

**Report on the 2009  
Airborne Geophysical Survey  
On the  
Strike Property**

NTS 1150/03  
Dawson Mining District, Yukon  
October 24-25, 2009

**Claims:**

Strike 11-16 (YC98711-98716)  
Strike 31-36 (YC98731-98736)  
Strike 51-55 (YC98751-98755)  
Strike 71-74 (YC98771-98774)  
Strike 91-94 (YC98791-98794)

**For: Newcastle Minerals Ltd.**  
416 - 108 - 800 Kelly Road  
Victoria, BC  
V9B 6J9

**By: Harmen J. Keyser, P.Geol.**  
**Precision GeoSurveys Inc.**  
520-355 Burrard Street  
Vancouver, BC  
V6C 2G8

June 15, 2010

## Table of Contents

---

Introduction	1
Property	1
Location and Access	1
History	1
Geology	4
Airborne Geophysics	4
Conclusions and Recommendations	5
References	6
Statement of Qualifications	7
Statement of Expenditures	8

### List of Figures

Figure 1, Location Map	2
Figure 2, Claim Map	3

### List of Appendices

Appendix A – List of Claims

Appendix B – Airborne Geophysical Survey Logistics Report (Chris Brown, 2009)

## Introduction

---

This report was prepared at the request of Newcastle Minerals Ltd. Its purpose is to satisfy assessment requirements of the Yukon Quartz Mining Act through a description of an airborne geophysical survey carried out on Newcastle's Strike Property in October 2009. The Property is located in west-central Yukon Territory, about 17 km northeast of Underworld's Whitegold property (Figure 1).

## Property

---

The Strike Property consists of 25 unsurveyed mineral claims located in accordance with the Yukon Quartz Mining Act, as shown in Figure 2 and listed in Appendix A. The Property covers about 522 hectares and is owned 100% by Newcastle Minerals Ltd.

## Location and Access

---

The Strike Property is located 350 kilometers northwest of Whitehorse and 90 kilometers south of Dawson. The area is best accessed by helicopter from bases at Carmacks or Dawson. Rough airstrips at Thistle Creek, Ballarat Creek, and Casino, as well as various gravel bars on the Yukon and Stewart Rivers, serve as suitable staging points. River barges are available for moving freight and equipment on the Yukon and Stewart Rivers.

