	0 N	2500
4600 W (overlap)	500 S	0 N	500
Block D			
4600 W	2500 S	0 N	2500
4400 W	2500 S	0 N	2500
4200 W	2500 S	0 N	2500
4000 W	2500 S	0 N	2500
3800 W	2500 S	0 N	2500
3600 W	2500 S	0 N	2500
3400 W	2500 S	0 N	2500
3200 W	2500 S	0 N	2500
Block E			
3200 W (overlap)	1000 S	0N	1000
3000 W	1800 S	1700 N	3500
2800 W	1800 S	1700 N	3500
2600 W	1800 S	1700 N	3500
2400 W	1800 S	1700 N	3500
2200 W	1800 S	1700 N	3500
2000 W	1800 S	1700 N	3500

Hopson Zone			
400W	1800 S	2200N	4000
200W	1800 S	2200 N	4000
000E	1800 S	2200 N	4000

Table I: Reconnaissance TDIP Survey Coverage.

- **Total Magnetic Field:** 50,050 feet (see Table II)

Line	MINIMUM EXTENT	MAXIMUM EXTENT	TOTAL (Feet)
10000 W	2800 S	300 S	2500
9800 W	2800 S	0 N	2800
9600 W	2800 S	0 N	2800
9400 W	2500 S	0 N	2500
9200 W	2500 S	0 N	2500
9000 W	2500 S	0 N	2500
8800 W	2500 S	100 S	2400
8600 W	2500 S	100 S	2400
8400 W	2500 S	0 N	2500
8200 W	2500 S	800 S	1700
8000 W	2500 S	1050 S	1450
7800 W	2500 S	1700 S	800
7600 W	2500 S	1800 S	700
7400 W	2500 S	750 S	1750
7200 W	2500 S	650 S	1850
7000 W	2500 S	300 S	2200
6800 W	2500 S	300 S	2200
6600 W	2500 S	250 S	2250
6400 W	2500 S	500 S	2000
6200 W	2500 S	850 S	1650
5200 W	2500 S	0 N	2500
5000 W	2500 S	0 N	2500
4800 W	2500 S	0 N	2500
4600 W	2500 S	2150 S	350
4600 W	750 S	0 N	750

Table II: Total Magnetic Field Coverage

3.5 INSTRUMENTATION

- **Receiver:** Iris Elrec IP-10 (10 channel/Time Domain)
- **Transmitter:** Phoenix IPT-2B (15 kW / 600 - 2400V output)
- **Power Supply:** Phoenix MG-15 (30KVA, 120V, 3 phase, 400 Hz) motor generator
- **Magnetometers:** GEM Model GSM-19 Overhauser-type manufactured by GEM Systems, Toronto, ON.

3.6 PARAMETERS

3.6.1 IP/Resistivity

- **Input Waveform:** 0.0625 Hz square wave at 50% duty cycle (4 seconds On/Off)
- **Receiver Decay Sampling:** IRIS IP-10 cole-cole mode windows (see Table III)
- **Measured Parameters:**

1) Chargeability in millivolts/Volt across max. 20 time-gates, plus area under decay curve.

2) Primary Voltage in millivolts and Input Current in milli-amperes for Resistivity in Ω-m, calculated according to the gradient array geometry factor (Appendix C).

Slice	Duration (msec)	Start (msec)	End (msec)	Mid-Point (msec)
T_d	20	0	20	
T_1	40	20	60	40
T_2	50	60	110	85
T_3	60	110	170	140
T_4	70	170	240	205
T_5	80	240	320	280
T_6	90	320	410	365
T_7	100	420	520	470
T_8	110	520	630	575
T_9	120	630	750	690
T_{10}	140	750	890	820
T_{11}	160	890	1050	970
T_{12}	180	1050	1230	1140
T_{13}	200	1230	1430	1330
T_{14}	220	1430	1650	1540
T_{15}	250	1650	1900	1775
T_{16}	280	1900	2180	2040
T_{17}	320	2180	2500	2340
T_{18}	380	2500	2880	2690
T_{19}	450	2880	3330	3105
T_{20}	530	3330	3860	3595
Total T_p	**3840**			

Table III: IRIS IP-10 Decay Curve Sampling Specifications

3.6.2 Total Magnetic Field

- **Measured Parameters:** Total Magnetic Field (diurnal-corrected)

3.7 Measurement Accuracy and Repeatability

3.7.1 IP/Resistivity

- **Chargeability**: generally< ± 0.5 mV/V. Measurements over certain areas of shallow water on Nighthawk Lake, though repeatable, were found to be inaccurate due to electrode polarization. See Sec. 3.9, Operator Comments.

- **Resistivity:** less than 5% cumulative error from Primary voltage and Input current measurements.

3.7.2 TFM Survey

- **Total Magnetic Field**: generally< ± 3 nT after diurnal correction.

3.8 Data Presentation

- **Maps:** Posted contoured plan maps of Total Chargeability, Apparent Resistivity and Total Magnetic Field. Posted stacked profile maps of Total Magnetic Field (1:4800 scale).

- **Digital:**

  Raw data: IP-10 digital dump files, GEM-19 digital dump files (Appendix D).

  Processed data:

ASCII GEOSOFT .XYZ format, (eg. NHL.XYZ), using the following format:

Header Lines:	Identified by "/" in 1st column, containing Header information, including Line, Array, Dipole, Units, etc.
Column 1:	Plot-point Station Easting (feet)
Column 2:	Plot-point Station Northing (feet)
Column 3:	Apparent Total Chargeability (millivolts per volt)
Column 4:	Apparent Resistivity (ohm-metres)
Column >4 =	TDIP Spectral Estimates (M, Tau) @ c=0.25 from IP-10

3.9 Operator Comments

The progress of gradient IP/Resistivity surveys at the Nighthawk property was hampered by an unusual difficulty in obtaining accurate chargeability measurements in particular portions of the exploration grid. Approximately 6.5% of the survey coverage was affected. The following provides a detailed summary of the areas of the grid where this difficulty was encountered, the troubleshooting, evaluation and resolution actions taken and the influence to survey progress and finally, the significance with respect to the final survey results.

The regions affected were the area immediately surrounding Deadman's Island and extending eastward from Deadman's Island through the region bounded by the mainland to the north, and east, and Callinan Island to the south and, to a lesser extent, between the mainland and Auer Island. The following table details the portions of coverage affected on a line by line basis.

LINE	MINIMUM EXTENT	MAXIMUM EXTENT	TOTAL (Feet)
Block A			
9600 W (overlap)	1200 S	200 S	1000
9400 W	2500 S	0 N	2500
9200 W	1300 S	600 S	700
9000 W	1600 S	400 S	1200
8800 W	1450 S	550 S	900
8600 W	1700 S	850 S	850
8400 W	1550 S	950 S	600
7600 W	1900 S	1700 S	200
Block B			
7400 W	1900 S	180 S	100
6800 W	1200 S	900 S	300
6600 W	1000 S	750 S	250
6400 W	1200 S	900 S	300
6200 W	1100 S	800 S	300
6000 W	1000 S	850 S	150
5800 W	1050 S	950 S	100
5600 W	1100 S	850 S	250
Block C			
5400 W	1600 S	1400 S	200

The symptoms of the difficulty were typified by relatively abrupt lateral changes in chargeability. For example on line 90+00W chargeabilities at 1025S and 1075S were measured at -3.6 and 9.2 respectively. Such signatures are sometimes referred to as "High-Low". Similar signatures were first noted during orientation coverage over the Deadman's Island zone (ref. Project QG-229). In relation to the orientation survey results, while only 6 to 8 measurement locations were affected, these occurred over areas of interest and were thus detrimental to the survey objectives. It was observed that, while measurements appeared accurate, repeat measurements taken after removal and replacement of receive electrodes were not always repeatable for measurements exhibiting the noted symptoms. None the less, there was insufficient information to establish concise correlation leading to an understanding of the cause. Such signatures are not considered consistent with variations in bedrock geology in this environment of conductive clay overburden cover. However, the signatures could represent the influence of localized culture, such as metal drill casing within the overburden.

When surveying of block A (Lines 9600W to 7600W) commenced and progressed through lines 9400W to 8600W it became evident that a more substantial area was exhibiting similar "high-low" chargeability signature behaviour. Initial coverage over portions of lines 9200W and 9000W was re-surveyed providing sufficient evidence that measurements exhibiting "high-low" chargeability signatures were not consistently repeatable when measurements sites were re-occupied, despite the apparent accuracy of individual measurements. This suggested the signatures could be related to the receive electrode contacts. Furthermore it was recognized that there was a spatial correlation with shallow water areas of the lake. By experimentation it was found that small but significant changes in the measured chargeability were sometimes produced by pushing the receive electrodes deeper into the clay underlying the lake. None the less, identification of the cause (and rectification) remained elusive.

After completion of additional survey coverage over lines 8800W to 8000W more extensive re-survey coverage was undertaken to isolate potential electrode effects which could be influencing the chargeability measurements. Steps taken included swapping in newly prepared electrodes, swapping electrode connection cables and acquiring measurements with a different receiver to verify that the problem was not associated with instrumentation or cable. Further steps included drilling larger diameter auger holes to reduce electrical contact between ice and slush and the upper part of the receive electrodes. A note-able elimination of "high-low" signatures was achieved with larger auger holes but only where the water depth above the clay lake bottom was minimal. In this condition, the larger auger hole removed water saturated slush thus isolating the receive electrode to contact with only the clay lake bottom. This provided strong evidence that the "high-low" signatures, being in shallow water regions, was related to the receive electrode contacts. It appears to be related to a polarization effect occuring between the bottom of the receive electrodes, in contact with the lake bottom clay, and the top portion of the receive electrode, in contact with ice and meltwater within the holes augered through the lake ice. While this detrimental influence was identified at this stage, devising an electrode configuration that could eliminate the influence was not yet at hand. It should be noted that the high accuracy of the orientation results at the Hopson Zone and over the deeper water and the land areas, representing the bulk of the Nighthawk grid, speak to the effectiveness of the receive electrode configuration (stainless steel rods 3 feet long) which was initially devised for the survey.

A set of much smaller 8 cm long stainless steel electrodes, which could be more easily isolated from contact with slush and melt-water by pushing them entirely into the clay lake bottom was prepared and tested, however they did not provide sufficiently stable contact, likely due to insufficient size. Survey work was stopped March 21st, at the request of Kinross for unrelated reasons, prior to arriving at a solution.

Upon resumption of the survey program in April a revised electrode configuration was implemented which eliminated the problem.

Both the magnetic field and IP/Resistivity surveys were halted prior to completion of the full survey grid due to the onset of spring break-up resulting in unsafe ice conditions on Nighthawk Lake. The magnetic survey coverage that was completed was restricted the extent of survey lines over the lake in order to complete as much as possible prior to the loss of the ice.

4. RESULTS

Reconnaissance IP/Resisitivity survey coverage was completed over approximately 60% of the Nighthawk Lake exploration survey grid. Magnetic field surveys were completed over approximately 30% of the grid. For both surveys, the completed work was over the west fraction of the grid. The results are discussed in relation to the current interpretation of the property geology as provided by Kinross.

The results of IP/Resistivity and magnetic field surveys over the Nighthawk Lake property provide plan maps of variation in Apparent Total Chargeability, Apparent Resisitivity and Total Magnetic field over the property. Each of these physical properties is uniquely associated with mineralogical and/or textural fabric characteristics of the subsurface.

