RIMFIRE MINERALS CORPORATION

2007 Geophysical Report on the Quesnel Trough Project

Omenica – Cariboo Mining Divisions
NTS 093K/09, 12, 13, 16
093 J/02, 03
093G/10, 15

54° 9' 49" North Latitude
122° 57' 0.15" West Longitude

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1. Summary

Rimfire Minerals Corporation conducted a reconnaissance airborne magnetic survey over seven groups of claims in the Quesnel Trough region of central British Columbia. The geophysical survey targeted magnetic anomalies, identified in regional geophysical surveys, which are hosted in geological units favorable to alkalic porphyry Cu-Au mineralization in the Quesnel Trough. Favorable magnetic anomalies on the Mags, Axis, Eye and Bark claim groups were identified. Reconnaissance mapping and prospecting in areas around the magnetic anomalies to identify the source of the magnetic anomalies, and their mineralization potential is recommended.

2. Introduction

Six groups of claims though the Quesnel Trough region of British Columbia was staked by Rimfire Minerals Corporation to target areas with alkalic porphyry Cu-Au mineralization potential. Ranking of targets was based upon regional geophysical data and geology. Targeting favored high-amplitude magnetic anomalies with sharp boundaries within rocks of the Quesnel terrane, which are characteristics identified from regional geophysical surveys to be representative of high-level alkalic intrusives in the Quesnel Trough. The location of the Quesnel Trough claim groups is shown in Figure 1 with Quesnel terrane rocks outlined.

The Mags, Axis, Magnus and Bass claim groups are located near Fort St. James, BC, approximately 50 km south-southwest of the Mt. Milligan a developed prospect with alkalic porphyry Cu-Au mineralization style (Figure 1). The Eye, and Bark claim groups are located near Prince George, BC. Work conducted by Rimfire Minerals Corporation on the six groups of Quesnel Trough claims is reported herein[a].

3. Property Title

The Mags, Axis, Magnus and Bass claim groups are within the Omineca mining division. The Eye, and Bark properties are within the Cariboo mining district. Rimfire Minerals Corporation has 100 % interest in each of the outlined claim groups. Claims data for each of the claim groups is indicated below.

3.1. Mags

See Figure 2 for a map of the Mags claim group tenures and regional physiography.

Table 1. Mags claim group claim data.

Tenure No.	Claim Name	Area km^2	Expiry Date
560577	MAGS 1	3.9	13-Jun-08
560578	MAGS 2	4.7	13-Jun-08
560579	MAGS 3	2.8	13-Jun-08
574561	MAGS 4	4.5	25-Jan-09
574562	MAGS 5	3.4	25-Jan-09
574565	MAGS 6	3.9	25-Jan-09

[a] The Quesnel Trough project claim groups are not contiguous. Hence, work conducted on the claim groups will be reported separately.

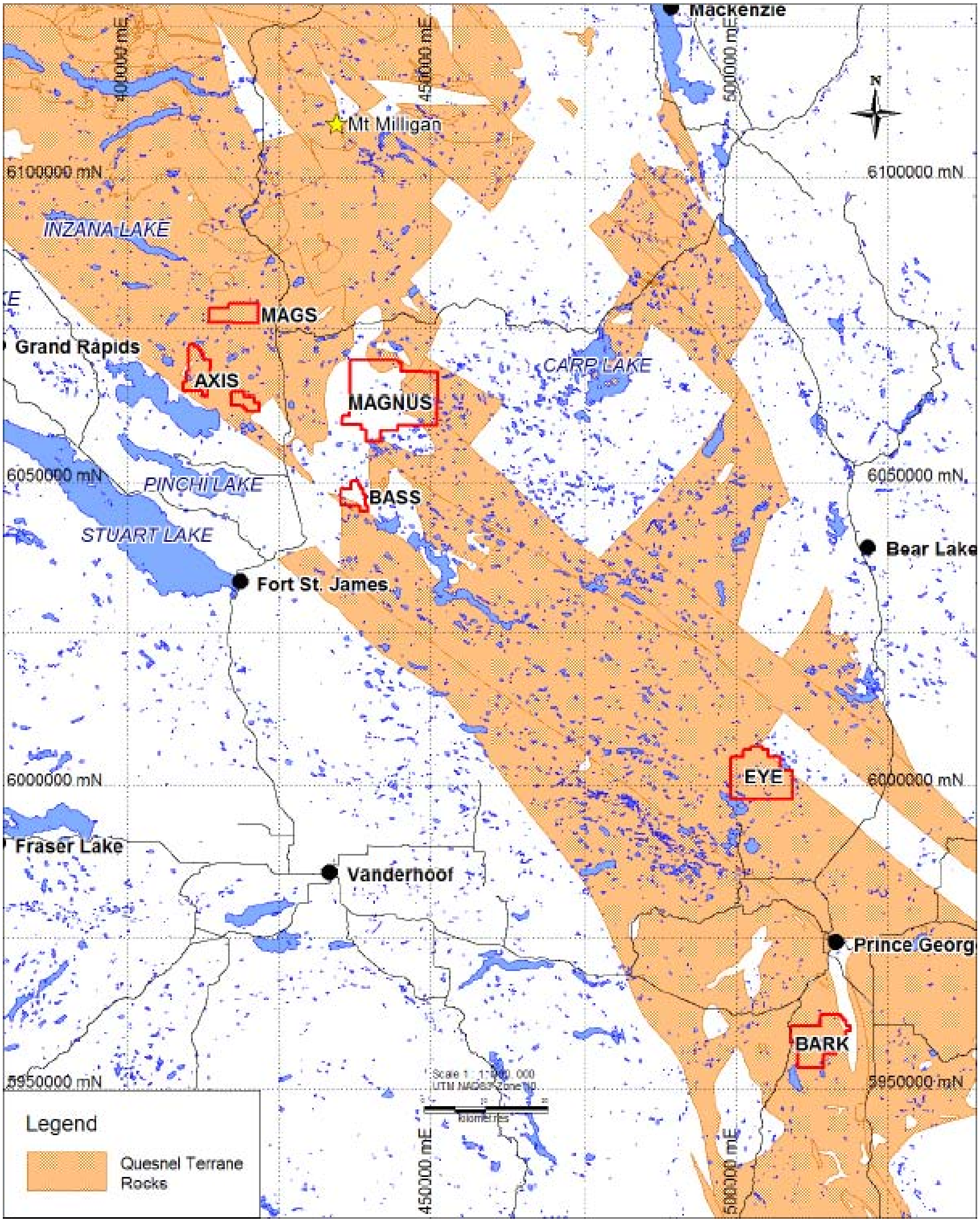

Figure 1. Quesnel Trough project claim groups and outline of Quesnel terrane rocks.

3.2. Axis

See Figure 2 for a map of the Axis claim group tenures and regional physiography.

Table 2. Axis claim group claim data

Tenure No.	Claim Name	Area km^2	Expiry Date
560580	AXIS 1	4.5	13-Jun-08
560581	AXIS 2	4.5	13-Jun-08
560582	AXIS 3	4.7	13-Jun-08
560583	AXIS 4	4.7	13-Jun-08
560584	AXIS 5	4.7	13-Jun-08
560585	AXIS 6	2.4	13-Jun-08
560586	AXIS 7	4.7	13-Jun-08
551449	HAT LAKE	0.2	30-Sep-08
551450	HAT 2	0.2	30-Sep-08
551451	HAT 3	2.6	30-Sep-08
551453	HAT4	3.5	30-Sep-08

3.3. Bass

See Figure 3 for a map of the Axis claim group tenures and regional physiography.

Table 3. Bass claim group claim data

Tenure No.	Claim Name	Area km^2	Expiry Date
560625	BASS 1	4.68322	13-Jun-08
560626	BASS 2	4.68522	13-Jun-08
560627	BASS 3	4.49703	13-Jun-08

3.4. Magnus

See Figure 3 for a map of the Magnus claim group tenures and regional physiography.

