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ASSESSMENT REPORT

describing

AIRBORNE GEOPHYSICS, MAPPING AND PROSPECTING

at the

DOLORES PROPERTY

Dolores 1-48 YB29240-YB29287

NTS 106C/14

Latitude 64°56'N; Longitude 133°17'W

in the

Mayo Mining District
Yukon Territory

prepared by

Archer, Cathro & Associates (1981) Limited

for

CASH MINERALS LTD.

and

TWENTY-SEVEN CAPITAL CORP.

by

Matthew R. Dumala, B.A.Sc., EIT
December 2006

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INTRODUCTION

The Dolores property hosts copper and cobalt mineralization in and adjacent to discordant breccia bodies and uranium in younger veins and fractures. Twenty-Seven Capital Corp. and Cash Minerals Ltd. optioned the property from Pamicon Developments Ltd. and Equity Engineering Ltd. in October 2005. The property is being explored under terms of the Yukon Uranium Project.

The 2006 exploration program was managed by Archer, Cathro & Associates (1981) Limited. Work was conducted between June 18 and September 15 from a camp located on the adjoining Lumina property. The author participated in the work and his Statement of Qualifications appears in Appendix I.

PROPERTY LOCATION, CLAIM DATA AND ACCESS

The property is located in east-central Yukon Territory at latitude 64°56'N and longitude 133°17'W on NTS map sheet 106C/14 (Figure 1). It comprises a total of 48 mineral claims covering approximately 960 hectares. The claims were staked under the Yukon Quartz Mining Act and are registered with the Mayo Mining Recorder in the name of Archer Cathro which holds them in trust for Twenty-Seven Capital. Claim registration data are summarized below while the locations of individual claims are shown on Figure 2.

<u>Claim Name</u>	<u>Grant Number</u>	<u>Expiry Date*</u>
Dolores 1-48	YB29240-YB29287	December 31, 2006

*expiry date does not include 2006 work which has not yet been filed for assessment credit.

The Dolores property is located 195 km northeast of the village of Mayo, which is accessible via the Yukon highway system using the Klondike Highway and Silver Trail. Mayo is situated 407 km by road north of Whitehorse. The closest road access to the property is at McQuesten Lake which lies 87 km northeast of Mayo and 135 km southwest of Lumina. From McQuesten Lake, the Wind River Trail, an abandoned winter road, extends northward to the Peel Basin. A cat trail branches off the winter road and leads directly to the property. The Dolores Creek airstrip is located on the Lumina property.

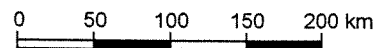
Access to the property in 2006 was accomplished using Hughes 500D and Bell 206B helicopters based in the Lumina camp and operated by Fireweed Helicopters of Whitehorse. Airborne radiometrics were done using an AStar B2 helicopter based out of the Lumina camp and operated by Trans North Helicopters of Whitehorse. Fuel, equipment and personnel were flown from Mayo to the Dolores Creek airstrip using a Britten-Norman Islander operated by Sifton Air of Haines Junction.

**CASH MINERALS LTD.
TWENTY-SEVEN CAPITAL CORP.**

FIGURE 1

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

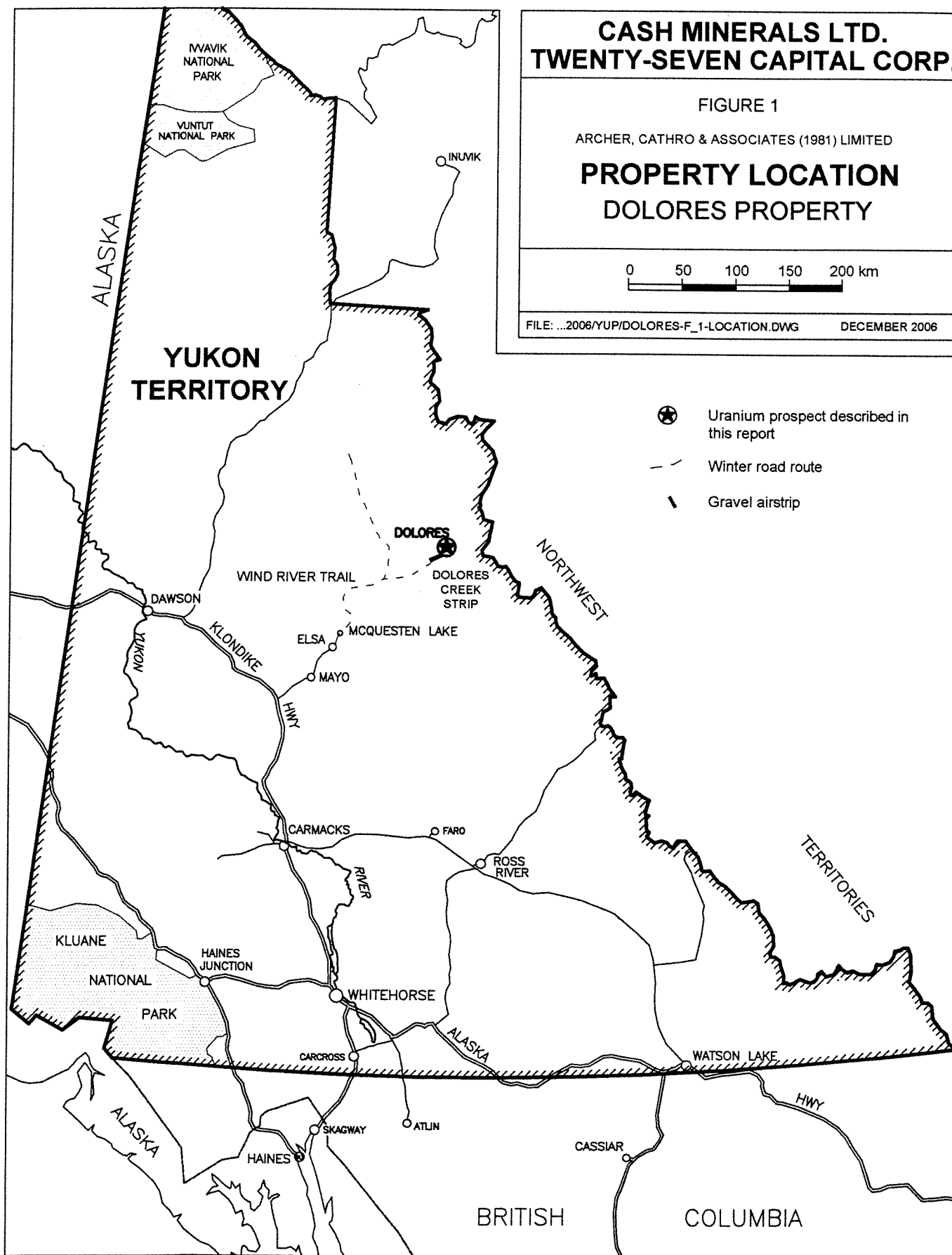
**PROPERTY LOCATION
DOLORES PROPERTY**

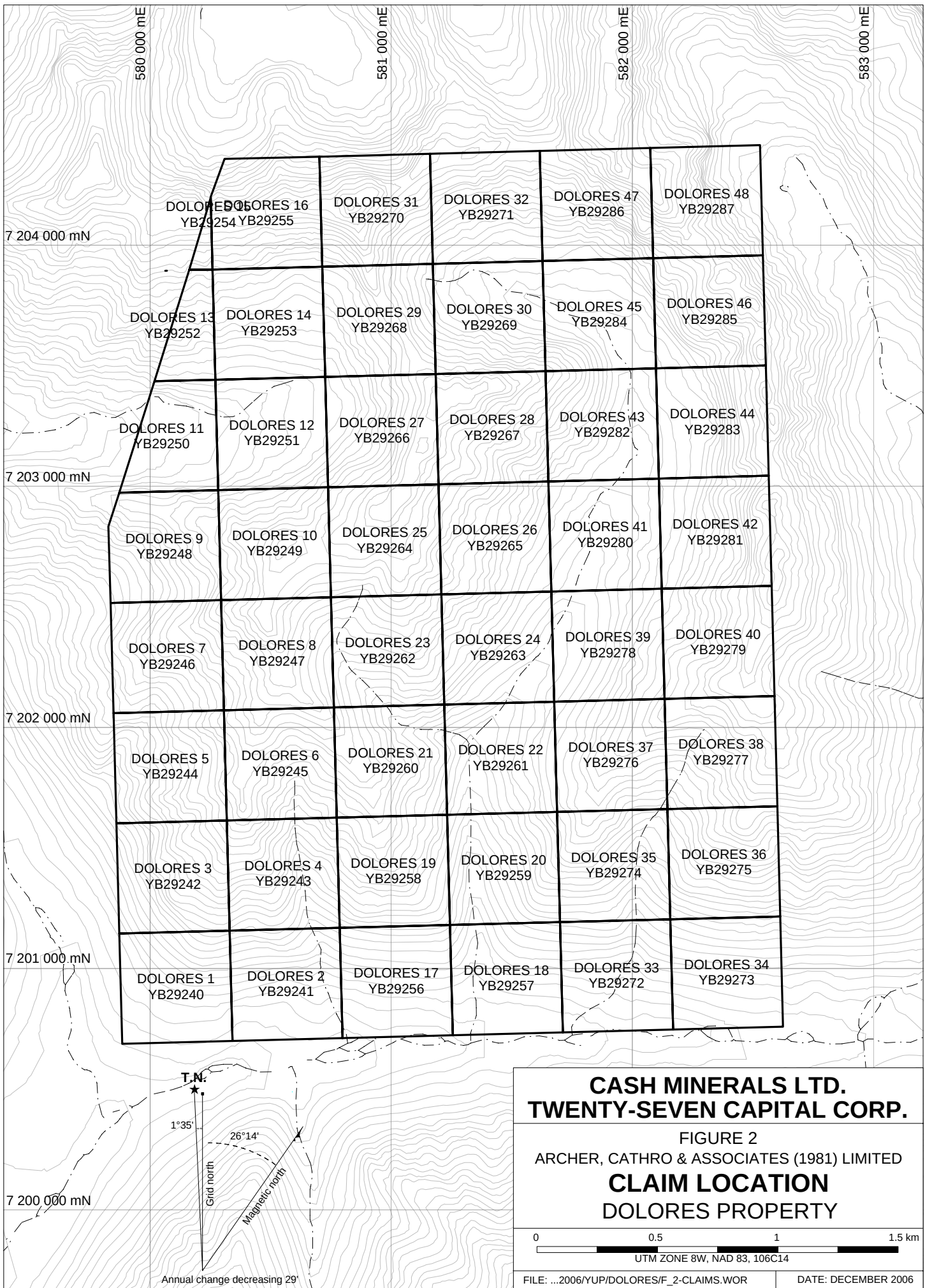


FILE: ...2006/YUP/DOLORES-F_1-LOCATION.DWG

DECEMBER 2006

-  Uranium prospect described in this report
-  Winter road route
-  Gravel airstrip





HISTORY

Regional

The first report of mineralization in the Wernecke Mountains was the discovery of hematite rich float in river gravels by prospectors enroute to the Klondike Goldfields in 1898. A few copper and gold prospects were identified and staked prior to the 1960s, but no serious exploration was undertaken. Following discovery of the Crest Iron Deposit by California Standard Company Ltd. in 1961, several hematite bodies were staked and briefly explored. This wave of exploration coupled with improved access spurred by construction of the Wind River Trail led to new copper discoveries in the mid 1960s, some of which were drilled or bulldozer trenched (Deklerk and Traynor, 2004).

Uranium was first discovered in the Wernecke Mountains in 1974 at the Igor property by Ogilvie Joint Venture (Chevron Canada Ltd., Marietta Resources International Ltd. and Aquitaine Company of Canada Ltd.). The following summer Wernecke Joint Venture (Chevron and Aquitaine) conducted helicopter borne radiometric reconnaissance throughout the district and staked a number of other properties based on ground radiometric follow up. Most of these occurrences are associated with large iron-oxide rich breccia bodies that are informally known as the Wernecke Breccias. Eldorado Nuclear optioned Wernecke Joint Venture's properties and regional exploration rights in 1976. It conducted property and regional exploration in 1976 and 1977 along with a number of other companies, notably Noranda Minerals Ltd. and Pan Ocean Oil Ltd. Wernecke Joint Venture resumed exploration in 1978 after Eldorado Nuclear began to drop its optioned properties. Systematic uranium exploration by various parties continued in the Wernecke Mountains until 1982, when uranium prices fell (Eaton and Wober, 2005).

Another wave of regional and property exploration occurred in the mid 1990s when Westmin Resources Ltd. and Newmont Mining Corp. explored some of the Wernecke Breccias for copper and gold using the IOCG model.

Property

Copper mineralization at the Discovery and Porphyry Showings (located on what is now the Dolores property) was first staked in 1967 by Nordex Exploration Limited, which later became Bonnet Plume Minerals. Work on these showings was performed between 1967 and 1969 and included mapping, prospecting, ground magnetic surveys, geochemical sampling and diamond drilling (Archer, 1967, Szetu, 1967 and Taylor, 1967). A total of seven diamond drilling holes totalling 609.9 m were completed at the Porphyry Showing in 1969.

In 1975 the area was partially restaked by Wernecke Joint Venture, which conducted helicopter borne and ground radiometric prospecting later that year and, through its option with Eldorado Nuclear, in 1976.

Pamicon Developments and Equity Engineering restaked both showings as part of the Dolores property in 1992. The claims were transferred to Newmont Exploration Limited in 1995 which conducted a work program based on the IOCG model. Newmont completed airborne

radiometrics and magnetics, mapping, geochemical sampling and three diamond drill holes totalling 337.4 m in 1997 in the southwest corner of the Dolores property, near the Porphyry showing (Montgomery, 1998).

PHYSIOGRAPHY AND GEOMORPHOLOGY

The Dolores property is located in a rugged alpine setting along the divide between the Bonnet Plume and Snake River systems. It is centred on Discovery Creek, which flows south into the Wind River via Dolores Creek. Local elevations range from 2160 m atop a peak located in the northern part of the property to 1100 m on the valley floor to the southwest. The entire property is above tree line. Vegetation is restricted to grass and scattered buckbrush along creeks and lichen at higher elevations.

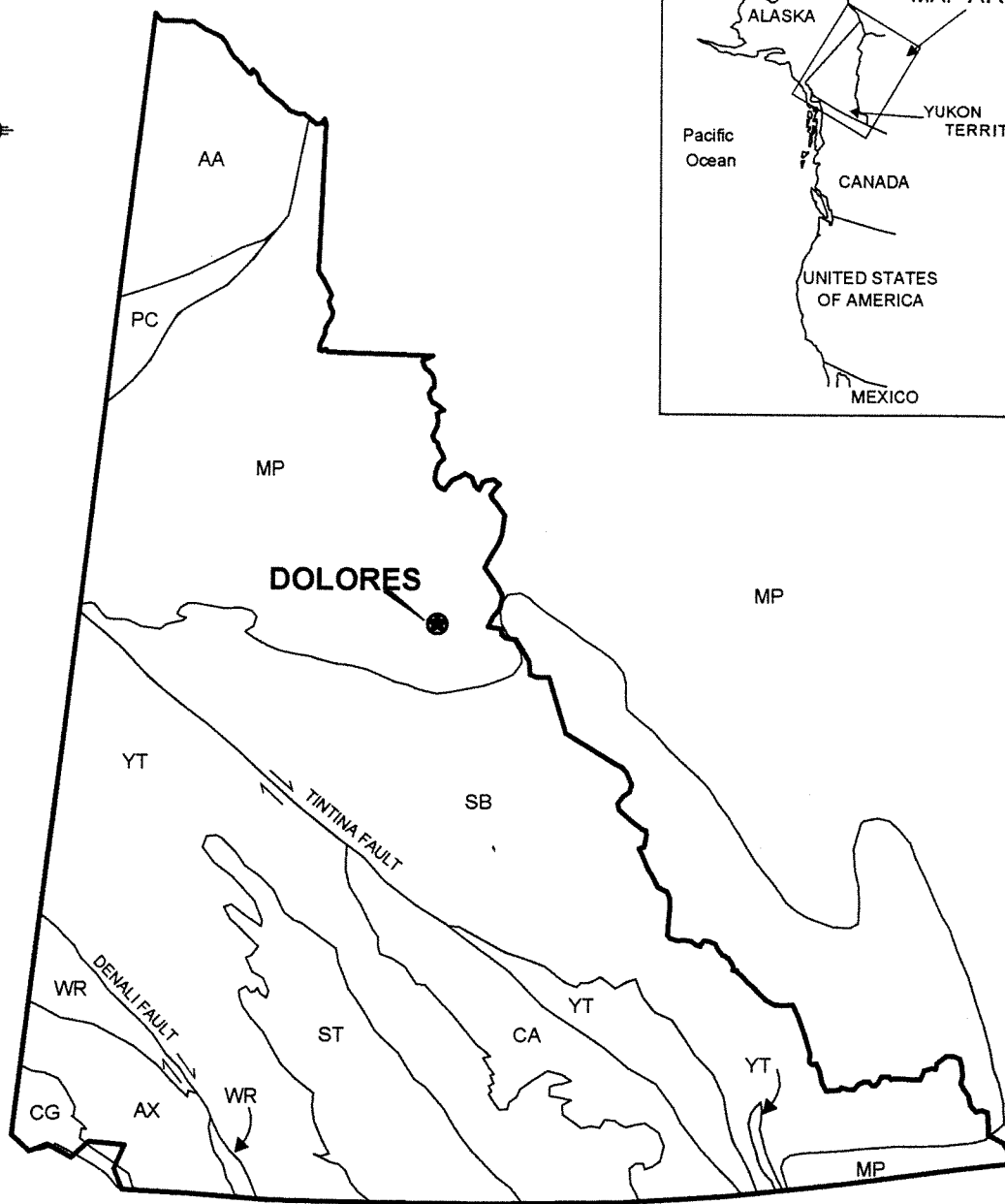
There are few suitable campsites on the property but water is a problem at most of them. Only creeks near the southern edge of the property contain enough water for camp and drill purposes.

The climate in the Wernecke Mountains is typical of northern continental regions with long, cold winters, truncated fall and spring seasons and short, cool summers. Average temperatures in January are about -25°C and in July about 10°C . Total annual precipitation is approximately 30 cm, mostly occurring as rain during the summer months. Maximum snow pack averages about 40 cm. Although summers are relatively mild, arctic cold fronts occasionally cover the area and snowfall can happen in any month. Sunlight ranges from 22 hours per day in late June to approximately six hours per day in late December. The property is relatively snow-free from early June until late September.

REGIONAL GEOLOGY

The Dolores property lies within the Mackenzie Platform tectonic element inside a 2500 sq km window of Proterozoic age rocks that is surrounded by Paleozoic and Mesozoic sediments (Figure 3). This window is the largest in a series of similar windows that stretch westerly across central Yukon from the Northwest Territories to Alaska (Figure 4). The Proterozoic rocks are predominantly fine grained clastic sedimentary rocks with lesser carbonate rich units, rare volcanic flows, scattered intrusive dykes of varying ages and widespread, discordant breccia bodies (Wernecke Breccias), which comprise about 3 to 5% of the rocks in each window (Delaney, 1981). Recent mapping and age determinations suggest that the Proterozoic sedimentary rocks are about 1850 to 1750 million years old and that the breccia bodies were formed about 1600 Ma (Thorkelson, et al., 2001a). These ages closely resemble those of similar units in Australia, which has led to speculation that Laurentia (North America) and Australia were once joined and that the breccia bodies were formed during initial rifting (Bell and Jefferson, 1987 and Thorkelson, et al., 2001a). The various intrusive dyke sets in the Wernecke Mountains have been dated at 1710, 1380, 1270 and 613 Ma (Thorkelson, et al., 2001b and Delaney, 1981).

The Dolores property is located within the Lower Proterozoic Wernecke Supergroup, a conformable marine sequence approximately 13 km thick comprised of sediments belonging to the Fairchild Lake Group, Quartet Group and Gillespie Lake Group. Regional mapping by



ANCESTRAL NORTH AMERICA

- MP** Mackenzie Platform
- SB** Selwyn Basin

TERRANES Displaced Continental Margin

- AA** Arctic Alaska
- CA** Cassiar
- PC** Porcupine

Pericratonic Terranes

- YT** Yukon-Tanana / Slide Mountain

ACCRETED TERRANES

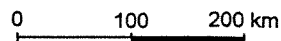
- ST** Stikinia / Cache Creek
- AX** Alexander
- WR** Wrangellia
- CG** Chugach

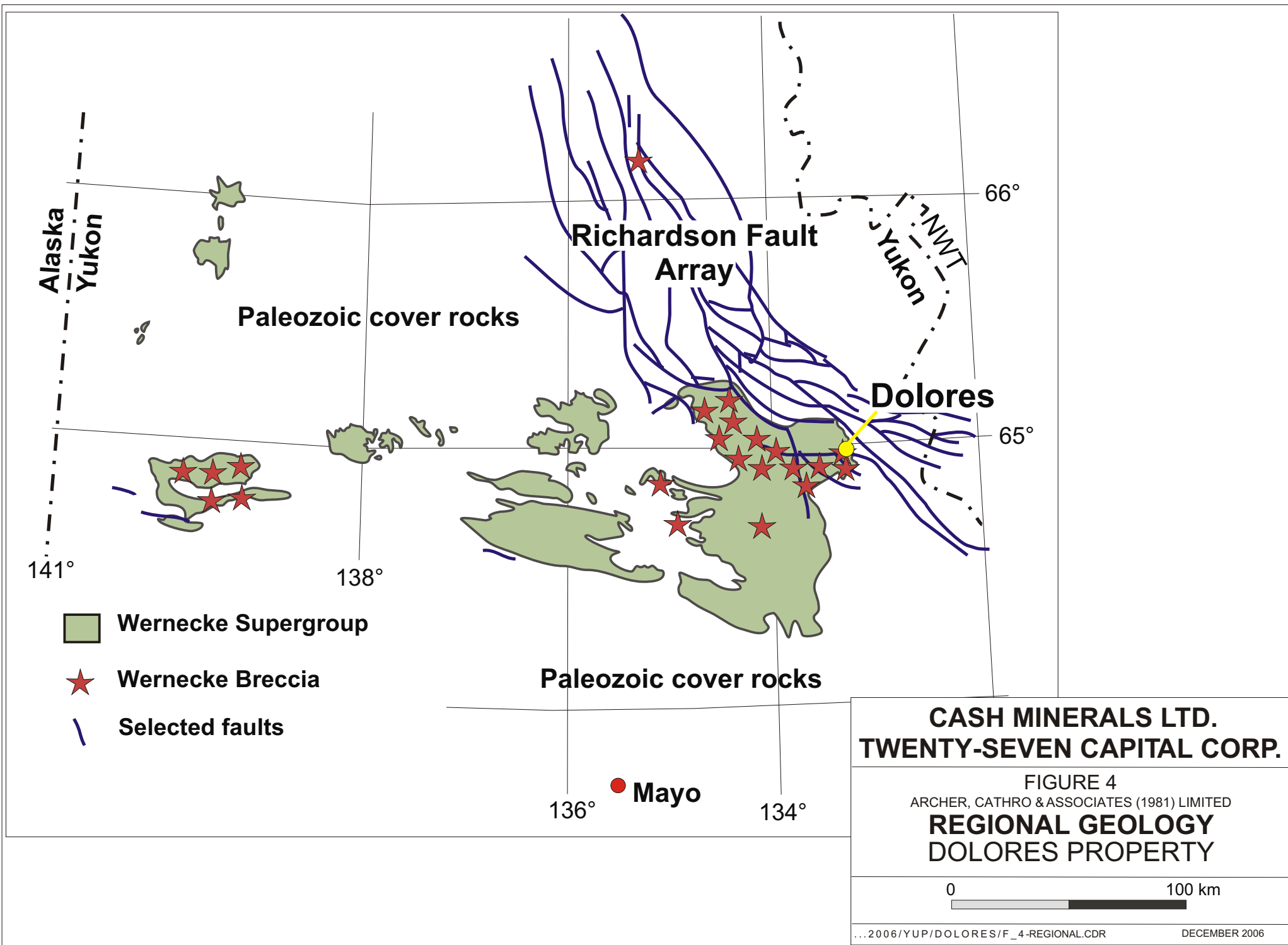
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FIGURE 3

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

TECTONIC SETTING DOLORES PROPERTY





Thorkelson and Wallace (1998) has placed a large north-south striking fault immediately west of the property, with Quartet Group rocks to the west and Fairchild Lake Group rocks to the east of the fault. Younger sedimentary rocks unconformably overlie the Wernecke Supergroup to the east. These include rocks belonging to the Upper Proterozoic Windermere Supergroup, Middle to Upper Proterozoic Hematite Creek Group and Middle Proterozoic Pinguicula Group.