Since the majority of rock forming minerals are not electrical conductors, the Apparent Resistivity (or it's mathematical inverse, Conductivity) is most generally influenced by variations in porousity and permeability, associated with electrical conductivity through pore fluids within the subsurface rocks and overburden. More rare occurrences of massive concentrations of electrically conductive mineralization (e.g. massive metallic sulphides) also influence the resistivity. The magnetic field is sensitive to magnetic mineral content, most commonly magnetite. The chargeability is sensitive to chargeable metallic mineralization content, primarily metallic sulphides and oxides, and semi-metallic graphite. While each of these properties is physically unique, there is considerable overlap in minerals which have these properties. For example, magnetite is magnetic, chargeable and conductive, as is pyrrhotite.

4.1 Resistivity Results

The apparent resistivity results over the Nighthawk Lake property range from approximately 200 to 20,000 ohm-meters, although only a small percentage of values exceed 5,000 ohm-m. Overall, the resistivities increase gradually from ENE to WSW on a regional scale. Higher resistivities, > 1000 ohm-m, are predominantly located within a broad zone trending ENE to WSW through the central region of the grid. The north boundary of this resistive region corresponds with the previously interpreted axes of the Nighthawk Break. Numerous discontinuities delineate NE to SW, E to W and SSE to NNW lineaments, some of which correspond with SSE to NNW fault structures known or interpreted from previous exploration of the property. Within the broad resistive zone, are located a pair of parallel resistive zones, >2000 ohm-m, encompassing the majority of the highest resistivities mapped by the survey. These correspond with the known and/or interpreted location of carbonatized mafic rocks crosscutting the western half of the property. The Deadman's Island deposit occurs within the northmost of these, at the west limit of the survey grid.

4.2 Magnetic Field Results

The total magnetic field over the completed portion of the Nighthawk Lake grid ranges from 56,800 to 57,800 nT, averaging approximately 57,100 nT decreasing gradually from ENE to WSW. The results feature a zone of increased magnetic field over a strike length of ~ 1,400 feet across lines 10000W to 8600W. This feature follows an overall ENE to WSW trend, but in more detail appears to consist of several offset E-W trending segments. The signature has a magnitude as much as 1,000 nT greater than background. The signature has a wavelength of approximately 600 feet, indicating a depth of approximately 300 feet to the top of the source. The signature is assymetric, with its assymetry indicating the source dips southward. The Deadman's Island deposit is located along the north margin of this feature.

A SE to NW trending signature trends across lines 8600W to 8200W through Callinen Island, suggesting a possible diabase dyke segment.

Linear trends in the magnetic signatures over the remainder of the coverage range from ENE to WSW, to SE to NW, with E to W lineaments forming the dominant trend. As with the resisitivity results, discontinuities highlight potential fault offsets, predominantly along SSE to NNW trends. Localized response signatures having short wavelengths of < 50 feet, but strong magnitudes of a few to several hundred nT which may be locating culture such as drill hole casings, were measured at a few locations. The lineaments and boundaries delineated by the magnetic field signatures are emphasized in the calculated vertical magnetic gradient.

4.3 CHARGEABILITY RESULTS

The apparent total chargeability over the Nighthawk Lake property is very low in magnitude, ranging from 0.5 to 5 mV/V. The low overall response level is undoubtedly due in part to attenuation effects resulting from the overburden cover. On a regional scale the chargeability appears to define two background domains. In the northeast and west regions of the grid, background chargeabilities are slightly higher, > 2mV/V. Chargeabilities are generally < 2 mV/V in the central and southeast regions of the grid. A low pass, non-linear filter, with a 50 feet wavelength and 5% amplitude tolerance was applied, which has removed some of the electrode polarization influence in those areas affected (see table IV, sec 3.9). The strongest, most well defined chargeability anomalies are located proximal to the known precious metals deposits, the Deadman's Island Zone at the west end of the grid, and the Hopson Zone at the east. In both cases the chargeability anomalies are located adjacent to, rather than coincident with the surface projection locations of the deposits. Narrow, sinuous, weakly anomalous chargeability axes crosscut the grid predominantly defining ENE to WSW lineaments. The signatures are similar to signatures measured over the Hopson Zone. The signatures are consistent with the narrow, elongate footprint of the known deposits, and their relatively small volume. Sixteen target zones have been identified based on anomalous chargeability signatures of this type. These have been differentiated based on the following criteria:

a) Location along margins of potential carbonate altered horizons as delineated by increased resistivity, in conjunction with zones of reduced magnetism, indicative of potential magnetite depletion, or along margins of increased magnetism indicative of potential ultramafic contact, or

b) Location within potential carbonate altered horizons, associated with reduced magnetism and potential cross-cutting structure.

Reduced priority has been assigned where the target zones do not have all of the priority signature elements, which includes those selected in areas where magnetometer survey coverage was not completed.

Anomaly	Line	From	To	Res	IP	Mag	Priority
A	9000W	1300S	1450S	HIGH	HIGH	EDGE	1
	9200W	1250S	1350S	HIGH	HIGH	EDGE	
	9400W	1250S	1350S	HIGH	HIGH	EDGE	
B	8400W	950S	1050S	HIGH	HIGH	EDGE	1
	8600W	1000S	1100S	HIGH	HIGH	EDGE	
C	7000W	700S	800S	HIGH		EDGE	1
	7200W	650S	750S	HIGH	HIGH	EDGE	
D	6400W	650S	900S	HIGH	HIGH	EDGE	1
	6600W	950S	1050S	HIGH	HIGH	EDGE	
E	9000W	1300S	1450S	LOW	HIGH	HIGH	1
	9200W	1250S	1350S	LOW	HIGH	HIGH	
	9400W	1250S	1350S	LOW	HIGH	HIGH	
F	8000W	850S	950S	HIGH		N/C	2
	8200W	800S	900S	HIGH	HIGH	N/C	

G	7600W	900S	1050S	HIGH		N/C	2
	7800W	1050S	1200S	HIGH	HIGH	N/C	
	8000W	1000S	1150S	HIGH		N/C	
H	5200W	450S	550S			EDGE	2
	5400W	400S	550S		HIGH	N/C	
	5600W	300S	400S	HIGH		N/C	
	5800W	250S	400S	HIGH		N/C	
	6000W	300S	400S	HIGH		N/C	
I	4800W	950S	1050S	HIGH		HIGH	2
	5000W	900S	1000S	HIGH		EDGE	
	5200W	900S	1000S			EDGE	
J	9400W	1625S	1675S	HIGH			1
	9600W	1625S	1675S	HIGH			
K	8800W	2100S	2250S	HIGH		EDGE	1
	9000W	2100S	2250S	HIGH		EDGE	
	9200W	2150S	2300S	HIGH		EDGE	
L	8000W	1500S	1700S	HIGH	HIGH	EDGE	1
	8200W	1450S	1700S	HIGH	HIGH		
	8400W	1450S	1700S	HIGH	HIGH	EDGE	
M	7200W	1750S	1850S	HIGH	HIGH	EDGE	1
	7400W	1650S	1850S	HIGH	HIGH	EDGE	
	7600W	1700S	1850S	HIGH	HIGH	EDGE	
	7800W	1650S	1800S	HIGH	HIGH		
N	6200W	1850S	1950S	HIGH	HIGH	EDGE	1
	6400W	1750S	1950S	HIGH		EDGE	
	6600W	1800S	1900S	HIGH		EDGE	
O	5000W	1500S	1600S			EDGE	2
	5200W	1500S	1600S	HIGH		EDGE	
	5400W	1550S	1650S	HIGH		N/C	
P	0W	300S	650S		MOD	N/C	2
	200W	250S	550S		MOD	N/C	
	400W	250S	550S	HIGH	MOD	N/C	

Table IV: Geophysical Exploration Targets

5. CONCLUSIONS AND RECOMMENDATIONS

The results of Induced Polarization, Resistivity and Magnetic Field surveys over the Nighthawk Lake property have provided detailed mapping of variations in these physical properties. The physical property variations are predominantly associated with characteristics of the bedrock geology and have therefore provided valuable delineation of lithologic, structural, alteration and mineralization features.

The magnetic field survey results have delineated a previously undifferentiated zone of increased magnetite content in the west region of the exploration grid. Since the Deadman's Island deposit occurs along the margin of this feature, investigation of the geologic explanation for the feature and potential relationship to mineralization of interest is recommended.

The resisitivity results have delineated zones of increased resisitivity which spatially correspond with carbonate alteration zones within mafic volcanic lithology. Based on this relationship, the resistivity has assisted in delineating the location of this alteration horizon.

The overall distributions of magnetic, resisitivity, and chargeability have assisted in delineating potential crosscutting geologic structures. Some of these may not have been previously identified, and may be of importance to the location of mineralization of interest.

The chargeability has delineated moderate well, defined chargeability anomalies proximal, but not coincident with the known Hopson and Deadman's Island deposits. Since similar anomalies are absent in the remainder of the area surveyed, investigation of the potential relationship of the source of these anomalies to precious metals mineralized zones is recommended.

The chargeability has further delineated weak, narrow, sinuous anomalies, which are similar to signatures measured over the Hopson Zone. The signatures are consistent with the narrow, elongate footprint of the known deposits, and their relatively small volume. Sixteen target zones, A through P (see table IV), have been identified on the basis of the geophysical results. Follow up investigation of these targets are recommended. Follow up investigation should commence with review of existing geoscientific data to determine if previous drill holes may have tested any of the target zones and review of any applicable results for explanation of the geophysical signatures. Follow up detailed IP/Resistivity surveys are recommended to provide high accuracy depth resolution for accurate drill testing of targets which remain unexplained.

A complete coverage of the property with a magnetic survey is recommended to assist in mapping the local geology.

Inversion modeling may be applied to magnetic survey results to enhance delineation of the sources of geophysical responses of interest.

Quantec further recommends borehole petrophysical measures to provide in situ quantification of physical property contrasts associated with mineralization, alteration , lithology and structure in ore zones and their surrounding host rocks.

Finally, these results should be combined into a common earth model, using GOCAD in order to provide better corroboration between the measured physical parameters and the geology.

RESPECTFULLY SUBMITTED
QUANTEC GEOSCIENCE INC.

G. R. Jeffrey Warne
Project Manager
Senior Geophysicist

APPENDIX A

STATEMENT OF QUALIFICATIONS

I, G.R. Jeffrey Warne, hereby declare that:

1. I am a geophysicist with residence in South Porcupine, Ontario and am presently employed in this capacity with Quantec Geoscience Inc. of Waterdown, Ontario.
2. I studied Engineering Geophysics in the Faculty of Applied Science at Queen's University in Kingston, Ontario, completing all but two of the course requirements for a B.Sc. (Eng.) in 1981.
3. I have practiced my profession continuously since May, 1981 in Canada, the United States, Australia, Argentina, Ireland, Mexico, Peru and Chile.
4. I am a member of the Ontario Association of Geoscientists, and the Porcupine Prospectors and Developers Association.
5. I have no interest, nor do I expect to receive any interest in the properties or securities of **Kinross Gold Corporation**.
6. I supervised the project field work, preparation of the final maps and co-authored this report. The statements made in this report represent my professional opinion based on my consideration of the information available to me at the time of writing this report.