Table 4. Magnus claim group claim data

Tenure No.	Claim Name	Area km^2	Expiry Date
560587	MAGNUS 1	4.7	13-Jun-08
560588	MAGNUS 2	4.7	13-Jun-08
560589	MAGNUS 3	4.7	13-Jun-08
560590	MAGNUS 4	4.7	13-Jun-08
560591	MAGNUS 5	4.7	13-Jun-08
560592	MAGNUS 6	4.7	13-Jun-08
560593	MAGNUS 7	4.7	13-Jun-08
560594	MAGNUS 8	4.7	13-Jun-08
560595	MAGNUS 9	4.7	13-Jun-08
560596	MAGNUS 10	4.7	13-Jun-08
560597	MAGNUS 11	4.5	13-Jun-08
560598	MAGNUS 12	4.7	13-Jun-08
560599	MAGNUS 13	4.7	13-Jun-08
560600	MAGNUS 14	4.7	13-Jun-08
560601	MAGNUS 15	4.7	13-Jun-08
560602	MAGNUS 16	4.7	13-Jun-08
560603	MAGNUS 17	4.7	13-Jun-08
560605	MAGNUS 18	4.7	13-Jun-08
560606	MAGNUS 19	4.7	13-Jun-08
560607	MAGNUS 20	1.9	13-Jun-08
560609	MAGNUS 21	4.7	13-Jun-08
560610	MAGNUS 22	4.7	13-Jun-08
560611	MAGNUS 23	4.7	13-Jun-08
560613	MAGNUS 24	4.7	13-Jun-08
560614	MAGNUS 25	4.7	13-Jun-08
560616	MAGNUS 26	4.7	13-Jun-08
560617	MAGNUS 27	4.7	13-Jun-08
560618	MAGNUS 28	4.5	13-Jun-08
560619	MAGNUS 29	4.7	13-Jun-08
560620	MAGNUS 30	4.7	13-Jun-08
560621	MAGNUS 31	4.7	13-Jun-08
560622	MAGNUS 32	4.5	13-Jun-08
560623	MAGNUS 33	4.5	13-Jun-08
560624	MAGNUS 34	4.5	13-Jun-08

3.5. Eye

See Figure 4 for a map of the Eye claim group tenures and regional physiography.

Table 5. Eye claim group claim data

Tenure No.	Claim Name	Area km^2	Expiry Date
560628	EYE 1	4.7	13-Jun-07
560629	EYE 2	4.7	13-Jun-07
560630	EYE 3	4.7	13-Jun-07
560631	EYE 4	4.7	13-Jun-07
560632	EYE 5	4.7	13-Jun-07
560633	EYE 6	4.7	13-Jun-07
560634	EYE 7	4.7	13-Jun-07
560635	EYE 8	4.7	13-Jun-07
560636	EYE 9	4.7	13-Jun-07
560637	EYE 10	4.7	13-Jun-07
560638	EYE 11	4.7	13-Jun-07
560639	EYE 12	4.7	13-Jun-07
560640	EYE 13	4.7	13-Jun-07
560642	EYE 14	4.7	13-Jun-07
560643	EYE 15	4.7	13-Jun-07

3.6. Bark

See Figure 5 for a map of the Eye claim group tenures and regional physiography.

Table 6. Bark claim group claim data

Tenure No.	Claim Name	Area km^2	Expiry Date
560655	BARK 1	4.8	14-Jun-07
560656	BARK 2	4.8	14-Jun-07
560657	BARK 3	4.8	14-Jun-07
560658	BARK 4	4.8	14-Jun-07
560659	BARK 5	4.8	14-Jun-07
560660	BARK 6	4.8	14-Jun-07
560661	BARK 7	4.8	14-Jun-07
560662	BARK 8	4.8	14-Jun-07
560663	BARK 9	4.6	14-Jun-07
560664	BARK 10	4.6	14-Jun-07
560665	BARK 11	3.4	14-Jun-07
560666	BARK 12	2.5	14-Jun-07

4. Location, Access, and Geography

The Mags, Axis, Magnus and Bass claim groups are located in the Nechako Plateau region of north central British Columbia. These claim groups may be accessed via packed dirt and gravel forestry service roads from Fort St. James, BC. Topography in the area consists of rolling ridgelines with flat valley bottoms. Outcrop exposure in the area is fair mostly exposed in road cuts and steep bluffs. Vegetation cover is moderately dense consisting of marsh plants, buck brush, spruce and pine trees. The area is workable from June to mid-October.

The Eye and Bass claim groups are located in the Interior Plateau region of central British Columbia. The claim groups may be accessed via packed dirt and gravel forestry service roads from Prince George, BC. Topography in the area consists of level, undulating terrain with northeasterly trending hills. Outcrop exposure is poor as the area is generally covered by Quaternary glacial sediments. Vegetation cover is sparse consisting of buck brush and pine trees. The area is workable from late-May to mid-October.

5. Exploration History

5.1. Mags

Table 7. Summary of work done on Mags tenures.

ARIS Report No.	Year	Operator	Claim Name	Geochemistry Work	Trenching Work	Drilling Work	Geophysics Work
1933	1969	N.B.C. Syndicate	HAT1				Electromagnetic and Magnetometer Surveys
11255	1982	Sico Inc. Guichon Elplorco	SASK			6 BQ DDH	
16272	1987	Noranda	HA1	290 B-horizon soil samples			
16675	1987	Big Valley Resources	BIO	1660 B-horiz soil samples			
19007	1989	Noranda	HA1	428 B-horizon soil sampes			
19663	1989	Rio Algom Exploration	BIO	1267 soil samples			IP
20563	1990	Rio Algom Exploration	BIO	3400 soil samples	15 trenches		
21867	1991	Rio Algom Exploration	BIO, BOB		581 m mechanical trenching,	2 DDH	10 km IP

5.2. Axis

Table 8. Summary of work done on Axis Tenures.

ARIS Report No.	Year	Operator	Claim Name	Geochemistry Work	Trenching Work	Drilling Work	Geophysics Work
15943	1986	Big Valley Resources	HAT	soil samples			
16339	1987	Big Valley Resources	HAT	2094 B-horizon soil samples			
16611	1988	Big Country Resources	Zar	7 soil samples, 3 rock samples			
21285	1990	Grand America Minerals	HAT1 and HAT 2	7 silt samples, 18 rock samples			
22277	1992	Noranda	DEM	822 B- horizon soil samples			
24872	1996	Birch Mountain Resources	HAT	5 rock samples, 4 silt samples, 128 soil samples			

5.3. Magnus

Table 9. Summary of work done on Magnus tenures.

ARIS Report No.	Year	Operator	Claim Name	Geochemistry Work	Trenching Work	Drilling Work	Previous Geophysics
20526	1990	Mingold Resources	OCOCK 1	Silt Samples			

5.4. Bass

No previous work was recorded for tenures of the Bass claim group.

5.5. Eye

No previous work was recorded for tenures of the Eye claim group.

5.6. Bark

Table 10. Summary of work done on Bark tenures.

ARIS_reps	Year	Company	Claim Name	Previous Stream/ Soils/ Rocks	Previous Trenching	Previous Drilling	Previous Geophysics
300	1959	Lundberg Exploration	Wed				Airborne Magnetics
3067	1971	Private	Minou	10 silt samples, soil sampling			
19740	1990	Cominco	Prince	Pionjar Soil Survey			IP Survey
21699	1991	Cominco	Prince 4			1 DDH	

6. 2007 Exploration Program

6.1. Airborne Geophysical Survey

The reader is referred to Appendix C for complete details of the geophysical report.

A detailed high-resolution helicopter-borne magnetic survey was conducted from November 15, 2007 to November 29, 2007 by McPhar Geosurveys Ltd., over the Quesnel Trough Survey Area located close to Fort Saint James and Prince George in British Columbia, Canada.

The purpose of the survey was to acquire high resolution magnetic data to map the magnetic anomalies and geophysical characteristics of the geology and structure in an effort to provide an insight into geologic and geophysical settings conducive to locating potential economic mineralization. Specifically, the survey areas were targeted for their potential to host intrusive bodies associated with

Alkalic and Calc – Alkaline copper – gold – molybdenum porphyry mineralization.

The survey area consisted of seven blocks on the six claim groups named[b]. Flight lines were orientated at various azimuth directions, at a spacing of 200 metres and tie lines were orientated perpendicularly to their respective flight lines, varying between spacing of 795 metres to 2,000 metres. A total of 1,927 line kilometres of data were acquired.

7. Regional Geology

The claim groups of the Quesnel Trough project are located in rocks of the Quesnellia terrane within the Quesnel Trough tectonic belt (Roddick et al., 1967, see Figure 1). The Quesnel Trough is defined as a belt of Lower Mesozoic volcanic rocks juxtaposed between deformed Proterozoic and Paleozoic rocks to the east and Upper Paleozoic rocks to the west (Garnett, 1978). This tectonic belt boasts economic interest due to its endowment of significant alkalic porphyry Cu-Au deposits (Garnett, 1978; Nelson and Bellefontaine, 1996). An extended legend of lithological groups and units in the Auddie region is presented in Table 11.

Areas of northern Quesnel Trough were mapped by the B.C. Geological Survey at 1:50 000-scale in three projects, the Manson Creek Project (Ferri et al., 1988; Ferri and Arksey, 1989), Nation Lakes Project (Nelson et al., 1991a, 1992a,b,

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[b] The Axis Claim group consisted of two blocks as the two parts of the claim group are not contiguous.