The Wernecke Breccias have attracted considerable academic and economic interest because of their abundance, size and characteristic mineralogy, which in many respects resemble those in similar age breccia bodies found in Australia (Hitzman, et al., 1992). The breccia bodies are closely related to large scale faults. They vary from irregularly shaped pipes up to 5000 m in diameter to tabular bodies a few metres wide. Their compositions typically range from: clast supported phases dominantly comprised of angular homolitic clasts; through matrix supported phases with subangular to rounded, variously altered clasts; and, to occasional clast deficient phases that are thought to have been channelways with high fluid flow. The breccia clasts are usually derived from adjacent sedimentary units but also include rare intrusive fragments. Up to 100 m diameter blocks of unbrecciated sediment occur in some breccia bodies. Dolomite, ankerite, sericite, hematite and chlorite are the most abundant matrix materials, but albite, potassium feldspar, calcite, magnetite, barite, quartz, pyrite and chalcopyrite are also common. The size of breccia bodies and intensity of alteration generally increases with depth.

The sedimentary rocks typically exhibit greenschist facies regional metamorphism and were affected by the Racklan, Corn Creek and Laramide Orogenies. Several generations of faults are present, many of which are associated with a very old set of westerly, northwesterly and northerly trending structures called the Richardson Fault Array (Delaney, 1981). In the immediate vicinity of the Dolores property the strongest faults exhibit northerly strikes with steep westerly dips or easterly strikes with near vertical dips. Some researchers have suggested that faults played important roles in breccia formation (Delaney, 1981 and Bell, 1986). However, many of the structures are clearly much younger or reactivated later because they juxtapose Proterozoic and Paleozoic units.

The following table briefly describes the major lithological units in vicinity of the property.

Table I: Regional Lithological Descriptions

STRATIFIED UNITS

QUATERNARY

Alluvium, colluvium and glacial deposits.

QUATERNARY

Continental clastic sediments including coal measures.

-UNCONFORMITY-

PALEOZOIC

Marine clastic and carbonate sedimentary rocks.

-UNCONFORMITY-

UPPER PROTEROZOIC

Marine sediments including carbonate, arenite, pebble conglomerate, siltstone and shale.

UPPER PROTEROZOIC

Windermere Supergroup: a conformable marine sequence consisting of basal Sayunei Formation, Shezal Formation, Profeit Dolostone, Twitya Formation, Keele Formation and upper Sheepbed Formation. Sayunei Formation is thick bedded to massive sandstone and conglomerate. Shezal Formation consists of massive diamictite. Profeit Dolostone is massive to thick bedded dolostone. Twitya Formation is comprised of thin bedded siltstone interbedded with sandstone, conglomerate and dolostone. Keele Formation is predominately thin bedded to massive micritic dolostone. Sheepbed Formation is recessive shale and siltstone.

MIDDLE TO UPPER PROTEROZOIC

Hematite Creek Group: medium to thick bedded dolostone with interbedded shale, siltstone, limestone and quartz arenite.

MIDDLE PROTEROZOIC

Pinguicula Group: a conformable marine sequence consisting of dolomite, limestone and thin bedded siltstone and shale.

-UNCONFORMITY-

LOWER PROTEROZOIC

Wernecke Supergroup: – a conformable marine sequence approximately 13 km thick consisting of basal Fairchild Lake Group, middle Quartet Group and upper Gillespie Lake Group. Fairchild Lake Group is predominantly siltstone and limy siltstone with minor slate and dolostone. Quartet Group is deeper water shale, siltstone and very fine sandstone. Gillespie Lake Group is dolostone and silty dolostone with minor shale and siltstone.

DISCORDANT AND INTRUSIVE UNITS

LOWER PROTEROZOIC TO CAMBRIAN

Various narrow dykes of mafic to intermediate composition including lamprophyres.

MIDDLE PROTEROZOIC

Wernecke Breccia: discordant hematitic breccia largely comprised of variably metasomatized country rock fragments. Contacts can be sharp or gradational. Breccias can include three gradational phases – homoclastic, heteroclastic or clast deficient. Homoclastic breccias consist of angular, lithologically similar fragments with minor carbonate- and hematitic-rich matrix. Heteroclastic breccias consist of rounded, lithologically diverse fragments supported by a more complex matrix commonly containing carbonate, hematite, magnetite, chlorite, pyrite, chalcopyrite and/or barite. Clast deficient breccias are found in late tabular zones or pipes and are comprised of typical heteroclastic matrix minerals with only a few small wallrock fragments.

EARLY PROTEROZOIC

Bonnet Plume River Intrusions: dykes, stocks and megaclasts of fine to medium grained diorite to gabbro.

REGIONAL MINERALIZATION

The Wernecke Breccias are notably enriched in iron, copper, uranium, gold, cobalt, barium and molybdenum and slightly enriched in rare earth elements. Iron oxide mineralization is ubiquitous in the Wernecke Breccias. Magnetite is most abundant in prograding alteration sequences. It normally occurs as disseminated euhedral grains but locally forms semi massive

bands up to 5 m thick. Hematite is found in all breccia phases but is best developed in retrograde alteration assemblages where it appears as specular hematite and as martite replacing magnetite.

Pyrite can occur with the iron oxide minerals but becomes more abundant deeper in the system, particularly within breccia bodies cutting Fairchild Lake Group strata. Iron bearing carbonate minerals such as ferroan dolomite and siderite are also common.

Copper is present in most Wernecke Breccias. Disseminated chalcopyrite is found in breccias cutting Fairchild Lake Group rocks, where it is associated with intense albite alteration, and in those cutting Quartet Group rocks, where it is found in strongly carbonate altered zones. Semi massive chalcopyrite occurs with breccia matrix minerals in late stage channelways within some breccia bodies. Quartz-carbonate veins are reported within the Fairchild Lake Group, Quartet Group and Gillespie Lake Group. These veins often contain chalcopyrite and pyrite. Other copper minerals (chalcocite, bornite and copper carbonate minerals) have been reported in weathered rocks but no significant supergene enrichment has been identified.

Uranium occurs in three main forms in the Wernecke Mountains. Brannerite appears as scattered blebs within most Wernecke Breccias and in quartz veins and fractures peripheral to them. Although pockets of coarse crystals up to 40 cm across have been discovered, no economically significant brannerite occurrence has been identified. Pitchblende is the main uranium mineral in the other two types of showings: (1) uraniferous carbonate-chalcopyrite-barite-magnetite assemblages within late stage channelways in Wernecke Breccias (Hitzman, 1990 and Eaton and Archer, 1982) and (2) much younger structurally controlled uraniferous veins that are most common immediately below major unconformities (Eaton and Archer, 1982).

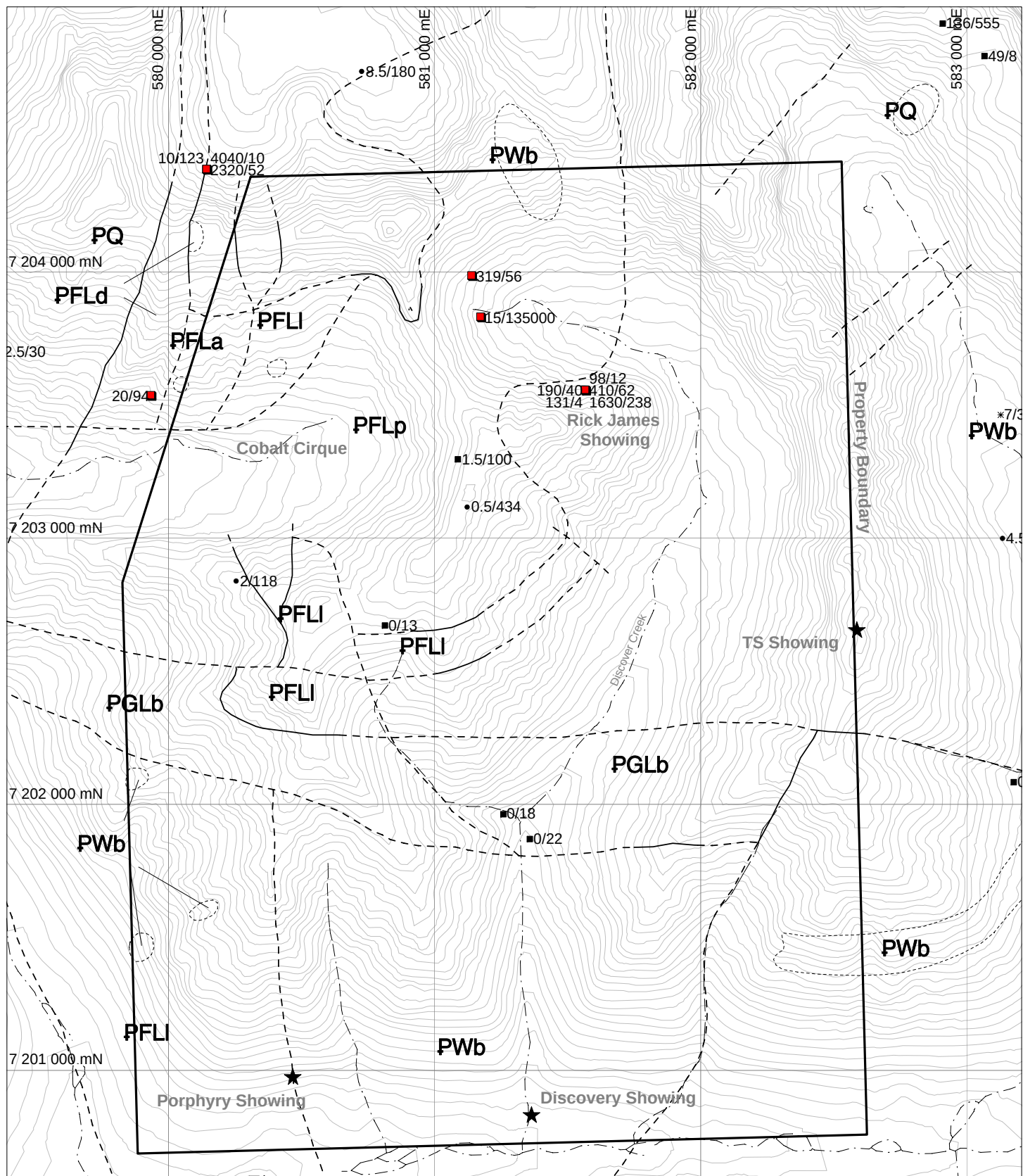
PROPERTY GEOLOGY

The Dolores property covers strongly faulted Wernecke Supergroup and Wernecke Breccia (Figure 5). Faults on the property generally strike northerly and dip steeply west. Wernecke Breccias underlie the core of the property, while Fairchild Lake Group sediments comprise much of the northwest corner. The main lithologies are described in the following paragraphs from oldest to youngest.

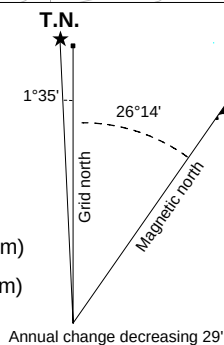
Fairchild Lake Group consists of pale green to spotted green phyllite with minor interbedded dolomite, and slightly younger, wavy banded, green argillite and brown weathering argillaceous limestone.

Quartet Group comprises medium grey to black, interbedded argillite, slate and fine quartzite which are frequently bleached to pale green adjacent to breccia bodies. Contacts between the breccia bodies and sediments are often gradational. This unit is located immediately northwest of the property.

Gillespie Lake Group occur immediately east and southeast of the property and consists of orange-brown weathering dolomite.

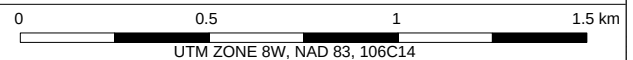


- PWb** Wernecke Breccia
PGL Gillespie Lake Group
PGLb Basal Gillespie Lake Group
PQ Quartet Group
PFL Fairchild Lake Group
PFLd siliceous
PFLa argillite
PFLI limestone
PFLp phyllite
- 2006 rock sample (U/Cu ppm)
■ WJV rock sample (U/Cu ppm)



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FIGURE 5 ARCHER, CATHRO & ASSOCIATES (1981) LIMITED GEOLOGY AND MINERALIZATION DOLORES PROPERTY



FILE: ...2006/YUP/DOLORES/F_5-GEO.WOR

DATE: DECEMBER 2006

Wernecke Breccias form a 1500 m wide body, which extends from south of the property to beyond the northeast corner. The breccias have been subdivided in two types: homoclastic and heteroclastic. The homoclastic breccias exhibit gradational contacts with surrounding wallrocks but show sharp contacts with heteroclastic assemblages. Typical homoclastic breccias consist of angular to subangular fragments with minor carbonate and specular hematite matrix. All of the clasts resemble adjacent wallrocks. Heteroclastic breccias are composed of variably altered subrounded fragments supported by a matrix of carbonate and hematite with minor quartz and chlorite. Some of the fragments exhibit lithologies and alteration not observed in adjacent wallrocks.

Mafic dykes and sills of uncertain age have been mapped peripheral to the property. They are not common and rarely exceed 5 m in width. The intrusions have sharp contacts with wallrocks and are not surrounded by alteration halos. They weather green or green-grey and range from diabase to gabbro in composition.

PROPERTY MINERALIZATION AND GEOCHEMISTRY

The Dolores property contains abundant copper and lesser cobalt mineralization. Significant gold and silver values are often associated with both copper and cobalt, while anomalous nickel values can occur with cobalt rich samples. Chalcopyrite is the dominant copper sulphide with lesser amounts of bornite (Owerko, 1995).

The Discovery Showing, located at the mouth of Discovery Creek (Figure 5), contains narrow quartz-carbonate vein copper mineralization within Gillespie Lake Group carbonates. A chip sample take over 2.8 m returned 6.91% copper and 10.0 ppm silver. A grab sample from this showing assayed 32.4% copper and 36.0 ppm silver (Caulfield, et al., 1994).

Significant copper mineralization occurs within what has been described as a syenite stock, diorite and heterolithic breccia at the Porphyry showing, located northwest of the Discovery showing. The syenite is most likely an intensely potassium feldspar altered breccia. Chalcopyrite occurs as evenly distributed disseminated grains and less frequently fracture coatings. Diamond drilling in 1969 intersected 0.75% copper over 22.9 m and 0.5% copper over 7.9 m (Caulfield, et al., 1993).

The TS Showing, located along the eastern property boundary, occurs as blebby disseminations and veinlets of bornite and chalcopyrite locally associated with magnetite. A chip sample taken here assayed 0.618% copper and 27.0 ppm silver over 4 m (Caulfield, et al., 1994).

At the head of Cobalt Cirque, a broad 500 by 500 m area reportedly contains discontinuous high grade copper and cobalt mineralization with lesser nickel and gold. The mineralization is associated with sericite, iron carbonate and quartz alteration and veining. Chalcopyrite, cobaltite and minor pyrite appear as blebs and crystal masses. Secondary minerals include erythrite, malachite and abundant manganese oxide. The mineralization appears to be conformable to the main foliation. Grab samples assayed up to 21.4% copper, 6.6% cobalt, 8860 ppm nickel and 2.82 g/t gold. Contour soil samples collected by Newmont in 1995 in this area returned a number of strongly anomalous copper assays (>2000 ppm).

Disseminated chalcopyrite and lesser cobaltite also occur within Fairchild Lake Group sediments at the head of Discovery Creek. Secondary minerals include erythrite and malachite. This mineralization appears similar to that found in Cobalt Cirque, approximately 500 m to the southeast. Contour soil sampling by Newmont in 1995 also returned a number of anomalous copper assays (>2000 ppm) in this area.

Prospecting and mapping in 2006 relocated several mineralized outcrops near the head of Discovery Creek. Disseminated chalcopyrite with minor malachite and erythrite were found within a finely laminated phyllite located along the headwall of Discovery Cirque. A grab sample collected from this area assayed 15 ppm uranium, 920 ppm cobalt, 28.3 ppm silver and 13.5% copper.

A radioactive outcrop, the Rick James Showing, was located along the south wall of Discovery Cirque, approximately 700 m southeast of the showing described immediately above. This outcrop lies within altered phyllite immediately below a faulted contact with the Wernecke Breccias. The fault obliquely cuts across an east-west trending cliff. Radioactivity averages 2000 cps over a 5 m diameter area containing highs up to 10000 cps over 1 m. This exposure is located at the base of the cliff. Its downhill projection is covered by thick talus. Visually similar exposures are located further uphill; however, they are inaccessible. Five chip samples were taken from the radioactive exposure with the best returning 0.19% U_3O_8 over 1 m.

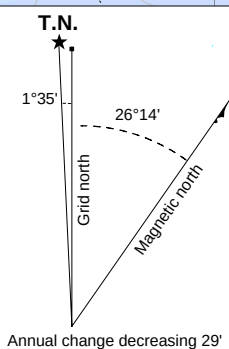
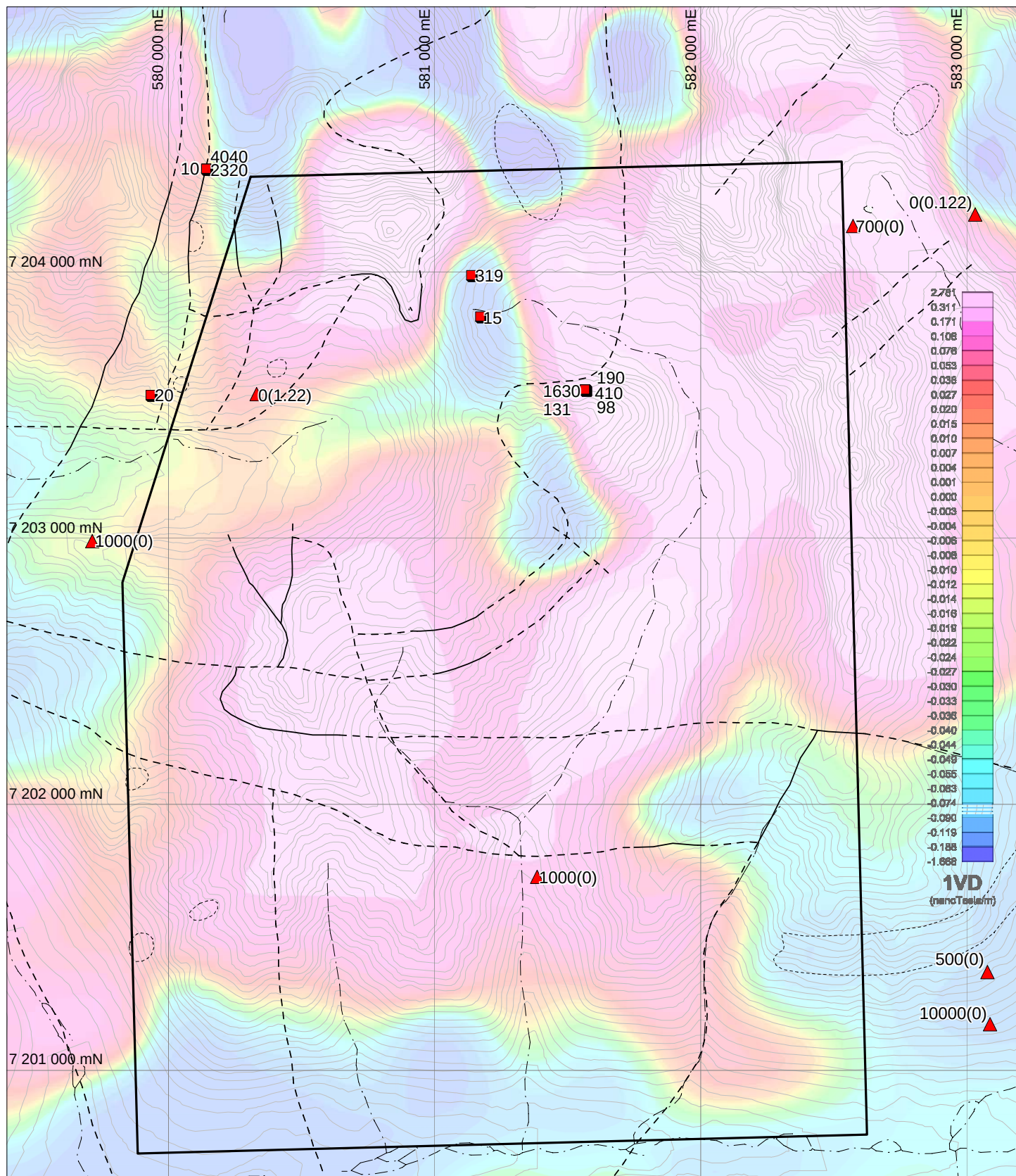
AIRBORNE GEOPHYSICS

An airborne magnetic survey was conducted over the Dolores property in spring 2006 by McPhar Geosurveys Ltd. of Newmarket, Ontario, using a Piper Navajo based in Mayo. Excerpts from the final report outlining the methods used in the survey can be found in Appendix III. Figure 6 shows the magnetic first vertical derivative.

Airborne magnetics outlined areas of high magnetic susceptibility in the northeast corner of the property, coincident with the main Wernecke Breccia body. A magnetic low at the headwaters of Discovery and Cobalt Creeks is closely associated with phyllites.

An airborne radiometric survey was completed by McPhar using an AStar B2 helicopter based out of the Lumina camp in early September 2006. Excerpts from the final report outlining the methods used in the survey can be found in Appendix IV. Figure 7 shows the apparent uranium concentration for the property.

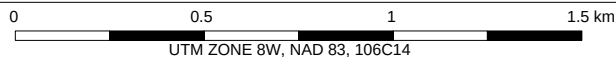
Airborne radiometrics outlined eight anomalous areas within the property. The strongest uranium high is in the northwest corner of the property and is related to the Jack Flash Showing, which is located 50 m to the west on the Lumina property. Strong radioactivity extends about 250 m east along the cliff from this showing. Due to the length of this anomaly and the steep terrain, it is unlikely that all of the radioactivity is caused by the known area of mineralization. None of the other weaker radiometric anomalies has been systematically explored but radioactive specimens have been discovered near many of them (Figure 7).

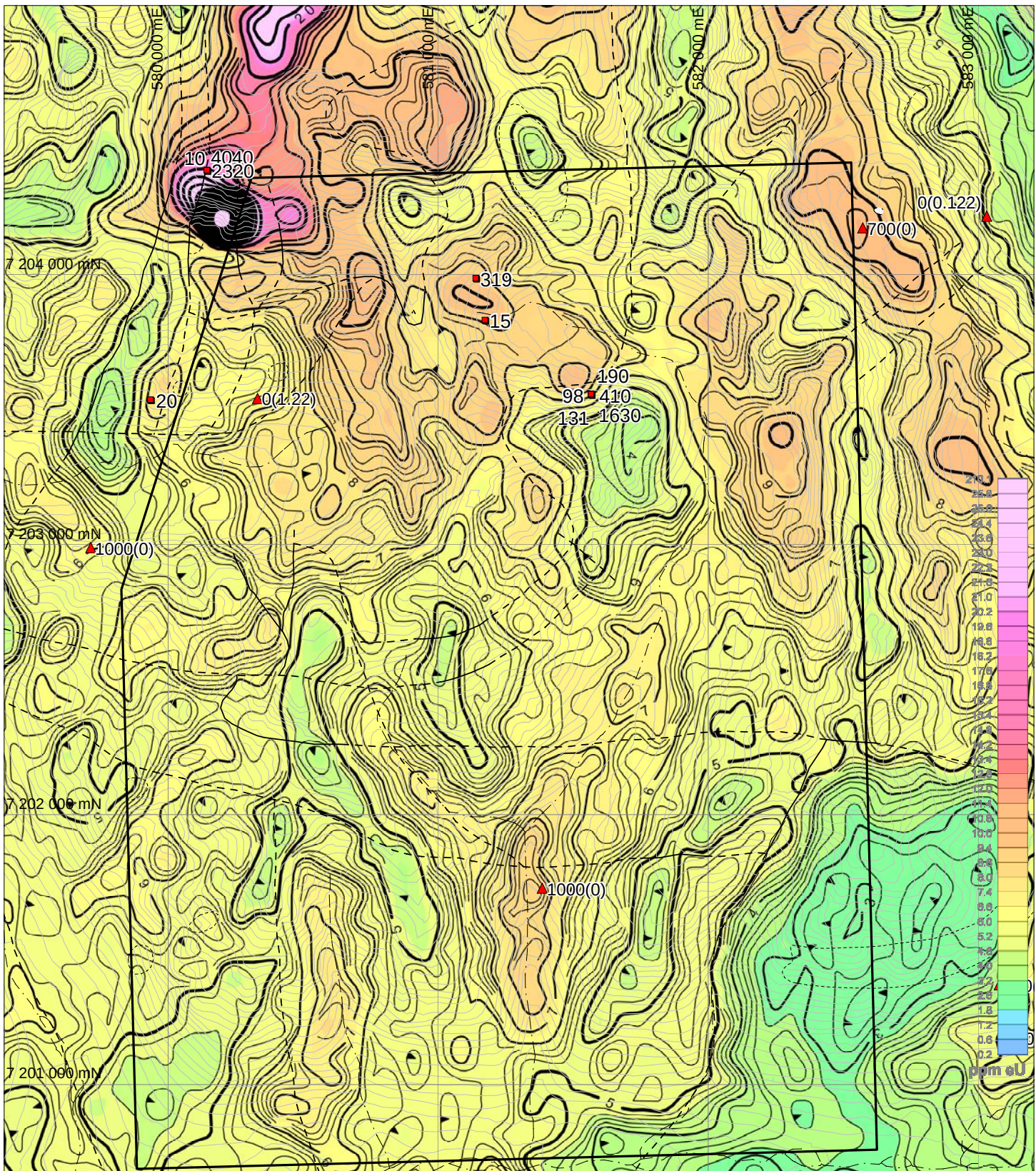


- 2006 sample: ppm U
- ▲ WJV radioactive occurrence: cps(% U3O8)
(0 indicates no reading/assay available)

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FIGURE 6
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED
AIRBORNE MAGNETICS (FVD)
DOLORES PROPERTY





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FIGURE 7
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED
AIRBORNE RADIOMETRICS
-APPARENT URANIUM CONCENTRATION-
DOLORES PROPERTY

0 0.5 1 1.5 km
UTM ZONE 8W, NAD 83, 106C14

FILE: ...2006/YUP/DOLORES/F_7-RAD(U).WOR

DATE: DECEMBER 2006

DISCUSSION AND CONCLUSIONS

Prospecting and mapping in 2006 identified anomalous copper and uranium showings within altered phyllite along a faulted contact with Wernecke Breccias at the Rick James Showing. This setting is similar to the Jack Flash Showing, located 1.5 km northwest, on the adjacent Lumina property, where high grade uranium in altered sediments is associated with strong north trending faults. Further geological and structural mapping should be conducted in and around this showing. Steep terrain and long waterlines will make drilling difficult at this location.