Porcupine, Canada
June, 2002

G.R. Jeffrey Warne
Senior Geophysicist, QGI

APPENDIX B

PRODUCTION LOG

QG-229: NIGHTHAWK LAKE PROJECT					
RSIP Survey					
Date	**Description**	**Line**	**Min Extent**	**Max Extent**	**Total Survey (ft)**
14-Feb	J. Warne, J.Ploeger, A. Dufour, E. Dufour, E Hotvedt access site via Aquarius Mine road. Establish 6000 ft AB over Hopson Zone. Survey.	0+00E	200	2200	2000
	Did not require skidoos, daily rate reduced.	2+00W	2200	-800	3000
	Total Survey				5000
15-Feb	Survey	2+00W	-800	-1800	1000
		0+00E	-1800	200	2000
		4+00W	2200	-1800	4000
	Total Survey				8000
16-Feb	Survey RSIP on L200W, levels 2 - 17	2+00W	1000	500	7500
	Reconnoitre access for grid location at Deadman's Island grid. Used 2 trucks to allow side trip to Deadman's Island.		500	0	7850
	Total Survey				15350
17-Feb	Access Deadman's Island grid. Establish AB, survey.	100+00W	-300	-2800	2500
		98+00W	-2800	200	3000
		96+00W	200	-300	500
	Total Survey				6000
18-Feb	Disconnected powerline grounds. Survey. Chargeability results affected by disconnecting powerline grounds.	96+00W	-300	-2800	2500
	Survey RSIP on line 98+00W, levels 2 - 10	98+00W	-550	-1050	0
	Total Survey				2500
19-Feb	Equipment problems				
21-Feb	Resurvey base level for two lines	98+00W	200	-2700	2900
		100+00W	-200	-2700	2500
	4500ft AB	98+00W	-200	-1200	1000
		100+00W	-200	-1200	1000
	3800ft AB	98+00W	-200	-1200	1000
		100+00W	-200	-1200	1000
	3000ft AB	98+00W	-200	-1200	1000
		100+00W	-200	-1200	1000
	2300ft AB	98+00W	-200	-1200	1000
		100+00W	-200	-1200	1000
	1600ft AB	98+00W	-200	-1200	1000
		100+00W	-200	-1200	1000
	Total Survey				15400
	Total Project				**51750**

APPENDIX B

QG-231: NIGHTHAWK LAKE PROJECT						
RSIP Survey						
Date	Description	Block	Line	Min Extent	Max Extent	Total Survey (ft)
06-Mar	Establish 6000 foot AB on line 8600W @ 1800N & 4200S. Set up tent for transmitting, prepared read wires. Tested current, strong signal. Having to skidoo equipment down road and preparing camp takes longer then anticipated due to the amount of fresh snowfall.					
	Survey Charge					
	Snowmobile Charge					
07-Mar	Gradient Survey	A	9400W	0N	2500S	2500
		A	9600W	200S	1200S	1000
	Equipment problems, 1/2 day survey	A	9200W	2500S	1750S	750
	1/2 Day Survey Charge					4250
	1/2 day Skidoo Charge					
08-Mar	Gradient Survey. Repeated previous day's result but unable to proceed due to non-functional ice augers. Heavy snowfall, near blizzard conditions.	A	9200W	-2000	-1750	NA
	Down Day Survey Charge					0
09-Mar	Gradient Survey. Had to move Tx site for snowplows. Ice augers still problematic. Rain	A	9200W	-1750	0	1750
		A	9000W	0	-2500	2500
	Total Survey					4250
	Snowmobile Charge					
10-Mar	Gradient Survey. Attempted re-survey for spurious results on-strike of Deadman's Island. High winds, white-out conditions	A	9200W	-1500	-500	NA
		A	9000W	-400	-900	NA
	1/2 Day Survey Charge					
	1/2 day Skidoo Charge					
11-Mar	Gradient Survey. Picketing error on line 8800W @ 1500S lost 100 feet north.	A	8800W	-100	-2500	2400
	Picketing error on line 8600W between 800S, 200S, lost 100 feet north. Note correction required for north AB electrode location due to chaining error.	A	8600W	-2500	0	2500
		A	8400W	0	-2500	2500
		A	8200W	-2500	-1500	1000
	Total Survey					8400
	Snowmobile Charge					
12-Mar	Gradient Survey. Picketing error on line 8200W @ 500S lost 200 feet north. Bush	A	8200W	-1500	0	1500

	crashed extra stations.					
		A	8000W	-2500	-1000	1500
	Resurvey to determine cause and resolve spurious chargeabilities in shallow water areas.	A	8400W	-1000	-1700	NA
		A	8600W	-1850	-900	NA
	1/2 Day Survey Charge					3000
	1/2 day Skidoo Charge					
13-Mar	Resurvey	A	8600W	-1100	-600	NA
		A	8800W	-500	-1500	NA
		A	9000W	-1400	-400	NA
		A	9200W	-500	-1000	NA
		A	8600W	-1850	-1100	NA
		A	8400W	-1000	-1500	NA
	Gradient Survey.	A	8000W	-1000	0	1000
		A	7800W	0	-2000	2000
	1/2 Day Survey Charge					3000
	1/2 day Skidoo Charge					
14-Mar	Gradient Survey.	A	7800W	-2000	-2500	500
		A	7600W	-2500	0	2500
	Change AB to line 6600W (Block B).	B	7600W	-500	-1500	NA
		B	7400W	-1000	-2500	1500
	Total Survey					4500
	Snowmobile Charge					
15-Mar	Meet P.Harvey to review Block A results prior to departure to project site. Gradient Survey. Heavy Snow all day.	B	7400W	-2000	-2500	NA
	Advise linecutters to chain lines on lake until finished up to line 5600W, then complete the portions where cutting required.	B	7200W	-2500	-1000	1500
		B	7000W	-500	-2500	2000
		B	6800W	-2500	-500	2000
		B	6600W	-500	-2500	2000
		B	6400W	-2500	-1500	1000
	Total Survey					8500
	Snowmobile Charge					
16-Mar	Gradient Survey.	B	6400W	-1500	-500	1000
		B	6200W	-1000	-2500	1500
		B	6000W	-2500	-1000	1500
		B	5800W	-1000	-2500	1500
		B	5600W	-2500	0	2500
	Total Survey					8000
	Snowmobile Charge					
17-Mar	Gradient Survey.	B	5600W	-500	0	NA
		B	5800W	0	-1000	1000
		B	6000W	-1000	0	1000
		B	6200W	0	-1000	1000

		B	6400W	-500	0	500
		B	6600W	0	-500	500
		B	6800W	-500	0	500
		B	7000W	0	-500	500
		B	7200W	-1000	0	1000
	Change AB to line 4600W (Block C).	C	7400W	0	-1000	1000
	Total Survey					7000
	Snowmobile Charge					
18-Mar	Attempted readings but found Low freq. Telluric noise. Added electrodes to AB increasing current from 7.5 amps to approx 10 amps, howver Tx could not operate at 10 amps. Apparent problem with 30 kVA alternator. Down day					
	Down Day Survey Charge					
19-Mar	Replacement genset in-operable lost morning rectifying wiring to Tx and swapping motor. Telluric noise still present but not as strong as yesterday.					
	Gradient Survey.	C	5600W	-1500	-500	NA
		C	5400W	0	-1500	1500
	1/2 Day Survey Charge					1500
	1/2 day Skidoo Charge					
20-Mar	Gradient Survey. Snow, moderate wind until mid afternoon. Telluric noise continues requiring additional stacking, and repeats.	C	5400W	-1500	-2500	1000
		C	5200W	-2500	0	2500
		C	5000W	0	-2500	2500
		C	4800W	-2500	0	2500
		C	4600W	0	-500	500
	Total Survey					9000
	Snowmobile Charge					
21-Mar	Retrieved AB wire and equipment on instructions to suspend the project.					
	1/2 Day Survey Charge					
	1/2 day Skidoo Charge					
	March Survey Charges					
14-Apr	Re-establish transmit dipole, 6000 foot AB on Line 4200W, 4200S to 1800N. Survey.	D	4600W	0	-2500	2500
		D	4400W	-2500	-2000	500
	Total Survey					3000
	Snowmobile Charge					
15-Apr	Survey.	D	4400W	-2000	0	2000
		D	4200W	0	-2500	2500
		D	4000W	-2500	0	2500
		D	3800W	0	-2500	2500
		D	3600W	-2500	0	2500
		D	3400W	0	-2500	2500
		D	3200W	-2500	0	2500
	Total Survey					17000

	Snowmobile Charge					
16-Apr	Establish transmit dipole, 6000 foot AB on Line 2200W, 3000N to 3000S.					
	Survey	E	3000W	1800S	1700N	3500
		E	2800W	1700N	1800S	3500
		E	2600W	1800S	300S	1500
	Total Survey					8500
	Snowmobile Charge					
17-Apr	Survey					
	Bad Tulluric Storm, data not repeatable					
	Ice conditions degrading rapidly					
	1/2 Day Survey Charge					
	1/2 day Skidoo Charge					
17-Apr	Walking Mag Survey. Base station was located at 900N on line 9800W		10000W	300S	2800S	2500
	57000 nT was used for base station corrections.		9800W	0	2800S	2800
			9600W	0	2800S	2800
			9400W	0	2500S	2500
			9200W	0	2500S	2500
			9000W	0	2500S	2500
			8800W	100S	2500S	2400
			8600W	100S	2500S	2400
	Total Survey					**20400**
18-Apr	Water over ice, ice conditions bad					
	AB wire pulled out of ice					
	Survey	E	2600W	300S	1700N	2000
		E	2400W	1700N	1800S	3500
		E	2200W	1800S	1700N	3500
		E	2000W	1700N	1800S	3500
	Total Survey					12500
	Snowmobile Charge					
18-Apr	Walking TFM Survey		8400W	0	2500S	2500
	Very bad ice. Lots of holes and knee deep slush		8200W	800S	2500S	1700
			8000W	1050S	2500S	1450
			7800W	1700S	2500S	800
			7600W	1800S	2500S	700
			7400W	750S	2500S	1750
			7200W	650S	2500S	1850
			7000W	300S	2500S	2200
			6800W	300S	2500S	2200
			6600W	250S	2500S	2250
			6400W	500S	2500S	2000
			6200W	850S	2500S	1650
	between 6200W & 5200W the ice was not safe		5200W	0	2500S	2500
			5000W	0	2500S	2500

			4800W	0	2500S	2500
	The power wire was on line 4200W and I re-ceived interference but did		4600W	0	750S	750
	not notice because I was watching for holes in the ice		4600W	2150S	2500S	350
	Total Survey					**29650**
19-Apr	Overnight thunderstorms make ice dangerous					
	AB wire recovered					
	Demob Timmins					
	1/2 Day Survey Charge					
	1/2 day Skidoo Charge					

APPENDIX C

THEORETICAL BASIS AND SURVEY PROCEDURES

GRADIENT REALSECTION INDUCED POLARIZATION SURVEY

The "RealSection" survey design uses multiple gradient arrays - with variable depths of investigation controlled by successive changes in array size/geometry. The method of data acquisition and the "RealSection" presentation are based on the specifications developed by Dr. Perparim Alikaj, of the Polytechnic University of Tirana, Albania, over the course of approx. 20 years of application. This technique has been further developed for application in Canada during the past six years, in association with Mr. Dennis Morrison, president of Quantec IP Inc.

The Gradient Array measurements are unique in that they best represent a bulk average of the surrounding physical properties within a relatively focused sphere of influence, roughly equal to the width of the receiver dipole, penetrating vertically downward from surface to great depths. These depth of penetration and lateral resolution characteristics are showcased when presented in plan, however through the use of multiple-spaced and focused arrays, the advantages of the gradient array are further highlighted when the IP/Resistivity data are fully developed in cross-section, using RealSections.