1993a,b,c), and Northern Quesnel Trough Project (Ferri et al., 1992, 1993). These projects provided a foundation of knowledge about the geological context of alkalic porphyry-type mineral deposits in the northern Quesnel Trough area.

7.1. Quesnellia Terrane

The Quesnellia terrane consists of Mesozoic island arc assemblages with a basement of Late Paleozoic arc and marginal basin rocks (Nelson and Bellefontaine, 1996). The Quesnel arc developed in an intra-oceanic setting during the Mesozoic and was obducted eastward onto the ancestral North American continental margin in the Early Jurassic (Nixon, 1993; Ferri and Melville, 1994).

The Quesnellia terrane is bound on its western margin by the Pinchi fault zone, a major structural lineament of the Cordillera interpreted to be an ophiolitic assemblage (Nelson and Bellefontaine, 1996; Nelson et al., 2003,). The Pinchi fault zone in the region around the Auddie property separates Permian Cache Creek group rocks on the southwest side from Upper Triassic Takla Group rocks to the northeast (Garnett, 1978). From results of gravity geophysics surveys the Pinchi fault is interpreted to dip west-southwest (Garnett, 1978). To the east, the Quesnellia terrane is bound by the Manson Fault zone a major tectonic structure in the Canadian Cordillera associated with precious metal mineralization (Ferri et al., 1988; Nelson and Bellefontaine, 1996). The Manson fault zone separates Proterozoic rocks of ancestral North America from Paleozoic to Tertiary oceanic-arc assemblages and basinal rocks (Nelson and Bellefontaine, 1996).

7.2. Regional Structure and Tectonics

From the Permain to Early Triassic, prior to the deposition of the Takla Group rocks, the Slide Mountain Terrane and Lay Range assemblages amalgamated (Monger et al., 1990). From the Late Triassic to Early Jurassic, as aforementioned, the Quesnel arc developed and was obducted east-ward onto the western edge of ancestral North America (Nelson and Bellefontaine, 1996). Magmatism at this stage was strongly controlled by regional structures as evidenced by the elongated morphology of intrusives from that period such as the Hogem Batholith and the Valleau Creek intrusive complex (Garnett, 1978; Nelson et al., 1993a; Nelson and Bellefontaine, 1996). It was recognized by Nelson et al. (1991b) that the presence of long-lived synvolcanic structures plays key roles in the generation of alkaline porphyry Cu-Au systems.

From the Cretaceous through Middle Tertiary major dextral fault systems, including the Manson —McLeod system and Pinchi fault, sheared rocks of the assembled Paleozoic to Mesozoic terranes (Ferri and Melville, 1994). Resultantly, second-order northwesterly striking transcurrent and normal faults developed breaking the assembled Quesnellia terrane into structural blocks (Nelson and Bellefontaine, 1996).

Two stages are interpreted for the docking of Quesnellia from structures in rocks of the Upper Triassic Takla Group (Nelson and Bellefontaine, 1996). In general, sequences of Quesnellia have a gently dipping attitude characteristic of forelandstyle thrust tectonics. In the Inzana Lake formation of the Upper Triassic Takla Group tight northwest plunging Fl folds are re-folded by co-axial F2 folds (Nelson and Bellefontaine, 1996). F2 folds represent regional upright open folding manifested in axial planar cleavages developed across Fl folds.

Table 11. Lithological groups and formations present in the Quesnel Trough region. Legend descriptions are abbreviated after Nelson et al. (1993a)

	LAYERED ROCKS	
Group	**Formation**	**Description**
Cretaceous to Tertiary		
	Uslika	- siliciclastic sedimentary rocks and coal
Middle Jurassic		
	Post-orogenic	- siliciclastic sedimentary rocks
Lower Jurassic		
Talda	Twin Creek Chuchi Lake	- heterolithic pyroclastics and lavas - intermediate lavas and fragmental volcanics
Upper Triassic		
Talda	Takla Felsic Plughat Mountain Witch Lake Willy George Inzana Lake Slate Creek	- heterolitic pyroclasics and amygdaloidal lavas, tuffa-ceous sediments, monzonite - plagioclase basalt lavas and fragmentals, volcaniclastic sedimentary rocks, limestone - intermediate lavas and volcaniclastics - intermediate lapilli and crystal tuffs, sedimentary breccias, siliciclastics - lapilli tuff, siltston and slate - slate and siltstone
Pennsylvanian *to* ***Permian***		
Nina Creek	Mount Howell Pillow Ridge	- argillite, ribbon chert, gabbro sills pillow basalts, diabase-gabbro sills
Mississippian to Permian		
Lay Range As-semblage	Main sequence (^{MP}LAc) Main sequence (^{MP}LRb) Cook Creek panel (^{MP}LRa)	- mafic lavas - crystal and lapilli tuffs, volcanic siliciclastic sedimentary rocks - siliceous siltstone and argillite, sandstones
	INTRUSIVE ROCKS	
	Intrusive Suite	**Description**
Early Cretaceous		
	Germansen Batholith Klawli Stock Hogem Batholith	- coarse grained hornblende, biotite granite - megacrystic orthoclase, hornblende, biotite granite - megacrystic orthoclase granite
Early Jurassic		
	Hogem Batholith Aplite Creek	- monzonite, granodiorite, diorite, quartz monzonite diorite and gabbro

8. Results

8.1. Aeromagnetics Survey

8.1.1. Mags

An east west elongate magnetic high anomaly measuring three kilometres long by one kilometre wide was resolved on the Mags property block. This anomaly corresponds to an epidote - carbonate – magnetite altered diorite body that outcrops on the property.

8.1.2. Axis

The Axis property consists of two blocks of mineral tenures. The magnetic data from both blocks revealed a northwest trending linear magnetic high measuring four kilometres long by one kilometre wide on the northwestern block, and the same dimensions on the southeastern block. The linear anomaly on the southeastern block appears to be broken by a northeastern trending structure.

8.1.3. Magnus

The Magnus survey block revealed numerous steep sided and high amplitude complexly shaped magnetic high anomalies concentrated in the western half of the survey area. Two moderate broad magnetic highs were defined in the eastern half of the survey area. Field examination of the western highs revealed that these represent prominent topographic highs consisting of young Chilcotin basalt units. The eastern anomalies are covered by glacial till and remain unexplained.

8.1.4. Bass

The Bass survey block defined a sickle shaped steep sided and high amplitude magnetic high anomaly. Field examination of the anomaly revealed that it represents a prominent topographic high consisting of young Chilcotin basalt units.

8.1.5. Eye

The Eye survey block defined two distinct magnetic high anomalies. One is a north – south elongated circular feature measuring six kilometres by two kilometres. Field examination of this area revealed that the area is covered by thick glacial till cover. The shape of this anomaly is believed to be consistent with that of a magnetic intrusive stock at depth. The second magnetic high anomaly is a northwest trending linear feature that corresponds to a fault slice of Slide Mountain Terrane on regional government maps.

8.1.6. Bark

The Bark survey block defined a northeast elongated oval magnetic high anomaly measuring six kilometres long by two kilometres wide. This magnetic feature is dissected by a northeast linear magnetic low and northwest linear magnetic low interpreted to be cross-cutting faults. Field examination of this area revealed that the area is covered by thick glacial till cover. The shape of this anomaly is believed to be consistent with that of a magnetic intrusive stock at depth.

1. Conclusions

- Magnetic high anomalies defined at the Mags, Bark and Eye are favourable magnetic features that may represent magnetic intrusions known to be associated with copper – gold porphyry mineralization elsewhere in the Quesnel Trough.
- The magnetic high anomaly defined at the Axis is linear in nature and may represent mafic intrusives.
- Magnetic high anomalies defined at the Bass and Magnus have been determined to be accumulations of Chilcotin basalt units.

2. Recommendations

Further ground truthing of the magnetic high anomalies at Mags, Axis, Eye and Bark is warranted to determine the best exploration approach to be taken. If conventional geochemical, mapping and prospecting techniques are not applicable due to thick till cover, then a program of widely spaced, deep penetrating Induced Polarization surveys is recommended. This will determine if any chargeable sulphide material is associated with the magnetic highs.

Figure 2. 1:50, 000 scale map of Mags and Axis claim group tenures and regional physiography.