Of the seven other radiometric anomalies outlined by airborne surveys, four have produced uranium bearing samples or are located near outcropping showings. The remaining three anomalies are located close to known copper mineralization at the head of Discovery Creek, Cobalt Cirque and downhill from the TS Showing. Where possible, a systematic scintillometer survey should be conducted over each of these occurrences in conjunction with detailed mapping, prospecting and sampling. Due to the steep terrain around the Jack Flash Showing, drilling is the only feasible method to test this radioactive anomaly.

Respectfully submitted,

Archer, Cathro & Associates (1981) Limited

Matthew R. Dumala, B.A.Sc., EIT



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APPENDIX I

AUTHOR'S STATEMENT OF QUALIFICATIONS

STATEMENT OF QUALIFICATIONS

I, Matthew R. Dumala, geological engineer, with business addresses in Vancouver, British Columbia and Whitehorse, Yukon Territory and residential address in Vancouver, British Columbia, do hereby certify that:

1. I graduated from the University of British Columbia in 2002 with a B.A.Sc in Geological Engineering, Option 1, mineral and fuel exploration.
3. I am registered as an Engineer in Training in the Province of British Columbia.
4. From 2003 to present, I have been actively engaged in mineral exploration in the Yukon Territory.
5. I have personally participated in the fieldwork reported herein.

Matthew R. Dumala, B.A.Sc., EIT



APPENDIX II
CERTIFICATES OF ANALYSIS

ICP6.3R Partial Digestion

Column Header Details

Silver in ppm (Ag)
 Arsenic in ppm (As)
 Bismuth in ppm (Bi)
 Cobalt in ppm (Co)
 Copper in ppm (Cu)

Germanium in ppm (Ge)
 Mercury in ppm (Hg)
 Molybdenum in ppm (Mo)
 Nickel in ppm (Ni)
 Lead in ppm (Pb)

Antimony in ppm (Sb)
 Selenium in ppm (Se)
 Tellurium in ppm (Te)
 Uranium in ppm (U, ICP)
 Vanadium in ppm (V)

Zinc in ppm (Zn)

Sample Number	Ag ppm	As ppm	Bi ppm	Co ppm	Cu ppm	Ge ppm	Hg ppm	Mo ppm	Ni ppm	Pb ppm	Sb ppm	Se ppm	Te ppm	U, ICP ppm	V ppm	Zn ppm
CG515/LS4	0.1	12.2	0.4	38.8	48.8	<0.2	0.5	10.5	49.6	24.7	0.3	<0.2	<0.2	32.3	100	205
C103635	0.3	18.1	1.5	183	60.6	<0.2	0.2	2.8	28.7	40.9	<0.2	<0.2	<0.2	397	11.7	<0.1
C103636	0.2	16.6	1.3	111	37.9	<0.2	<0.2	1.4	15.1	24.7	<0.2	<0.2	<0.2	187	8.0	<0.1
C103637	0.1	24.2	1.2	133	3.6	<0.2	0.2	5.1	8.5	17.8	<0.2	<0.2	<0.2	129	4.5	<0.1
C103638	0.2	18.1	1.9	86.5	11.1	<0.2	<0.2	<0.1	32.5	9.95	0.7	<0.2	<0.2	95.6	17.2	<0.1
C103640	<0.1	16.8	0.4	100	52.9	<0.2	0.4	22.8	11.6	85.8	<0.2	<0.2	<0.2	303	3.9	<0.1
C107048	0.1	22.2	1.4	26.1	260	<0.2	<0.2	25.5	17.2	12.8	<0.2	<0.2	<0.2	100	7.5	4.8
C107049	<0.1	88.2	4.9	82.6	291	<0.2	0.8	99.0	30.0	127	<0.2	<0.2	<0.2	2330	8.9	7.9
C107050	0.1	19.2	1.3	21.6	87.6	<0.2	<0.2	28.1	14.1	12.7	<0.2	<0.2	<0.2	138	8.1	5.9
C107052	<0.1	16.3	0.8	15.2	278	<0.2	<0.2	9.2	15.1	2.74	<0.2	<0.2	<0.2	34.8	7.9	4.4
C107053	0.5	7370	6.0	6160	728	<0.2	3.2	27.2	314	11.6	<0.2	2.4	<0.2	684	9.0	1.5
C107054	<0.1	11.9	1.1	59.7	70.9	<0.2	<0.2	14.1	15.5	11.8	<0.2	<0.2	<0.2	69.5	13.2	<0.1
C107055	<0.1	20.2	1.5	19.1	93.2	<0.2	0.2	12.9	10.8	2.86	<0.2	<0.2	<0.2	18.6	6.2	<0.1
C107052 R	<0.1	17.3	0.9	15.8	288	<0.2	<0.2	10.4	14.8	2.81	<0.2	<0.2	<0.2	34.3	8.6	4.6

Partial Digestion: A 0.5 g pulp is digested with 2.25 ml of 9:1 HNO₃:HCl for 1 hour at 95 C.
 The standard is LS4.

SRC Geoanalytical Laboratories

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Archer, Cameron & Associates (1981) Limited

Attention:

PO #/Project:

Samples: 14

Report No: 06-1154

Date: September 22, 2006

ICP6.3 Total Digestion

Column Header Details

Silver in ppm (Ag)
Aluminum in wt % (Al₂O₃)
Barium in ppm (Ba)
Beryllium in ppm (Be)
Calcium in wt % (CaO)

Cadmium in ppm (Cd)
Cerium in ppm (Ce)
Cobalt in ppm (Co)
Chromium in ppm (Cr)
Copper in ppm (Cu)

Dysprosium in ppm (Dy)
Erbium in ppm (Er)
Europium in ppm (Eu)
Iron in wt % (Fe₂O₃)
Gallium in ppm (Ga)

Gadolinium in ppm (Gd)
Hafnium in ppm (Hf)
Holmium in ppm (Ho)
Potassium in wt % (K₂O)
Lanthanum in ppm (La)

Lithium in ppm (Li)
Magnesium in wt % (MgO)
Manganese in wt % (MnO)
Molybdenum in ppm (Mo)
Sodium in wt % (Na₂O)

Niobium in ppm (Nb)
Neodymium in ppm (Nd)
Nickel in ppm (Ni)
Phosphorus in wt % (P₂O₅)
Lead in ppm (Pb)

Praseodymium in ppm (Pr)
Scandium in ppm (Sc)
Samarium in ppm (Sm)
Tin in ppm (Sn)
Strontium in ppm (Sr)

Tantalum in ppm (Ta)
Terbium in ppm (Tb)
Thorium in ppm (Th)
Titanium in wt % (TiO₂)
Uranium in ppm (U, ICP)

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Report No: 06-1154

Date: September 22, 2006

ICP6.3 Total Digestion

Column Header Details

Vanadium in ppm (V)

Tungsten in ppm (W)

Yttrium in ppm (Y)

Ytterbium in ppm (Yb)

Zinc in ppm (Zn)

Zirconium in ppm (Zr)

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Date: September 22, 2006

ICP6.3 Total Digestion

Sample Number	Ag ppm	Al2O3 wt %	Ba ppm	Be ppm	CaO wt %	Cd ppm	Ce ppm	Co ppm	Cr ppm	Cu ppm	Dy ppm	Er ppm	Eu ppm	Fe2O3 wt %	Ga ppm	Gd ppm	Hf ppm
CG515/LS4	<0.2	17.2	2260	2.0	4.78	0.8	161	18	115	4	3.1	2.2	2.7	7.10	22	5.2	4.6
C103635	0.4	10.5	354	2.8	11.0	<0.2	33	199	62	62	5.1	4.0	3.3	10.3	11	5.7	3.7
C103636	0.3	16.3	567	3.6	4.84	0.2	86	114	60	40	3.1	2.4	2.8	5.91	20	5.0	3.1
C103637	0.4	17.8	677	4.1	0.75	0.3	85	134	84	4	2.5	1.5	2.1	3.49	24	4.2	3.1
C103638	0.3	6.94	208	2.1	18.8	0.3	31	95	37	12	2.6	3.6	3.0	14.5	10	2.9	2.8
C103640	0.3	9.89	521	2.2	2.01	<0.2	72	104	128	56	6.1	3.0	2.8	2.23	10	9.7	3.8
C107048	0.4	11.2	250	3.2	0.86	0.4	109	25	107	291	2.4	1.6	1.0	2.28	16	3.2	2.5
C107049	1.3	10.5	262	3.7	0.21	0.2	121	88	124	317	9.9	4.5	4.0	2.54	<1	13.2	9.4
C107050	0.5	12.5	279	3.7	0.27	0.5	120	21	119	99	2.4	1.6	1.0	2.49	17	3.3	3.1
C107052	0.3	11.3	265	3.2	0.87	0.4	148	15	104	304	1.7	1.2	0.9	2.27	17	2.8	2.0
C107053	1.6	17.3	403	4.7	1.62	<0.2	146	6250	160	787	2.7	2.2	1.0	2.49	20	4.0	4.1
C107054	<0.2	13.3	391	3.2	5.12	0.4	109	60	63	73	2.4	2.1	1.8	5.48	22	4.0	2.4
C107055	<0.2	12.9	235	3.8	2.75	0.5	78	21	79	100	1.8	1.5	0.8	2.75	18	2.5	2.5
C107052 R	0.2	11.4	265	3.3	0.89	0.4	142	15	107	305	1.7	1.3	0.9	2.32	17	2.8	1.8

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Report No: 06-1154

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Date: September 22, 2006

ICP6.3 Total Digestion

Sample Number	Ho ppm	K2O wt %	La ppm	Li ppm	MgO wt %	MnO wt %	Mo ppm	Na2O wt %	Nb ppm	Nd ppm	Ni ppm	P2O5 wt %	Pb ppm	Pr ppm	Sc ppm	Sm ppm	Sn ppm
CG515/LS4	1.1	3.10	83	30	2.86	0.072	1	3.31	6	64	27	0.659	20	14	12	8.6	<1
C103635	1.4	3.71	14	6	3.48	0.782	5	0.07	<1	18	44	0.161	43	3	20	6.4	<1
C103636	0.8	5.81	41	6	1.77	0.360	2	0.10	2	35	30	0.142	26	7	13	7.0	<1
C103637	0.6	6.33	41	6	0.757	0.069	5	0.10	1	32	26	0.145	19	7	11	5.5	<1
C103638	1.2	2.34	16	5	5.73	1.11	<1	0.14	<1	16	46	0.132	13	3	11	6.1	<1
C103640	1.1	2.66	31	8	1.08	0.098	23	0.99	3	32	19	0.176	84	6	13	9.6	<1
C107048	0.7	3.60	77	21	1.66	0.036	31	0.06	2	30	21	0.172	15	7	7	4.1	<1
C107049	1.8	3.27	69	37	1.18	0.006	115	0.05	3	42	34	0.192	129	9	10	9.4	<1
C107050	0.7	3.95	82	22	1.49	0.010	35	0.06	3	32	19	0.186	17	7	6	4.2	<1
C107052	0.6	3.59	112	17	1.59	0.040	12	0.05	3	36	20	0.182	5	9	6	4.2	<1
C107053	1.1	6.06	109	21	2.13	0.089	30	0.08	<1	36	327	0.163	13	10	11	4.3	<1
C107054	0.7	4.78	60	15	3.37	0.285	17	0.06	3	40	21	0.200	15	9	11	7.0	<1
C107055	0.5	4.29	49	20	2.55	0.127	15	0.06	2	25	14	0.184	4	5	9	3.6	<1
C107052 R	0.6	3.63	110	17	1.61	0.041	12	0.05	2	36	21	0.182	5	8	7	4.4	<1

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PO #/Project:

Report No: 06-1154

Samples: 14

Date: September 22, 2006

ICP6.3 Total Digestion

Sample Number	Sr ppm	Ta ppm	Tb ppm	Th ppm	TiO2 wt %	U, ICP ppm	V ppm	W ppm	Y ppm	Yb ppm	Zn ppm	Zr ppm
CG515/LS4	1160	1	0.4	13	1.05	4	131	<1	22	1.8	86	144
C103635	40	3	5.2	10	0.144	410	51	1	35	3.0	16	45
C103636	21	<1	2.0	15	0.283	190	86	3	24	2.2	10	75
C103637	10	<1	0.9	16	0.275	131	97	3	16	1.9	4	83
C103638	64	4	2.9	6	0.059	98	16	1	29	2.7	18	27
C103640	36	<1	3.9	12	0.156	319	69	2	25	3.3	8	89
C107048	6	<1	0.8	9	0.309	107	79	<1	15	1.9	14	66
C107049	6	<1	24.0	7	0.298	2430	85	3	48	4.7	15	64
C107050	5	<1	1.3	9	0.373	154	87	<1	15	2.0	14	76
C107052	6	<1	<0.3	9	0.320	38	78	<1	12	1.4	16	56
C107053	9	<1	5.5	144	0.408	690	155	<1	21	3.0	17	120
C107054	18	<1	1.0	95	0.327	69	106	7	17	2.1	17	66
C107055	11	<1	<0.3	12	0.302	21	71	<1	15	1.6	17	75
C107052 R	6	<1	<0.3	10	0.320	38	80	1	11	1.4	14	57

Total Digestion: A 0.125 g pulp is gently heated in a mixture of HF/HNO3/HClO4 until dry and the residue is dissolved in dilute HNO3.
The standard is CG515.

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Attention:

PO #/Project:

Samples: 24

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Report No: 06-1154

Date: September 22, 2006

Column Header Details

U3O8 Assay by ICP in wt % (U3O8)

Sample Number	U3O8 wt %
CG515/LS4/BL4A	0.148
C103639	0.190
C107049	0.289

Uranium Assay: A 1.00 g pulp is digested with 24 ml of 3:1 HCl:HNO₃ for 1 hour at 95 C.
The standard is BL4A.

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Attention:

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PO #/Project:

Report No: 06-1154

Samples: 10

Date: September 22, 2006

ICP6.3R Partial Digestion

Column Header Details

Silver in ppm (Ag)
Arsenic in ppm (As)
Bismuth in ppm (Bi)
Cobalt in ppm (Co)
Copper in ppm (Cu)

Germanium in ppm (Ge)
Mercury in ppm (Hg)
Molybdenum in ppm (Mo)
Nickel in ppm (Ni)
Lead in ppm (Pb)

Antimony in ppm (Sb)
Selenium in ppm (Se)
Tellurium in ppm (Te)
Uranium in ppm (U, ICP)
Vanadium in ppm (V)

Zinc in ppm (Zn)

Sample Number	Ag ppm	As ppm	Bi ppm	Co ppm	Cu ppm	Ge ppm	Hg ppm	Mo ppm	Ni ppm	Pb ppm	Sb ppm	Se ppm	Te ppm	U, ICP ppm	V ppm	Zn ppm
CG515/LS4/BL4A	0.1	12.4	0.4	39.1	50.3	<0.2	0.3	11.8	48.7	25.7	0.4	<0.2	<0.2	31.5	101	211
C103639	<0.1	41.6	3.0	179	230	<0.2	0.8	1.2	23.2	96.6	<0.2	<0.2	<0.2	1630	9.8	10.1
C103641	3.7	137	376	918	131000	<0.2	1.1	39.6	59.0	77.7	<0.2	18.2	4.9	13.0	19.2	10.5
C107046	1.2	4.7	15.0	11.2	10000	<0.2	0.3	<0.1	8.9	11.4	<0.2	0.4	<0.2	3.2	7.9	30.4
C107056	1.2	121	3.7	68.1	850	<0.2	0.2	133	17.7	6.02	7.7	<0.2	<0.2	37.6	28.4	30.1
C107057	<0.1	8.1	0.7	11.9	92.6	<0.2	0.2	23.4	6.2	4.18	<0.2	<0.2	<0.2	44.2	7.0	26.3
C107058	0.2	13.1	1.8	41.0	37.3	<0.2	0.2	1.6	25.9	2.87	<0.2	<0.2	<0.2	29.0	10.3	25.0
C107059	0.1	16.7	2.5	48.0	54.0	<0.2	0.2	9.0	28.0	9.23	<0.2	<0.2	<0.2	139	8.4	23.2
C107060	0.2	14.5	1.3	36.6	65.4	<0.2	0.2	2.1	15.4	2.37	<0.2	<0.2	<0.2	16.4	8.5	22.5
C107056 R	1.0	113	3.4	65.9	839	<0.2	0.2	128	16.5	5.91	7.2	<0.2	<0.2	36.5	27.4	29.7

Partial Digestion: A 1.00 g pulp is digested with 2.25 ml of 9:1 HNO3:HCl for 1 hour at 95C.
The standard is LS4.

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Report No: 06-1154

Date: September 22, 2006

ICP6.3 Total Digestion

Archer, Casso & Associates (1981) Limited

Attention:

PO #/Project:

Samples: 10

Column Header Details

Silver in ppm (Ag)
Aluminum in wt % (Al₂O₃)
Barium in ppm (Ba)
Beryllium in ppm (Be)
Calcium in wt % (CaO)

Cadmium in ppm (Cd)
Cerium in ppm (Ce)
Cobalt in ppm (Co)
Chromium in ppm (Cr)
Copper in ppm (Cu)

Dysprosium in ppm (Dy)
Erbium in ppm (Er)
Europium in ppm (Eu)
Iron in wt % (Fe₂O₃)
Gallium in ppm (Ga)

Gadolinium in ppm (Gd)
Hafnium in ppm (Hf)
Holmium in ppm (Ho)
Potassium in wt % (K₂O)
Lanthanum in ppm (La)

Lithium in ppm (Li)
Magnesium in wt % (MgO)
Manganese in wt % (MnO)
Molybdenum in ppm (Mo)
Sodium in wt % (Na₂O)

Niobium in ppm (Nb)
Neodymium in ppm (Nd)
Nickel in ppm (Ni)
Phosphorus in wt % (P₂O₅)
Lead in ppm (Pb)

Praseodymium in ppm (Pr)
Scandium in ppm (Sc)
Samarium in ppm (Sm)
Tin in ppm (Sn)
Strontium in ppm (Sr)

Tantalum in ppm (Ta)
Terbium in ppm (Tb)
Thorium in ppm (Th)
Titanium in wt % (TiO₂)
Uranium in ppm (U, ICP)

Archer, Cameron & Associates (1981) Limited

Attention:

PO #/Project:

Samples: 10

SRC Geoanalytical Laboratories

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Report No: 06-1154

Date: September 22, 2006

ICP6.3 Total Digestion

Column Header Details

Vanadium in ppm (V)

Tungsten in ppm (W)

Yttrium in ppm (Y)

Ytterbium in ppm (Yb)

Zinc in ppm (Zn)

Zirconium in ppm (Zr)

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Report No: 06-1154

Samples: 10

Date: September 22, 2006

ICP6.3 Total Digestion

Sample Number	Ag ppm	Al2O3 wt %	Ba ppm	Be ppm	CaO wt %	Cd ppm	Ce ppm	Co ppm	Cr ppm	Cu ppm	Dy ppm	Er ppm	Eu ppm	Fe2O3 wt %	Ga ppm	Gd ppm	Hf ppm
CG515/LS4/BL4A	<0.2	17.6	2280	2.0	4.75	0.8	165	16	117	3	3.2	2.4	2.8	7.22	24	5.6	4.6
C103639	0.7	11.7	379	3.3	9.95	<0.2	65	180	56	238	8.7	5.1	5.8	9.01	<1	13.0	7.8
C103641	28.3	7.92	150	1.5	0.44	<0.2	18	920	63	135000	0.2	1.1	1.6	25.8	14	<0.5	7.1
C107046	1.7	0.62	26	<0.2	9.36	<0.2	9	11	152	10100	1.3	1.5	0.9	4.84	2	2.2	1.6
C107056	0.6	8.04	144	2.0	17.7	0.5	80	70	51	848	2.1	3.1	1.6	10.6	12	2.8	4.5
C107057	<0.2	13.3	248	4.0	4.13	0.6	129	11	78	98	2.1	1.7	1.1	3.12	18	3.4	2.8
C107058	<0.2	13.0	393	2.6	7.71	0.3	89	41	58	39	1.8	2.0	1.5	5.14	20	3.5	4.8
C107059	<0.2	12.4	368	2.5	7.86	0.5	82	48	49	64	2.4	2.2	1.7	5.04	17	3.9	1.9
C107060	<0.2	13.4	402	2.7	7.54	0.5	100	40	60	59	1.9	2.0	1.7	5.09	20	3.7	2.8
C107056 R	0.9	7.90	147	2.0	17.4	0.6	79	66	51	840	2.0	3.0	1.5	10.4	11	2.8	4.8

SRC Geoanalytical Laboratories

Archer, Cameron & Associates (1981) Limited

125 - 15 Innovation Blvd., Saskatoon, Saskatchewan, S7N 2X8

Attention:

Tel: (306) 933-8118 Fax: (306) 933-5656 Email: geochem@src.sk.ca

PO #/Project:

Report No: 06-1154

Samples: 10

Date: September 22, 2006

ICP6.3 Total Digestion

Sample Number	Ho ppm	K2O wt %	La ppm	Li ppm	MgO wt %	MnO wt %	Mo ppm	Na2O wt %	Nb ppm	Nd ppm	Ni ppm	P2O5 wt %	Pb ppm	Pr ppm	Sc ppm	Sm ppm	Sn ppm
CG515/LS4/BL4A	1.0	3.21	86	31	2.93	0.073	1	3.41	6	65	26	0.671	20	14	12	8.7	<1
C103639	2.0	4.00	20	9	3.66	0.686	3	0.29	2	38	36	0.173	99	7	11	11.1	<1
C103641	0.5	1.15	12	4	0.289	0.027	45	2.71	<1	12	67	<0.002	277	1	4	3.0	8
C107046	0.5	0.146	5	10	5.30	0.497	1	0.04	<1	6	12	<0.002	26	1	<1	3.3	<1
C107056	1.0	2.22	68	28	10.0	0.821	148	0.06	5	23	22	0.136	14	5	9	6.0	<1
C107057	0.6	4.61	92	16	2.85	0.199	27	0.07	5	36	12	0.208	5	8	8	4.7	<1
C107058	0.8	4.80	53	13	4.30	0.425	3	0.15	4	33	39	0.184	5	7	10	6.1	<1
C107059	0.7	4.58	48	14	4.41	0.436	11	0.14	3	30	43	0.181	11	6	10	5.9	<1
C107060	0.8	4.99	60	15	4.16	0.414	4	0.28	4	36	39	0.196	4	8	11	6.3	<1
C107056 R	1.0	2.17	67	28	9.81	0.804	145	0.06	6	23	18	0.137	13	5	9	5.9	<1

Attention:

PO #/Project:

Samples: 10

ICP6.3 Total Digestion

Sample Number	Sr ppm	Ta ppm	Tb ppm	Th ppm	TiO2 wt %	U, ICP ppm	V ppm	W ppm	Y ppm	Yb ppm	Zn ppm	Zr ppm
CG515/LS4/BL4A	1200	1	0.4	13	1.09	4	132	1	22	1.9	87	142
C103639	48	1	17.3	8	0.151	1630	60	4	55	4.0	15	56
C103641	30	<1	1.7	4	0.043	15	19	<1	8	1.0	13	27
C107046	28	1	1.0	<1	0.004	3	6	<1	14	0.7	46	47
C107056	53	3	1.7	11	0.149	40	69	1	23	2.3	46	90
C107057	17	<1	0.3	10	0.412	49	81	2	17	1.9	28	95
C107058	29	1	0.9	12	0.328	30	82	7	16	1.9	15	320
C107059	31	1	1.5	12	0.302	141	78	6	19	1.9	14	58
C107060	33	2	0.5	13	0.350	17	80	5	17	1.8	11	108
C107056 R	51	3	1.7	11	0.155	38	68	2	23	2.3	48	96

Total Digestion: A 0.125 g pulp is gently heated in a mixture of HF/HNO3/HClO4 until dry and the residue is dissolved in dilute HNO3.
The standard is CG515.