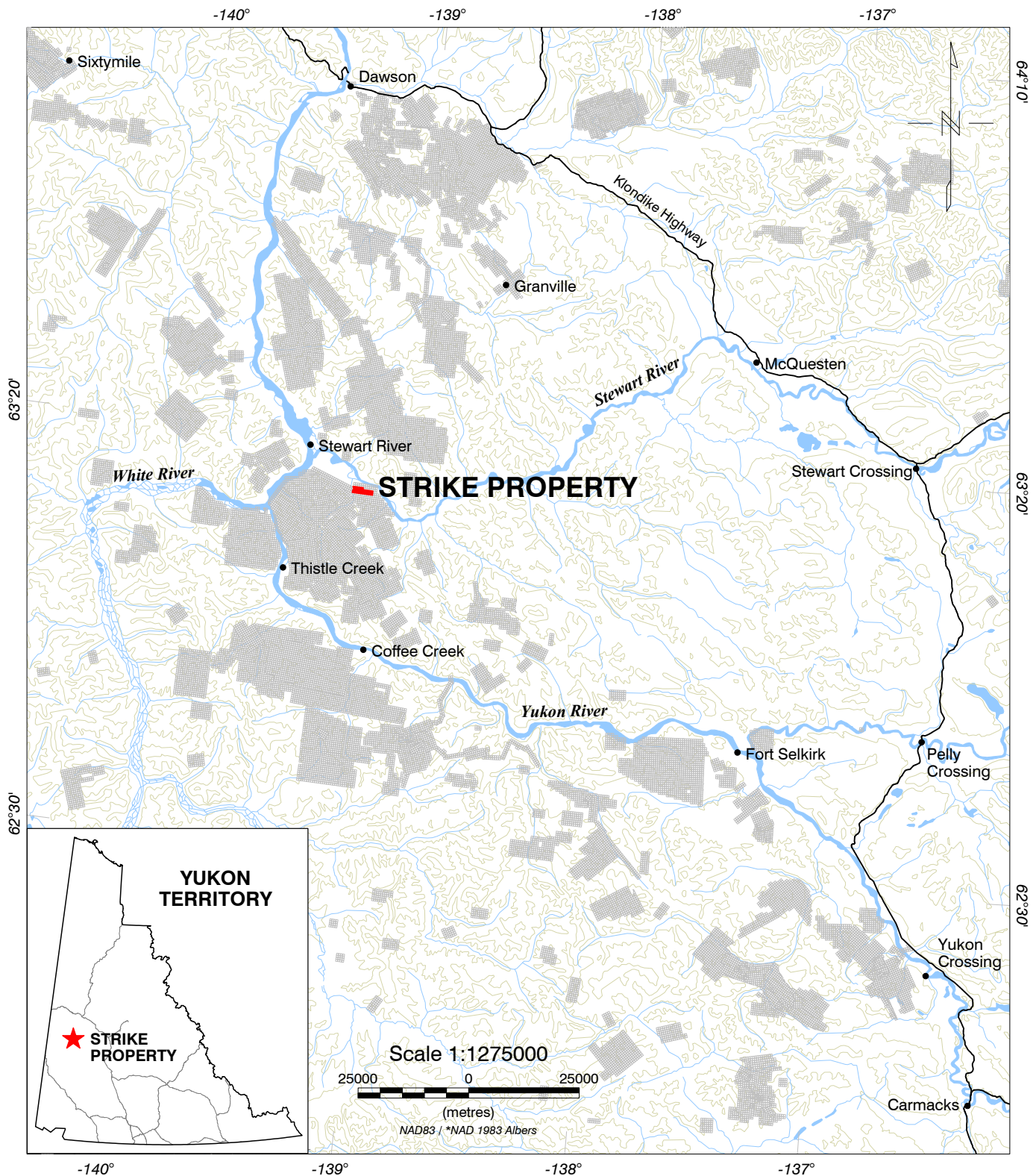
## History

---

Although placer gold has been known in the general area of the Strike Property since the 1890's, there are no records of prior mineral exploration activities or discoveries on ground now covered by the Strike Property.

Systematic exploration work by Ryanwood Explorations and Underworld Resources Inc. in 2007, 2008, and 2009 resulted in the discovery of a significant gold deposit at the White Gold property, located 17 km southwest of the Strike Property. On January 19, 2010, Underworld announced a total combined resource of 1,004,570 ounces of gold at a grade of 3.2 g/t Au in an indicated category, with an additional 407,413 ounces of inferred resources at an average grade of 2.5 g/t Au at the Golden Saddle Zone. At the Arc Zone, the initial resource includes 170,470 ounces at an average grade of 1.2 g/t Au in the inferred category.

The Whitegold discovery has resulted in extensive claim staking and mineral exploration activity in the Dawson Range between Carmacks and Dawson, including the Strike Property.