(See Map Pocket)

405000 mE
410000 mE
415000 mE
420000 mE
425000 mE
6085000 mN
6080000 mN
6075000 mN
6070000 mN
6065000 mN
6060000 mN
6055000 mN
N
560,579
560,578
560,577
574,561
574,565
574,562
MAGS CLAIM GROUP
551,453
551,449
551,450
551,451
560,580
560,581
560,585
AXIS CLAIM GROUP
560,586
560,582
560,583
560,584
GERMANSEN FSR
HAT FSR
To Fort St. James
LEGEND
streams, drainages
Lakes
BC Forestry Road
Main Roads
RFM Tenure
BC Mineral Tenure
RIMFIRE MINERALS CORPORATION
Quesnel Trough Project
Mags and Axis Claim Groups
Mineral Tenures
Figure 2
Date: 2008/08/08
Author: DKL
Office:
Drawing:
Scale 1 : 50, 000
Projection: UTM NAD 1983 Zone 10

Figure 3. 1:50, 000 scale map of Magnus and Bass claim group tenures and regional physiography.

(See Map Pocket)


Magnus
Claim Group
Bass Claim
Group
560,587
560,588
560,589
560,590
560,598
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560,594
560,595
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560,627
560,626
Ocock FSR
Teardrop FSR
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430000 mE
435000 mE
440000 mE
445000 mE
450000 mE
455000 mE
6075000 mN
6070000 mN
6065000 mN
6060000 mN
6055000 mN
6050000 mN
6045000 mN
6040000 mN
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LEGEND
streams, drainages
Lakes
BC Forestry Road
Main Roads
RFM Tenure
BC Mineral Tenure
RIMFIRE MINERALS
CORPORATION
Quesnel Trough Project
Magnus and Bass Claim Groups
Date 2008/08/08
Author DKL
Mineral Tenure
Office:
Figure 3
Drawing:
1 : 50, 000
Projection: UTM NAD 1983 Zone 10

Figure 4. 1:50, 000 scale map of the Eye claim group tenures and regional physiography.

(See Map Pocket)

N
495000 mE
500000 mE
505000 mE
510000 mE
515000 mE
6020000 mN
6015000 mN
6010000 mN
6005000 mN
6000000 mN
5995000 mN
5990000 mN
5985000 mN
560,643
560,636
560,637
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560,639
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560,629
560,628
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560,640
560,631
560,632
560,633
560,634
560,642
Eye Claim Groiup
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4
kilometres
To Prince George
LEGEND
streams, drainages
Lakes
BC Forestry Road
Main Roads
RFM Tenure
BC Mineral Tenure
RIMFIRE MINERALS CORPORATION
Quesnel Trough Project
Eye Claim Group
Mineral Tenure
Figure 4
Date: 2008/08/08
Author: DKL
Office:
Drawing:
1 : 50, 000
Projection: UTM NAD 1983 Zone 10

Figure 5. 1:50, 000 scale map of the Bark claim group tenures and regional physiography.

(See Map Pocket)

N
505000 mE
510000 mE
515000 mE
520000 mE
525000 mE
5975000 mN
5970000 mN
5965000 mN
5960000 mN
5955000 mN
5950000 mN
5945000 mN
560,664
560,666
560,665
560,660
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560,655
560,656
LEGEND
streams, drainages
Lakes
BC Forestry Road
Main Roads
RFM Tenure
BC Mineral Tenure
RIMFIRE MINERALS CORPORATION
Quesnel Trough Project
Bark Claim Group
Mineral Tenure
Figure 5
Date: 2008/08/08
Author: DKL
Office:
Drawing:
1 : 50, 000
Projection: UTM NAD 1983 Zone 10

Appendices

Appendix A - List of References

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Appendix B – Statement of Expenditures

STATEMENT OF EXPENDITURES
Quesnel Trough Project
BARK 1-12 (16% of total line-km)

June 25-November 29, 2007

PROFESSIONAL FEES AND WAGES:		
Rob Duncan, Manager Exploration		
1.67 days @ $475/day	794.58	
Daniel Lui, Project Geologist		
0.24 days @ $475/day	113.51	
Wes Hodson, Drafting/Logistics		
3.03 hours @ $75/hour	227.02	
		$ 1,135.12
EXPENSES:		
Accommodation	$ 129.60	
Airfare	39.87	
Automotive Fuel	6.44	
Courier	4.12	
Chemical Analyses		
Equipment Rental		
Freight	5.74	
Geophysical (airborne)	15,038.54	
Geophysical consulting	398.29	
Line-cutting		
Maps and Publications		
Materials and Supplies		
Meals	36.77	
Plot Charges	255.22	
Project Management Fees	31.31	
Taxi and Airporter	1.20	
Truck Rental		
Radio Rental		
Report (estimated)	250.00	16,197.10
TOTAL:		**$ 17,332.22**

Appendix C - Geophysics Report

Final Report on a
Helicopter-borne Magnetic Survey
Quesnel Trough Survey Area
British Columbia, Canada

For

Rimfire Minerals Corporation
700 – 700 West Pender Street
Vancouver, British Columbia
Canada, V6C 1G8

By

McPhar Geosurveys Ltd.,
500 Cochrane Drive, Unit A
Markham, Ontario,
Canada, L3R 8E2

January, 2008
McPhar # 0742

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- Crescent R121 DGPS positioning system
- FreeFlight TRA-3000 / TRI-40 Radar Altimeter System
- KMAG4 Data Acquistion System
- GEM GSM-19 Proton Base Station Magnetometer
- Geosoft Montaj Processing Software
- Field Data Processing Workstations

APPENDIX 2 **Page Size Maps**

- Flight Path with Topography
- Total Magnetic Field (IGRF Removed)
- Reduced to the Magnetic Pole (IGRF Removed)
- Calculated First Vertical Derivative of TMF (IGRF Removed)
- Calculated Second Vertical Derivative of TMF (IGRF Removed)
- Calculated Analytic Signal of TMF (IGRF Removed)

1. INTRODUCTION

A detailed high-resolution helicopter-borne magnetic survey was conducted during the period November 15, 2007 to November 29, 2007 on behalf of Rimfire Minerals Corporation (hereinafter referred to as "Rimfire") by McPhar Geosurveys Ltd., (hereinafter referred to as "McPhar"), over the Quesnel Trough Survey Area located close to Fort Saint James and Prince George in British Columbia, Canada.

The purpose of the survey was to acquire high resolution magnetic data to map the magnetic anomalies and geophysical characteristics of the geology and structure in an effort to provide an insight into geologic and geophysical settings conducive to locating potential economic mineralization.

The survey area consisted of seven blocks. Flight lines were orientated at various azimuth directions, at a spacing of 200 metres and tie lines were orientated perpendicularly to their respective flight lines, varying between spacing of 795 metres to 2,000 metres. A total of 1,927 line kilometres of data were acquired.

The geophysical system was mounted on a Robinson R44 Raven II helicopter, with Canadian registration C-FTPG, supplied by Okanagan Mountain Helicopters, Kelowna, British Columbia. Equipment installation was completed in Prince George on November 15, 2007.

Data acquisition utilized precision differential GPS positioning. A high sensitivity magnetometer was installed in a towed bird. Ancillary equipment included a GPS navigation system, a radar altimeter and a base station magnetometer.

Mobilization of the helicopter, equipment and personnel was completed on November 15, 2007. The test and calibration flights were completed during the survey. The data acquisition was undertaken from November 16, 2007 to November 28, 2007. Demobilization was completed on November 29, 2007.

The helicopter and crew operated from the Yellowhead Base helicopter pad. The field data QC and data processing centre was set up in the Carmel Motor Inn in Prince George.

Final data processing, map compilation and report preparation was completed by McPhar at its Markham, Ontario office.

2. SURVEY AREA

The survey consisted of seven blocks. The survey blocks were located north-west of Prince George in British Columbia, Canada.