The resistivity is among the most variable of all geophysical parameters, with a range exceeding 10^6. Because most minerals are fundamentally insulators, with the exception of massive accumulations of metallic and submetallic ores (electronic conductors) which are rare occurrences, the resistivity of rocks depends primarily on their porosity , permeability and particularly the salinity of fluids contained (ionic conduction), according to Archie's Law. In contrast, the chargeability responds to the presence of polarizeable minerals (metals, submetallic sulphides and oxides, and graphite), in amounts as minute as parts per hundred. Both the quantity of individual chargeable grains present, and their distribution with in subsurface current flow paths are significant in controlling the level of response. The relationship of chargeability to metallic content is straightforward, and the influence of mineral distribution can be understood in geologic terms by considering two similar, hypothetical volumes of rock in which fractures constitute the primary current flow paths. In one, sulphides occur predominantly along fracture surfaces. In the second , the same volume percent of sulphides are disseminated throughout the rock. The second example will, in general, have significantly lower intrinsic chargeability.

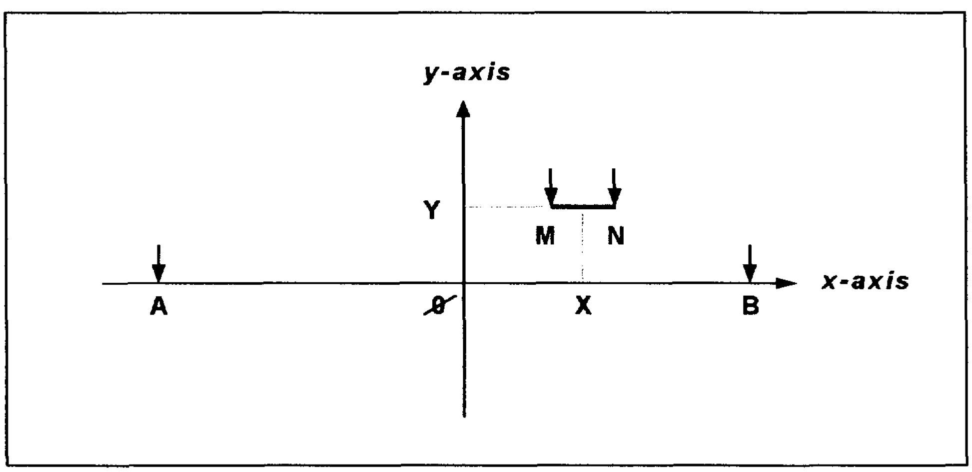


Figure B1: Gradient array configuration

Using the diagram in Figure B1 for the gradient array electrode configuration and nomenclature:[1], the gradient array apparent resistivity is calculated:

where: the origin **0** is selected at the center of **AB**
the geometric parameters are in addition to **a = AB/2** and **b = MN/2**
X is the abscissa of the mid-point of **MN** (positive or negative)
Y is the ordinate of the mid-point of **MN** (positive or negative)

Gradient Array Apparent Resistivity:

$$\rho a = K \frac{VP}{I} \ ohm\text{-}metres$$

$$where: \ K = \frac{2\pi}{(AM^{-1} - AN^{-1} - BM^{-1} + BN^{-1})}$$

$$AM = \sqrt{(a + x - b)^2 + y^2}$$

$$AN = \sqrt{(a + x + b)^2 + y^2}$$

$$BM = \sqrt{(x - b - a)^2 + y^2}$$

$$BN = \sqrt{(x + b - a)^2 + y^2}$$

Using the diagram in Figure B2 for the Total Chargeability:

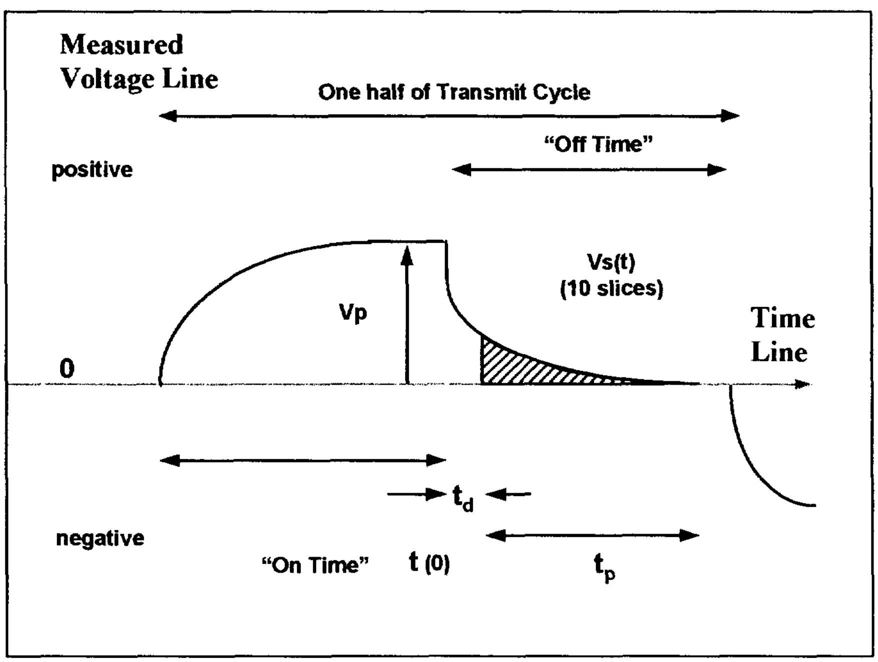


Figure B2: The measurement of the time-domain IP effect

[1] From Terraplus\BRGM, IP-6 Operating Manual, Toronto, 1987.

the total apparent chargeability is given by:

Total Apparent Chargeability:[2]

$$M_T = \frac{1}{t_p V_p} \sum_{i=1 \text{ to } 10} \int_{t_i}^{t_{i+1}} Vs \quad (t)\, dt \qquad \text{millivolts per volt}$$

where t_i, t_{i+1} are the beginning and ending times for each of the chargeability slices,

More detailed descriptions on the theory and application of the IP/Resistivity method can be found in the following reference papers:

Cogan, H., 1973, Comparison of IP electrode arrays, Geophysics, 38, p 737 - 761.

Langore, L., Alikaj, P., Gjovreku, D., 1989, Achievements in copper sulphide exploration in Albania with IP and EM methods, Geophysical Prospecting, 37, p 925 - 941.

TOTAL MAGNETIC FIELD SURVEY

Base station corrected Total Field Magnetic surveying is conducted using at least two synchronized magnetometers of identical type. One magnetometer unit is set in a fixed position in a region of stable geomagnetic gradient, and away from possible cultural effects (such as moving vehicles) to monitor and correct for daily diurnal drift. This magnetometer, given the term 'base station', stores the time, date and total field measurement at fixed time intervals, generally every 3 seconds, over the survey day. The second, remote mobile unit stores the coordinates, time, date, and the total field measurements simultaneously. The procedure consists of taking total magnetic measurements of the Earth's field at stations, along individual profiles, including Tie and Base lines. A 2-meter staff is used to mount the sensor, in order to optimally minimize localized near-surface geologic noise. In the Station Mag mode, readings are obtained while the operator is stationary, at each surveyed picket. In the Walking Mag mode, measurements are obtaining in a continuous fashion, at 2 second intervals – with the operator maintaining adequate ground-survey control by regularly updating the survey fiducials at known points – usually at every survey picket. At the end of a survey day, the mobile and base-station units are linked, via RS-232 ports, for diurnal drift and other magnetic activity (ionospheric and spheric) corrections using internal software.

[2] From Telford, et al., Applied Geophysics, Cambridge U Press, New York, 1983..

APPENDIX D

Iris ELREC 10 Receiver
(From Iris ELREC 10 Operating Manual)

Weather proof case

Dimensions:	31.0 cm x 21.0 cm x 25.0 cm
Weight:	9.0 kg (with internal battery)
Operating temperature:	-30°C to 70°C
Storage:	(-30°C to 50°C)
Power supply:	1 x 12.0 V external battery (30 hr. @ 20°C) or 2 x 6.0 V NiCad rechargeable (20 hr. @ 25°C) or
Input channels:	10
Input impedance:	10 Mohm
Input over voltage protection:	up to 1000 volts
Input voltage range:	10 V maximum on each dipole 15 V maximum sum over ch. 1 to 10
SP compensation:	Automatic ± 15 V with linear drift correction
Noise rejection:	100 dB common mode rejection (for Rs= 0) automatic stacking
Primary voltage resolution:	1 µV after stacking
accuracy:	0.3% typically; maximum 1 over whole temperature range
Secondary voltage windows:	up to 20 windows; preset window specs for Cole-Cole parameter analysis.
Sampling rate:	10 ms
Synchronization accuracy:	10 ms, minimum 40 µV
Chargeability resolution:	0.1 mV/V
accuracy:	typically 0.6%. maximum 2% of reading ± 1 mV/V for V_p > 10 mV
Battery test:	manual and automatic before each measurement
Grounding resistance:	0.1 to 100 kohm
Memory capacity:	3200 records, 1 dipole/record
Data transfer:	serial link @ 300 to 19200 baud

Iris Elrec 10 Dump File Format:

Channel: 1 Date: 12/15/1998 08:59:25
Spacing (foot): XP : 13500 Ii.P: 20400 D : 50 XA : 12900 XB : 16400 I.AB: 20400
Rs: 1.61 kohm

M1/5	M6/10	M11/15	M16/20
70.93	31.57	20.10	12.63
50.69	28.69	18.34	11.44
43.96	26.19	16.71	10.32
38.95	24.00	15.25	9.23
34.93	21.99	13.89	8.21

Sp: -2.05 mV
In: 1400.00 mA Rho: 6645.39 ohm.m #: 20
Vp: 652.204 mV Mg: 16.81 mV/V Q: 0.04 mV/V
Tau: 4.560 s Mcc: 199.87 mV/V rms: 0.25 %

Channel: 2 Date: 12/15/1998 08:59:25
Spacing (foot): XP : 13550 Ii.P: 20400 D : 50 XA : 12900 XB : 16400 I.AB: 20400
Rs: 2.54 kohm

M1/5	M6/10	M11/15	M16/20
69.98	31.53	20.15	12.70
50.36	28.68	18.39	11.52
43.75	26.20	16.78	10.39
38.82	24.03	15.32	9.31
34.86	22.03	13.96	8.28

Sp: -67.15 mV
In: 1400.00 mA Rho: 6504.35 ohm.m #: 20
Vp: 552.303 mV Mg: 16.85 mV/V Q: 0.05 mV/V
Tau: 5.378 s Mcc: 199.85 mV/V rms: 0.28 %

APPENDIX D

INSTRUMENT SPECIFICATIONS

Phoenix IP Transmitter Model IPT-2B

Power Sources: Phoenix MG-10 (10KVA, 120V, 3 phase, 400 Hz) motor generator (30KVA,120V, 3 phase) motor generator Phoenix MG-1, 2 or 3 can also be used, but will generate ½ the voltage

Output Voltage: To 2400V in four ranges of resp. 400-600V, 800-1200V, 1200-1800V, 1600-2400V. Voltage is continuously variable ± 20% from each nominal step value.

Output Power: Maximum continuous output power is 10KW. Absolute maximum output power is 15KW.