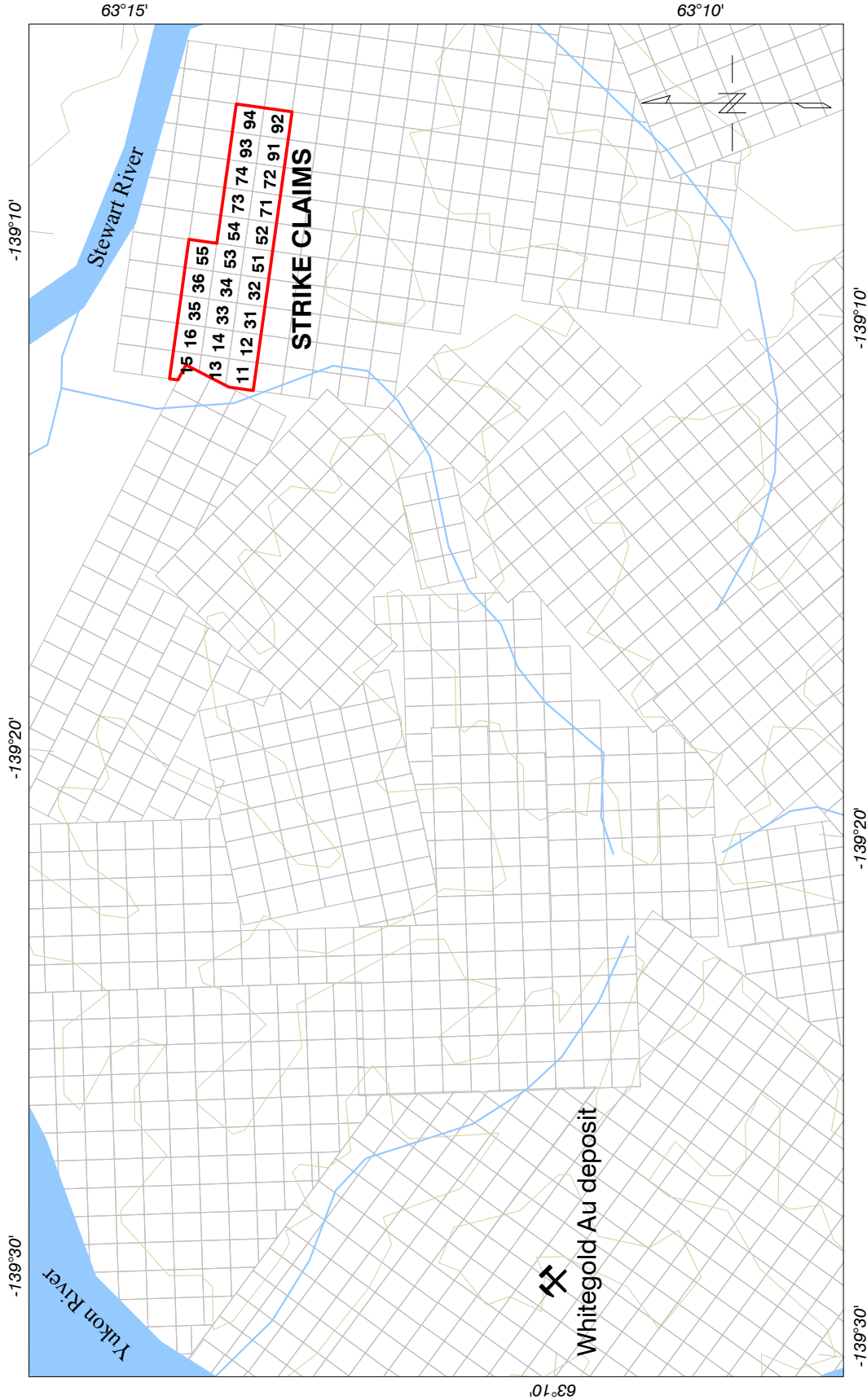


Newcastle Minerals Ltd.

**STRIKE PROPERTY  
FIGURE 1 - LOCATION MAP  
Dawson Mining District**

NTS: 115003  
Projection: Albers Yukon

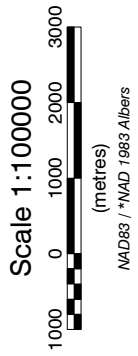
Scale: 1:1275000  
Date: May 17, 2010



Newcastle Minerals Ltd.

**STRIKE PROPERTY**  
**FIGURE 2 - CLAIM LOCATION MAP**  
 Dawson Mining District

NTS: 115O03  
 Projection: Albers Yukon  
 Scale: 1:100000  
 Date: May 17, 2010



**Precision**  
 GeoSurveys Inc.

## Geology

---

The Strike Property is situated within the Yukon-Tanana Terrane (YTT), which is the largest terrane in the Canadian Cordillera. It was accreted to the western margin of the North American craton between the late Paleozoic and early Cenozoic. This terrane is bounded to the northeast and southwest by the right-lateral Tintina-Kaltag and Denali-Farewell fault systems, respectively (Gordey and Makepeace, 2001).

The oldest rocks in the area of the Strike property are an undivided assemblage of quartz-rich gneiss, schist, and quartzite of the Nasina Series (Ryan and Gordey, 2001). These rocks were deformed and metamorphosed in the late Paleozoic (Mortensen, 2006). Compressional tectonics during the Jurassic resulted in kilometre-scale stacked thrust sheets marked along strike with thin metre-scale lenses commonly containing irregular bodies of magnetic ultramafic rocks (MacKenzie and Craw, 2009). This thrusting event was overprinted by Permian, Jurassic, and Cretaceous structural and metamorphic fabric. Jurassic and Cretaceous plutonic rocks intrude these metamorphosed units, and Cretaceous to Eocene volcanic rocks and conglomerate are present in the general area.

At Underworld's White Gold property, located 17 km southwest of Newcastle's Strike Property, an important geological structure for exploration is a probable east-northeast-trending lateral ramp that occurs just south of the Golden Saddle zone of gold mineralization (Weirshauser, et al, 2010). This structure is demarcated by discontinuities that offset the north-northwest trending lithologic contacts, including a possible thrust fault contact between meta-volcanic gneiss and the underlying meta-sedimentary unit. These east-northeast-striking features could have formed above an underlying basement structure that was reactivated intermittently during ductile thrusting and again during subsequent faulting, ultimately influencing hydrothermal activity and gold mineralization.

Mineralization at White Gold may be related to post-metamorphic orogenesis, or deeper buried (Tombstone Suite?) plutonism (Weirshauser, et al, 2010). The dominant mineralization at Golden Saddle is associated with quartz, albite, and carbonate breccias with low volumes of disseminated pyrite and arsenopyrite containing gold in felsic gneiss and quartzite (MacKenzie and Craw, 2009).

The lower Stewart River and White Gold area has not been intensely glaciated, and as a result bedrock is weathered and outcrops are rare. The area is covered by a discontinuous layer of volcanic ash.

## Airborne Geophysics

---

In October, 2009, Newcastle Minerals contracted Precision GeoSurveys to carry out a high resolution helicopter-borne magnetic and radiometric survey over the Strike Property. The survey was flown on October 24 and 25, 2009. Details of the survey are described in a logistics report presented in Appendix B.

## Conclusions and Recommendations

---

Newcastle Minerals Ltd's Strike Property is located in west-central Yukon Territory, about 17 km northeast of a significant new gold discovery at the White Gold property. There has been no prior exploration work on the ground now covered by the Strike claims, and there is no known mineralization.