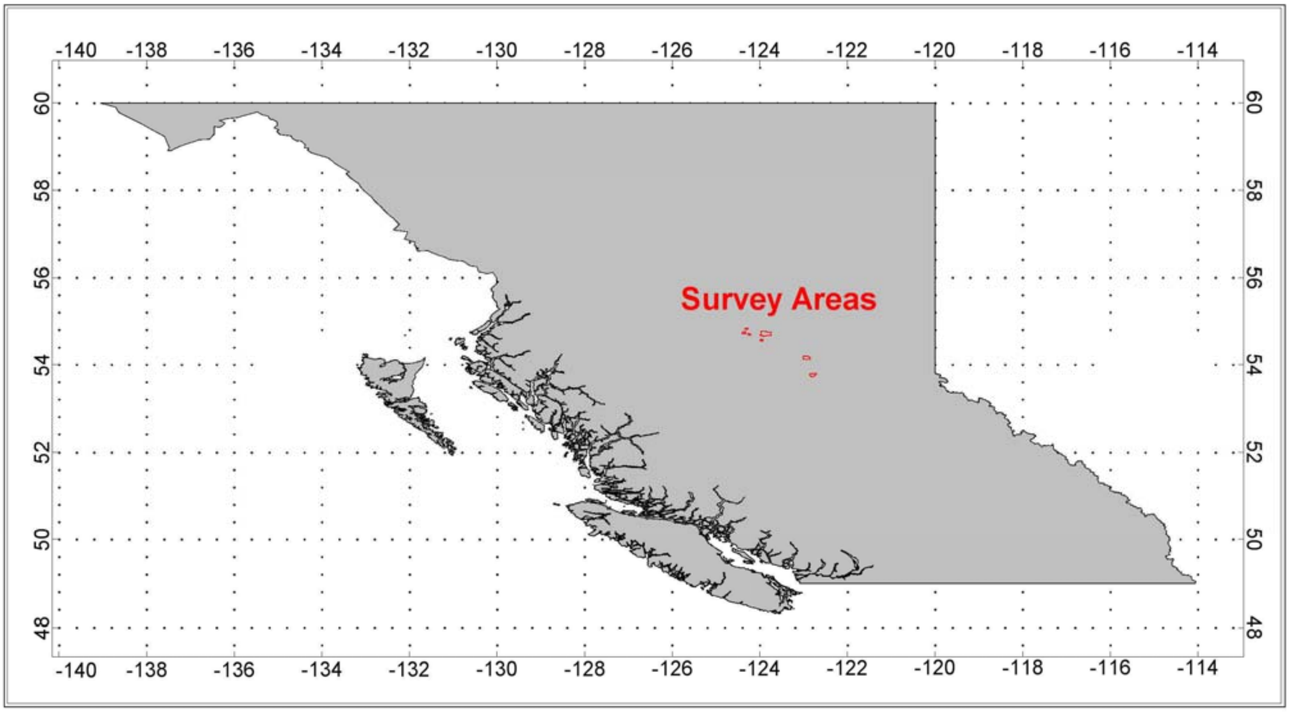


Figure 1: Map of British Columbia showing location of the survey areas

The corner coordinates of the block were provided by Rimfire, and are presented in the following tables. The coordinates are in WGS84, UTM Zone 10N.

Table 1: Tables Containing Corner Co-ordinates of the Survey Blocks

BLOCK 1		
Corner	Easting	Northing
1	416841	6079326
2	418044	6079304
3	417985	6076059
4	413568	6076141
5	413613	6078459
6	416823	6078399

BLOCK 4		
Corner	Easting	Northing
1	451138	6059348
2	444690	6059422
3	444679	6058495
4	441857	6058530
5	441834	6056676
6	439414	6056708
7	439439	6058562
8	438633	6058573
9	438645	6059500
10	435421	6059545
11	435441	6060936
12	436650	6060919
13	436780	6070191
14	444820	6070085
15	444815	6069622
16	445217	6069617
17	445200	6068226
18	451233	6068156

BLOCK 2		
Corner	Easting	Northing
1	413373	6065942
2	413337	6064087
3	412532	6064103
4	412550	6065030
5	409330	6065093
6	409357	6066484
7	409760	6066476
8	412550	6065030
9	410199	6068322
10	410218	6069250
11	412630	6069202
12	412648	6070130
13	413855	6070106
14	413810	6067788
15	415017	6067765
16	414982	6065911

BLOCK 5		
Corner	Easting	Northing
1	435229	6046100
2	435269	6048881
3	436885	6048859
4	436904	6050250
5	438115	6050233
6	438103	6049306
7	438507	6049300
8	438500	6048837
9	438904	6048831
10	438892	6047904
11	439296	6047898
12	439271	6046044
13	439675	6046039
14	439663	6045111
15	438450	6045127
16	438463	6046055

BLOCK 3		
Corner	Easting	Northing
1	419351	6062584
2	417338	6062621
3	417380	6064939
4	419393	6064903
5	419376	6063975
6	420987	6063947
7	420970	6063020
8	419746	6062114
9	421752	6061615
10	419738	6061650
11	419746	6062114
12	419343	6062121

Block 6		
Corner	Easting	Northing
1	499084	5997888
2	499085	6004842
3	501124	6004842
4	501124	6005769
5	502347	6005770
6	502347	6006233
7	504385	6006235
8	504386	6005771
9	505201	6005772
10	505202	6004845
11	507241	6004848
12	507245	6002530
13	509285	6002533
14	509294	5997897

Block 7		
Corner	Easting	Northing
1	516378	5958048
2	516386	5955730
3	514326	5955723
4	514333	5953405
5	510209	5953394
6	510200	5957566
7	508964	5957564
8	508959	5960345
9	513900	5960358
10	513894	5962212
11	517187	5962223
12	517189	5961760
13	517600	5961761
14	517602	5961298
15	518014	5961299
16	518017	5960372
17	518841	5960375
18	518844	5959448
19	518021	5959445
20	518026	5958054

3. SURVEY OPERATIONS

3.1 Operations Base

The survey operation was based at Yellowhead Base helicopter pad. Permission was obtained to park and operate the helicopter there.

Quality control and preliminary data processing was undertaken in the field by the McPhar geophysicist at the Carmel Motor Inn in Prince George and by the McPhar senior geophysicist/quality control supervisor at McPhar's Markham, Ontario office.

3.2 Ground Base station

The combined GPS and magnetic base station was positioned near the Yellowhead Base helicopter pad. The base station position was determined by averaging of 12 hours of continuous observations of the GPS base station receiver at the start of the survey.

Every effort was made to ensure that the magnetometer was placed in a location of low magnetic gradient, away from electrical transmission lines and moving metallic objects, such as motor vehicles and aircraft.

A mean value of 57,053 nT was determined for the total magnetic field at the base station position by averaging the measurements made through November 15, 2007 to November 28, 2007.

3.3 Survey Conditions

Weather conditions during the survey were, for a large portion of the project, not ideal, with low cloud cover, rain, snow and very few sunny breaks. The average temperature was close to 3.7^0 Celsius. Sunspot activity, and hence diurnal geomagnetic activity, was quiet during the entire data acquisition period. No survey days were lost due to the geomagnetic activity being out of specifications.

3.4 Navigation

Navigation was assisted by a differential GPS receiver system that reports the real-time differentially WAAS corrected GPS co-ordinates in WGS-84 latitude / longitude and directs the pilot over the pre-programmed two-dimensional (2-D) survey grid. The x-y position of the aircraft, as reported by the GPS system, was recorded together with the terrain clearance as reported by the radar altimeter.

Projection information used for navigation:

Projection : WGS84, UTM Zone 10N
Projection Type : Transverse Mercator
Spheroid/Ellipsoid: WGS84
Base latitude: 0 degree
Central Meridian: longitude of -123 degree
Scaling factor: 0.9996

False easting: 500000
False northing: 0
Local Transform: World Geodetic System 84 – World

3.5 Survey Specifications

3.5.1 Survey Line Specifications

Table 2: Survey Lines Description

AREA NAME	APPROX. AREA (km^2)	LINE /TIE LINE SPACING	FLIGHT LINE-KM	TIE-LINE KM	TOTAL LINE-KM	MAIN FLIGHT DIRECTION
Block 1	11.35	200m/2000m	59	9	68	01°/91°
Block 2	21	200m/1200m	104	20	124	91°/181°
Block 3	10	200m/1000m	48	11	59	91°/181°
Block 4	155	200m/1700m	782	95	877	91°/181°
Block 5	14	200m/795m	70	20	90	91°/181°
Block 6	71	200m/1950m	359	43	402	0°/90°
Block 7	53	200m/1500m	268	39	307	0°/90°
ESTIMATED TOTALS	**335.35**		1690	237	1927	

3.5.2 Flight Specifications

The following technical flight specifications were adhered to:

a) Traverse Lines - maximum deviation from the nominal traverse line location should not exceed more than 25% over a distance greater than 1 mile, except where safety requirements take precedence.
b) Airborne data is not acceptable when gathered during magnetic storms or short term disturbance of magnetic activity at the ground base station that exceeds parameters as specified in section 3.5.3 below.

3.5.3 Magnetic Diurnal Variations

The following technical specifications for magnetic diurnal were adhered to:

a) Flight lines, or portions thereof, should be reflown if the magnetic diurnal exceeds a maximum deviation of 25 nT peak-to-peak over a straight-line chord over 5 minutes.
b) Survey flying will be suspended in the case of severe magnetic diurnal activity.

3.5.4 Aircraft Speed

Normal helicopter speed was proposed as 150 km/h, ± 15km/h (approx. 81 knots ± 8.1 knots , 42 m/s ± 4.2 m/s). The pilot made every sensible effort to keep an accurate airspeed, however, it was accepted that aircraft speed varied, based on the pilot's judgment of safe flying conditions around man-made structures, over rugged terrain, or where prohibited by Canadian DOT regulations (such as over towns / built-up areas). An average helicopter speed of **108 kph** was achieved during the survey.