Maximum Current: 15 Amps

Ammeter Ranges: 30m A, 100m A, 1A, 3A, 10A and 30A full scale.

Meter Display: A meter function switch selects the display of current level, regulation status, input frequency, output voltage, control battery voltage or line voltage

Current regulation: The change in output current is less than 0.2% for a 10% change in input voltage or electrode impedance. Regulation is achieved by feedback to the alternator of the motor generator unit.

Output waveform (Standard): Either DC, single frequency, two frequencies simultaneously, or time domain (50% duty cycle). Frequencies of 0.078, 0.156, 0.313, 1.25, 2.5 and 5.0 Hz are standard, whereas 0.062, 0.125, 0.25, 1.0, 2.0 and 4.0 Hz are optionally available. The simultaneous transmission mode has 0.313 and 5.0 Hz as standard, whereas 0.156 and 2.5 Hz are optional.

Output waveform IPT-2B option: 9 frequencies in binary progression: 1/16 - 1/32 - 1/16 - 1/8 -1/4 -1/2 - 1 2 and 4, with variable duty cycle. Selectable to one of four values: 0.25, 0.5, 0.75, and 1. NOTE: Duty cycle = 1 is the operation equal to the standard frequency domain cycling, i.e. Full On, except for a 50m sec. gap at each half cycle.

Operating Temperature: -40°C to +60°C

Frequency Stability: ±1% from -40°C to +60°C is standard. A precision time base is optionally available for coherent detection and phase IP measurements.

Transient Protection: Current is turned off automatically if it exceeds 150% full scale or is less than 5% full scale.

Thermal Protection: Unit is fan-forced cooled. Thermostat turns transmitter off at 65°C and turns back on at 55°C internal temperature.

Dimensions:	46 x 46 x 32 cm (18 x 18 x 13 in)
Weight:	45 kg
Shipping Weight:	56 kg

GSM-19
(from GSM-19 Overhauser Magnetometer Operating Manual)

Weather proof case

Dimensions: Console 223 mm x 69 mm x 240 mm Sensor 170 mm x71mm diameter cylinder
Weight: Console 2.1 kg; Sensor 2.2 kg (staff included)
Operating temperature: -40°C to 60°C
Power supply: 12V 1.9 Ah sealed lead acid battery
Power Consumption: 2 Ws per reading
Resolution: 0.01 nT
Relative Sensitivity: 0.02 nT
Absolute Accuracy: 0.2 nT
Range: 20,000 to 120,000 nT
Gradient Tolerance: Over 10,000 nT/m
Operating Modes: Base station -time/date reading stored 3 to 60 sec Walking- time/date reading stored at coordinates of fiducial with 0.5 to2 sec. cycle time
Memory Capacity: Base station- 43,000 readings standard Walking- 131,000 readings
Data transfer: Serial link @ 300 to 19200 baud; remote control capability through serial link @ 19200 baud

APPENDIX E

LISTS OF MAPS

- **Plan Maps at scale of 1:4800**

Description	Drawing No.
1. Posted/Contoured Total Chargeability	QG-231-PLAN-CHG-1
2. Posted/Contoured Apparent Resistivity	QG-231-PLAN-RES-1
3. Posted/Contoured Total Magnetic Field	QG-231-MAGCONT-TF
4. Posted/Stacked Profiles of Total Magnetic Field	QG-231-MAGPROF-TF
5. Contoured Calculated Vertical Magnetic Gradient	QG-231-MAGCONT-VG
6. Interpretation Plan Map	QG-231-PLAN-INTERP-1
TOTAL PLANS	**6**

TOTAL MAPS: 6

APPENDIX F

MAPS AND SECTIONS

Work Report Summary

Transaction No: W0260.01473 **Status:** APPROVED
Recording Date: 2002-SEP-09 **Work Done from:** 2002-FEB-14
Approval Date: 2002-SEP-25 **to:** 2002-APR-19

Client(s):

130666 KINROSS GOLD CORPORATION
300210 PLACER DOME (CLA) LIMITED/PLACER DOME (CLA) LIMITEE

Survey Type(s):

IP MAG

Work Report Details:

Claim#		Perform	Perform Approve	Applied	Applied Approve	Assign	Assign Approve	Reserve	Reserve Approve	Due Date
G	6000022	$170	$170	$0	$0	$0	0	$170	$170	
G	6000051	$2,563	$2,563	$0	$0	$0	0	$2,563	$2,563	
G	6000393	$18,155	$18,155	$0	$0	$0	0	$18,155	$18,155	
G	6060025	$12,053	$12,053	$0	$0	$0	0	$12,053	$12,053	
G	6060026	$1,961	$1,961	$0	$0	$0	0	$1,961	$1,961	
G	6060027	$7,157	$7,157	$0	$0	$0	0	$7,157	$7,157	
G	6060028	$525	$525	$0	$0	$0	0	$525	$525	
G	6060029	$2,922	$2,922	$0	$0	$0	0	$2,922	$2,922	
G	6060030	$5,189	$5,189	$0	$0	$0	0	$5,189	$5,189	
G	6060031	$957	$957	$0	$0	$0	0	$957	$957	
G	6060032	$442	$442	$0	$0	$0	0	$442	$442	
G	6060033	$237	$237	$0	$0	$0	0	$237	$237	
G	6060034	$3,018	$3,018	$0	$0	$0	0	$3,018	$3,018	
G	6060035	$3,072	$3,072	$0	$0	$0	0	$3,072	$3,072	
P	1129803	$368	$368	$0	$0	$0	0	$368	$368	2003-OCT-17
P	1188861	$329	$329	$0	$0	$0	0	$329	$329	2003-DEC-03
		$59,118	$59,118	$0	$0	$0	$0	$59,118	$59,118	

External Credits: $0

Reserve:

$59,118 Reserve of Work Report#: W0260.01473

$59,118 Total Remaining

Status of claim is based on information currently on record.

42A10SW2026 2.24232 MACKLEM 900

Ministry of
Northern Development
and Mines

Ministère du
Développement du Nord
et des Mines

Ontario

Date: 2002-SEP-27

GEOSCIENCE ASSESSMENT OFFICE
933 RAMSEY LAKE ROAD, 6th FLOOR
SUDBURY, ONTARIO
P3E 6B5

Tel: (888) 415-9845
Fax:(877) 670-1555

CHRISTINE M. SAARI
KINROSS GOLD CORPORATION
BOX 70, 1 GOLD MINE RD.,
SOUTH PORCUPINE, ONTARIO
P0N 1H0 CANADA

Submission Number: 2.24232
Transaction Number(s): W0260.01473

Dear Sir or Madam

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.

If you have any question regarding this correspondence, please contact STEVEN BENETEAU by email at steve.beneteau@ndm.gov.on.ca or by phone at (705) 670-5855.

Yours Sincerely,

Ron Gashinski
Senior Manager, Mining Lands Section

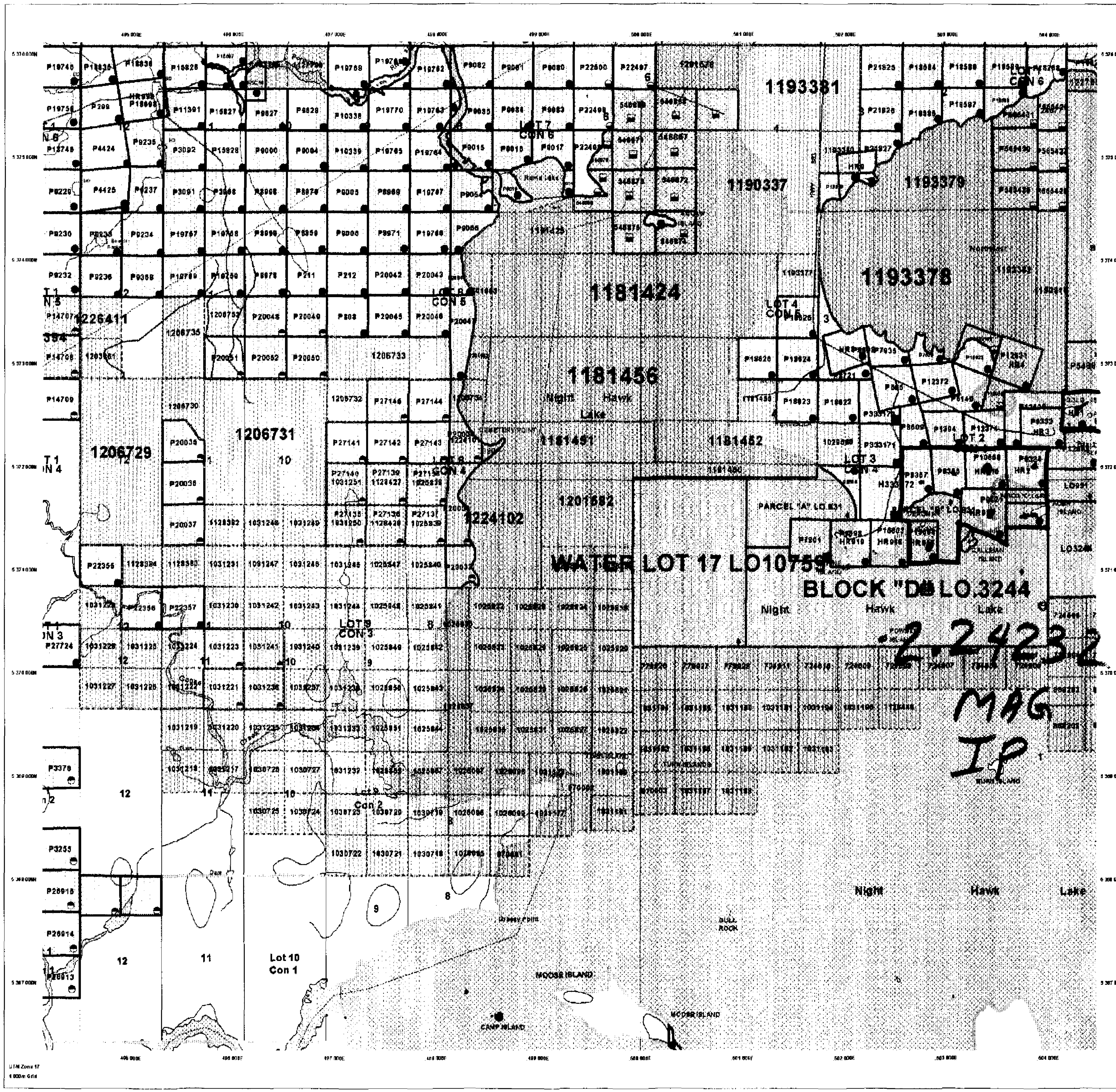
Cc: Resident Geologist

Kinross Gold Corporation
(Claim Holder)

Placer Dome (Cla) Limited/Placer Dome (Cla) Limitee
(Claim Holder)

Assessment File Library

Kinross Gold Corporation
(Assessment Office)



MINISTRY OF NORTHERN DEVELOPMENT AND MINES
PROVINCIAL MINING RECORDER'S OFFICE

MINING LAND TENURE MAP

Date / Time of Issue Jan 8 2002 13:42h Eastern

TOWNSHIP / AREA CODY

PLAN G-3994

ADMINISTRATIVE DISTRICTS / DIVISIONS

Mining Division	Porcupine
Land Titles/Registry Division	COCHRANE
Ministry of Natural Resources District	TIMMINS

TOPOGRAPHIC

LAND TENURE

LAND TENURE WITHDRAWALS

IMPORTANT NOTICES

0 m 1000.0 m

LAND TENURE WITHDRAWAL DESCRIPTIONS

Identifier	Type	Date	Description
3300	Wsm	Jan 1 2001	INDIAN BURIAL GROUND, SURFACE RIGHTS RESERVED
3404	Wsm	Jan 1 2001	FLOODING TO ELEVATION [illegible] FEET TO ONTARIO HYDRO
3430	Wsm	Jan 1 2001	RESERVE FLOODING RIGHTS ON NIGHT HAWK LAKE TO ONTARIO HYDRO TO ELEVATION [illegible] FT
3400	Wsm	Jan 1 2001	FLOODING TO H.E.P.C. OF ONTARIO TO ELEVATION [illegible] FEET T.&N.O. RAILWAY DATUM ON NIGHT HAWK LAKE
W.53/76	Ws	Jan 1 1980	W53/76 [illegible] S.R.O. [illegible]

IMPORTANT NOTICES

Areas under which special regulations, limitations or conditions exist that affect mineral prospecting, staking and mineral development activities.