The 2009 airborne geophysical survey has identified several positive and negative magnetic features with a relief exceeding 100 nT as well as locally high gamma counts. These features reflect variations in the earth's local magnetic field and various radioisotopes, which in turn represent a variety of different lithologies, alteration patterns, and structures.

Due to the proximity of the Strike Property to the White Gold discovery and a similar geological setting, the Strike Property is considered prospective. Further exploration work is recommended and should consist of:

1. interpretation of the airborne geophysical data
2. geological mapping and prospecting
3. sediment and soil geochemistry

Respectfully submitted,



June 15, 2010

Harmen J. Keyser, P.Geol.

## References

---

Gordey, S.P. and Makepeace, A.J. (compilers), 2001: Bedrock Geology, Yukon Territory. Geological Survey of Canada, Open File 3754

MacKenzie, D and Craw, D, 2009: Structural controls on hydrothermal gold mineralization in the White River area, Yukon. In: Yukon Exploration and Geology 2009, Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, Whitehorse, P. 253-263.

Mortensen, J.K., 2006: Geological compilation maps of the northern Stewart River map area, Klondike and Sixtymile Districts (115N/15, 16; 115O/13, 14; and parts of 115O/15,16). Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, Open File 1996-1(G)

Ryan, J.J. and Gordey, S., 2005: Geology, Stewart River area (115N, 115O and part of 115J), Yukon Territory. Yukon Geological Survey, Open File 4970.

Weirshauser, L., Nowak, M, and Barnet, W., 2010: White Gold Property, Dawson Range, Yukon, Canada. SRK Consulting Report 2CU003.000 for Underworld Resources Inc., filed on sedar.com

## Statement of Qualifications

---

I, Harmen J. Keyser, hereby certify that:

1. I am the author of this assessment report on the Strike Property.
2. I am a graduate of Saint Mary's University, Halifax, with a degree in geology (B.Sc., 1981).
3. I have been employed as a geologist on a full-time and part-time basis continuously since 1978.
4. I am a Licensee of the Northwest Territories Association of Professional Engineers, Geologists, and Geophysicists (L1034).
5. I was personally involved in the geophysical survey of the Strike Property in October, 2009.
6. The costs referred to in the Statement of Expenditures were incurred on the Strike Property for assessment purposes.
7. This report is to be used for assessment purposes only.



June 15, 2010

Harmen J. Keyser, P.Geol.

## Statement of Expenditures

---

Summarized from Precision GeoSurveys Inc. invoice No. 911

56.4 line km of combined mag-spec surveying @ \$80/km:	\$ 4,512.00
Mobilization/demobilization*:	4,000.00
Set-up, processing, and reporting fee:	2,500.00
Fuel positioning:	800.00
Standby, ¼ day @ \$2500/day:	<u>625.00</u>
Subtotal:	\$ 12,437.00

\* 50% of Mobilization fees were incurred outside Yukon, therefore total assessment credits are: **\$10,437.00**.

# **APPENDIX A**

## **List of Claims**

**Newcastle Minerals Ltd.**  
**Summary of Strike Claims, Yukon**  
**March 22, 2010**

District	Grant Number	Reg Type	Claim Name	Claim Number	Claim Owner	Recording Date	Expiry Date	New Expiry Date	NTS Map Sheet	Ops Number
Dawson	YC98711	Quartz	Strike	11	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195479
Dawson	YC98712	Quartz	Strike	12	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195480
Dawson	YC98713	Quartz	Strike	13	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195481
Dawson	YC98714	Quartz	Strike	14	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195482
Dawson	YC98715	Quartz	Strike	15	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195483
Dawson	YC98716	Quartz	Strike	16	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195484
Dawson	YC98731	Quartz	Strike	31	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195499
Dawson	YC98732	Quartz	Strike	32	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195500
Dawson	YC98733	Quartz	Strike	33	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195501
Dawson	YC98734	Quartz	Strike	34	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195502
Dawson	YC98735	Quartz	Strike	35	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195503
Dawson	YC98736	Quartz	Strike	36	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195504
Dawson	YC98751	Quartz	Strike	51	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195519
Dawson	YC98752	Quartz	Strike	52	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195520
Dawson	YC98753	Quartz	Strike	53	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195521
Dawson	YC98754	Quartz	Strike	54	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195522
Dawson	YC98755	Quartz	Strike	55	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195523
Dawson	YC98771	Quartz	Strike	71	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195539
Dawson	YC98772	Quartz	Strike	72	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195540
Dawson	YC98773	Quartz	Strike	73	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195541
Dawson	YC98774	Quartz	Strike	74	Newcastle Minerals - 100%.	6/18/2009	6/18/2010	6/18/2014	115003	195542
Dawson	YC98791	Quartz	Strike	91	Newcastle Minerals - 100%.	6/30/2009	6/30/2010	6/30/2014	115003	200161
Dawson	YC98792	Quartz	Strike	92	Newcastle Minerals - 100%.	6/30/2009	6/30/2010	6/30/2014	115003	200162
Dawson	YC98793	Quartz	Strike	93	Newcastle Minerals - 100%.	6/30/2009	6/30/2010	6/30/2014	115003	200163
Dawson	YC98794	Quartz	Strike	94	Newcastle Minerals - 100%.	6/30/2009	6/30/2010	6/30/2014	115003	200164