3.5.5 Terrain Clearance

The nominal survey altitude was 30 metres for the magnetometer and 55 metres for the helicopter. The pilot made every sensible effort to maintain accurate terrain clearances, however, it was accepted that terrain clearance may vary, based on the pilot's judgment of safe flying conditions around man-made structures, over rugged terrain, or where prohibited by Canadian DOT regulations (such as over towns / built-up areas. An average terrain clearance of **91 metres** was achieved over the survey.

3.5.6 Data Recording

The following parameters were recorded during the survey:

Table 3: Survey Sampling Rates

SURVEY PARAMETER	PROJECTED SAMPLING RATES	ACHIEVED SAMPLING RATES
Airborne GPS positional data (Longitude, Latitude, height, time)	1 sec	1 sec
Terrain clearance provided by radar altimeter	0.1 sec	0.1 sec
Airborne Total Magnetic Field	0.1 sec	0.1 sec
Ground based Total Magnetic Field – GEM system	1 sec	1 sec

Considering the projected nominal and actual average helicopter speed, the following scan rates were achieved:

Table 4: Survey Scan Rates

SURVEY PARAMETER	PROJECTED SCAN RATE	ACHIEVED SCAN RATE
Airborne GPS positional data (Longitude, Latitude, height, time)	39 m	33.6 m
Terrain clearance provided by radar altimeter	3.9 m	3.36 m
Airborne Total Magnetic Field	3.9 m	3.36 m

3.6 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's GDB database format and inspection of all data for adherence to contract specifications.

3.7 Survey Statistics and Project Diary

The survey entailed a total of thirty four flights; of which all but four were production flights including tests and calibrations. The first production flight was Flt #1 on November 16, 2007, with the last production flight, Flt #14 on November 28, 2007. A total of 1,927 line-kilometres of data were acquired.

Table 5: Project Diary

Date	Flight #	Hours Flown	Line Kms Accepted	Comments
11/15/2007				Mobilization
11/16/2007	1	2:54	207.7	Production flight of Block 7
11/16/2007	2	2:11	99.3	Production flight of Block 7
11/17/2007	3	2:21	0.0	Production flight of Block 6
11/18/2007	4	2:22	9.6	Production flight of Block 4
11/18/2007	5	2:50	129.4	Production flight of Block 4
11/18/2007	6	1:28	169.7	Production flight of Block 4
11/19/2007	7	2:44	220.9	Production flight of Block 6
11/20/2007				Poor weather prevented flights
11/21/2007				Poor weather prevented flights
11/22/2007				Poor weather prevented flights
11/23/2007				Aircraft undergoing routine maintenance
11/24/2007				Poor weather prevented flights
11/25/2007	8	2:24	159.35	Production flight of Blocks 4
11/25/2007	9	2:45	227.66	Production flight of Blocks 4
11/25/2007	10	1:26	37.86	Production flight of Blocks 4
11/26/2007				Poor weather prevented flights
11/27/2007	11	2:32	111.64	Production flight of Block 2 & 3
11/27/2007	12	2:53	148.09	Production flight of Block 1,2 & 5
11/27/2007	13	1:28	43.41	Production flight of Block 5
11/28/2007	14	2:05	158.68	Production flight of Block 6 (END OF PROJECT)
11/29/2007				Demobilization
Totals		**32:94**	**1927**	

3.8 Field Personnel

The following personnel participated in field operations onsite:

Table 6: Onsite Personnel

Title	Name	Days Onsite
Project Manager /QC	Jason Cann	15
Operator	Jan Niemeijer	15
Aircraft Pilot	Ben Tanner	15

Quality control and preliminary processing was supervised by McPhar's Data Processing Manager Asif Mirza.

The field operations were supervised by McPhar's Operations Manager, Adam Barrett.

McPhar Geosurveys Ltd. of Markham, 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 Helicopter

The survey was flown using a Robinson R44 Raven II helicopter, with Canadian registration C-FTPG, supplied by Okanagan Mountain Helicopters. This helicopter features up to 3.0 hours flight duration with the geophysical system and a crew of 2 persons onboard.

The installation of the geophysical and ancillary equipment was carried out by McPhar Geosurveys Ltd. personnel in Prince George. Final adjustments, calibration and testing were completed prior to production survey flights.

Aircraft Registration:	C-FTPG
Engine:	Lycoming IO-540
Empty weight:	1,506 lbs
Gross weight:	2,500 lbs
Max cruise:	113 knots
Service ceiling:	14,000 ft
Standard fuel:	30.6 US gals
Helicopter flight duration:	3.0 hours

4.2 The Survey Instrumentation

4.2.1 Survey System Overview

The equipment installed in the helicopter included:

- A Geometrics G-822A high-sensitivity Cesium magnetometer mounted in the towed bird
- A navigation system, comprising a Crescent R121 DGPS receiver and computer with pilot steering indicator (PSI)
- A Pico-Envirotec AGIS Data Acquisition System
- A FreeFlight TRA-3000/TRI-40 Radar Altimeter system

The software and instruments used at the base stations:

- A Combined GPS and Magnetometer Base Station, comprising of a GEM GSM-19 Proton magnetometer and GPS card.
- A Field Workstation, comprising of a portable Pentium PC, printer and full data processing software (Geosoft Montaj Processing Software)
- A complement of spare parts and test equipment were maintained at the survey site.

4.2.2 Airborne Magnetometer

A Geometrics G-822A magnetometer with an optically pumped cesium vapour split-beam sensor, installed in a towed-bird, was utilized for the survey. The sampling rate was ten (10) times per second with an in-flight sensitivity of 0.001 nT in a range of 20,000 to 100,000 nT. Aerodynamic magnetometer noise was less then 0.25 nT. A cesium vapour magnetic sensor is in essence a miniature atomic absorption unit, which produces a signal whose frequency (Larmor frequency) is proportional to the intensity of the ambient magnetic field.

The unit consists of three main elements: a cesium vapour lamp, an absorption cell and a photosensitive diode. These three units are all mounted along a common optical axis within the sensor housing.

Figure 2: Geometrics G-822A Cesium Magnetometer Sensor

The electronic support system is mounted approximately one metre from the sensor, and transmits the Larmor signal to a counter in the data acquisition system. The counter then converts the signal to magnetic field strength in NanoTesla. The G-822A magnetometer is described in Appendix 2.

4.2.3 Altimeter

A FreeFlight TRA-3000/TRI-40 radar altimeter system 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.

System specifications are further described in Appendix 2.

4.2.4 The GPS Satellite Navigation System

A navigation system, comprising a Crescent R121 DGPS receiver with an AGIS system with pilot steering indicator (PSI) provided in-flight real-time navigation control. The pilot steering indicator (PSI) was installed on top of the cockpit dashboard, in front of the pilot, provided steering and cross-track guidance. The pilot was provided with GPS, and altimeter data to aid in flying the helicopter. This navigation system yielded a real-time WAAS differentially corrected positional accuracy of ± 2 metre.

Flight plan co-ordinates were set up prior to commencement of the survey, and this information was then 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 1 second. The GPS receiver is fully described in Appendix 2.

4.2.5 Data Acquisition/Recording System

A PC-based Pico-Envirotec AGIS data acquisition system (DAS) was used to record the geophysical and navigation survey data on an internal hard disk drive. Data is displayed on an LCD screen as traces to allow the operator to monitor the integrity of the system. 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.

4.2.6 Ground Data Acquisition System / Base Station Magnetometer

The magnetometer base station was a GEM GSM-19T system using a high-sensitivity proton sensor to monitor and record diurnal variations in the Earth's magnetic field. The base-station magnetometer was operated continuously throughout the airborne data acquisition phase at sampling rate of 1.0 per second, with 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 3: GEM Base station magnetic system

The base station magnetometer systems are described in Appendix 2.

4.2.7 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, checks them 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. 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 in the office at the airport.

5. INSTRUMENT CHECKS AND CALIBRATIONS

5.1 Airborne Magnetic System Tests and Calibrations

5.1.1 Magnetic Heading Effect

The magnetic heading effect was determined by flying a cloverleaf pattern oriented along the 0 and 90 azimuth directions. One pass in each direction (0 , 90 , 180 , 270 azimuth) were flown in two sets over an area that would unlikely be prone to magnetic interference at an altitude of 6,000 ft. in order to obtain sufficient statistical information to estimate the heading error. The heading error was determined from the test completed on November 16, 2007. Detailed information of the heading test is provided in Appendix 1.

5.1.2 Lag Test

A Lag Test was performed to ascertain the time difference between the magnetometer readings and the operation of the GPS System. The test was flown over an identifiable magnetic anomaly by flying the same line in opposite directions at survey altitude. The lag test is included in Appendix 1.