Archer, Cameron & Associates (1981) Limited

Attention:

PO #/Project:

Samples: 11

SRC Geoanalytical Laboratories

125 - 15 Innovation Blvd., Saskatoon, Saskatchewan, S7N 2X8

Tel: (306) 933-8118 Fax: (306) 933-5656 Email: geochem@src.sk.ca

Report No: 06-1154

Date: December 22, 2006

Column Header Details

Au Fire Assay by ICP in ppb (Au)

Sample Number	Au ppb
C103639	5
C103641	529
C107046	6
C103635	2

Fire Assay: A 30 g pulp is subjected to standard fire assaying procedures.

Archer, Camero & Associates (1981) Limited

Attention:

PO #/Project:

Samples: 14

SRC Geoanaly laboratories

125 - 15 Innovation Blvd., Saskatoon, Saskatchewan, S7N 2X8

Tel: (306) 933-8118 Fax: (306) 933-5656 Email: geochem@src.sk.ca

Report No: 06-1154

Date: December 22, 2006

Column Header Details

Au Fire Assay by ICP in ppb (Au)

Sample Number	Au ppb
C103636	2
C103637	4
C103638	2
C103640	4

Fire Assay: A 30 g pulp is subjected to standard fire assaying procedures.

APPENDIX III

EXCERPT FROM MCPHAR GEOSURVEYS LTD. REPORT ON AIRBORNE MAGNETIC SURVEY

SUMMARY

An airborne geophysical survey program was completed over the Wernecke Properties, northern Yukon, situated approximately 200 km to the north east of Mayo, Yukon Territories under contract to Archer, Cathro & Associates (1981) Ltd., signed October 24, 2005 and amendments were made on March 06, 2006. The project consisted of a fixed-wing magnetic survey.

Data acquisition was initiated on November 2005 and was completed June 2006. Mobilization of the equipment and personnel to the survey area was completed on November 09, 2005 and 11% of the area with production flights was completed by December 09, 2005. The data acquisition of remaining 89% area was carried out, again during the period of April 11, 2006 to June 13, 2006.

First tests and calibrations flight was completed on November 20, 2005 and remaining tests and calibrations flights were completed on April, May & June 2006 respectively. The final survey flight was completed on June 12, 2006. A total of 13,092 line-kilometres of data were acquired. The survey was flown over five blocks; Block 'A', Block 'A' Infill, Block 'B' Block 'B' south extension and Block 'B'; west extension with a nominal mean terrain clearance of 100 metres. The flight lines were oriented at specific directions and spacing explained in the table 1.

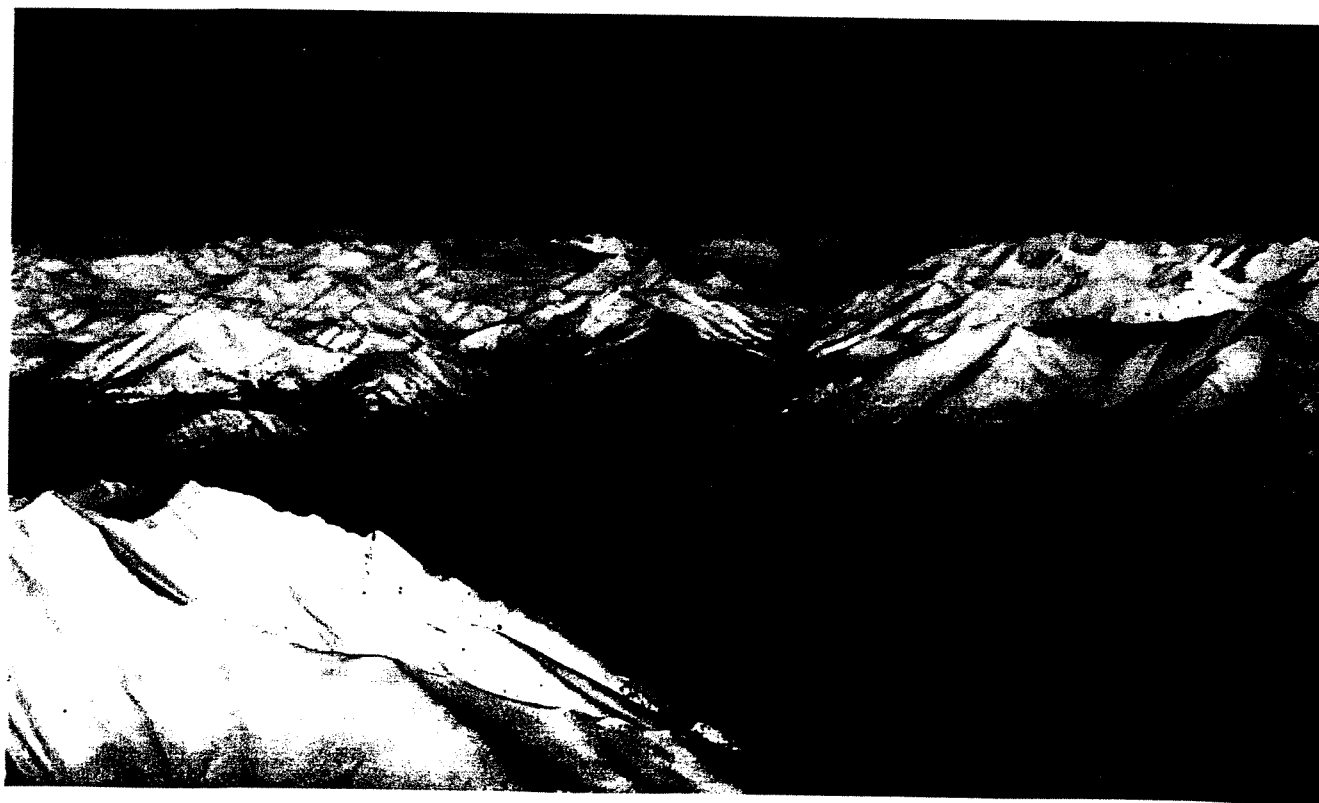


Figure 1: Aerial photograph of survey area

1. INTRODUCTION

A detailed fixed-wing magnetic survey was carried out during the period of November 09, 2005 to June 13, 2006 on behalf of Archer, Cathro & Associates (1981) Ltd., hereinafter referred to as "Archer, Cathro", by McPhar Geosurveys Ltd, hereinafter referred to as "McPhar", over five blocks situated Wernecke Properties, northern Yukon, situated approximately 200 km to the north east of Mayo, Yukon Territories, Canada.

The purpose of the survey was to acquire high-resolution geophysical data to map the geophysical characteristics of the geology and structure in an effort to provide an insight into geologic and geophysical settings conducive to (Au) mineralization.

Table 1: Archer, Cathro Project, Yukon Territories, Survey Areas Descriptions

AREA NAME	LINE /T.L. SPACING	FLIGHT LINE-KM	TIE LINE-KM	TOTAL LINE-KM	MAIN FLIGHT DIRECTION
Wernecke Block A	350 x 4,000 m	7,898	724	8,622	NE - SW
Infill Block A	150 m	230	0	230	N - S
Wernecke Block B	350 x 3,500 m	1,303	148	1,451	ENE - WSW
Extension Block B West	350m x 3,650m	1,359	155	1,514	345.5° / 255°
Extension Block B South	350 x 3,500 m	1,119	117	1,236	255° / 344°
Totals		11,909	1,144	13,053	

Magnetic data acquisition involved the use of GPS positioning and one high sensitivity magnetometer installed in the tail stinger of a fixed-wing aircraft to measure the Earth's magnetic field. In this instance the aircrafts used were PA-31 Piper Navajo aircraft with Canadian registration C-FFRY supplied by Aries Aviation of Calgary, Alberta and C-GPVN Bruce land Air of Wiarton, Ontario, Canada respectively.

Installation of the survey equipment into aircraft C-FFRY was completed in Calgary prior to mobilization. Pre-survey test and calibration flights were undertaken over the period of November 20, 2005 and data acquisition was initiated on November 27, 2005. The last survey flight was conducted on December 09, 2005 and then the client stopped the survey due to poor weather.

Remobilization of aircraft C-GPVN, equipment and personnel to Mayo was accomplished on April 13, 2006. Installation of the survey equipment into the aircraft and pre-survey test flight was undertaken on April 11, 2006 at Norman Wells, NWT, Canada. The final survey flight was completed on June 12, 2006. This report describes the data acquisition and processing procedures, parameters and delivery products for this survey.

2. SURVEY AREA

The survey consisted of five blocks identified as Block 'A', Block 'A' Infill, Block 'B' Block 'B' south extension and Block 'B'; west extension approximately 200 km north east of Mayo, Yukon Territories. The primary objective of the survey was to acquire geophysical data in support of (mineral) exploration.

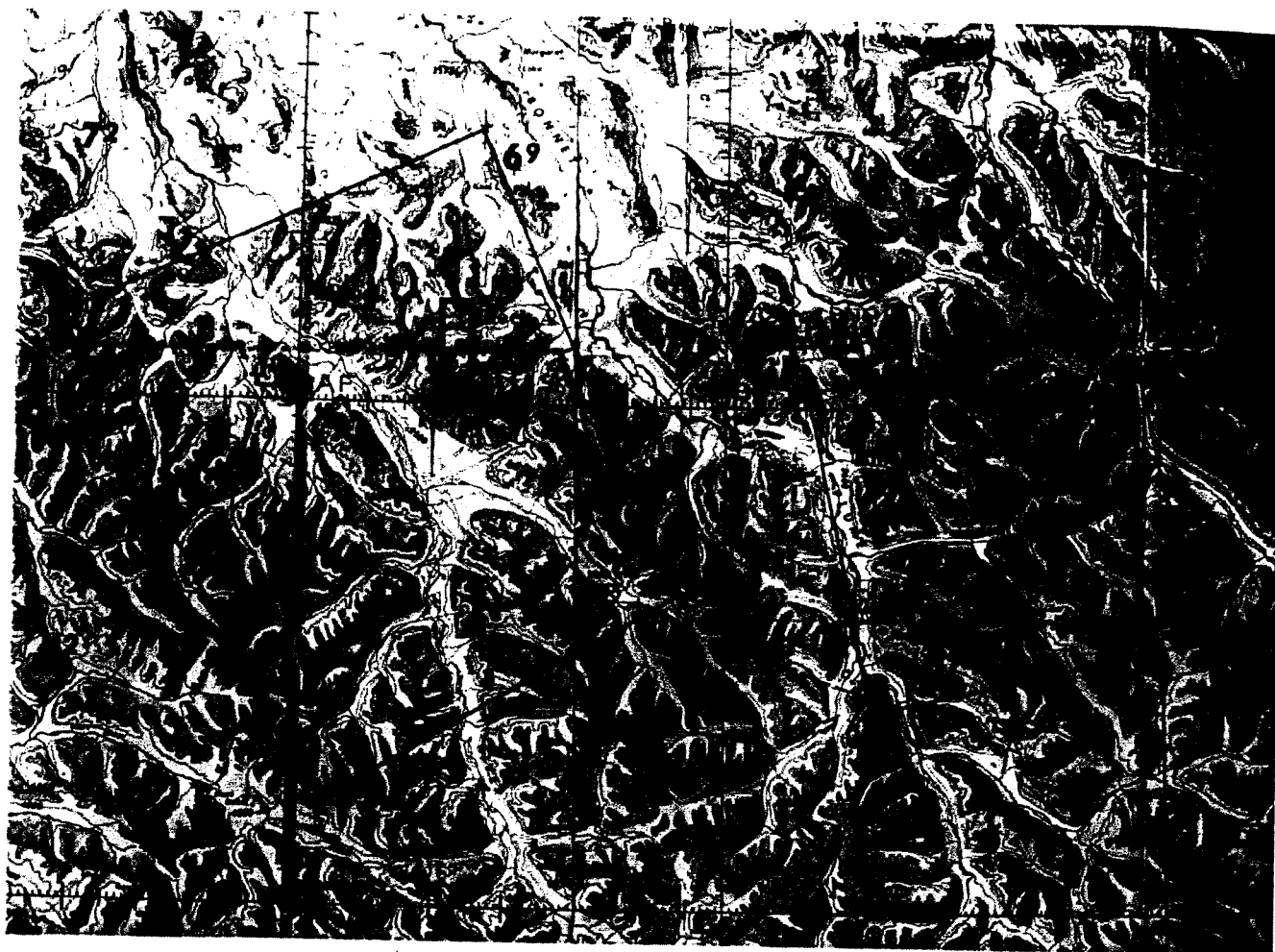


Figure 2: Location of survey areas

The topography of the Wernecke survey areas is variable, from narrow valleys to steep mountain slopes with incised river valleys with steep cliffs. The elevation ranged from approximately 150 metres to over 2800 metres above sea level. Weather conditions during the survey were typically in the -35°C to $+16^{\circ}\text{C}$. Conditions varied from clear to cloudy, freezing rain, snow showers, and at times windy. More often than not, these poor weather conditions kept the survey crew grounded and thus the number of standby days accumulated.

The corner coordinates of the blocks were provided by Archer Cathro, and are presented in the following table. All coordinates are NAD83, UTM Zone 8N.

Table 2: Project Survey Areas Coordinates

Wernecke Block A		
UTM Zone 8, NAD 83		
Corner	Easting	Northing
NE corner	513590E	7239650N
NW corner	473600E	7218000N
SW corner	503600E	7164300N
SE corner	542850E	7188300N

INFILL Area - Wernecke Block A		
UTM Zone 8, NAD 83		
Corner	Easting	Northing
NE corner	515060	7217960
NW corner	518360	7217960
SW corner	515060	7207960
SE corner	518360	7207960

Wernecke Block B - West		
UTM Zone 8, NAD 83		
Corner	Easting	Northing
SE corner	579275	7190075
SW corner	562000	7185500
NW corner	556200	7210750
NE corner	572800	7215125

Wernecke Block B		
UTM Zone 8, NAD 83		
Corner	Easting	Northing
NE corner	590750E	7219400N
NW corner	573200E	7215500N
SW corner	578750E	7190500N
SE corner	596000E	7194500N

Wernecke Block B - South		
UTM Zone 8, NAD 83		
Corner	Easting	Northing
SE corner	599495	7185050
SW corner	564310	7175565
NW corner	562000	7185500
NE corner	596500	7194800

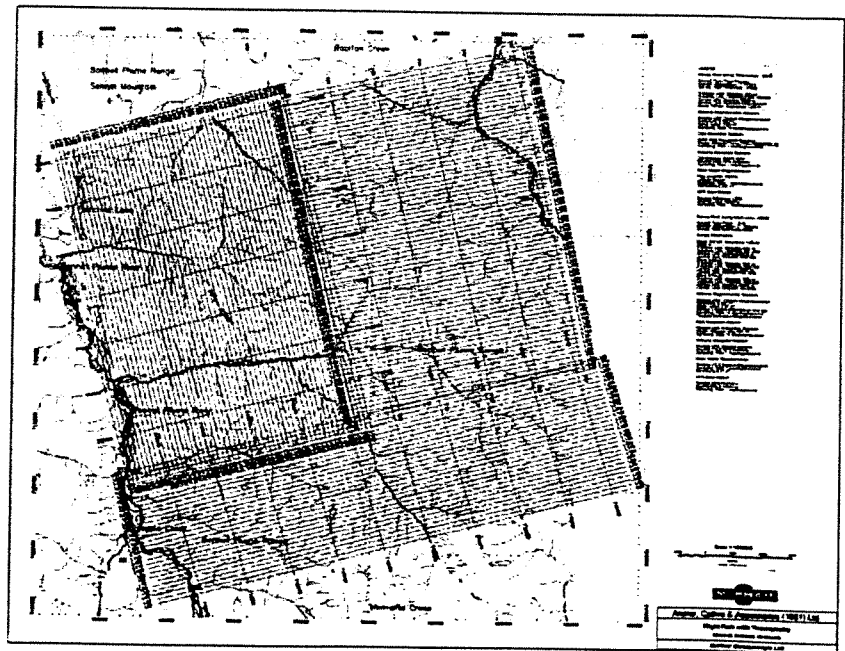
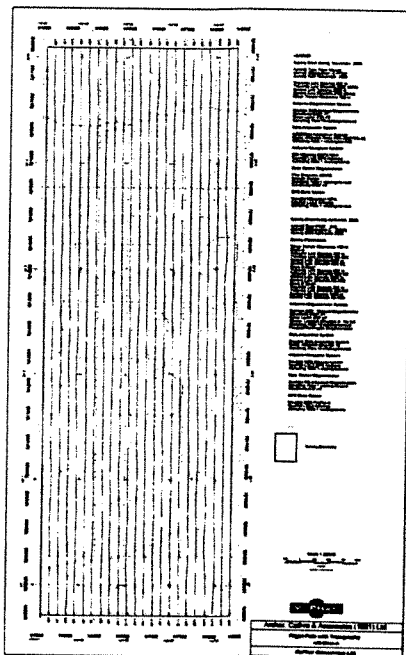
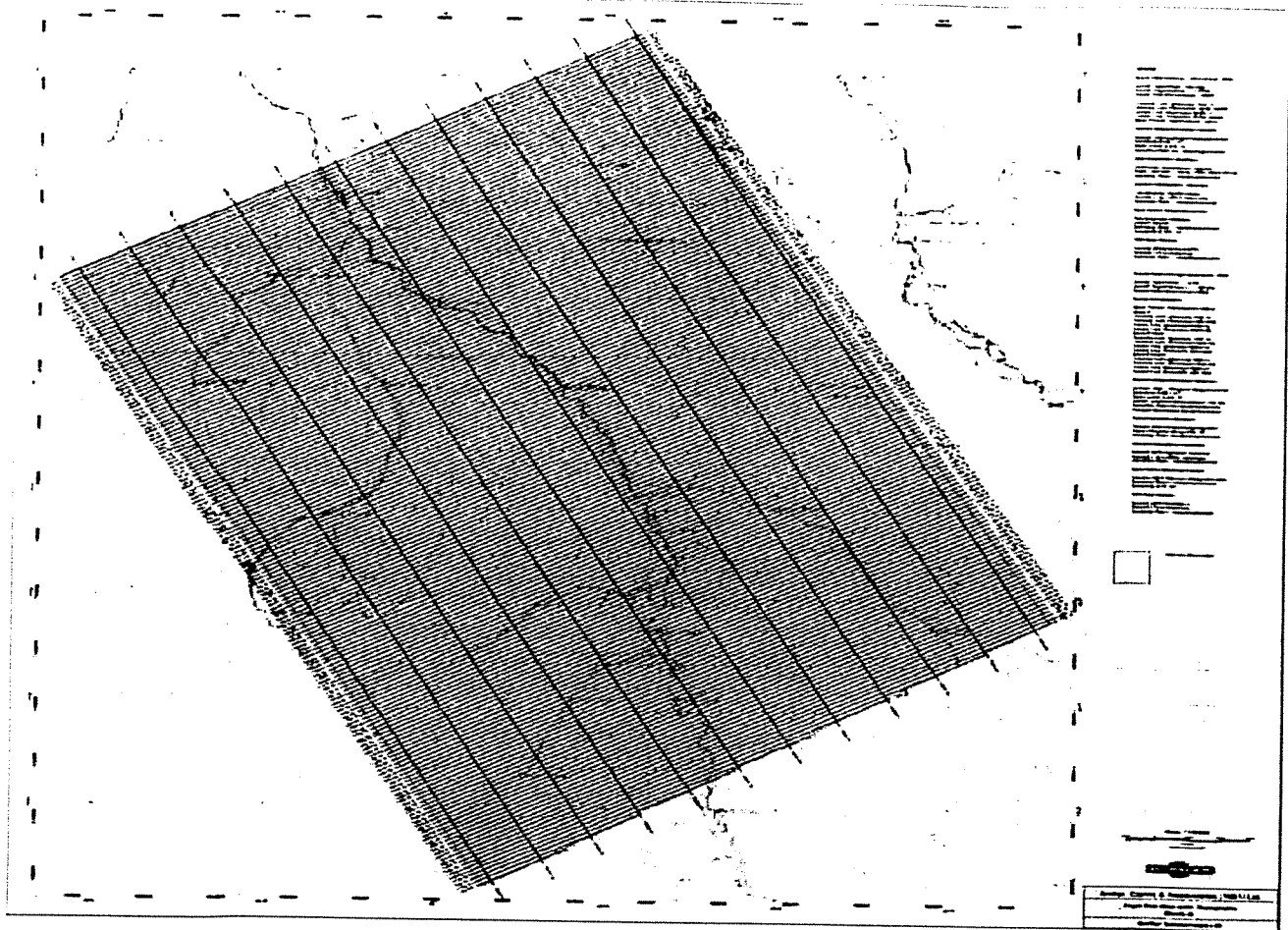


Figure 3: Flight Path with topography, all Blocks

3. SURVEY OPERATIONS

3.1 Operations Base

Survey operations were based out of the airport of the Mayo. Permission was obtained to operate, park and refuel the aircraft at the airport. The GPS base station antenna and the magnetic base station sensor was positioned approximately 5 kilometres from the airport.



Figure 4: Base Station system with Antenna (2005)



Figure 5: GPS Base Station system with Antenna (2006)



Figure 6: Magnetic Base Station system with sensor

Initial Quality Control and Preliminary data processing was undertaken at a temporary data processing centre set up at the Bed Rock Motel in the town of Mayo.

3.2 Survey Conditions

Weather conditions during the survey were varied, ranging from occasionally good with clear skies and cloud cover, to low clouds overcast, freezing rain, snow showers and windy. The temperature ranged from a low -35° Celsius to $+16^{\circ}$ Celsius. During the whole survey, a total of sixty days were lost as the result of bad weather.

Sunspot activity, and hence diurnal geomagnetic activity, varied from quiet to active during the data acquisition period. No data were lost due to the geomagnetic activity being out of contract specification.

3.3 Navigation

The nominal data acquisition speed was 220 kilometres per hour. Scan rates for the magnetic data acquisition was 0.05 second, 0.1 second for the radar altimeter, and 1.0 second for the GPS navigation/positioning system. Therefore, there is a magnetic value recorded at an approximate interval of 3.25 metres and a position fix at an approximate interval of 60 metres along the flight track.

Navigation was assisted through use of a GPS receiver system that reported GPS co-ordinates in WGS-84 latitude and longitude, directing the pilot over a pre-programmed two-dimensional (2-D) survey grid. The x-y position of the aircraft reported by the GPS system was recorded together with the terrain clearance as reported by the radar altimeter. For surveying purposes, the coordinates of the survey area were transformed from WGS84 latitude and longitude to the NAD83, UTM 8N coordinates system.

Vertical navigation along flight lines was enabled by using the radar altimeter. The optimum terrain clearance during normal survey flying was 100 metres for the aircraft and geophysical instrumentation. However, due to rugged terrain in some areas, and the pilot's judgment of safe flying conditions in these areas, these terrain clearances were not possible 100% of the time. The final vertical and horizontal survey positions were differentially corrected in real-time to a precision of approximately +/- 1.5 metres.

Projection information:

Projection type: NAD83, UTM Zone 8N
Spheroid: Transverse Mercator
Base latitude: 0 degree
Base longitude: -135 degree
Scaling factor: 0.9996
False easting: 0
False northing: 500000
Local Transform: World Geodetic System

3.4 Field Processing & Quality Control

The survey data was transferred to portable magnetic media on a flight-by-flight basis, and then copied to the field data processing workstation. In-field data processing included: reduction of the data to Geosoft GDB database format, post-flight compensation of the magnetometer data using McPhar's CCMAG software, and inspection of all data for adherence to contract specifications. Survey lines which showed excessive deviation, or which were considered to be of inferior quality, for whatever reason, were reflown.

3.5 Survey Statistics and Project Diary

The survey entailed a total of 40 flights; of which 26 flights were production flights. The first production flight was Flt #2 on November 20, 2006, with the last production flight, Flt #32 on June 12, 2006.

McPhar Geosurveys Ltd. of Newmarket, Ontario, Canada, was responsible for the field operations, all geophysical matters and the overall coordination and management of the survey.