## **APPENDIX B**

### **Airborne Geophysical Survey Logistics Report**



**Airborne Geophysical Survey Report  
Strike Property  
Dawson Mining District, Yukon**

Prepared for: Newcastle Minerals Ltd.  
November 30, 2009



Chris Brown, B.Sc., GIT  
Precision GeoSurveys Inc.  
520-355 Burrard Street, Vancouver, Canada V6C 2G8  
[www.precisiongeosurveys.com](http://www.precisiongeosurveys.com)

## Table of Contents

1.0	Introduction.....	3
2.0	Geophysical Data.....	4
2.1	Magnetic Data.....	4
2.2	Radiometric Data.....	5
3.0	Survey Operations.....	5
4.0	Equipment.....	6
4.1	AGIS.....	6
4.2	Spectrometer.....	7
4.3	Magnetometer.....	7
5.0	Data Processing.....	8
5.1	Magnetic Processing.....	8
5.2	Radiometric Processing.....	8
5.3	Final Data Format.....	9
	Appendix A: Maps.....	10

## 1.0 Introduction:

This report outlines the survey operations and data processing actions taken during the airborne geophysical survey flown over the Strike Property. The airborne geophysical survey was flown by Precision GeoSurveys Inc. for Newcastle Minerals Ltd. The geophysical survey, carried out on October 24 and October 25, 2009, saw the acquisition of gamma ray spectrometer data and magnetic data.



Figure 1: Survey lines outlined in red

The Strike property (Figure 1) is located south of the Stewart River and approximately 190 km north-west of Carmacks, YT (Figure 2). The survey area itself is approximately 4.7 km by 1.3 km. A total of 56.4 line kilometers of radiometric and magnetic data were flown for this survey, this total includes tie lines and survey lines. The survey lines were flown at 100 meter spacing's at a  $90^{\circ}/270^{\circ}$  heading; the tie lines were flown at 1 km spacing's at a heading of  $0^{\circ}/180^{\circ}$ .



Figure 2: Strike survey area location relative to Carmacks, YT.

## 2.0 Geophysical Data:

Geophysical data are collected in a variety of ways and are used to aid in the exploration and determination of geology, mineral deposits, oil and gas deposits, contaminated land sites and UXO detection.

For the purposes of this survey, airborne gamma ray spectrometer and magnetic data were collected to serve in the exploration of the Strike property. This property is part of the White Gold area play which is host to intrusion related gold mineralization.

### 2.1 Magnetic Data:

Magnetic surveying is probably the most common airborne survey type to be conducted for both mineral and hydrocarbon exploration. The type of survey specifications, instrumentation, and interpretation procedures, depend on the objectives of the survey. Typically magnetic surveys are performed for:

1. Geological Mapping to aid in mapping lithology, structure and alteration in both hard rock environments and for mapping basement lithology, structure and alteration in sedimentary basins or for regional tectonic studies.
2. Depth to Basement mapping for exploration in sedimentary basins or mineralization associated with the basement surface.

## 2.2 Radiometric Data:

Radiometric surveys detect and map natural radioactive emanations, called gamma rays, from rocks and soils. All detectable gamma radiation from earth materials come from the natural decay products of three primary elements, uranium, thorium, and potassium. The purpose of radiometric surveys is to determine either the absolute or relative amounts of U, Th., and K in surface rocks and soils.

## 3.0 Survey Operations:

Precision GeoSurveys flew the Strike property using a Bell 206 BIII Jet Ranger (Figure 3). The survey lines were flown at a nominal line spacing of one hundred (100) meters and the tie lines were flown at 1 km spacing for both the spectrometer and magnetometer as they were acquired simultaneously. The average survey elevation was 34.8 meters vertically above ground. The experience of the pilot helped to ensure that the data quality objectives were met and that the safety of the flight crew was never compromised given the potential risks involved in airborne surveying.



Figure 3: Bell 206 Jet Ranger equipped with mag stinger for magnetic data acquisition.

The base of operations for this survey was 192 km away in Carmacks, YT. The Precision crew consisted of a total of two members:

Harmen Keyser - Pilot

Chris Brown – Geophysicist/operator

The survey took place on October 24 and October 25, 2009. The survey was completed without any equipment issues, but the crew did experience some inclement weather and were unable to fly full days.

#### 4.0 Equipment:

For this survey a magnetometer, spectrometer and a data acquisition system were required to carry out the survey and collect quality, high resolution data.