5.2 Altimeter Calibration Checks

The altimeter test was performed during the survey. The radar altimeter was calibrated by comparing the radar altitudes with suitable readings from the GPS navigation system during a radar "stack" flown over the airport runway. The ellipsoidal height of the runway was determined by GPS. The procedure employed involved having the helicopter fly over the runway at various altitudes above the ground (150, 200, 250, 300, 400 & 500 feet) recording the values of the radar altimeter and GPS altimeter, which were then plotted and compared. The result of the test is 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.

6. QC AND DATA PROCESSING

Data quality control and data processing were carried out in two stages. The initial field processing was completed on-site at the base of operations in the survey area. The final data processing was completed in the data processing centre of McPhar in Markham, Ontario. A summary of the basic actions conducted during each data-processing stage appears below.

Field data QC and pre-processing

a.) Separation of Magnetic data and GPS data from raw sdas binary data file
b.) Transfer of extracted magnetic and GPS data into Geosoft Databases
c.) Transfer of magnetic base station data into a Geosoft Database
d.) Referencing of GPS data and base station data into the magnetic data database
e.) QC and pre-processing of the database being a compilation of magnetic, GPS, and base station data

Final Processing

a.) Processing of GPS and altimeter data
b.) Final flight path compilation
c.) Processing of magnetic data
  - Processing of magnetic base station data
  - Corrections of magnetic data and levelling
  - Gridding
  - Production of magnetic derivative maps
d.) Production of final maps
e.) Compilation of final report

6.1 Data Management

Each production flight was recorded as a separate raw data binary file on removable media. Data duplication was transferred to a field computer workstation and archived on CD.

The raw file was comprised of:

- Real-time differentially corrected GPS data defined by WGS84 longitude, latitude, ellipsoidal height and GPS time
- Radar altimeter data
- Magnetic data measured by airborne magnetometer

The airborne data together with static magnetic data recorded at magnetic base station was merged into a flight specific Geosoft's database.

The raw data binary files, Geosoft databases of specific flights, flight logs and operational reports were shipped to the Markham, Ontario office of McPhar for further QC and processing and archiving. Upon completion of the QA/QC process, the flight specific Geosoft database was merged into the project master database. The project master database was used for basic and advanced data processing and for compilation of final maps and products.
Staff at McPhar's Markham, Ontario office completed final data processing, map compilation and

report generation.

Table 7: Processing Personnel

Title	Name	Activity
Chief Geophysicist	Dr. Tomas Grand	Processing supervisor and reporting
Data Processing Manager	Asif M. Mirza	Map compilation, processing and reporting
On site P.Manager and QC	Jason Cann	QC, pre-processing
GIS	Liz Johnson	GIS, map compilation and reporting

6.2 Field Data Quality Control and Pre-Processing

Daily quality control, initial processing and archiving of the data were completed on-site at the base of operations in survey area using Geosoft's Montaj software and a notebook PC computer. All data were verified upon receipt.

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) Extraction of pre-processed data using SDAS software
c) Transfer of extracted data into a Geosoft's database.
d) Merging and processing of magnetic base station data into a Geosoft's database.
e) The production of preliminary flight path maps, speed checks, terrain clearance checks. The flight path was plotted and compared to the nominal flight plan. The line number and its delimiting fiducials were noted in the Flight Log and in the Geosoft's database
f) Full profile quality control of all acquired traces for noise levels, data completeness and adherence to contract specifications.
g) Preliminary processing of magnetic data:
   - The magnetic data was edited for spikes and interpolated.
   - Magnetic diurnal corrections
   - Edited magnetic data was gridded and inspected in plan.
h) Archiving of raw and in field pre-processed data

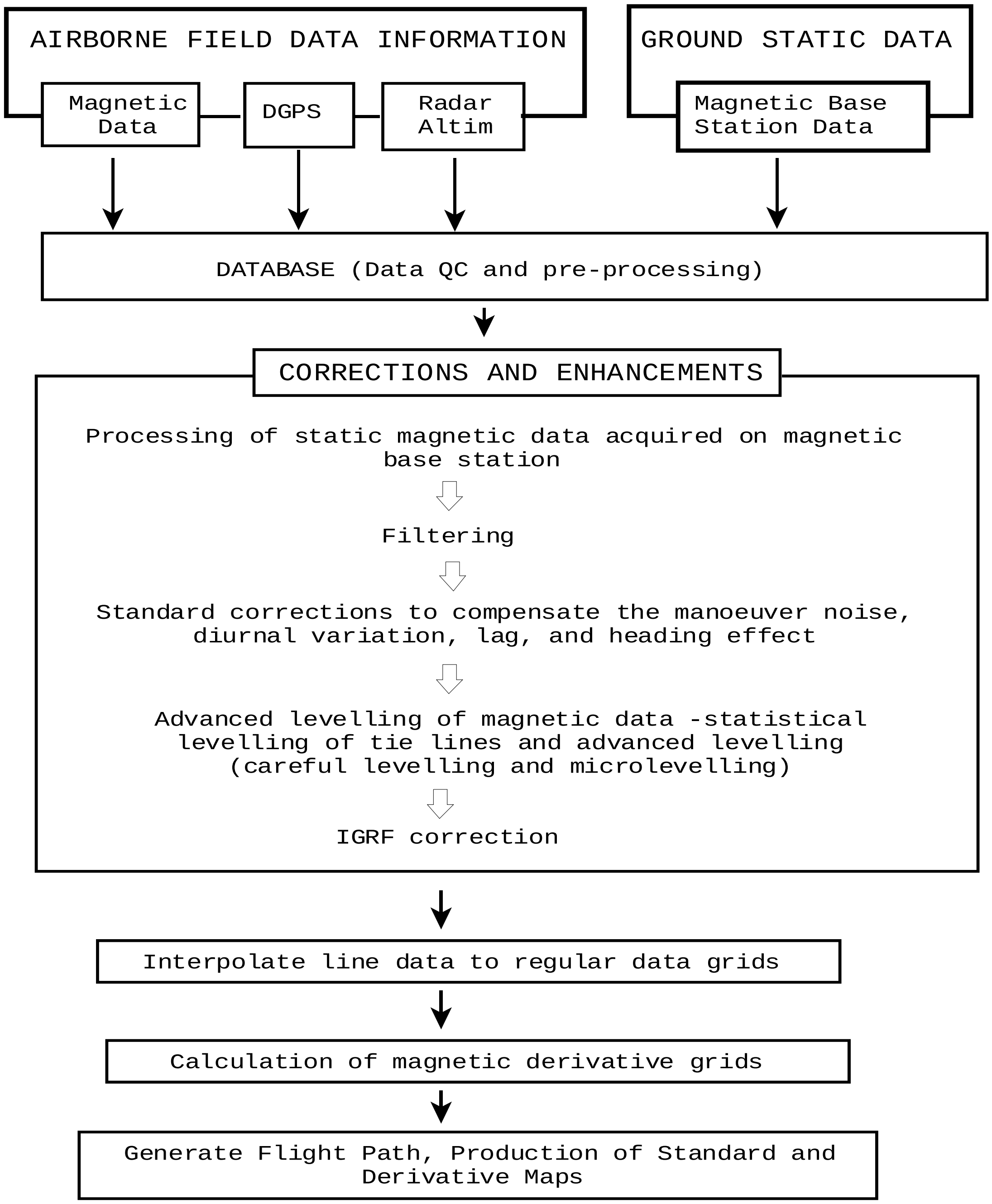


Figure 4: Data Processing and Data Loading Flow Chart (magnetic data)

6.3 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 every 1.0 second (approx. each 39 metres along the flight path) to an accuracy of +/- 2-3 metres. The position data was merged with geophysical and ancillary data in the Geosoft's GDB database.