General Information and Limitations

MINISTRY OF NORTHERN DEVELOPMENT AND MINES
PROVINCIAL MINING RECORDER'S OFFICE

MINING LAND TENURE MAP

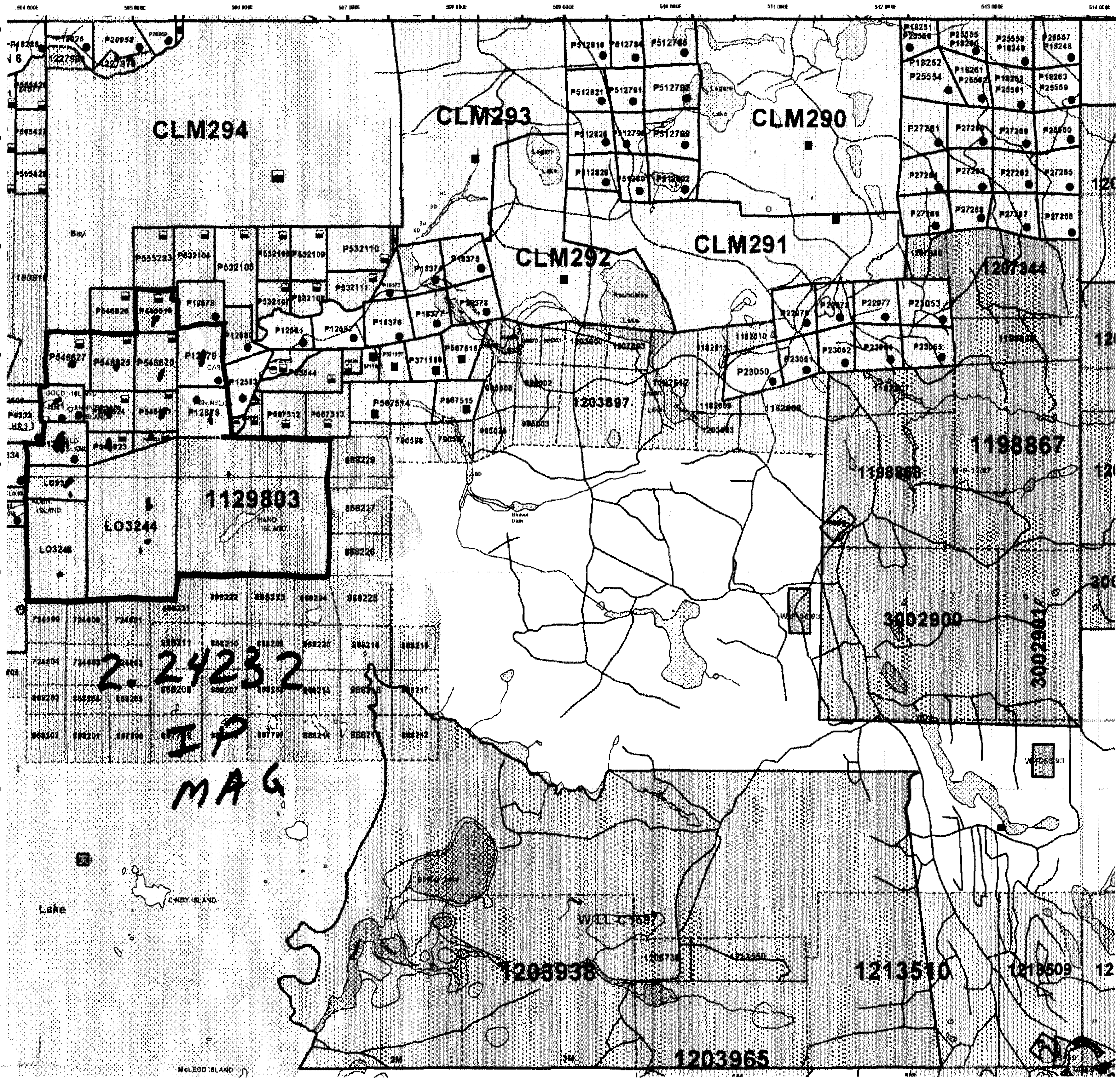
Date / Time of Issue Sep 18 2002 11:57h Eastern

TOWNSHIP / AREA MACKLEM

PLAN G-3997

ADMINISTRATIVE DISTRICTS / DIVISIONS

Mining Division	Porcupine
Land Titles/Registry Division	COCHRANE
Ministry of Natural Resources District	TIMMINS



TOPOGRAPHIC

LAND TENURE

Freehold Patent
Surface And Mining Rights

LAND TENURE WITHDRAWALS

IMPORTANT NOTICES

0 m 1000.0 m

LAND TENURE WITHDRAWAL DESCRIPTIONS

Identifier	Type	Date	Description
[illegible]	Wsm	Jan 1 2001	SURFACE AND MINING RIGHTS WITHDRAWN FROM PROSPECTING, STAKING OUT, SALE OR LEASE BY ORDER NO. W-P-5893 NER DATED SEPT. 27, 1993 SECTION 35, THE MINING ACT, R.S.O. 1990 (FOREST TEST PLOTS)
[illegible]	Wsm	Jan 1 2001	RESERVE FLOODING RIGHTS ON NIGHT HAWK LAKE TO ONTARIO HYDRO TO ELEVATION 903.5 FT
[illegible]	Wsm	Jan 1 2001	SITE PREPARATION [illegible]
[illegible]	Wsm	Jan 1 2001	FLOODING TO H.E.P.C. OF ONTARIO TO ELEVATION 905.5 FEET T. AND N.O. RAILWAY DATUM ON NIGHT HAWK LAKE
W-25/93	Wm	Jul 15 1993	Sect. 1 W-25/93 July 15/93 M.R.O. reservation under the Beds of Navigable Waters Act
W-P-1297	Ws	May 2 1997	SURFACE RIGHTS ONLY WITHDRAWN FROM PROSPECTING, STAKING OUT, SALE OR LEASE BY ORDER NO. WP-1297 NER DATED MAY 2/97 SECTION 35 THE MINING ACT, R.S.O. 1990
W-P-5893	Wsm	Sep 27 1993	SURFACE AND MINING RIGHTS WITHDRAWN FROM PROSPECTING, STAKING OUT, SALE OR LEASE BY ORDER NO. W-P-5893 NER DATED SEPT. 27, 1993 SECTION 35, THE MINING ACT, R.S.O. 1990 (FOREST TEST PLOTS)
W-P-5893	Wsm	Sep 27 1993	SURFACE AND MINING RIGHTS WITHDRAWN FROM PROSPECTING, STAKING OUT, SALE OR LEASE BY ORDER NO. W-P-5893 NER DATED SEPT. 27, 1993 SECTION 35, THE MINING ACT, R.S.O. 1990 (FOREST TEST PLOTS)
W-LL-C1697	Wsm	Nov 21 2001	Mining and surface rights withdrawal Section 35 of the Mining Act RSO 1990 Order # W-LL-[illegible] ONT, Nov. 21, 2001 Note: this boundary closely represents the area that is being proposed for regulation and may be subject to further change.

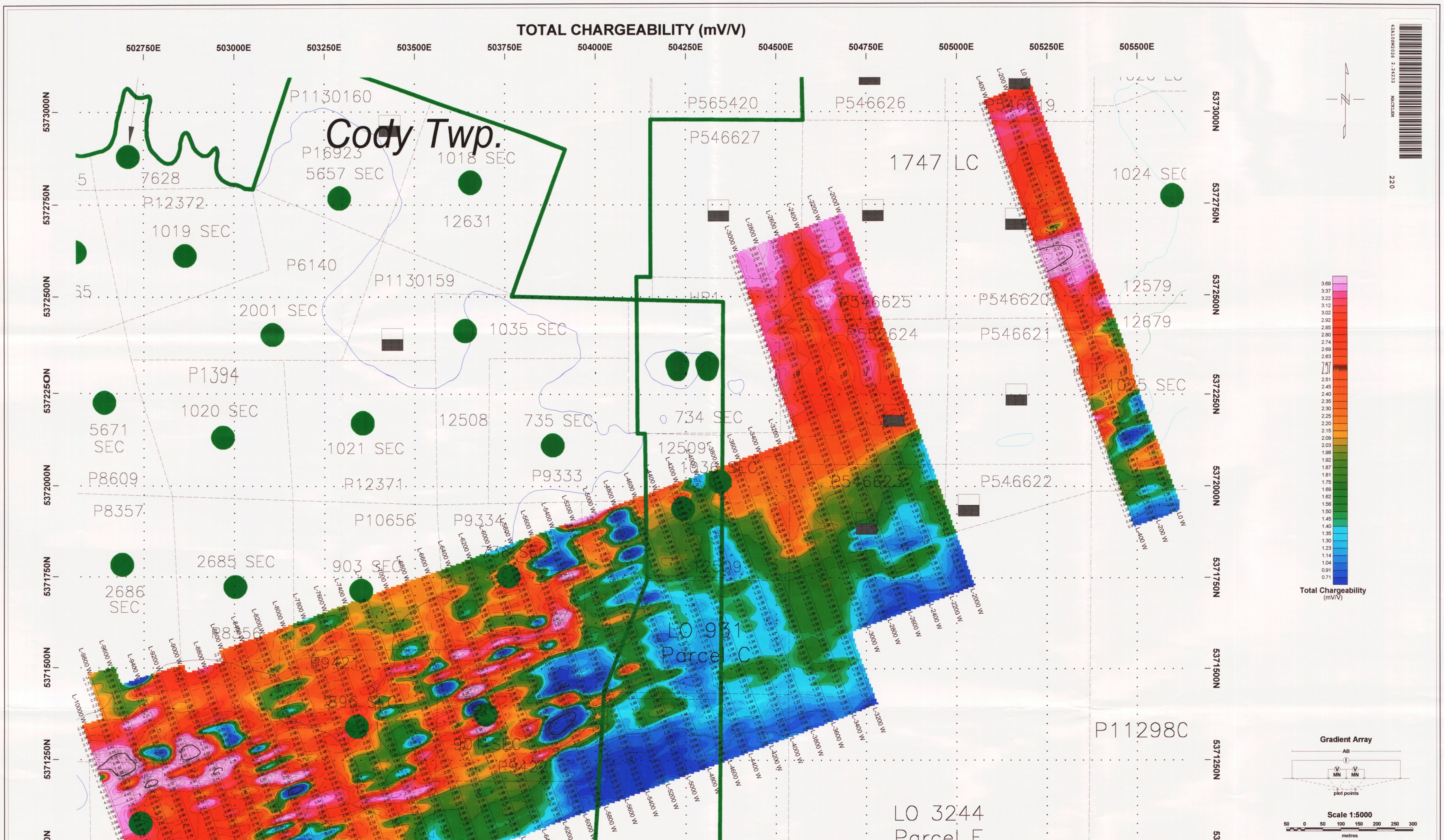
IMPORTANT NOTICES

Areas under which special regulations, limitations or conditions exist that affect normal prospecting, staking and mineral development activities.