#### 4.1 AGIS:

The Airborne Geophysical Information System, AGIS, (Figure 4), is the main computer used in data recording, data synchronizing, displaying real-time data for the operator to QC, pilot navigation and pilot display information.



Figure 4: AGIS installed in the Bell 206.

The AGIS was manufactured by Pico Envirotec; therefore the system uses standardized MS Windows-based Pico software and external sources are connected to the system via RS-232 serial communication cables. The AGIS data format is easily converted into Geosoft or ASCII file formats by a supplied conversion program called PEIView. Additional Pico software allows for post survey quality control procedures.

## 4.2 Spectrometer:

The IRIS, or Integrated Radiometric Information System is a fully integrated, gamma radiation detection system containing two downward facing NaI detecting crystals for a total volume of 8.4 litres (figure 5). Real time data acquisition, navigation and communication tasks are integrated into a single unit that is installed in the rear of the aircraft as indicated below. Information such as total count, counts of various elements (K, U, Th, etc.), temperature, barometric pressure, atmospheric humidity and survey altitude can all be monitored on the AGIS screen for immediate QC. All the radiometric data are recorded at 1 Hz.



Figure 5: IRIS strapped into the cargo box of the helicopter.

## 4.3 Magnetometer:

The magnetometer used by Precision GeoSurveys is a Scintrex cesium vapor CS-3 magnetometer. The system was housed in a front mounted “stinger” (Figure 6). The CS-3 is a high sensitivity/low noise magnetometer with automatic hemisphere switching and a wide voltage range, the static noise rating for the unit is +/- 0.01 nT. On the AGIS screen the operator can view the raw magnetic response, the magnetic fourth difference and the survey altitude for immediate QC of the magnetic data. The magnetic data are recorded at 10 Hz. A magnetic compensator is also used to remove noise created by the movement of the helicopter as it pitches, rolls and yaws within the Earth’s geomagnetic field.



Figure 6: View of the mag stinger.

## 5.0 Data Processing:

After all the data are collected after a survey flight several procedures are undertaken to ensure that the data meet a high standard of quality. All data were processed using Pico Envirotec software and Geosoft Oasis Montaj geophysical processing software.

### 5.1 Magnetic Processing:

During aeromagnetic surveying noise is introduced to the magnetic data by the aircraft itself, movement in the aircraft (roll, pitch and yaw) and the permanent magnetization of the aircraft parts (engine and other ferric objects) are large contributing factors to this noise. To remove this noise a process called magnetic compensation is implemented. The magnetic compensation process starts with a test flight at the beginning of the survey where the aircraft flies in the four orthogonal headings required for the survey ( $50^{\circ}/230^{\circ}$  and  $140^{\circ}/320^{\circ}$  in the case of this survey) at an elevation where there is no ground effect in the magnetic data. In each heading roll, pitch and yaw maneuvers are performed by the pilot, these maneuvers provide the data that is required to calculate the necessary parameters for compensating the magnetic data. A computer program called PEIComp is used to create a model for each survey to remove the noise induced by aircraft movement; this model is applied to each survey flight so the data can be further processed.

A magnetic base station is set up before every flight to ensure that diurnal activity is recorded during the survey flights. Precision GeoSurveys uses a Geometrics 858 base station and sampled at 0.1Hz. Base station readings were reviewed at regular intervals to insure that no data were collected during periods with high diurnal activity (greater than 5 nT per minute). The base station was installed at a magnetically noise-free area, away from metallic items such as steel objects, vehicles, or power lines. The magnetic variations recorded from the stationary base station are removed from the magnetic data recorded in flight to ensure that the anomalies seen are real and not due to solar activity.

Some filtering of the magnetic data is also required. A Non Linear filter was used for spike removal. The 1D Non-Linear Filter is ideal for removing very short wavelength, but high amplitude features from data. It is often thought of as a noise spike-rejection filter, but it can also be effective for removing short wavelength geological features, such as signals from surficial features. The 1D Non-Linear Filter is used to locate and remove data that are recognized as noise. The algorithm is 'non-linear' because it looks at each data point and decides if that datum is noise or a valid signal. If the point is noise, it is simply removed and replaced by an estimate based on surrounding data points. Parts of the data that are not considered noise are not modified. The combination of a Non-Linear filter for noise removal and a low pass trend enhancement filter resulted in level data as indicated in the results section of this report. The low pass filters simply smoothes out the magnetic profile to remove isolated noise.

A lag correction was applied to the total magnetic field data to compensate for the lag in the recording system as the magnetometer sensor flies 6.45 m ahead of the GPS antenna.

Following a lag correction of 1.7 seconds, a low-pass filter equivalent to 1 second was then applied to the lag corrected data.