Table 3: Project Diary

Date 2006	Flt #	Hours Flown	Line-Km Accepted	Comments
10-11-05				Crew arrived at Mayo, Yukon Territories
11-11-05				Waiting for the plane from Whitehorse
12-11-05				Plane arrived from Whitehorse, setup base station And program AGIS
13-11-05				Waiting for drape file from office
14-11-05				Installed drape file and ready for survey, Poor weather
15-11-05				Poor weather, snow storm, Standby Day
16-11-05				Poor weather, snow storm, Standby Day
17-11-05				Poor weather low ceiling, snow storm, Standby Day
18-11-05				Poor weather low ceiling, snow, Standby Day
19-11-05				Poor weather low ceiling, freezing rain, Standby Day
20-11-05	1	1:28		Flight aborted due to bad weather, Back to Mayo and performed the Tests
21-11-05				Poor weather low ceiling, freezing rain and snow Standby Day
22-11-05				Poor weather low ceiling, freezing rain and snow Standby Day
23-11-05				Poor weather low ceiling, freezing rain and snow Standby Day
24-11-05				Poor weather low ceiling, freezing rain and snow Standby Day
25-11-05				Poor weather low ceiling, freezing rain and snow Standby Day
26-11-05				Poor weather low ceiling, freezing rain and snow Standby Day
27-11-05	2	5:25	506	Flown at block 'B'. Production flight
28-11-05	3	1:22		Flight aborted due to high turbulence, Standby Day
29-11-05	4	5:30	751	Flown at block 'B'. Production flight
30-11-05				Low ceiling, less visibility, snow showers and freezing drizzle, Standby Day
01-12-05				Low ceiling, less visibility, snow showers, Standby Day
02-12-05	5	2:05		Flight aborted due to RAD Alt problems
03-12-05				Diurnal active, Standby Day
04-12-05	6	5:37	194	Finished Block 'B' and also started Block 'A'
05-12-05	7	1:17		Flight aborted due to high turbulence, Standby Day
06-12-05				Low ceiling, less visibility, snow showers and gusty wind, Standby Day
07-12-05				Low ceiling, less visibility, snow showers and gusty wind, Standby Day
08-12-05	8	0:31		Flight aborted due to bad weather, Standby Day
09-12-05				Demobilization, project stopped by client and will be started next year
11-04-06				Test and calibration flight at Norman Wells, NWT
12-04-06				Mobilizing to Mayo, QA /QC Geophysicist stuck in Whitehorse and remaining crew in Norman Wells due to bad weather
13-04-06				QA /QC Geophysicist arrived at Mayo, Setup the base station, remaining crew stuck in Norman Wells due to

				bad weather
14-04-06				Crew stuck in Norman Wells due to bad weather
15-04-06				Crew stuck in Norman Wells due to bad weather
16-04-06				Crew stuck in Norman Wells due to bad weather
17-04-06				Crew arrived at Mayo, couldnt have production flight at afternoon due to low ceiling, Standby Day
18-04-06				Low ceiling, less visibility, Standby Day
19-04-06				Low ceiling, less visibility, snow showers, Standby Day
20-04-06	1	1:26		Flight aborted due to bad weather, Standby Day
21-04-06	2	1:04		Flight aborted due to bad weather, Standby Day
22-04-06	3	2:38	182	Flown on Block 'A', Flight aborted due to high turbulence, Production flight
23-04-06				Cloudy with wet snow and light rain, Standby Day
24-04-06				Cloudy with wet snow, rain & high wind, Standby Day
25-04-06				Cloudy with light rain & high wind, Standby Day
26-04-06	4	3:00	152	Flown at Block 'B' south, Flight aborted due to bad weather, Standby Day
27-04-06				Overcast all day, Standby Day
28-04-06				Cloudy with light rain & snow, Standby Day
29-04-06				Overcast all day, Standby Day
30-04-06	5	2:28		Flight aborted due to bad weather, Performed Heading Test, Standby Day
01-05-06	6	4:42	568.2	Flown at Block 'B' south & Block 'B' west, Production flight
02-05-06	7	2:40	241	Flown on Block 'A', Flight aborted due to high turbulence and low ceiling, Production flight
03-05-06				Overcast all day, Standby Day
04-05-06				Overcast all day, Standby Day
05-05-06				Overcast & diurnal active all day, Standby Day
06-05-06				Diurnal stormy to active all day, Standby Day
07-05-06				Overcast & diurnal active all day, Standby Day
08-05-06	8	4:55		Block 'B' south is completed, Production flight
09-05-06	9	0:36	652.5	Second flight aborted due to bad weather
10-05-06	10	3:03	232.5	Overcast all day, Standby Day
11-05-06				Flown at Block 'B' west, Flight aborted due to bad weather, Production flight
12-05-06				Overcast all day, Standby Day
13-05-06				Overcast & diurnal active all day, Standby Day
14-05-06	11	5:06		Overcast & diurnal active all day, Standby Day
15-05-06	12	4:09	1126.1	Two production flights
16-05-06	13	4:29	640.8	Block 'B' west is completed
17-05-06	14	0:45		Flown at Block 'A'. Production flight
18-05-06				Heavy rain at AM and low ceiling at PM, Standby Day
19-05-06	15	4:54	826.9	Flight aborted due to bad weather, Standby Day
20-05-06	16	5:12	917.7	Overcast all day, Standby Day
21-05-06	17	2:22		Flown at Block 'A'. Production flight
22-05-06				Flown at Block 'A'. Production flight
23-05-06				Flight aborted due to bad weather, FOM test performed for Block 'B'. Standby Day
				Overcast all day, Standby Day
				Overcast all day, Standby Day

24-05-06	18	2:08		Flight aborted due to bad weather, FOM test performed for Block 'B'. Standby Day
25-05-06	19	3:57	641.7	Flown at Block 'A'. Production flight
26-05-06	20	2:00	91	Flight aborted due to high turbulence, Standby Day
27-05-06				Overcast all day, Standby Day
28-05-06	21	1:25	91	Flight aborted due to high turbulence, Standby Day
29-05-06	22	4:49	756	Flown at Block 'A'. Production flight
30-05-06	23	1:00		Flight aborted due to bad weather, Standby Day
31-05-06				Overcast all day, Standby Day
01-06-06				Overcast all day, Standby Day
02-06-06	24	4:49	822.4	Flown at Block 'A'. Production flight
03-06-06	25	5:09	915.1	Flown at Block 'A'. Production flight
04-06-06				Overcast all day, Standby Day
05-06-06	26	4:03	366.6	Flown at Block 'A' & Infill 'A'. Production flight
06-06-06	27	2:32	273.8	Flown on Block 'A', Flight aborted due to high turbulence and low ceiling, Production flight
07-06-06	28	0:45		Flight aborted due to bad weather, Radar Test performed, Standby Day
08-06-06	29	4:36	731	Flown at Block 'A'. Production flight
09-06-06				High winds and turbulence all day, Standby Day
10-06-06	30	1:27	45.7	Flight aborted due to high turbulence, Standby Day
11-06-06	31	5:23	593	Flown at Block 'A'. Production flight
12-06-06	32	5:16	735	Flown at Block 'A' & Block 'B' west added tie line Production flight
13-06-06				Demoblization
Totals:		128:05	13,053	

The following personnel comprised the onsite crew for the project at Mayo in 2005 & 2006:

Table 4: Onsite Personnel

Title	Name	Days Onsite
Project Manager (2006)	Kevin Lindsay	57
QC Geophysicist (2005)	Adam Barrett	29
Operator (2005)	Adam Barrett	29
Aircraft Pilot (2005)	Rory Clayton	29
QC Geophysicist (2006)	Asif Mirza	61
Operator (2006)	Kevin Lindsay	57
Operator (2006)	Jan Niemeijer	57
Aircraft Pilot (2006)	Marieke Niemeijer	57

4. AIRCRAFT AND EQUIPMENT

4.1 The Aircraft

The survey was flown using a PA-31 Piper Navajo aircrafts with Canadian registration C-FFRY supplied by Aries Aviation of Calgary, Alberta and C-GPVN Bruce land Air of Wiarton, Ontario, Canada respectively. The aircrafts were modified as a geophysical survey platform, and features one high sensitivity magnetometer installed in a tail stinger. This aircraft can acquire aeromagnetic data at nominal survey airspeed of 135 knots (Approx. 230 km/hour) with has approximately 6 hours flight duration including the geophysical system and a crew of 2 persons onboard.

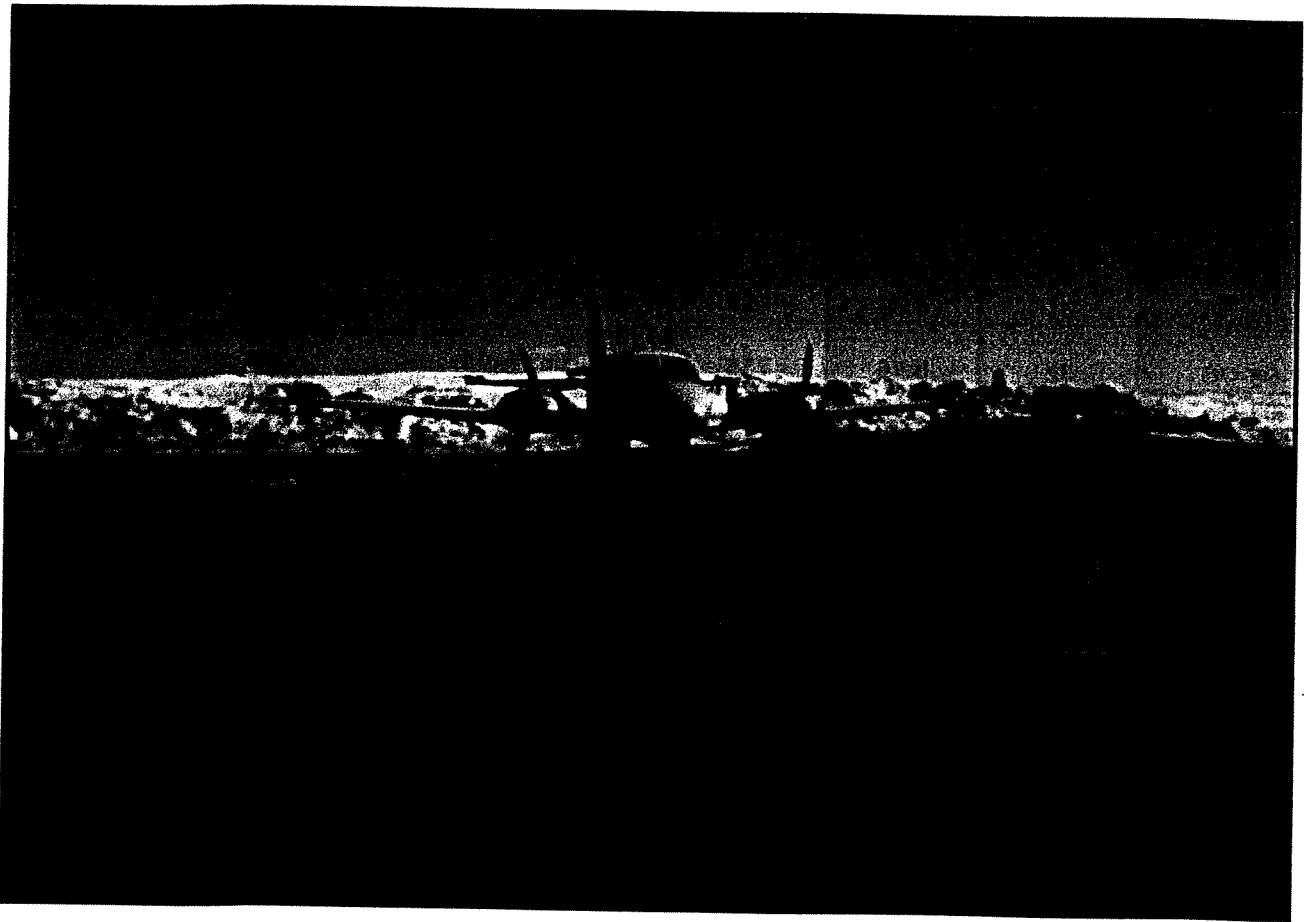


Figure 7: PA-31 Piper Navajo aircraft with Canadian registration C-FFRY (2005)



Figure 8: PA-31 Piper Navajo aircraft with Canadian registration C-GPVN (2006)

Mobilization of the aircraft, equipment and personnel to Mayo was again accomplished on April 13, 2006. Installation of the survey equipment into the aircraft and pre-survey test flight was undertaken on April 11, 2006 at Norman Wells, NWT, Canada. The final survey flight was completed on June 12, 2006.

McPhar personnel at the Calgary, Alberta and Norman Wells, NWT, CANADA carried out the installation of the geophysical and ancillary equipment, respectively. After the aircraft's arrival, final adjustments, calibration and testing was completed in Mayo, Yukon Territories, prior to production survey flights commencing.

Aircraft Model:	- Piper Navajo
Aircraft Registration:	- Canadian, C-FFRY
Engine:	- 2 x Textron Lycoming TIO-540-A2C
Empty weight:	- 3,759 lbs / 1,709 kg
Gross weight:	- 6,500 lbs / 2,955 kg
Fuel Capacity:	- 350 gal / 1,330 litres
Survey speed:	- 120-160 knots / 220-295 km/h
Survey duration:	- 7.5 hours
Ferry:	- 185 knots / 340 km/h
Cruise range:	- 1.295 nm/ 2300 km
Max. Alt:	- 26,000 ft / 8092 m

Aircraft Model:	-	Piper Navajo
Aircraft Registration:	-	Canadian, C-PGVN
Engine:	-	2 x Textron Lycoming TIO-540-A2C
Empty weight:	-	4,336 lbs / 1,966 kg
Gross weight:	-	6,770 lbs / 3,070 kg
Fuel Capacity:	-	240 gal / 1,019 litres
Survey speed:	-	120-160 knots / 220-295 km/h
Survey duration:	-	4:45 hours
XC:	-	160 knots
Cruise range:	-	1,040 nm/ 1926 km
Max. Alt:	-	1,000 ft

4.2 The Survey Instrumentation

4.2.1 Survey System Overview

The instrumentation installed in the aircraft included:

- One Scintrex CS-2 high resolution cesium magnetometer (2005)
- One Scintrex CS-3 high resolution cesium magnetometer (2006)
- Pico-Envirotec AGIS 100 Data Acquisition System (2005)
- Fluxgeo Data Acquisition System (2006)
- NovAtel GPS Glonass System
- NovAtel L1/L2 Antenna
- Instrumentation Rack and Power Distribution System

The processing and base stations comprised:

- A Field Workstation, comprising a portable Pentium PC, printer and full data processing software (Waypoint Navigation GrafNav GPS Processing Software, CCMag Magnetic Compensation Software and Geosoft Montaj Processing Software)
- A Magnetometer Base Station, comprising a GEM GSM-19 Proton magnetometer (2005)
- A Magnetometer Base Station, comprising a Scintrex CS-3 High Resolution cesium magnetometer and KMAG 4 mag counter (2006)
- NovAtel ProPak II GPS System
- NovAtel L1/L2 Antenna
- A complement of spare parts and test equipment were maintained at the survey site.

4.2.2 Airborne Magnetometer

A Scintrex CS-2 & CS-3 cesium split-beam total-field magnetometer was installed in the tail stinger of the aircraft, respectively. Sampling rate was ten (10) times per second with an in-flight sensitivity of 0.001 nT. Aerodynamic magnetometer noise was +/- 0.01 nT. The sensitivity of the magnetometer was recorded at 0.001 nT when operated at a sampling rate of 0.1 second.

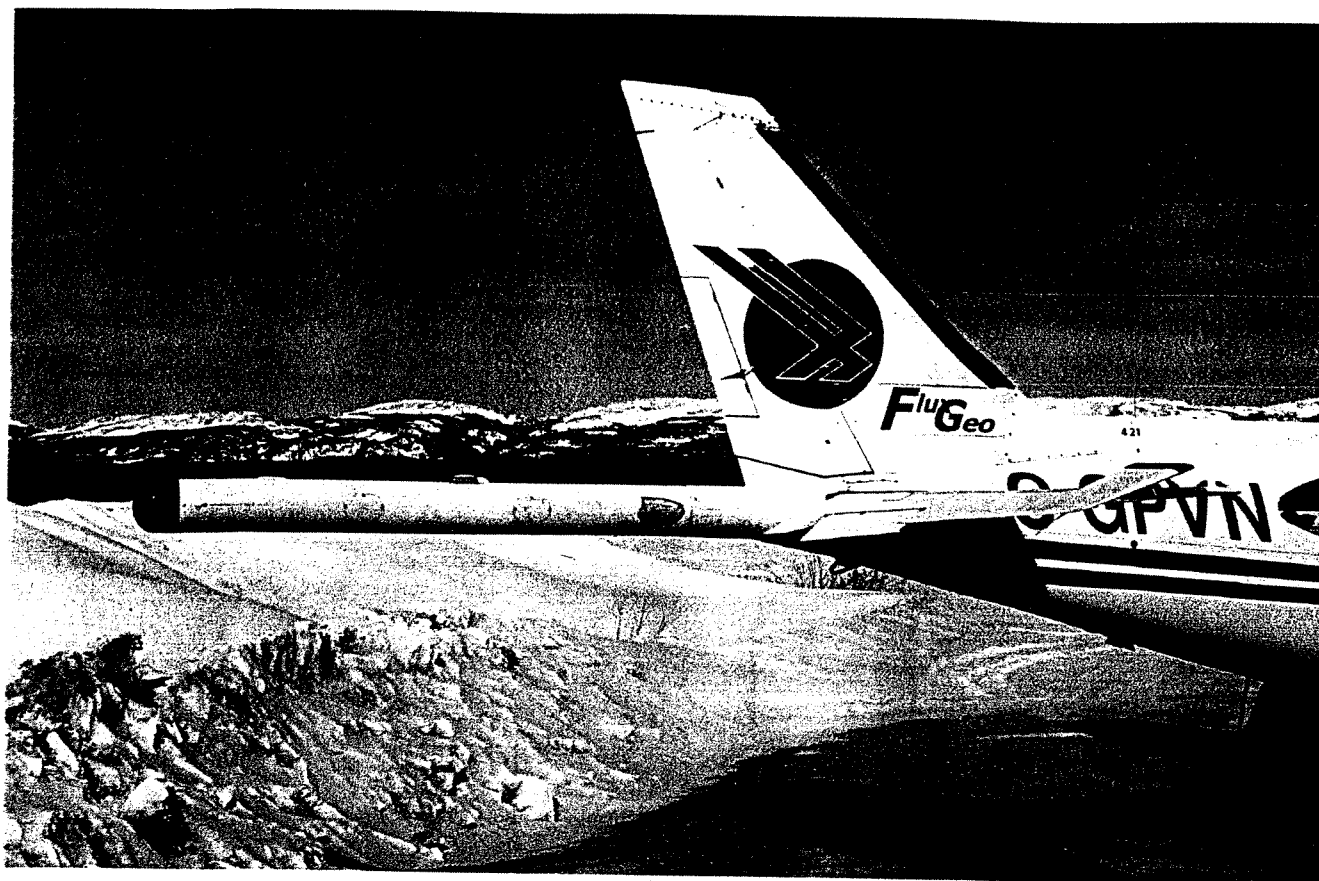


Figure 9: Tail stinger of the aircraft with CS-3 Mag sensor

The magnetic Figure-of-Merit (FOM) of the aircraft was determined using the Geological Survey of Canada's method, and was demonstrated to be better than 1 nT. The Scintrex CS-3 magnetometer is described in Appendix 1.

4.2.3 Magnetic Compensation

Compensation for the orientation and movement of the aircraft in the Earth's ambient magnetic field was undertaken post flight using a proprietary program "CCMAG" installed on the Field Workstation. The Larmor frequency output of the cesium magnetometer sensor was processed by a high precision frequency counter in the Fluxgeo and AGIS 100 / MMS-4 data acquisition systems (resolution of 0.001nT at a sampling rate of 10 times per second). A three-axis Bartington fluxgate magnetometer monitored the attitude and motion of the aircraft in flight. The output from this fluxgate magnetometer, or attitude sensor, was then used in the "CCMAG" processing of the raw magnetic data to produce magnetic data compensated for the orientation and motion of the aircraft in the Earth's magnetic field.

The CCMAG post-flight compensation program is described in Appendix 2.

4.2.4 The Base Station Magnetometer

The magnetometer base stations used were comprised of a GEM System GSM 19 base station data recorder, proton magnetometer and KMAG 4 mag counter utilizing a Scintrex CS-3 cesium magnetometer to monitor and record diurnal variations of the Earth's magnetic field. The base station magnetometers were set up at the distance of 5 kilometres from Mayo airport. Every effort was made to ensure that the magnetometer sensor was placed in a location of low magnetic gradient and sited away from electric transmission lines, and moving ferrous objects, such as motor vehicles and aircraft.

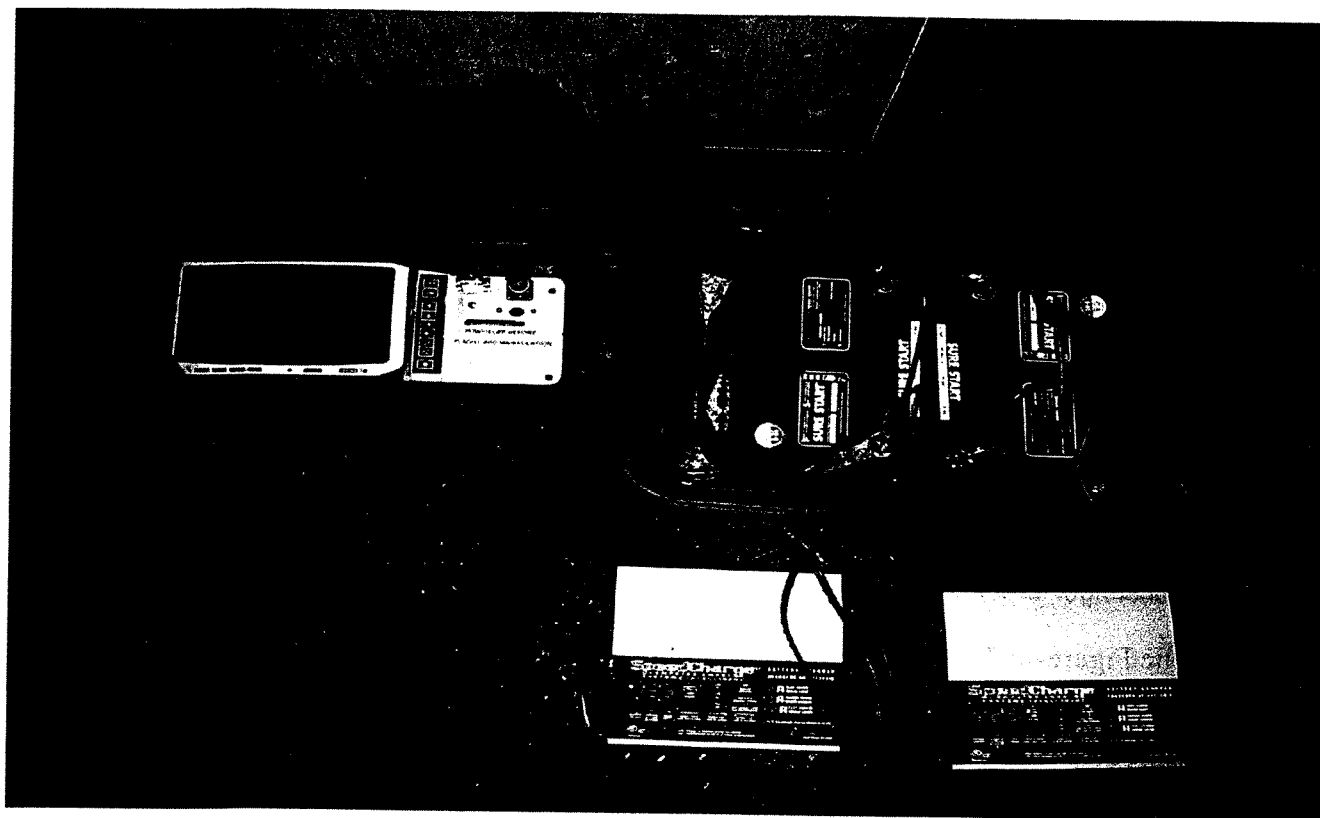


Figure 10: Base station magnetic system (2005)

The base-station magnetometer was operated continuously throughout the airborne data acquisition phase at sample rate at 1.0 second of a sensitivity of 0.01 nT. The ground and airborne system clocks were synchronised using GPS time, to an accuracy of 1 second or better. A continuously updated profile plot of the base station values was presented on the base station screen. At the end of the day, the digital data was transferred from the base station's data-logger to the fieldwork station.

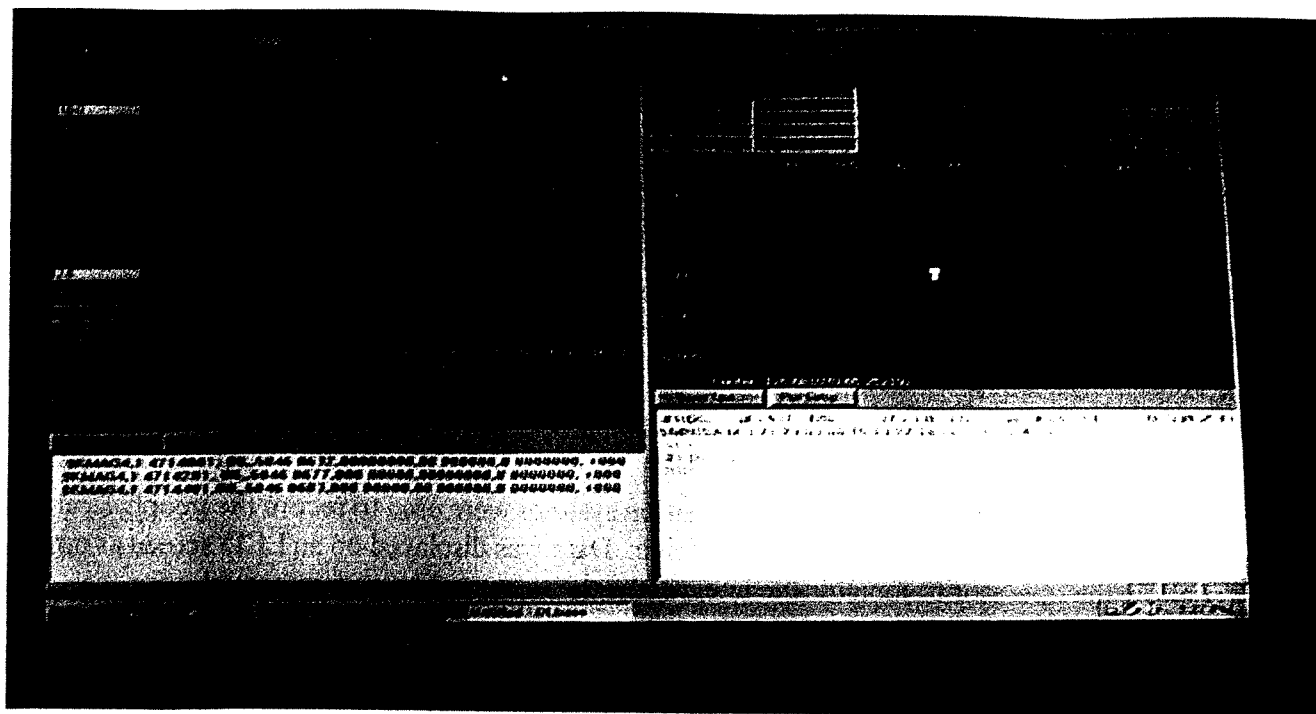


Figure 11: Base station magnetic system (2006)

4.2.5 Altimeter

The Terra TRA-3000/TRI-30 and King KP-10 radar altimeter systems were used to record the aircraft terrain clearance to an accuracy of less than 1 metre (approximately 3 ft), over a range of 40 ft to 2,500 ft. The altimeter was interfaced to the data acquisition system with an output repetition rate of 0.1 second, and were digitally recorded.