General Information and Limitations

42A10SW2026 2.24232 MACKLEM

210



KINROSS GOLD CORP.
NIGHTHAWK LAKE PROJECT, Block D
Cody, Macklem Twps., ON

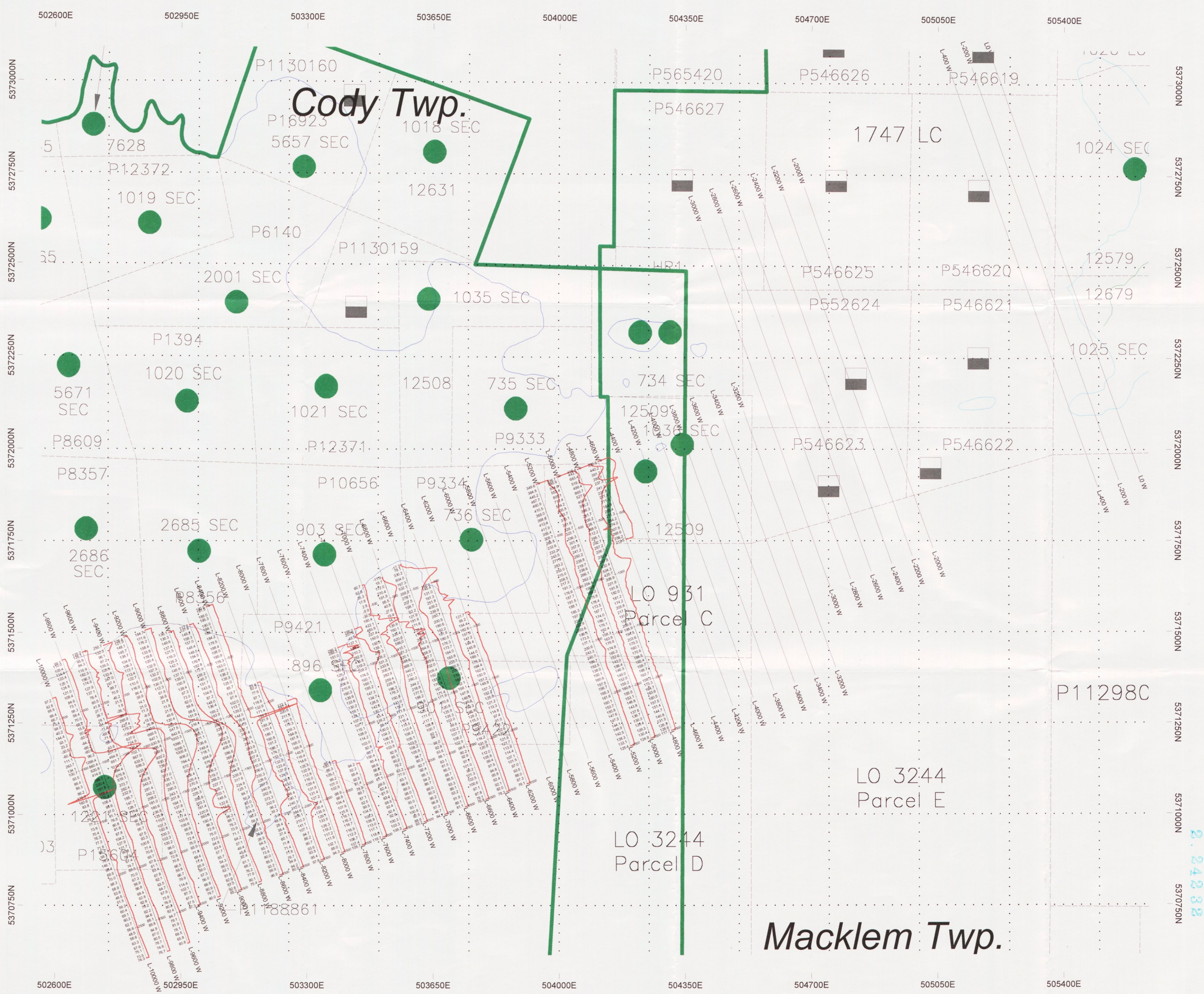
TIME DOMAIN IP SURVEY
Gradient Array (AB= 6000 feet)
TOTAL CHARGEABILITY

Transmitter Frequency:	0.0625 Hz (50% duty cycle)
Transmitter Current:	6.6 Amps
Decay Curve:	QGI Custom Semilogarithmic Windows 20 Gates (40ms to 3860ms)
Station Interval:	50 feet
Gridding Method:	Bi-Directional
Grid Cell Size:	5 units
Contour Interval:	0.25, 1.0, 5.0 mV/V
Colour Scale:	Equal Area Zoning
Survey Date:	Apr 14-15, 2002
Instrumentation:	Rx = IRIS ELREC-10 (10 channels) Tx = PHOENIX IPT-2B (15 kW) + MG-30(30 kVA)

Surveyed & Processed by:
QUANTEC GEOSCIENCE INC.
DWG. #: QG-231-PLAN-CHG-1

2.24232

NIGHTHAWK GRID - TOTAL MAGNETIC FIELD



NIGHTHAWK GRID

Scale 1:5000

50 0 50 100 150 200

metres

KINROSS GOLD CORPORATION

NIGHTHAWK LAKE PROJECT

Cody, MacKlem Twps, ON

GROUND MAGNETIC SURVEY

TOTAL MAGNETIC FIELD PROFILES

(Base Station Corrected)

Field Datum:	56900 nanoTesla
Field Inclination:	76.0 deg N
Field Declination:	12 deg W
Diurnal Correction:	Base Station (3 sec/cyc)
Base Station Position:	
Station Interval:	500 foot
Postings:	Left/Top=nanoTesla; Right/Bottom=station
Postings Base Level:	56900 nanoTesla
Profile Base Level:	56900 nanoTesla
Vertical Profile Scale:	50 nanoTesla per cm

Survey Date:	17-18 April, 2002
Instrumentation:	GEM, GSM-19
Operator:	DMG

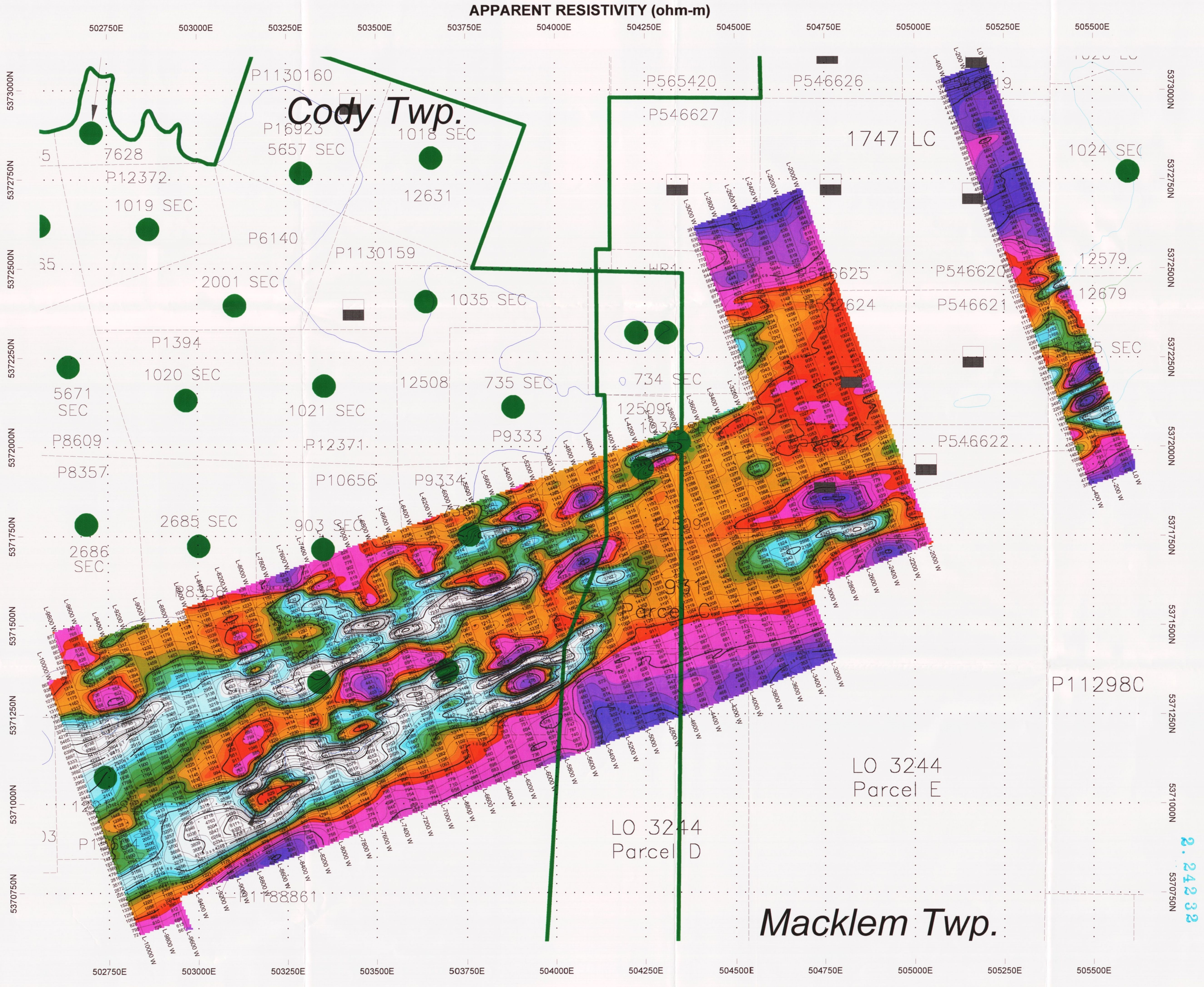
Surveyed & Processed by:

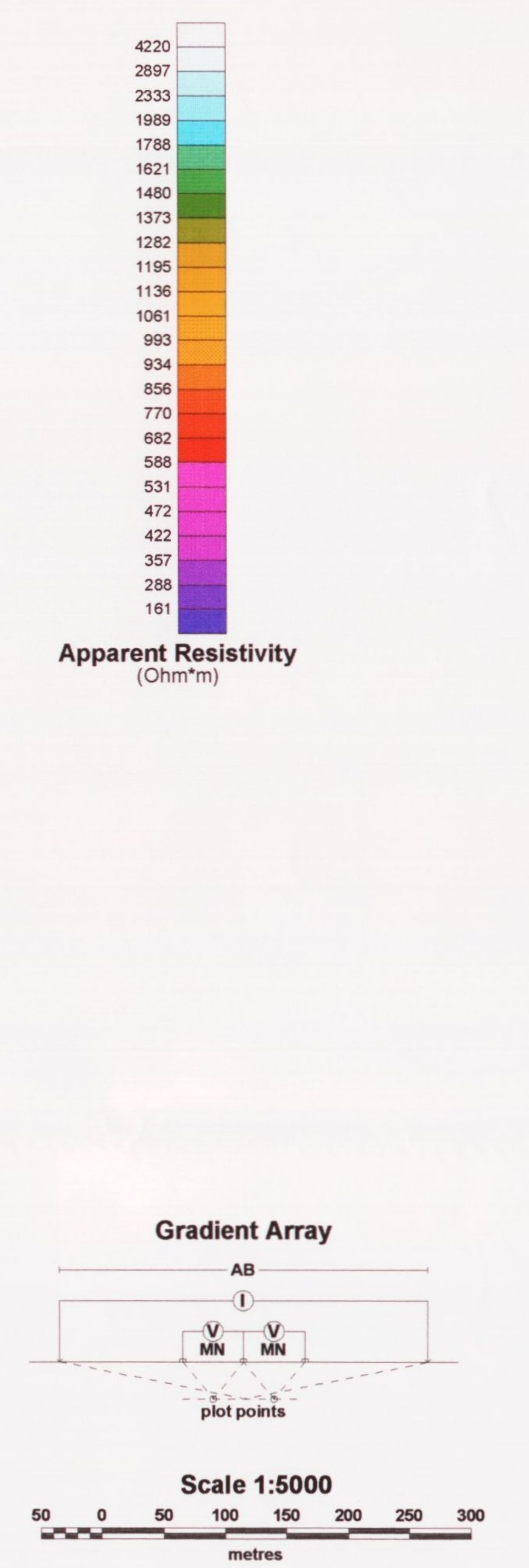
QUANTEC GEOSCIENCE INC.