## 5.2 Radiometric Processing:

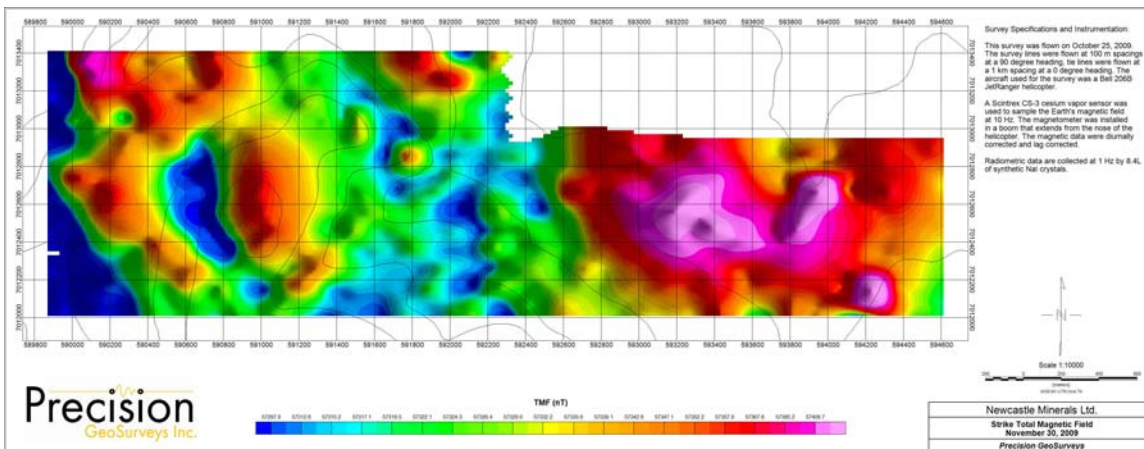
Radiometric data are processed by windowing the full spectrum to create channels for U, K, Th and total count. The data are then lightly filtered and corrected for survey altitude at standard temperature and pressure. Background radioactive contributions from the aircraft, cosmic radiation and atmospheric radon must also be removed. Finally the data are corrected by removing spectral overlap; this is done using the striping ratios that have been calculated for the spectrometer by prior calibration, this breaks the corrected elemental values down to the apparent radioelement concentrations.

## 5.3 Final Data Format

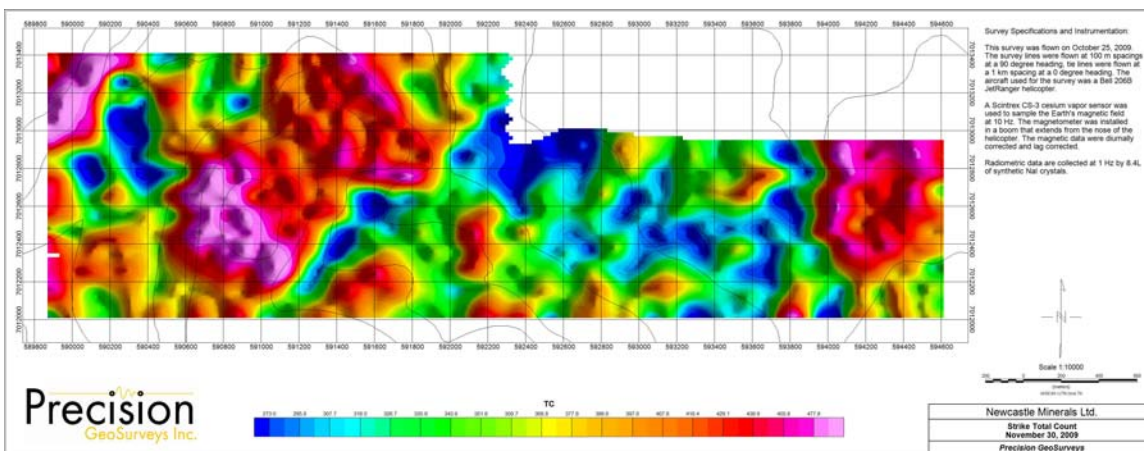
X – Easting in NAD83, UTM zone 7N  
Y – Northing in NAD83, UTM zone 7N  
utctime – UTCTime  
basemag – diurnal data  
mag – total magnetic field  
lalt – laser altimeter readings  
tc\_cor – corrected total count  
eK – percent potassium  
eU – equivalent uranium  
eTh – equivalent thorium

The file format will be provided in two (2) formats, the first will be a .GDB file for use in Geosoft Oasis Montaj, the second format will be a .XYZ file, this is text file. Two separate files will be provided for each format, one for the magnetic and one for the radiometrics.