4.2.6 The GPS Satellite Navigation System

A CSI-Wireless DGPS MAX navigation system input to a navigation computer and pilot steering indicator (PSI) provided the navigation control. The PSI provided steering and cross-track guidance to the pilot. The pilot was provided with GPS and altimeter data to aid in the flying of the aircraft.

The co-ordinate system employed in the survey design and digital recording was WGS84 latitude and longitude. The GPS positional data was recoded at one second intervals and used with data obtained from three different differential services: Space Based Augmentation Systems (SBAS), OmniSTAR, and DGPS beacon stations, to calculate real-time differentially corrected locations. The GPS ground base station, comprised of NoveAtel ProPak II GPS System with Aero Antenna AT, recorded GPS data on a Pocket PC Based Data Logger (2005).

A NovAtel high-performance navigation/positioning system was used on the aircraft. This system consisted of a NovAtel GPS/GLONASS receiver and NovAtel L1/L2 Antenna. A pilot steering indicator, providing steering instructions to the pilot in three dimensions, was installed on top of the

cockpit dashboard. The indicator was connected to the Fluxgeo data acquisition system. A GPS ground base station, comprising a NovAtel ProPak II GPS receiver and NovAtel L1/L2 Antenna, was set up near a hut in Mayo. The GPS data was recorded on a Notebook PC-data logger for post-survey differential corrections (using GrafNav software). The GPS receivers are fully described in Appendix 2.

Survey co-ordinates were set-up prior to commencement of the survey and the information located into the airborne navigation system. The co-ordinate system employed in the survey design and digital recording was WGS-84 latitude and longitude. The GPS positional data was recorded at one-second intervals and used with the base station data to calculate differentially corrected locations (2006).

This navigation system yielded a real-time positional accuracy of better than ± 2 metres.

4.2.7 Data Acquisition/Recording System

The PC-based AGIS 100 and Fluxgeo data acquisition systems were used to record the geophysical and navigation survey data on an internal hard disk drive. Data was displayed on an LCD screen as profile traces to allow the operator to monitor the integrity of the system. The system provides for the:

- System control and monitoring
- Data acquisition recording
- Real-time data processing
- Navigation processing, and
- Post flight data playback and analysis

All data collection routines, checking and verification, buffering, and recording are software controlled for maximum flexibility both during and after the survey flight.

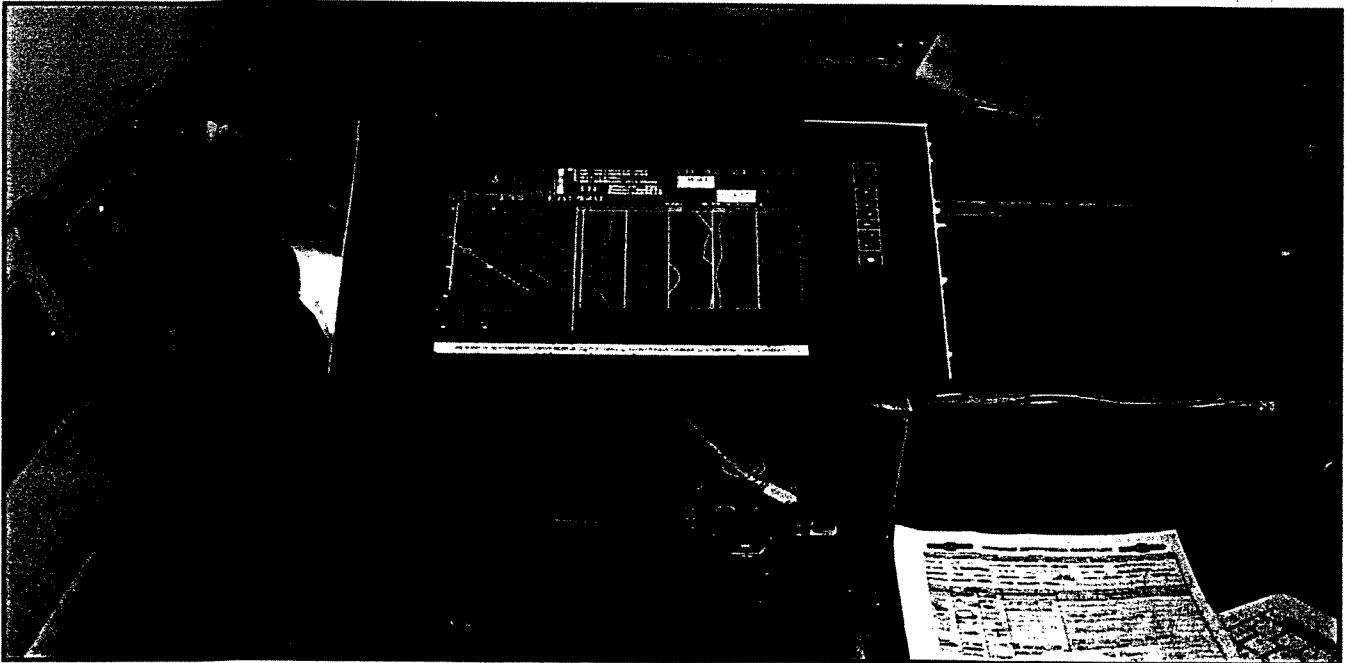


Figure 12: AGIS 100 Data Acquisition System installed in C-FFRY (2005).

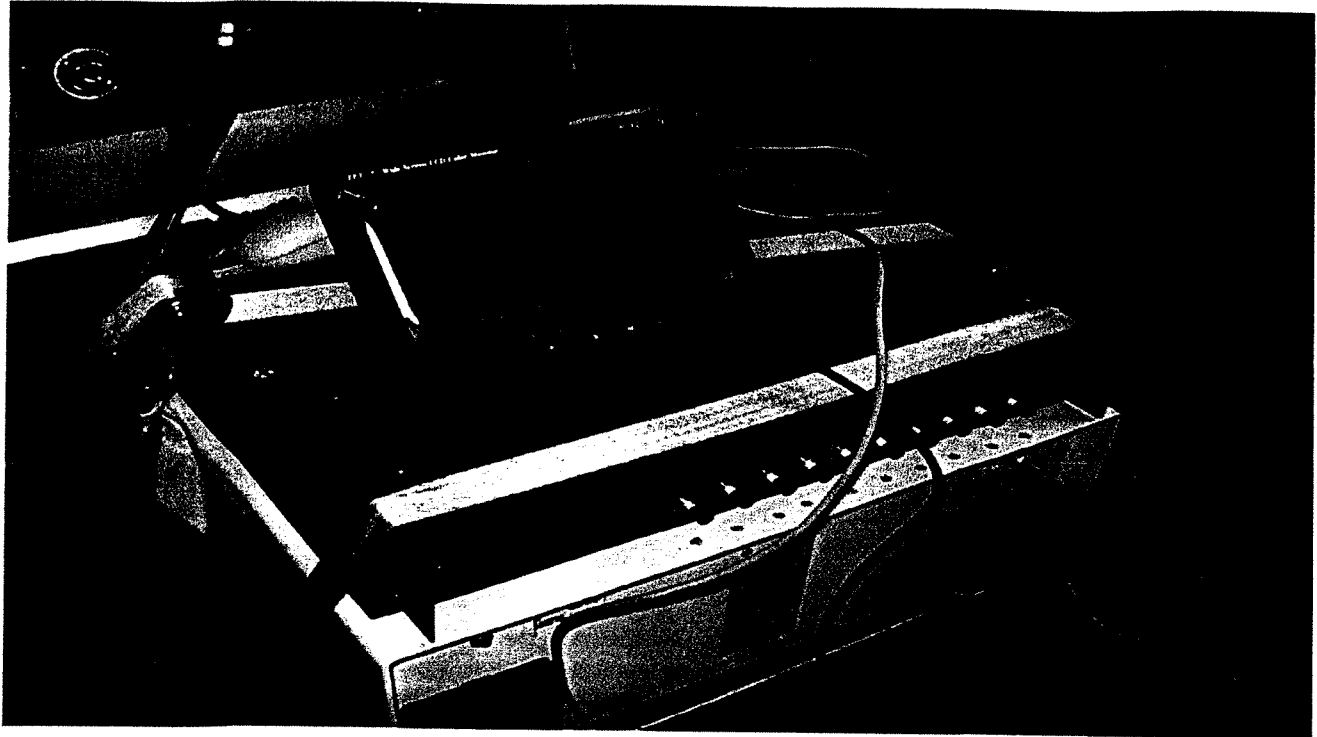


Figure 13: Fluxgeo Data Acquisition System installed in C-GPVN (2006)

4.2.8 Field Computer Workstations

A Data Processing Field Workstation (FWS) comprised of a dedicated PC-based notebook computer for use at the technical base in the field, was used on this project. The FWS is designed for use with Geosoft OASIS/Montaj Data Processing Software. The FWS has a data replot capability, and may be used to produce pseudo-analogue charts from the recorded digital data within less than 12 hours after the completion of a survey flight, if this is necessary. It is also capable of processing and imaging all the geophysical and navigation data acquired during the survey, producing semi-final, preliminary-levelled maps.

The FWS was used to accomplish the following:

- **Quality Control/Digital Data Verification** - flight data quality and completeness were assured by both statistical and graphical means on a daily basis
- **Flight Path Plots** - flight path plots were generated from the GPS satellite data to verify the completeness and accuracy of each day's flying
- **Preliminary Maps** - the Geosoft software system permitted preliminary maps to be quickly and efficiently created for noise and coherency checks.

The FWS is fully described in Appendix 2.

The Geosoft Oasis/Montaj software is designed for airborne data editing, compilation, processing and plotting. The software reads the portable data media from the airborne system checking for gaps, spikes or other defects and permits the data to be edited where necessary. The base station GPS/magnetometer data is checked, edited, processed and then merged with the airborne data by using GrafNav GPS Post-Processing Software. GPS flight path plots are created and plotted for both flight planning and flight path verification.

4.2.9 Spares

A normal compliment of spare parts, tools, back-up software, and necessary test instrumentation was available in the office at the airport.

5. INSTRUMENT CHECKS AND CALIBRATIONS

5.1 Airborne Magnetic System Tests and Calibrations

5.1.1 Manoeuvre Noise

As the magnetometer system sensor, installed in the tail stringer, is still within the magnetic effect of the aircraft structure, tests were conducted at regular intervals to determine the effects of aircraft roll, pitch and yaw. These tests were completed at high altitude over an area of low magnetic gradient by performing $\pm 10^\circ$ rolls, $\pm 5^\circ$ pitches and $\pm 5^\circ$ yaw manoeuvres flown over periods of 4-5 seconds in the same direction as the flight and tie lines. A compensated Figure-of-Merit (FOM) for the aircraft was calculated by summing the peak-to-peak amplitudes of the twelve magnetic manoeuvres. The FOM was determined at the commencement of flight operations on flight # 1 on November 20, 2005, 11 April 2006 and again on May 21 & 24, 2006. The FOM tests were determined to be 1.10 nT, 0.72 nT & 0.27 nT for tail stinger sensor respectively. Detailed information about the FOM tests is provided in Appendix 1.

5.1.2 Magnetic Heading Effect

The magnetic heading effect was determined by flying a cloverleaf pattern oriented in the same direction as the survey lines and tie lines. Two passes in each direction were flown over a recognizable feature on the ground in order to obtain sufficient statistical information to estimate the heading error. The heading errors were determined at the start of the survey on November 11, 2005 and again April 30, 2006. The results of the heading tests are presented in Appendix 1.

5.1.3 Lag Tests

The Lag Tests were performed on November 11, 2005 and on April 30, 2006 respectively to ascertain the time difference between the magnetometer readings and the operation of the GPS System. The tests were flown over an identifiable magnetic anomaly by flying the same line in opposite directions at survey altitude.

5.1.4 GPS Checks & Tests

In addition to carefully selecting a suitable area for the positioning of the base station, care was also taken to ensure that the base station GPS antenna maintained a maximum field-of-view to the GPS satellites, and was not obstructed due to movement and placement of airport equipment.

5.1.5 Altimeter Calibration Checks

Two altimeter tests were performed during the survey, the first on November 20, 2005, and the second on April 11, 2006. The radar altimeter was calibrated by comparing the radar altitudes with suitable readings from the GPS navigation system during radar "stack" flown over Mayo airport runway and the Norman Wells airport runway respectively. The ellipsoidal height of runway was determined by GPS.

The procedure employed involved having the aircraft fly over the runway at various altitudes above the ground (100, 200, 300, 400, 500 and 600 feet) recording the values of the radar altimeter and GPS altimeter, which were then plotted and compared. The results of the tests are included in Appendix 1.

The radar calibration was checked on a daily basis by completing a vertical calibration test flight during take off and landing.

5.1.6 Other Daily Checks

The validity of data on all system channels were checked at the start and end of each survey flight, together with the synchronization of each of the systems (airborne and ground).

6. QC AND DATA PROCESSING

Daily quality control, initial processing and archiving of the data were completed in Mayo at the temporary data processing centre established at the Bed Rock Motel, using Geosoft MONTAJ software and a notebook PC computer. All data were verified upon receipt, and checked against the operator's flight logs.

The pre-processing or infield processing sequence included the following quality control measures:

- Examination of all incoming data to ensure completeness of data set.
- The production of preliminary flight path maps, speed checks, and aircraft terrain clearance checks.
- Full profile quality control of all acquired traces for noise levels, data completeness, spike editing, and adherence to contract specifications.

The final data processing, map generation and report was completed by McPhar at the Newmarket, Ontario office.

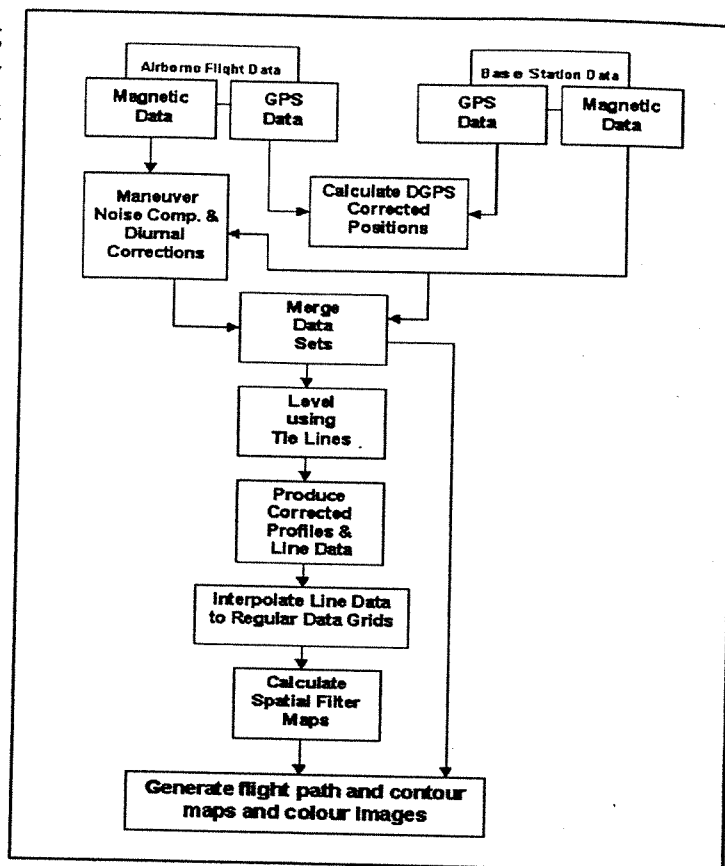


Figure 14: Data Processing Flow Chart

6.1 Flight Path Compilation

The flight path was derived from differentially corrected GPS positions using the airborne and static GPS data. Differential GPS data editing and processing was accomplished using the GrafNav GPS Post-Processing Software as developed by WayPoint Navigation, Inc. A position was calculated each 1.0 second (approx. each 60 metres along the flight path) to an accuracy of better than ± 1.5 metre. The position data was then merged into the magnetic and ancillary data in the Geosoft GDB database.

If the contract specifications were not met, a reflight was deemed necessary. All positional data was projected in NAD83, UTM Zone 8N coordinates as specified by the contact.

6.2 Base Station Magnetic Data

The base station magnetometer data was edited, plotted and merged into the GDB database on a daily basis.

The QA/QC procedure to determine acceptable magnetic base station data involved:

- Despiking of the base station data resulting from cultural activities not associated with the performance of the survey.
- Determination of the maximum noise of the observed total magnetic intensity
- Determination of the average 4th difference noise of the signal
- Determination of the rate of diurnal change

6.3 Processing the Airborne Magnetic Data

Final processing of the magnetic data was completed at the McPhar office in Newmarket, Ontario. The following processing steps were applied to the magnetic data:

6.3.1 Corrections

The processing of the data involved: post-flight compensation for the movement and orientation of the aircraft in the Earth's magnetic field; correcting for diurnal variations by using the digitally recorded ground base station magnetic values; network adjustment using the flight-line and tie-line information to level the survey data set. The corrected data set was used to generate the initial Total Magnetic Products grid and served as a base for all further processing and analysis.

6.3.2 Levelling

Levelling of the magnetic data included the following steps:

- statistically levelling the tie lines;
- levelling the traverse lines using statistically levelled ties (note: this procedure involves editing/adjusting of individual corrections at selected intersections as required in order to obtain the best possible levelled data before microlevelling);
- micro-levelling the traverse lines. After applying the above corrections to the profile data any residual line-direction-related noise was removed through the application of microlevelling. The microlevelling technique consisted of the application of directional and high pass filters to produce a grid containing noise-only in the line direction. The grid is extracted to the profile database, and an amplitude limit and a filter length are determined, so that the final error channel reflects only noise present in the grid without removing or changing geologic signal. The error channel is then subtracted from the initial input magnetic data channel in order to obtain the final micro-levelled channel. The resulting grid is free of line direction noise.

6.3.3 Compudrape Method

In order to be able to merge the different datasets and provide a single merged data and map product, the data was processed using a procedure commonly referred to as CompuDrape.

As a result of the survey being completed in two stages, it was inevitable that the mean terrain clearance between the two survey parts varied considerably from 2005 and 2006. This variance was in part due to:

- Different survey specifications with respect to flying heights and line spacing;
- Different survey aircraft and pilots and hence different levels of experience in flying and aircraft performance characteristics;
- Different weather conditions;
- Similar but different data processing and magnetic compensation procedures.

The application of Compudrape involves computation through the use of upward and downward height continuation on aeromagnetic profile data to transform it from the original magnetic field on an arbitrary observation surface to the magnetic field on a new surface of specified height.

In areas with steep topography such as encountered in some areas of the Project, it was difficult for the survey aircraft to maintain a constant nominal height above the ground. This was further complicated by the fact that the survey was flown in two parts, similar but different aircraft, few months difference apart, and under different survey conditions. The result was large variations in the distance between the magnetic sensor and the ground (from 50 to 500 m), making it very difficult to process the data.

Compudrape attempts to correct this variable terrain clearance effect by generating a magnetic grid that "simulates" the result that would have been obtained had the magnetic sensor been maintained a constant height above ground. In the case of this Project, a sensor height of 100 metres was used for the Compudrape surface.

In this application, the raw profile data was processed for multiple continuation surfaces using a 1D FFT transform to achieve maximum removal of the effects of the variation in terrain clearance from line-to-line and at traverse-tie line intersections.

The Compudrape process was designed to perform a loose drape transformation. The elevation channel is the magnetic sensor elevation above sea level. The Topography channel is the topography (i.e., sensor terrain clearance above ground subtracted from sensor elevation above sea level). The new observation height value is the desired constant drape height above ground. The end result is for a more acceptable merging of the different data sets to produce a relatively contiguous TMI image for the entire area covered by the two surveys. Microlevelling was performed again to get rid of line direction noise.

6.3.4 IGRF Removal

The International Geomagnetic Reference Field (IGRF) is a long-wavelength regional magnetic field calculated from permanent magnetic observatory data collected around the world. The IGRF is updated and determined by an international committee of geophysicists every 5 years. Secular variations in the Earth's magnetic field are incorporated into the determination of the IGRF.

Through the removal of the IGRF from the observed Total Magnetic Intensity (TMI), the resulting residual magnetic intensity provides for more valid modelling of individual near surface anomalies. Additionally, the data can be more easily incorporated into databases of magnetic data acquired in the past or to be acquired in the future.

6.3.5 Gridding

The corrected magnetic line data was interpolated between survey lines using a random point minimum curvature gridding algorithm to yield x-y grid values for a standard grid cell size of $1/5^{\text{th}}$ of the line spacing (70m).

6.3.6 Filter Derivatives

The Total Magnetic Intensity (TMI) data were subjected to:

- Reduction-to-the-Pole
- Calculation of the First Vertical Derivative (1VD)
- Calculation of the Second Vertical Derivative (2VD)
- Calculation of the Analytic Signal
- Calculated Horizontal Derivative

Colour/contour images were produced for all the above listed magnetic products.

All of these spatial filtering techniques were completed using the Oasis/Montaj Magmap and IGRF modules for filtering in the 2D FFT domain.

6.3.6.1 Reduction-to-the-Pole

To compensate for the shift of the true anomaly position over the causative source due to the magnetic inclination and declination, the magnetic data was recomputed so that magnetic anomalies will appear as they would if located at the north magnetic pole. The result of this operation is that in theory the magnetic anomaly is located directly overtop of the causative source. The computation is referred to as "reduction-to-the-pole" (RTP). The reduction-to-the-pole is computed using a FFT (Fast Fourier Transform) operator.

The RTP not only shifts the anomalies to their correct position with respect to the causative magnetic bodies, but assists in the direct correlation and comparison of magnetic anomalies, trends, structural axis, and discontinuities with mapped geologic surface expression.

6.3.6.2 First Vertical Derivative

To "sharpen" magnetic anomalies and to provide better spatial location of source axes and boundaries, a first vertical derivative map was computed from the RTP-TMI. Vertical derivatives compute the rate of change of the TMI as it drops off when measured vertically over the same point (upward continuation). Potential field data obeys Laplace's equation, which allows for the computation, through the application of analysis FFT, to take advantage of this symmetry and solve for the vertical or "z" component of the field.

6.3.6.3 Second Vertical Derivative

To enhance local magnetic anomalies and to outline the edges of anomalous bodies observed in the TMI, a second vertical derivative map was computed of the RTP_TMI. The Second Vertical Derivative map is a powerful interpretive tool and is used to assist in the delineation of causative bodies and accurate location of changes in the potential field gradient. Better definition of discontinuities and their relation to geology can be gained from the use of this tool. A Second Vertical Derivative map will show steep gradients over faults and positive closures over the “up thrown” blocks.

6.3.6.4 Analytic Signal

The Analytic Signal is the square root of the sum of the squares of the derivatives in the x, y, and z directions:

$$asig = \text{sqrt} (dx*dx + dy*dy + dz*dz)$$

*where: asig is the Analytic Signal
sqrt is the square root of
dx is the horizontal gradient in the x direction
dy is the horizontal gradient in the y direction
dz is the vertical gradient in the z direction*

The analytic signal is useful in locating the edges of magnetic source bodies, particularly where remanence and/or low magnetic latitude complicates interpretation.

6.3.6.5 Calculation of the Total Horizontal Derivative (TOTHDRV)

To highlight anomalous areas, which may be the result of a magnetic source of limited strike length, a Total Horizontal Derivative (TOTHDRV) is computed. The TOTHDRV is a powerful interpretive tool that can accurately define the edges of magnetic features such as dykes and vertical cylindrical geologic units that have sharp, but limited in area, magnetic gradients and geometry. A TOTHDRV will indicate peak gradients along the edges of narrow dykes and a circular, donut shaped anomaly over vertical cylinder sources.