DWG. NO. QG-231-MAGPROF-TF

2.24232

Map Generated by D Lapointe (09/07/02)





KINROSS GOLD CORP.
NIGHTHAWK LAKE PROJECT, Block D
Cody, Macklem Twps., ON

TIME DOMAIN IP SURVEY
Gradient Array (AB= 6000 feet)
APPARENT RESISTIVITY

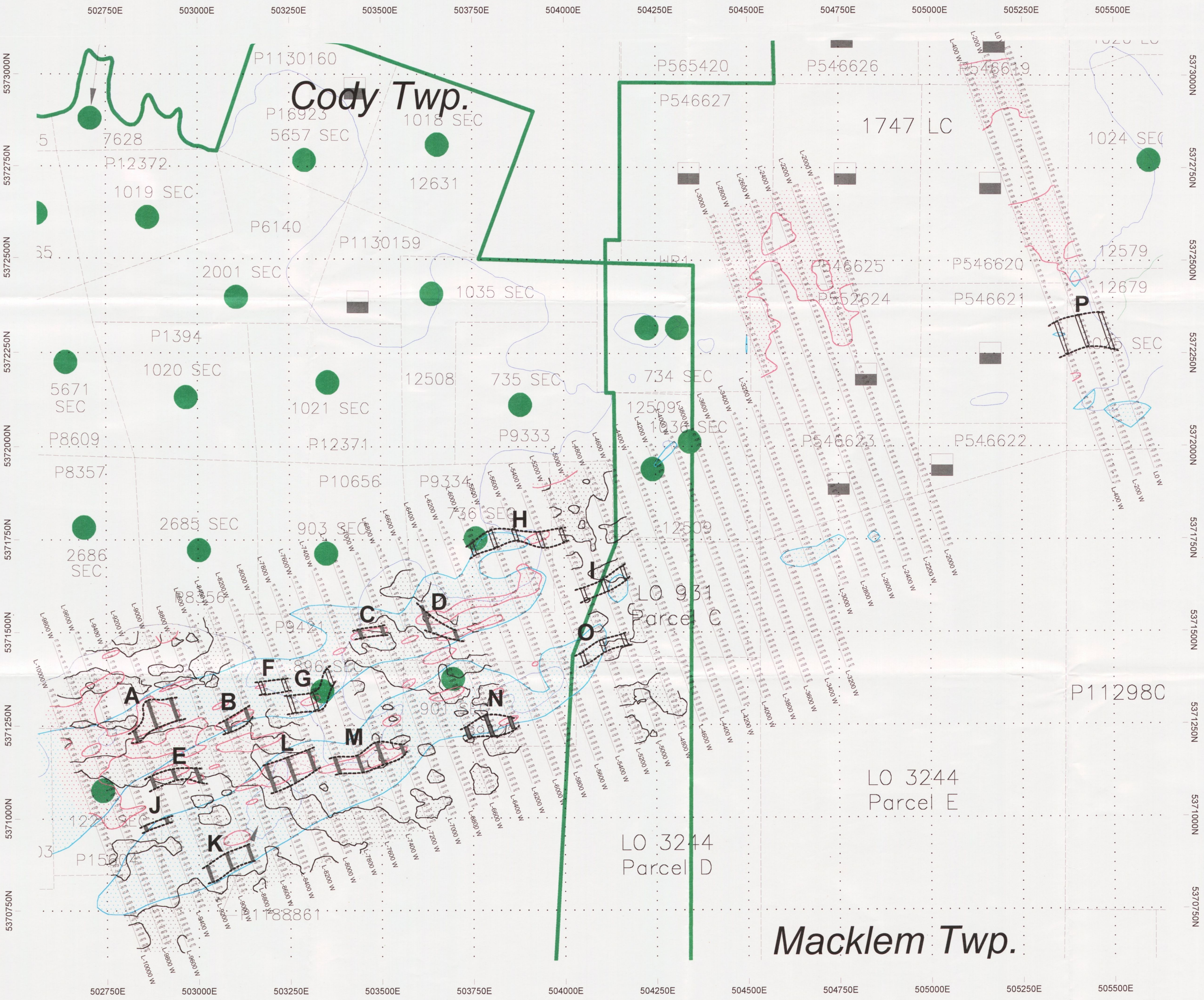
Transmitter Frequency:	0.0625 Hz (50% duty cycle)
Transmitter Current:	6.6 Amps
Decay Curve:	QIP Custom Semilogarithmic Windows 20 Gates (40ms to 3860ms)
Station Interval:	50 feet
Gridding Method:	Bi-Directional
Grid Cell Size:	25 units (2x Hanning Filter Applied)
Contour Interval:	10 levels/log decade
Colour Scale:	Equal Area Zoning
Survey Date:	Apr 14-15, 2002
Instrumentation:	Rx = IRIS ELREC-10 (10 channels) Tx = PHOENIX IPT-2B (15 kW) + MG-30(30 kVA)

Surveyed & Processed by:
QUANTEC GEOSCIENCE INC.
DWG. #: QG-231-PLAN-RES-1

2.24232

NIGHTHAWK GRID - MAGNETIC VERTICAL GRADIENT
502750E
503000E
503250E
503500E
503750E
504000E
504250E
504500E
504750E
505000E
505250E
505500E
5373000N
5372750N
5372500N
5372250N
5372000N
5371750N
5371500N
5371250N
5371000N
5370750N
Cody Twp.
Macklem Twp.
P1130160
P16923
5657 SEC
1018 SEC
12631
7628
P12372
1019 SEC
P6140
P1130159
2001 SEC
1035 SEC
P1394
1020 SEC
5671 SEC
12508
735 SEC
1021 SEC
P8609
P12371
P9333
P8357
P10656
P9334
736 SEC
2685 SEC
903 SEC
2686 SEC
P9421
896 S
P1188861
P565420
P546627
P546626
P546619
1747 LC
1024 SEC
P546625
P546620
P552624
P546621
12579
12679
1025 SEC
734 SEC
12509
1036 SEC
P546623
P546622
LO 931
Parcel C
P11298C
LO 3244
Parcel E
LO 3244
Parcel D
Magnetic Vertical Gradient (Calculated)
NIGHTHAWK GRID
Scale 1:5000
metres
KINROSS GOLD CORPORATION
NIGHTHAWK LAKE PROJECT
Cody, MacKlem Twps, ON
GROUND MAGNETIC SURVEY
MAGNETIC VERTICALGRADIENT CONTOURS
(Base Station Corrected)
Field Datum: 56900 nanotesla
Field Inclination: 76.0 deg N
Field Declination: 12 deg W
Diurnal Correction: Base Station (3 sec/cyc)
Base Station Position: Deadmans Point Gate
Station Interval: 50 foot
Gridding Method: Rangrid
Grid Cell Size: 5 ft
Contour Interval: 0.2, 1, 5
Colour Zoning: Equal Area / Colour.tbl
Survey Date: 17-18 April, 2002
Instrumentation: GEM, GSM-19
Operator: DMG
Surveyed & Processed by:
QUANTEC GEOSCIENCE INC.
DWG. NO. QG-231-MAGCONT-VG
Map Generated by D Lapointe (13/07/09)
2.24232

NIGHTHAWK GRID - GEOPHYSICAL INTERPRETATION



INTERPRETATION LEGEND

- High Chargeability Area
- High Apparent Resistivity Area
- High Magnetic Susceptibility Area
- A — Exploration Target:
  - First Priority
  - Second Priority

Gradient Array

Scale 1:5000

metres

KINROSS GOLD CORP.
NIGHTHAWK LAKE PROJECT
Cody, Macklem Twps., ON

TIME DOMAIN IP & MAGNETIC SURVEYS
Gradient Array - Walking Mag
GEOPHYSICAL INTERPRETATION

Transmitter Frequency:	0.0625 Hz (50% duty cycle)
Transmitter Current:	6.6 Amps
Decay Curve:	QGI Custom Semilogarithmic Windows 20 Gates (40ms to 3860ms)
Diurnal Correction:	Base Station (3 sec
Field Datum:	56900 nanoTesla
Field Inclination:	76.0 deg N
Contour Interval:	0.25, 1.0, 5.0 mV/V
Field Declination:	12.0 deg W
Survey Date:	Apr 14-15, 2002
Instrumentation:	Rx = IRIS ELREC-10, GEM GSM-19 Tx = PHOENIX IPT-2B (15 kW) + MG-30(30 kVA)

Surveyed & Processed by:
QUANTEC GEOSCIENCE INC.
DWG. #: QG-231-PLAN-INTRP-1

2.24232

Map Generated by DL (11/07/02)

NIGHTHAWK GRID - TOTAL MAGNETIC FIELD
2.24232
Cody Twp.
Macklem Twp.
1747 LC
LO 931
Parcel C
LO 3244
Parcel E
LO 3244
Parcel D
Total Magnetic Field
(nanoTesla)
NIGHTHAWK GRID
Scale 1:5000
metres
KINROSS GOLD CORPORATION
NIGHTHAWK LAKE PROJECT
Cody, MacKlem Twps, ON
GROUND MAGNETIC SURVEY
TOTAL MAGNETIC FIELD CONTOURS
(Base Station Corrected)
Field Datum: 56900 nanotesla
Field Inclination: 76.0 deg N
Field Declination: 12 deg W
Diurnal Correction: Base Station (3 sec/cyc)
Base Station Position: Deadmans Point Gate
Station Interval: 50 foot
Postings Base Level: 56900 nanotesla
Gridding Method: Rangrid
Grid Cell Size: 5 ft
Contour Interval: 20, 100, 500 nanotesla
Colour Zoning: Equal Area / Colour.tbl
Survey Date: 17-18 April, 2002
Instrumentation: GEM, GSM-19
Operator: DMG
Surveyed & Processed by:
QUANTEC GEOSCIENCE INC.
DWG. NO. QG-231-MAGCONT-TF