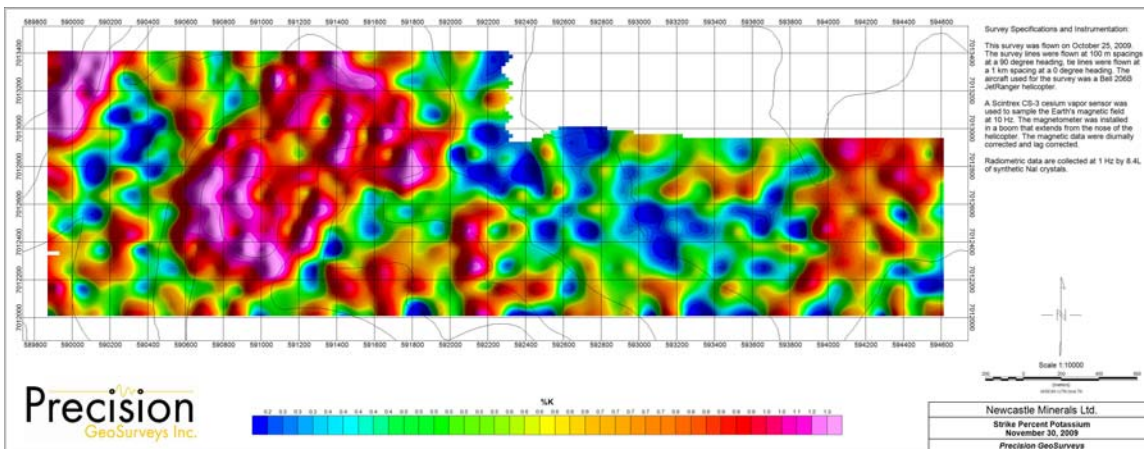
## Appendix A Maps



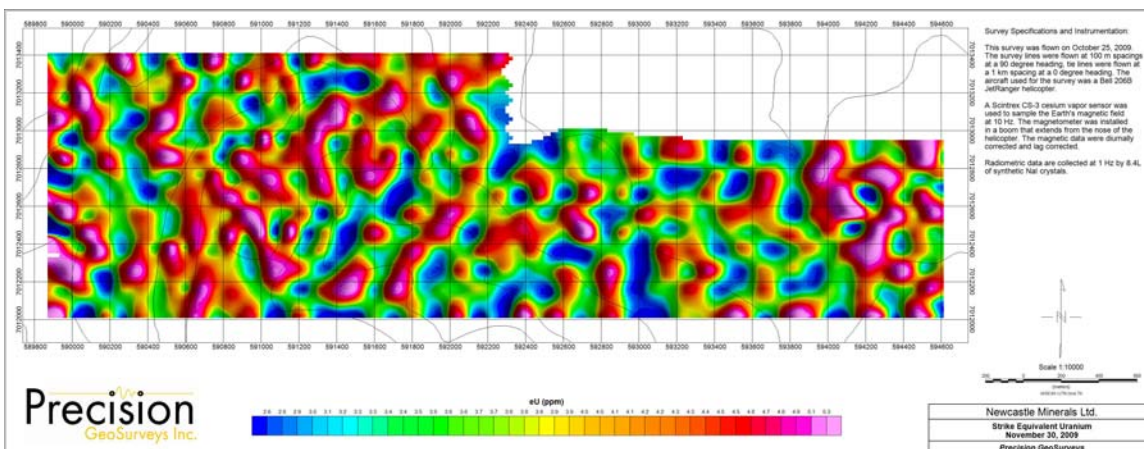
Map 1: Strike total magnetic field.



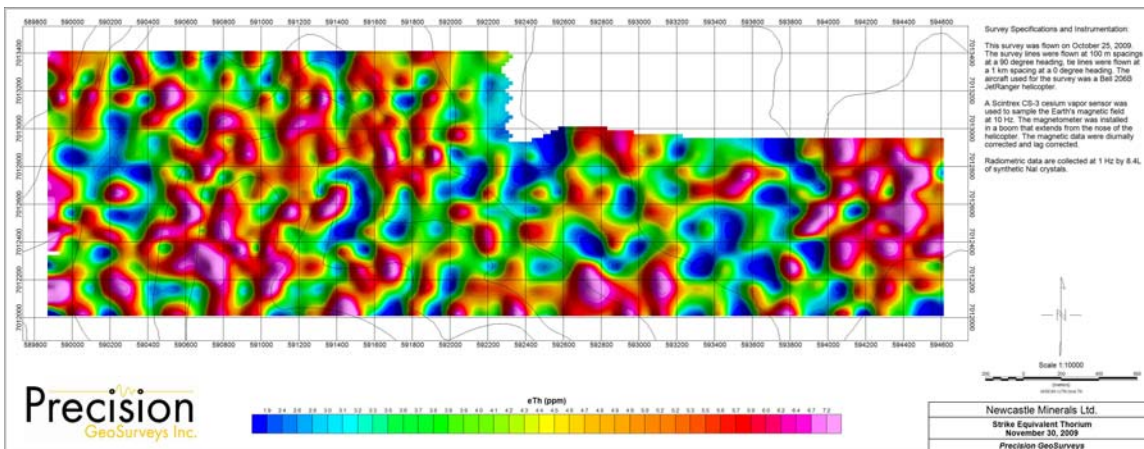
Map 2: Strike total count radiometrics



Map 3: Strike percent potassium



Map 4: Strike equivalent uranium



Map 5: Strike equivalent thorium