7. DELIVERABLE PRODUCTS

The survey data is presented as colour/contour maps on paper, produced at a scale of 1:100,000 for Block 'A' & Block 'B' and 1:20,000 for Block 'A' Infill. A set of report-sized colour/contour images, on paper, is included as Appendix 5. The basic co-ordinate system used was NAD83, Universal Transverse Mercator (UTM) Zone 8N. All digital data are also presented on CD-ROM in ASCII format.

The deliverable items of this survey are:

7.1 Maps

The following maps, at a scale of 1:100,000 for the Block 'A' & Block 'B' and Block 'A' Infill, at a scale of 1:20,000, are delivered in two (2) paper copies.

- Flight Path with Topography
- Digital Terrain Model (DTM)
- Total Magnetic Intensity (TMI)
- Total Magnetic Intensity (IGRF removed)
- Total Magnetic Intensity (CompuDrape)
- Total Magnetic Intensity (IGRF removed) CompuDrape
- Total Magnetic Intensity Reduced to the Pole (CompuDrape)
- First Vertical Derivative (1VD) (CompuDrape)
- Calculated Second Vertical Derivative (2VD) (CompuDrape)
- Calculated Analytic Signal of TMI (CompuDrape)
- Calculated Horizontal Derivative (CompuDrape)

7.2 Digital Data

The edited field and processed digital data are delivered in two (2) copies, in ASCII code, on CD-ROM. The final processed line and grid data, in GEOSOFT format, are also delivered in two (2) copies on CD-ROM. Full descriptions of the digital data formats are included in this final report and as text files on each CD-ROM.

7.3 Report

Two (2) copies of a survey report are delivered, complete with all final maps. This report provides information about the acquisition, processing and presentation of the survey data.

Respectfully submitted,
McPhar Geosurveys Ltd.

Dr. Thomas Grand
Chief Geophysicist
McPhar Geosurveys Ltd.

APPENDIX IV

EXCERPT FROM MCPHAR GEOSURVEYS LTD. REPORT ON AIRBORNE RADIOMETRIC SURVEY

SUMMARY

McPhar Geosurveys Ltd conducted an airborne geophysical survey on the Wernecke Mountain Properties, Yukon, on behalf of Archer, Cathro and Associates, Vancouver, BC.

The project areas were located approximately 180 km northeast of the town 'Mayo' and was flown using a helicopter equipped with a high-resolution radiometric system.

The McPhar crew was in the Lumina camp survey area on August 31, 2006. Instrument calibration flights for spectrometer cosmic stripping coefficients, background effect and radar altimeter calibration (radar stack) were completed on September, 01, 2006, as well as the first two production flights. A total of 1,748 line-kilometres or 179 square kilometres were flown. The survey area was flown with a mean terrain clearance of 50 metres. Flight lines were flown at 90° with spacing of 100 metres.

1. INTRODUCTION

A detailed high-resolution helicopter-borne radiometric survey was conducted during the period between August 31, 2006 to September 15, 2006 on behalf of Archer, Cathro & Associates (1981) Limited, ("Archer") by McPhar Geosurveys Ltd, ("McPhar"), over a portion of the Wernecke Mountains, Yukon.

The purpose of the survey was to acquire high-resolution geophysical data to map the geophysical characteristics of the geology and structure in an effort to provide an insight into geological and geophysical settings.

The geophysical system was mounted in the cabin of a Eurocopter AS-350B2 helicopter. Data acquisition utilized precision differential GPS positioning and a Pico-Envirotec GRS-410 multi-channel gamma-ray spectrometer. This instrument has a 16.8 litres "downward looking" NaI sensor mounted in the cabin inside the side of the helicopter. Ancillary equipment included a differential GPS navigation and positioning system, barometric pressure transducer, temperature and relative humidity probe and a radar altimeter.

Originally the survey area comprised of four separate blocks in the contract. The area known as 'Pay' was unable to be completed due to the presence of substantial snow. So three survey blocks were completed known as "Lumina", "Bonnie/Coma" and "Bond/Vic". The survey lines were flown in an east-west direction (90°) at spacing of 100 metres. The survey comprised a total of 1,748 line kilometres of data acquisition.

Table 1: Survey Areas Description

AREA NAME	APPROX AREA (KYP)	LINE SPACING	HEIGHT LINE (KM)	PRIMARY HEIGHT DIRECTIONS
Lumina	123	100m	1,178	090°
Bonnie/Coma	19	100m	194	090°
Bond/Vic	37	100m	376	090°
Totals	179		1,748	

Mobilization of the helicopter, equipment and personnel to Whitehorse, Yukon was completed on August, 2006 and final settlement in the Archer, Cathro 'Lumina' camp occurred on August 31, 2006, when fuel and accommodations were established. Pre-survey test and calibration flights for spectrometer cosmic stripping coefficients, aircraft background and for radar altimeter calibration (radar stack) were completed August 11, 2006. The final survey flight was completed on Sept 15, 2006.

Final data processing, map compilation and a report were completed by McPhar at its Newmarket, Ontario office.

2. SURVEY AREAS

The survey consisted of 3 irregular shaped blocks, identified by Archer, Cathro as 'Lumina', 'Bonnie/Coma' and 'Bond/Vic'. These blocks are situated 30 km southeast of Copper point camp and approximately 180 km northeast of the town of Mayo. The primary objective of the survey was to acquire geophysical data in support of uranium exploration.

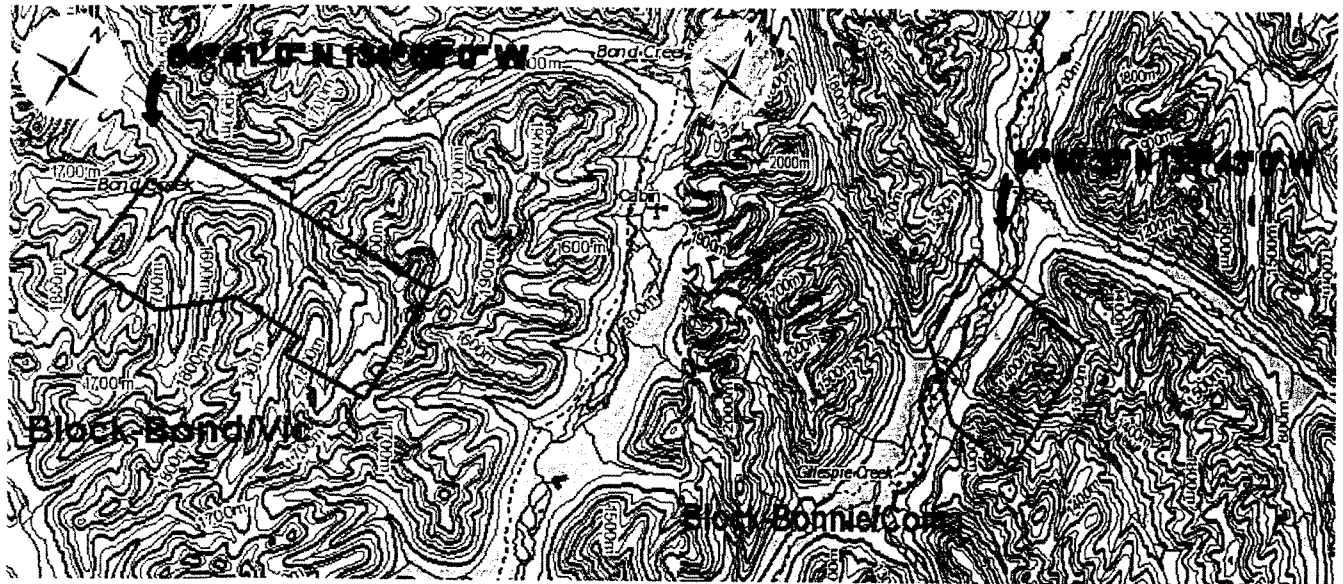


Figure 1: Location of the flown radiometric survey blocks, Yukon.



Figure 2: Typical survey topography, Yukon.

The elevation ranged from approximately 915 metres to over 2400 metres above sea level. Weather conditions were generally favourable, however some 'standby' days were incurred where survey flying was impossible as fog, rain and low ceiling prevailed. Temperatures varied from 5 to 18 degrees Celsius.

Archer, Cathro provided the survey block corner coordinates, in easting and northing. Projections were converted to WGS84, UTM zone 08 N. The geographic location and corner coordinates follows.

Table 2: Survey Area Coordinates

Lumina		Bond/Vic		Bonnie/Coma	
X	Y	X	Y	X	Y
578935	7215310	512710	7172985	561221	7190665
578935	7203885	503290	7172985	565300	7190665
575135	7203885	503290	7171625	565300	7185350
572540	7200675	502315	7171625	563320	7185350
573295	7200030	502315	7168725	561469	7187210
574960	7201970	505372	7168725	561221	7190665
578935	7201970	506658	7169810		
578935	7191500	510575	7169810		
582330	7191500	510575	7169260		
582325	7200620	512710	7169260		
586070	7200620	512710	7172985		
586070	7207230				
584070	7207230				
584070	7211750				
582065	7211750				
582065	7215310				
578935	7215310				

3. SURVEY OPERATIONS

3.1 Operations Base

Survey operations were based from the Archer, Cathro camp inside the 'Lumina' survey block, with daily pre/post flight calibrations performed at the cleared helipad, located adjacent to the camp and the dirt airstrip.



Figure 3: The Lumina camp at survey area.

All quality control and preliminary data processing were performed at the camp.

3.2 Survey Conditions

Of the time spent at the Lumina camp, weather prevented survey production on two occasions. Fog and rain nestled inside the hills surrounding the camp and completely capped the peaks of the survey blocks in the area. When weather conditions were fair, production was obtained. The average temperature over the course of the survey was approximately 11°C.

The topography of the survey area is rugged, consisting of steep mountain slopes and incised river valleys. The presence of snow in the hills of the 'Pay' survey block prevented it from being flown. Of the original 1,885 km scheduled, this area represented 77 km. Also 14 lines of the 'Lumina' block were omitted for being 'too densely snow covered'.

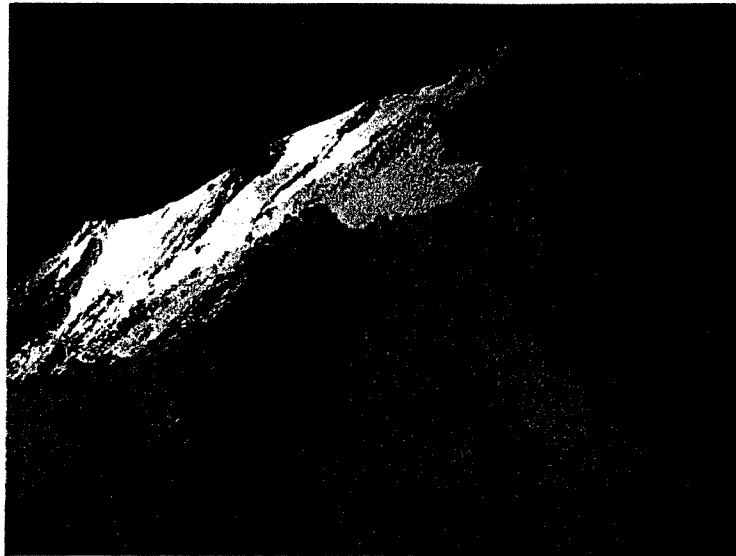


Figure 4: Snow covered conditions of survey block 'Pay'

3.3 Navigation

An air speed of approximately 110 kilometres per hour was maintained during data acquisition. The sampling rate for the spectrometer, radar, barometric altimeters and GPS navigation/positioning system was one measurement every 1.0 second. This resulted in spectrometric spatial sampling and position fixes every 41 metres along the flight path.

Navigation was assisted by a GPS receiver system that reported real-time differentially corrected GPS co-ordinates in WGS-84 latitude and longitude, directing the pilot over a pre-programmed two-dimensional (2-D) survey grid. The x-y position and ellipsoidal altitude of the aircraft, as reported by the GPS system, was recorded together with the terrain clearance, as reported by the radar altimeter. The coordinates of the survey area were submitted as NAD83 then transformed into WGS84, UTM zone 08N coordinates for purposes of navigation.

Vertical navigation along flight lines was effectively controlled through the use of a radar altimeter. The optimum terrain clearance during normal survey flying was 50 metres for the helicopter. However, due to rugged terrain in some areas, and the pilot's judgment of safe flying conditions in these areas, these terrain clearances were not possible 100% of the time.

The final vertical and horizontal survey positions as obtained with onboard real time differentially corrected GPS had a precision of approximately +/- 1.5 metre.

3.4 Field Processing & Quality Control

The survey data was transferred to portable magnetic media on a flight-by-flight basis, and then copied to the field data processing workstation. In-field data processing included reduction of the data to GEOSOFTE GDB database format and inspection of the data for adherence to contract specifications. Survey lines that exhibited excessive deviation or that were considered to be of inferior quality were designated to be reflight.

3.5 Survey Statistics and Project Diary

The survey was completed with a total of 30 flights; of which 29 were production flights. The first production flight was Flt# 02 on September 01, 2006, and the last production flight, Flt# 30 on September 15, 2006.

Table 3: Project Diary

Date	Flt #	Hours Flown	Line-Km Accepted	Comments
August 31	1	2.3		Crew mobilized by helicopter with equipment from Whitehorse to Lumina Camp.
September 01	2 & 3	3.9	115.3	Poor weather in the morning. Afternoon two production flights at Lumina block
September 02				Poor weather, standby day
September 03	4, 5 & 6	5.8	238.8	Three production flights at Lumina block
September 04	7	2.3	64.2	Poor weather in the morning, afternoon short production flight at Lumina block
September 05	8 & 9	4.7	158.6	Two production flights at Lumina block
September 06	10, 11, 12 & 13	7.7	259	Flt# 10 was Test and Calibration flight. Remaining three were production flights at Lumina block
September 07	14 & 15	4.5	58.8	Flt# 14 comprised production and reflight lines Flt# 15 contains partial reflight lines and Tests over Fairchild Lake
September 08				Helicopter maintenance
September 09	16	1.8	51.1	Switch the helicopter Short production flight at Bonnie/Coma block
September 10	17, 18 & 19	7.5	180.9	Three production flights at Lumina block
September 11				Poor weather, standby day
September 12	20, 21 & 22	7.1	205.5	Three production flights at Lumina and Bond/Vic blocks
September 13	23, 24, 25 & 26	8.3	277.2	Four production flights, finished the Bond/Vic block and started the Bonnie/Coma block
September 14	27, 28 & 29	7.6	253.6	Three production flights. Completed all blocks including reflight lines
September 15	30	3.1		Ferry to Mayo and then Whitehorse. Demobilization
Totals		66.6	1,863	

- Total are inclusive 115 line-kms of reflights

Table 4: Field Personnel

Title	Name	Days Onsite
Project Manager/QA/QC	Adam Barrett	16
Operator	Adam Barrett	16
Helicopter Pilots	Doug Hladun	16

McPhar Geosurveys Ltd. of Newmarket, Ontario, Canada, was responsible for the field operations, all geophysical matters and the overall coordination and management of the survey.

4. HELICOPTER AND EQUIPMENT

4.1 The Helicopters

The survey was flown using two Eurocopter AS-350B2 A-Star model helicopters, with Canadian registration C-GTNU & C-GTNT provided by TransNorth Helicopters, Yukon. These helicopters featured up to 2.5 hours flight duration with the geophysical system and a crew of 2 persons onboard.

McPhar personnel, at the TransNorth base in Whitehorse, Yukon, did the installation of the geophysical and ancillary equipment. Final adjustments, calibration and testing were completed prior to production survey flights originating at the Lumina base camp.

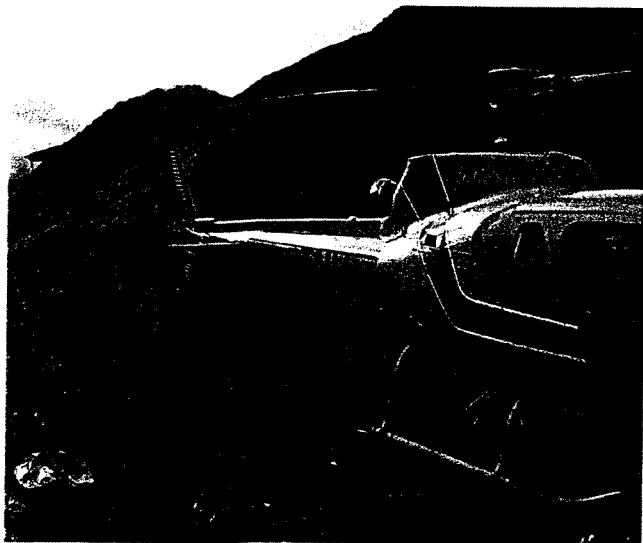


Figure 5: Helicopter C-GTNU fuelling at Lumina camp



Figure 6: Helicopter C-GTNT fuelling at Lumina camp

Table5: Survey Helicopters Specifications

Helicopter Model	Eurocopter AS-350 B2
Registration	C-GTNU
Engine	Turbomeca Arriel 1D1 - 732 shp
Gross Weight	4,991 lb
Empty Weight	2,561 lb
Useful Load	3,530 lb
Useful Fuel Capacity	143 gal /540 liters
Cargo-swing Load	2,557 lb / 1.160 kg
Typical Survey Speeds	45 – 60 knots/ 80 – 120 kph
Survey Fuel Consumption	47 gal/hour / 180 litres/hour
Flight Duration (no reserves)	3 hours
Cruise Speed - Ferry	122 knots
Cruise Range	371 nm / 688 km
Maximum Operating Altitude	18,700 ft / 5,700 m
H.I.G.E. (ISA)	13,450 ft / 4,100 m
H.O.G.E. (ISA)	11,300 ft / 3,450 m
Climb Performance	1,950 ft min / 594 m / min
Power Available for Equipment (28 VDC)	150 amps

4.2 The Survey Instrumentation

4.2.1 Survey System Overview

The equipment installed in the helicopter included:

- A Pico-Envirotec GRS-410 self-stabilizing multi-channel gamma-ray spectrometer with 16.8 litres “downward looking” NaI sensor.
- A navigation system, comprising an CSI Wireless DGPS-MAX and a Pico-Envirotec AGNAV GPS computer with pilot guidance unit (PGU)
- A SETRA model-276 digital barometric altimeter/pressure transducer
- A Campbell Scientific Model-CS500 Temperature and Relative Humidity Probe
- Pico-Envirotec AGIS Data Acquisition System
- A Terra TRA-3000/TRI-30 Radar Altimeter

The processing and base stations included:

- A Field Workstation, consisting of a portable Pentium PC, printer and full data processing software

4.2.2 Gamma-ray Spectrometer System

The gamma ray system included a Pico-Envirotec GRS-410 multi-channel gamma-ray spectrometer with 16.8 litres of “downward looking” NaI sensor with sampling rate of 1 measurement per second. The thermally insulated NaI crystal sensors were installed inside the cabin of the helicopter.

The GRS-410 is a 512 channel, self-stabilizing spectrometer that tracks and corrects for the spectral drift of the system by following a thorium spectral peak. Standard regions of interest for Total Count (TC), potassium (K), uranium (U), thorium (Th) and cosmic radiation were recorded for post survey processing. The averages recorded with window limits in MeV are shown in the following table:

Table 6: Standard Gamma-ray Spectrometer Data Acquisition Windows

Standard Gamma-ray Spectrometer Data Acquisition Windows		
Element	Lower Boundary (MeV)	Upper Boundary (MeV)
Total Count	0.41	2.81
Potassium	1.37	1.57
Uranium	1.66	1.86
Thorium	2.41	2.81
Cosmic	3.00	∞

Recommendations in the International Atomic Energy Agency – IAEA – TECDOC-1363 – *Guidelines for radioelement mapping using gamma ray spectrometry* were followed throughout the survey.

Gamma-ray spectrometer specifications are further described in Appendix 2.

4.2.3 Altimeter

A Terra TRA-3000/TRI-30 radar altimeter was used to record terrain clearance to an accuracy of about 1 ft (30 cm), over a range of 12 metres to 762 metres. The antenna was mounted beneath the bubble of the helicopter cockpit. The altimeter was interfaced to the data acquisition system with an output repetition rate of 0.1 second, and digitally recorded.

A Setra model 276 Barometric Altimeter was utilized to measure height above sea level and barometric pressure changes. The barometric pressure transducer was connected directly to the data acquisition system with an output repetition rate of 1 second, and digitally recorded. The barometric altimeter has a resolution of approximately 30 cm (1 ft) and an accuracy of +/-0.02% full scale at 70°F (19°C).

System specifications are further described in Appendix 2.

4.2.4 Outside Air Temperature System

A Campbell Scientific CS500 Temperature & Relative Humidity Probe was used to record outside air temperature and humidity. The probe was attached to a GRS-410 gamma ray sensor housing.

System specifications are further described in Appendix 2.

4.2.5 The GPS Satellite Navigation/Positioning System

A CSI-Wireless DGPS-MAX GPS receiver input to a Pico-Envirotec AGNAV navigation computer and pilot steering indicator (PGU) provided in-flight real-time navigation control. Mounted on top of the cockpit dashboard, in front of the pilot, it provided steering and cross-track guidance in conjunction with GPS and altimeter data.

This navigation system yielded a real-time positional accuracy of better than ± 2 metre.

Survey co-ordinates were set-up prior to commencement of the survey, the information fed into the airborne navigation system. The co-ordinate system employed in the survey design and digital recording was WGS-84 latitude and longitude. The real time differentially corrected GPS positional data was recorded at one-second intervals.

The GPS receiver is fully described in Appendix 2.

4.2.6 Data Acquisition/Recording System

A PC-based Pico-Envirotec AGIS data acquisition system was used to record the geophysical and ancillary survey data on an internal hard disk drive and comprised of a pilot guidance colour display. Data is displayed on an LCD screen as traces allowing the operator to monitor the integrity of the system. The system records temperature, barometric pressure and humidity by itself using

The Pico-Envirotec AGIS provides for the:

- System control and monitoring
- Data acquisition recording
- Real-time data processing
- Navigation processing, and
- Post flight data playback and analysis

All data collection routines, checking and verification, buffering and recording are software controlled for maximum flexibility both during and after the survey flight. The Pico-Envirotec AGIS is fully described in Appendix 2.

4.2.7 Field Computer Workstations

A Data Processing Field Workstation (FWS) was used on this project, comprising of a dedicated PC-based notebook computer for use at the technical base in the field. The FWS is designed for use with Geosoft OASIS Montaj Data Processing Software. The FWS has a data replot capability, and may be used to produce pseudo-analogue charts from the recorded digital data within less than 12 hours after the completion of a survey flight, if necessary. It is also capable of processing and imaging all the geophysical and navigation data acquired during the survey, producing semi-final, preliminary-levelled maps.

The FWS was used to accomplish the following:

- **Quality Control/Digital Data Verification** - flight data quality and completeness were assured by both statistical and graphical means on a daily basis
- **Flight Path Plots** - flight path plots were generated from the GPS satellite data to verify the completeness and accuracy of each day's flying
- **Preliminary Maps** - the Geosoft software system permitted preliminary maps to be quickly and efficiently created for noise and coherency checks.

The Montaj software is designed for airborne data editing, compilation, processing and plotting. The software reads the portable data media from the airborne system checks them for gaps, spikes or other defects and permits the data to be edited where necessary. GPS flight path plots are created and plotted for both flight planning and flight path verification.

4.2.8 Spares

A normal compliment of spare parts, tools, back-up software, and necessary test instrumentation was available at the field office.

5. INSTRUMENT CHECKS AND CALIBRATIONS

5.1 Airborne Gamma-ray Spectrometer System Tests and Calibrations

All gamma-ray spectrometer system tests and calibrations were carried out according to the standard procedures following the recommendations of

IAEA-TECDOC-1363 - Guidelines for radioelement mapping using gamma ray spectrometry data,
IAEA-TECDOC-323 – Airborne Gamma Ray Spectrometer Surveying,
GSC-TECPAEPER 90-23 – Transportable Calibration Pads for Ground and Airborne Gamma Ray Spectrometers

5.1.1 Spectrometer Calibration on Transportable Pads – Stripping Ratios

The stripping ratios for the gamma-ray spectrometer were determined as a part of seasonal calibration prior to the survey on July 18, 2006 using the Pico Envirotec calibration pads. These pads are stored at the Holland Landing Airpark nearby Newmarket, Ontario. The tests were performed with the crystal box placed on U, Th, K and background pads and data recorded over a minimum of 10 minutes for each pad.

The results of this calibration are included in Appendix 1.

5.1.2 Altitude Attenuation Coefficient

The exponential altitude attenuation coefficients were derived from test flights completed on September 07, 2006 in the survey area and on September 26, 2006 at the Holland Landing Airpark, Newmarket. This was accomplished by flying a test line at various altitudes of approximately 50, 100, 150, 200, 250 and 300 feet. A series of background measurements were made at the same time and same altitudes over the water body to determine the background due to cosmic radiation, radon decay products in the air and the radioactivity of the aircraft and equipment.

The closure altitude attenuation coefficients of this calibration are included in Appendix 1.

5.1.3 Spectrometer System Sensitivity

Sensitivity coefficients were determined during the post-survey seasonal test by hovering at different altitudes over McPhar's calibration spot at Holland Landing Airpark, Ontario on September 26, 2006. A series of background measurements were made at the same time at different altitudes over Lake Simcoe. These were to determine the background due to cosmic radiation, radon decay products in the air and the radioactivity of the aircraft.

The test flights served to determine system sensitivities through comparison of airborne data with data acquired on the ground, and to determine the variation of the window counts with aircraft altitude. The ground measurements were made with an Exploranium portable gamma ray spectrometer by the Geological Survey of Canada. Measurements were acquired at 37 stations along 2 diagonal lines crossing the 300 x 300 m calibration spot. Measurements were also made with the portable

spectrometer on the lake located near Holland Landing to determine background radiation due to cosmic radiation, radon decay products in the air and any radioactivity of the equipment. The background was subtracted from the ground measurements. Next ground concentrations of potassium, uranium and thorium were determined by calibration of the portable spectrometer using the Pico Envirotec calibration pads located at Holland Landing Airport.

The sensitivities of the airborne system to potassium, equivalent uranium, and equivalent thorium were calculated by dividing the average count rates corrected to an effective height of 50 m above ground by the ground concentrations of the test spot.

The results of this calibration are included in Appendix 1.

5.1.4 Cosmic Stripping and Aircraft Background

Cosmic stripping coefficients and aircraft background for K, U, Th & TC windows were measured and calculated for the detector crystal packs prior to the survey on August 11, 2006 near Copper point camp and during the survey on September 07, 2006 over Fairchild Lake, Yukon. The coefficients were calculated from a sequence of passes flown at various high altitudes above the ground (approximately 1532, 1843, 2154, 2465, 2772 & 3083 metres and 1528, 1836, 2143, 2443, 2749, & 3051 metres respectively). Each altitude was flown for a minimum of 2 minutes.

Coefficients were determined by linear regression of cosmic counts versus each spectral window (TC, K, Th and U) as described in the IAEA Report 323 (1991).

The results of the calibration are presented in Appendix 1.

5.1.5 Radon Background

No self-sustaining test or calibrations for radon background were made. The radon background was removed using the 'Full Spectrum' method analyzing the survey and test line data.

5.1.6 Test Line

A test line was flown and recorded at survey altitude at the start and end of each survey day to test the repeatability of the gamma-ray spectrometer system and to monitor the effects of soil moisture. The statistics and average deviation of the radiometric data were calculated and inspected for repeatability. After live time, background, and height correction, the average Th window count rate over the test line should be within +/-5% of the mean Th window count rate for all previous flights. No flights were suspended following the criteria of this test.

The statistics of the data acquired on the test line is included in Appendix 1.

5.2 Altimeter & Barometer Calibration Checks

The altimeter and barometer test flight was performed on September 07, 2006. The calibrations were done by comparing the radar altitudes and barometric pressure with a suitable reading from the GPS navigation system, during radar "stack" flown over Fairchild Lake, Yukon. The ellipsoidal height at the lake was determined by GPS. This procedure involved having the helicopter hover for 30 seconds at various altitudes above the ground (69, 96, 118, 142, 180, 206 and 230 metres) and recording the values of the radar altimeter, GPS altimeter and barometric pressure, which were then plotted and compared. These calibrations were checked on a daily basis by completing a vertical calibration test flight during take off and landing.

The results of the test are included in Appendix 1.

6. QC AND DATA PROCESSING

Data quality control and processing were carried out in two stages.

Daily quality control, initial processing and archiving of the data were completed on-site at the base of operations using Geosoft MONTAJ software and a notebook PC computer. All data were verified upon receipt, and checked against the operator's flight logs.

The final data processing was completed in the data processing centre of McPhar in Newmarket, Ontario.

All processing of radiometric and ancillary data was undertaken according to the standard procedures incorporated in Geosoft Radiometric Data Processing and Praga3 software, following the recommendations of:

IAEA-TECDOC-1363 - Guidelines for radioelement mapping using gamma ray spectrometry data,
IAEA-TECDOC-323 - Airborne Gamma Ray Spectrometer Surveying

A summary of the basic actions conducted during each data-processing stage appears below.

Field data QC and pre-processing

- a.) Data pre-processing and extraction with PicoEnvirotec PEIView Extractor software
- b.) Transfer of extracted data into Geosoft Database
- c.) QC and pre-processing of GPS and altimeter data
- d.) Compilation of flight path
- e.) QC and pre-processing and evaluation of test and calibration data
- f.) QC and pre-processing of radiometric data

Final Processing

- a.) Processing of GPS and altimeter data
- b.) Final flight path compilation
- c.) Processing of radiometric data
 - Principal component (NASVD and MNF) analysis and spectra processing
 - Window (ROI) extraction
 - Corrections and levelling of radiometric data
 - Conversion to radioelement concentration
 - Gridding
 - Calculation of radioelement ratios
- d.) Production of radioelement, ratio and ternary maps
- e.) Compilation of final report

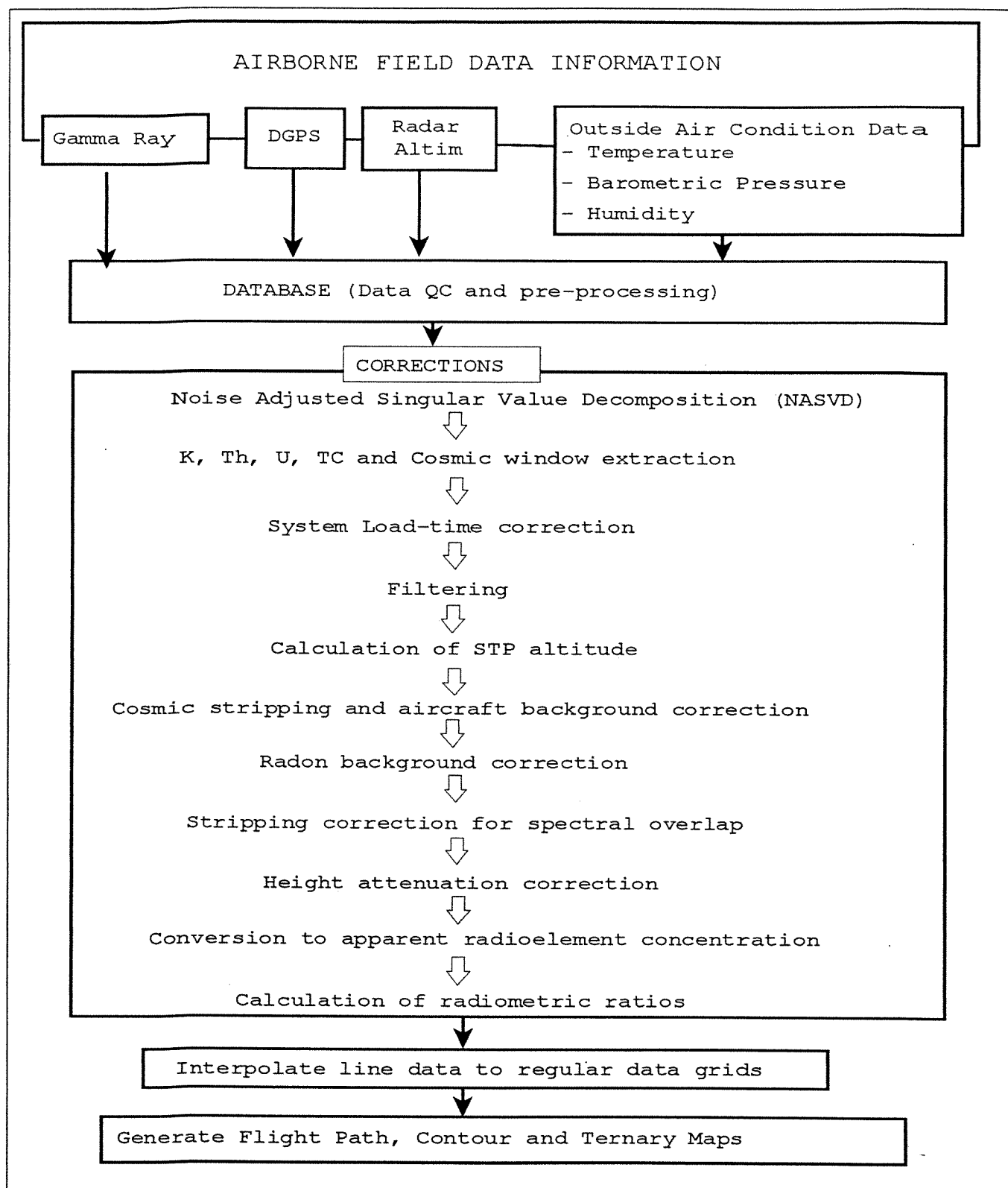


Figure 7: Data Processing Flow Chart

6.1 Data Management

Raw data in binary file format were recorded in the helicopter on portable media. Data duplication was carried out with DVD-ROM burning hardware and software and archived on DVD.

The raw file was comprised of:

- Real-time differentially corrected GPS data defined by WGS84 longitude and latitude, WGS84 ellipsoidal height and GPS time
- Radar Altimeter data
- Outside air condition data – temperature, barometric pressure and humidity
- Radiometric data recorded as gamma ray spectrum resolved into 256 channels over the energy detection range of 50 keV to 3000 keV and the cosmic channel over 3 MeV.

The binary raw file was pre-processed and extracted using PicoEnvirotec PEIView extractor software. The extracted data was loaded on a daily basis into a flight specific Geosoft database.

The pre-processing sequence included the following quality control measures:

- a) Examination and checking of all incoming data to ensure completeness of data sets.
- b) Production of preliminary flight path maps, speed checks, terrain clearance checks and evaluation of test and calibration data
- c) Full profile quality control of all acquired traces for noise levels, data completeness, spike editing, and adherence to contract specifications.

Upon completion of the QA/QC process, the flight specific Geosoft database was merged into the project master database.

Following the survey demobilization, the raw data binary files, daily and master Geosoft databases, flight logs and operational reports were shipped to the Newmarket, Ontario office of McPhar for final processing and archiving.

The project master database was used for basic and advanced data processing and for compilation of final maps and products. Final data processing, map compilation and report generation were completed by McPhar at the Newmarket, Ontario office.

6.2 Positional Data Processing and Flight Path Compilation

The flight path was derived from differentially corrected GPS positions using the recorded real-time airborne GPS data. A position was calculated each second (approx. every 39 meters along the flight path) to an accuracy of +/- 2-3 metres. This position data was merged with gamma ray spectrometry and ancillary data in the Geosoft GDB database.

As part of the QA/QC process, the following parameters were checked during a flight:

- Number of satellites under observation (average of 6, minimum of 4 allowed)
- PDOP (position dilution of precision; maximum value of 3 allowed)

Flight path deviation in position (maximum of +/-15 m over a linear distance of 2,000 metres) was checked on daily basis as a part of QA/QC process after the flight.

If the above specification was not met, a reflight was necessary.

All positional data (X, Y, Z) was recorded in WGS 84 (World) geographic coordinates and converted to the contract specified NAD83 UTM zone 08N projected coordinates.

Parameters for datum used on this project are as follows:

X,Y channels	Lon deg,Lat deg
Datum	WGS 84
Ellipsoid	WGS 84
MajAx,Eccen,PrimeMer	6378137,0.08181919084,0
Local datum transform	[WGS 84] World

X,Y channels	X,Y
Length units	metre
Projection	UTM zone 8N
Type	Transverse Mercator
Lat0,Lon0,SF,FE,FN	0,-135,0.9996,500000,0
Datum	NAD83
Ellipsoid	GRS 1980
MajAx,Eccen,PrimeMer	6378137,0.08181919104,0
Local datum transform	[NAD83] Canada; Central America; Mexico; USA (

6.3 Altimeter Data and Digital Terrain Model

The radar altimeter data was recorded in feet at a frequency of 10 Hz. Data was converted to metres and filtered with a non-linear filter to remove spurious spikes. Additional smoothing of the radar altimeter data was achieved through application of low-pass filtering.

Altimeter data was inspected for criteria given by the contract (nominal 50 m terrain clearance above ground level based on the pilot's judgement of safe flying conditions around man-made structures or tall trees or in rugged terrain, or where prohibited by civil aviation authority regulations). The mean terrain clearance achieved over the entire survey was 47 m AGL.

Barometric pressure data was recorded in system units at a frequency of 1 Hz, and then converted to air

pressure in mbar, following the results of barometric calibrations. Additional smoothing of the barometric data was achieved by low-pass filtering.

A digital terrain model (DTM) channel was calculated by subtracting the filtered radar altimeter data from the GPS elevation defined by the WGS84 ellipsoidal height. This model provided information on the topography for interpretation of the radiometric data.

The DTM channel was gridded using a minimum curvature algorithm with a grid cell size of 20 metres and inspected for continuity. Micro-levelling of the DTM was then completed accompanied by further smoothing utilizing three passes of a 3 x 3 cell Hanning filter prior to contouring and DTM map production.

6.4 Radiometric Data Processing

6.4.1 Background to Corrections and Processing

Gamma-ray spectrometer surveys are utilized for mapping the concentration and distribution of naturally occurring radio elements. The use of an airborne gamma-ray spectrometer allows for the in-situ analysis of radioelement concentrations of naturally occurring potassium (K), uranium (U) and thorium (Th) in the field.

For a geologist, maps showing concentrations of K, U, and Th can be diagnostic in the mapping of rocks and soils, which aid in geological mapping, and exploration for uranium, gold, tin and tungsten. With these deposits, the primary mineralization process is often related to K metasomatism or alteration.

Radioactivity measurements from an airborne platform are dependent upon the detection of gamma rays produced through radioactive decay of the nuclide to be detected. Only three natural radioactive elements emit sufficient gamma radiation to be measured by airborne methods. The three major sources are:

- Potassium-40 (^{40}K) which is 0.011% of all potassium
- Daughter products from the ^{238}U decay series,
- Daughter products from the ^{232}Th decay series.

High-energy cosmic rays of non-terrestrial origin can be detected by airborne gamma-ray spectrometer surveys. This cosmic radiation interacts with molecules in the atmosphere, the aircraft, and the NaI detectors resulting in the production of high-energy radiation. This radiation is detectable and increases exponentially with height above sea level. It must be compensated for to obtain reliable and repeatable measurements and the detection of terrestrial radiation sources.

The traditional energy windows used to detect gamma ray radiation from K, Th, and U sources have overlapping areas where the energy recorded for a given element contains some contribution from all three radio elements. A correction procedure, known as stripping, is applied to the data to compensate for this spectral overlapping.

The natural gamma ray spectrum over the range of 0 to approximately 3000 keV is resolved by the spectrometer into 256 or 512 channels, each channel ranging from 5 to 6.5 keV in width. A separate channel records all high-energy radiation above 3000 KeV, the cosmic radiation contribution. Within the defined radioelement windows, the counts recorded are summed over a given time period.

Care must be taken during the acquisition of gamma-ray spectrometer data because the contribution from radon gas, related to decay products in the atmosphere, can result in misleading count rates. Radon gas can also diffuse from the ground, but only one radon nuclide is directly related to the uranium decay series. In order to minimize the impact of radon "contamination", radiometric surveys are not completed during rain, which "washes" radon from the air, increasing ground concentrations. Also surveys are not carried out in fog conditions and for a period of not less than 2 hours after precipitation has finished, allowing for dispersion of radon gas to normal background levels.

Radiometric surveys have no depth penetration; most radioactive sources are recorded from the upper 1.5 metres of the ground. Over water bodies or snow-covered areas, these surveys are ineffective, as the presence of water (in either liquid or solid state) effectively masks the radiation.

Spectrometer data are recorded in counts per second. The instrumentation requires a fraction of a second to process the incoming data – during this time period no counts are recorded. This interval is referred to as "*equipment down time or system dead-time*". A correction is applied to compensate for this time period.

6.4.2 Processing Applied Using GEOSOFT Radiometric Processing System and Praga3

Please refer to Fig.7 for a summary of radiometric data processing.

The reduction of radiometric data follows standard processing steps implemented in the Geosoft Radiometric Processing System with the Praga 3 module, as outlined in the recommendations of IAEA-TECDOC-1363 - Guidelines for radioelement mapping using gamma ray spectrometry data.

The processing of radiometric data involved advanced full spectrum processing of downward looking detectors:

1. Principal component (NASVD and MNF) analysis and spectra processing
2. Extraction of uncorrected data accumulated in K, U, Th, TC and Cosmic windows from NASVD smoothed spectra
3. System dead-time correction
4. Filtering
5. Calculation of STP (Standard Temperature and Pressure) altitude.
6. Cosmic stripping and aircraft background correction
7. Radon background correction
8. Stripping correction for spectral overlap
9. Altitude attenuation correction
10. Reduction to apparent radio elemental concentrations
11. Calculation of radioelement ratios
12. Gridding
13. Production of radioelement, ratio and ternary maps

Principal component (NASVD and MNF) analysis

Principal component (NASVD and MNF) analysis tools allow us to investigate spectrum signatures included in the actual dataset. A spectrum dataset is converted into a limited set of spectral components (eigenvectors) which are ordered by variance (NASVD) or by signal to noise ratio (MNF). NASVD expects noise to be Poisson distributed, while MNF computes a noise model directly from the data. Higher order components can be explained as mixed nuclide responses collected at average survey altitude. They are followed by components that account for the altitude changes. Remaining components contain statistical and instrumental noise.

Principal components can be used for gamma-ray data processing. The approach is very similar to the spectrum fitting technique. However, instead of model responses, a subset of spectrum components, derived directly from the data, is used to replace the input spectrum.

Using *Praga3*, an “*eigenvalue plot*” can be displayed, allowing the user to browse through the individual components (*eigenvectors*) to investigate their shape. *Covariance matrices* can be displayed as well. Spectra can be *interactively composed* from the chosen number of components and compared with input spectra or alternatively, *residual spectra* can be displayed. In a situation where the user chooses to re-process data with another subset of components, there is no need to compute the eigenvectors again.

Energy Window Extraction

The uncorrected data accumulated in K, Th, U and TC energy windows was extracted from the spectra after the principal component analysis and full spectra processing completion. Further standard radiometric processing was applied following the guidelines defined by IAEA technical reports. A summary of coefficients applied for corrections of radiometric data is presented in Appendix 1. For this extraction, standard energy regions of interest (ROI) were used.

Dead-time Correction and filtering

A dead-time system correction of 10 micro seconds/pulse was applied to each window using the following equation:

$$N = n / (1 - TC t)$$

where:

N	- corrected count rate (counts/sec);
n	- observed count rate (counts/sec);
TC	- total count rate over all channels(counts/sec);
t	- the equipment dead time per pulse.

The data was subjected to a suitable low pass filter to minimize the statistical noise and to improve the count statistics.

Calculation of the Effective Altitude above Ground Level

The low-pass pre-filtered radar altimetry, barometric pressure and temperature data was used to calculate the effective height AGL for standard temperature and pressure (STP) using the following equation:

$$H_{STP} = (273.15 P H_s) / [101.325 (T + 273.15)]$$

where: H_s - observed height above ground level (metres);
 H_{STP} - effective height at STP (metres);
 T - air temperature ($^{\circ}\text{C}$);
 P - barometric pressure (kPa).

Cosmic stripping and aircraft background correction

Cosmic radiation and aircraft background radiation was removed from each spectral window using the cosmic coefficients and aircraft background radiation values determined from test flight data using the following equation:

$$N = a + bC$$

where: N - the combined cosmic and aircraft background in each spectral window,
 a - the aircraft background in the window,
 b - the cosmic stripping factor for the window, and
 C - the low-pass pre-filtered cosmic channel count.

Radon background correction

The presence of radon (^{222}Rn) gas in the atmosphere contributes to the measured spectrometric data which constitutes the 'Radon Background' component.

A 'Full Spectrum' method implemented in Praga 3 software was used as the radon detection and removal technique for this survey. The 'Full Spectrum' method is based on the difference in source-detector geometry for the radon spectrum. The atmospheric radon component of the spectrum is defined as the response due to close sources. The terrestrial radiation component of the spectrum is defined as the response due to distant sources. This difference in geometry produces relative differences in the amplitudes of the photo peaks of the uranium disintegration series and also in the contribution of scattered radiation.

Stripping correction for spectral overlap

The stripping correction was used to correct each of the K, U and Th window count rates for gamma rays not originating from their particular radioelement or decay series using the following equations:

$$n_{K,K} = [n_{Th} (\alpha \gamma - \beta) + n_U (a \beta - \gamma) + n_K (1 - a \alpha)] / A$$

$$n_{U,U} = [n_{Th} (g \beta - \alpha) + n_U (1 - b \beta) + n_K (b \alpha - g)] / A$$

$$n_{Th,Th} = [n_{Th} (1 - g \gamma) + n_U (b \gamma - a) + n_K (a g - b)] / A$$

$$A = 1 - g \gamma - a (\alpha - g \beta) - b (\beta - \alpha \gamma)$$

where: n_{Th}, n_U, n_K - unstripped counts in Th, U, K windows
 $n_{Th,Th}, n_{U,U}, n_{K,K}$ - stripped counts in Th, U, K windows

Coefficients α, β, γ are forward stripping ratios and a, b , and g are reverse stripping ratios

Coefficients $\alpha, \beta, \gamma, a, b$ and g were determined by system experiments during the pad calibrations. Summary of the determined coefficients used for processing is presented in Appendix 1.

Altitude attenuation correction

This correction was used to normalize the data to a constant terrain clearance of 50 m above ground level (AGL) at standard temperature and pressure (STP). Attenuation coefficients for each of the energy windows were determined from test flights. The measured count rate is related to the actual count rate at the nominal survey altitude by the equation:

$$N_s = N e^{\mu(h-h_o)}$$

where: N_s - the count rate normalized to the nominal survey altitude, h_o
 N - the background corrected, stripped count rate at effective height
 μ - the attenuation coefficient for that window,
 h_o - the nominal survey altitude, and
 h - the effective height.

Finally, de-corrugation and micro-levelling techniques were applied to minimize the fine line directional levelling noise.

Reduction to apparent radio elemental concentrations

The final corrected units of the count rates (cps) for each spectral radioelement window (K,Th,U) and Total Count (TC) were converted to "Apparent Radio Element Concentrations" and "Ground Level Dose Rate" using the following equation:

$$C = N / S$$

where: C - concentration of the radio element
 N - count rate for the energy window after dead time, background, stripping and attenuation
 S - sensitivity coefficient

Sensitivities were determined from test flight data and are indicated in Appendix 1.

Potassium concentration is expressed as a percentage, while thorium and uranium as parts per million of the accepted standards. Uranium and thorium are described as “equivalent” since their presence is inferred from gamma-ray radiation from daughter elements (^{214}Bi for uranium, ^{208}Tl for thorium). Total count is expressed as ground level dose rate in nGy/h.

Calculation of radioelement ratios

U/Th, U/K and Th/K ratios were calculated using the final reduced concentration of radio elements.

Gridding

The K, Th, U concentrations, TC dose rate and radio element ratios were gridded using a minimum curvature algorithm with a grid cell size of 20 metres and used for contouring and map compilation.

Ternary Radio Element Maps

Finally ternary radio element maps were produced. A ternary radio element map is a color composite image generated by modulating the red, green and blue colors in RGB color space in proportion to the radio element concentrations of K, Th and U grids. The standard display practice is to use red, green and blue for K, Th and U respectively. The radio element values are scaled to an equal range (0 to 1) to distribute the ranges of K, Th and U equally in RGB color space and the normalization is applied according to the following relations:

$$\begin{aligned}K_n &= K_{01}/(K_{01}+eU_{01}+eTh_{01}) \\eU_n &= eU_{01}/(K_{01}+eU_{01}+eTh_{01}) \\eTh_n &= eTh_{01}/(K_{01}+eU_{01}+eTh_{01})\end{aligned}$$

where subscript n refers to the normalized channel and the subscript 01 refers to the scaled values in (0, 1) range.

The normalization converts the radio element concentrations in to relative abundances and helps in reducing the effects of the attenuation of gamma rays by vegetation, soil and moisture. The ternary radio element maps are generated using the composite display of normalized grids in the RGB color model with histogram equalization stretching.

7. DELIVERABLE PRODUCTS

The survey data are presented as colour/contour maps on paper, produced at a scale of 1:25,000 for Block-Lumina and at scale 1:120,000 for Blocks Bonnie/Coma & Bond/Vic respectively. A set of report-sized colour/contour images, on paper, is included as Appendix 5.

The deliverable items of this survey are:

7.1 Maps

For the Wernecke Properties, the following maps of each block were delivered in two (2) paper copies.

- Differentially Corrected GPS Flight Path
- Digital Terrain Model Calculated from survey data (DTM)
- Calculated Dose rate from Total Count
- Apparent Concentration of Uranium
- Apparent Concentration of Thorium
- Apparent Concentration of Potassium
- Uranium/Potassium Ratio Map
- Uranium/Thorium Ratio Map
- Thorium/Potassium Ratio Map
- Ternary Radio Element Map

7.2 Digital Data

The final processed line and grid data, in GEOSOFT format is also delivered in two (2) copies on CD/DVD-ROM. Full descriptions of the digital data formats are included in this final report.

7.3 Report

Two (2) copies of a survey report were delivered, complete with all final maps as page size maps. This report provides information about the acquisition, processing and presentation of the survey data.

Respectfully submitted,
McPhar Geosurveys Ltd.

A handwritten signature in black ink, appearing to read "Tomas Grand", with a long horizontal stroke extending to the right.

Dr. Tomas Grand
Chief Geophysicist