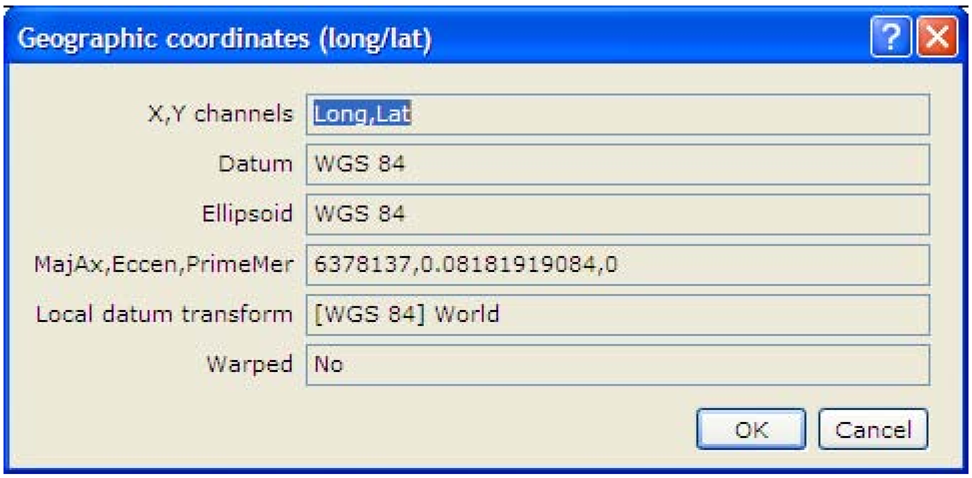
As part of the QA/QC process, the following parameters were checked during a flight:

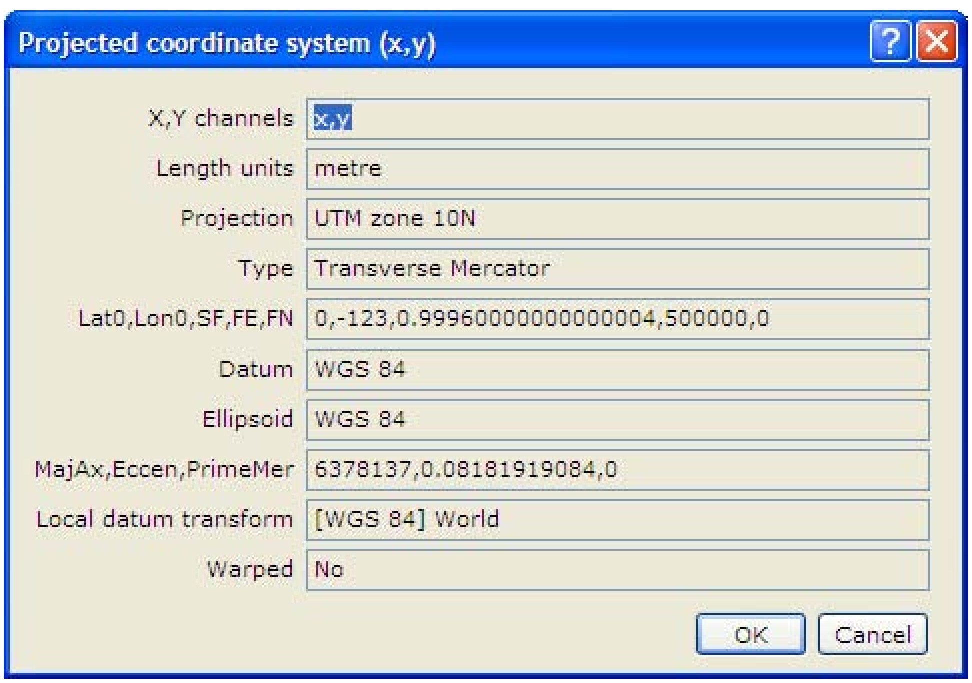
- Number of satellites under observation (average of 6, minimum of 4 allowed)
- PDOP (position dilution of precision; maximum value of 3 allowed)

Flight path deviation in position (adherence to contract specifications) was checked on a 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 presented in WGS 84, UTM zone 10N projected coordinates.

Parameters for datum used on this project are as follows:





6.4 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.

6.5 Magnetic Data Processing

Final processing of the magnetic data involved the application of traditional corrections to compensate for diurnal variation, lag, heading effects and levelling prior to gridding. Processes applied to improve the gridding include micro-levelling and application of higher order filter operators.

Advanced full processing of magnetic data was implemented in Geosoft's Oasis Montaj software as follows:

1. Processing of static magnetic data acquired from magnetic base station
2. Filtering of airborne magnetic data
3. Standard corrections to compensate the diurnal variation, lag and heading effect
4. IGRF correction
5. Statistical levelling of tie lines and advanced levelling (careful levelling and microlevelling)
6. Gridding
7. Calculation of magnetic derivative grids
8. Production of standard magnetic and derivative maps

6.5.1 Processing of Static Magnetic Data Acquired on Magnetic Base Station

The base station magnetometer data was edited, plotted and merged into the base station Geosoft GDB database on a daily basis for further processing. A non-linear filter to remove spikes and a 5 fiducials (5 seconds) low-pass filter were applied to smooth the diurnal channel. To adjust the airborne magnetic data for relative drift, an average total field value was subtracted from all diurnal values.

6.5.2 Filtering

A non-linear filter to remove spikes and a 5 fiducials (0.5 seconds) low-pass filter were applied to smooth the airborne magnetic data.

6.5.3 Corrections to the Magnetic Data

The processing of the data involved the application of the following corrections:

- Correction for diurnal variation using the digitally recorded ground base station magnetic values
- Adjustment of the data for the time lag between the GPS position and the position of the magnetic sensor (lag correction of 7 fiducial was applied)
- Heading correction, with coefficients derived from the heading test (Appendix 1).
- IGRF correction
- Network adjustment using the flight line and tie line information to level the survey data set.

6.5.4 Advanced Levelling of Magnetic Data - Microlevelling

After applying the above corrections to the profile data, residual line-direction-related noise was removed through application of micro-levelling. This technique consists of applying directional and high pass filters to produce a grid containing noise only in the line direction. In order to differentiate between the signal and noise, the noise grid is extracted from the profile database. An optimum amplitude limit and a filter length are determined, so that the final error channel reflects only the noise present on the grid, without removing or changing the geological signal content. This error channel is then subtracted from the initial data channel to obtain the final micro-levelled channel. The corrected data were then used to generate the final Total Magnetic Field grid free of line direction noise.

6.5.5 IGRF Correction

The International Geomagnetic Reference Field (IGRF) is a long-wavelength regional magnetic field calculated from permanent 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.

The IGRF was calculated using the following parameters for the survey area:

IGRF model year: 2005
Date: variable according to date channel in database
Position: variable according to WGS84 longitude and latitude GPS data
Elevation: variable according to GPS data

6.5.6 Gridding

The corrected data was used to generate the Total Magnetic Field grid. 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 approximately 1/3rd of the nominal flight line spacing (a 65 metres grid cell size). Further smoothing utilizing of a 3 x 3 cell Hanning filter prior to contouring and TMF map production was applied.

6.5.7 Magnetic Derivatives

The Total Magnetic Field data was subjected to a variety of filtering techniques, yielding colour/contour images of the following:

- Reduction to the magnetic pole (RTP)
- Calculation of the first vertical derivative (1VD)
- Calculation of the second vertical derivative (2VD)
- Calculation of the analytic signal (AS)

All of these spatial filtering techniques were completed using the Oasis Montaj Magmap module.

Reduction to the Magnetic Pole

The true magnetic anomaly position over the source may be shifted by the magnetic inclination and declination of the magnetic field at a given location on the Earth. To compensate for the shift, the magnetic data was recomputed so that magnetic anomalies will appear as 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 source. The computation is referred to as "reduction to the magnetic pole" (RTP) and is computed using a FFT (Fast Fourier Transform) operation.

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.

The RTP was calculated from IGRF corrected TMF using the following parameters for the survey area:

Geomagnetic Inclination: 74.1^o
Geomagnetic Declination: 20.1^o

First Vertical Derivative

The vertical derivative indicates the rate of change of the magnetic field with height. The first vertical derivative (1VD) has the effect of sharpening anomalies, allowing improved spatial location of source axes and contacts. The 1VD was calculated using standard procedures implemented with the Geosoft's Magmap module, using the IGRF corrected TMF grid for processing.

Second Vertical Derivative

To enhance local anomalies in the map and help outline the edges of anomalous bodies from the data, a second vertical derivative (2VD) map was computed from the data. A second vertical derivative map is a powerful interpretive tool that can be used to assist in the delineation of causative bodies and accurately locate changes in the magnetic field gradients. 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 "up thrown" blocks. The 2VD was calculated using standard procedures implemented with the Geosoft's Magmap module, using the using the IGRF corrected TMF grid for processing.

Analytic Signal

The Analytic signal (Roest et al. 1992) is the square root of the sum of the squares of the derivatives in the x, y, and z directions of the TMF:

$$AS = \sqrt{\left(\frac{dTF}{dx}\right)^2 + \left(\frac{dTF}{dy}\right)^2 + \left(\frac{dTF}{dz}\right)^2}$$

Where: AS is the Analytic Signal;
dTF/dx is the horizontal gradient in the x direction;

dTF/dy is the horizontal gradient in the y direction;
dTF/dz is the horizontal gradient in the z direction;
and TF is the total magnetic field intensity.

The analytic signal image is useful for interpretation, as it does not depend of the direction of magnetization or the direction of the Earth's magnetic field. As a result, bodies of the same geometry will have the same analytic signal shape. The Analytic was also calculated using Geosoft's Magmap module. Analytic Signal (AS) was calculated from the grid of IGRF corrected TMF.

7. DELIVERABLE PRODUCTS

The survey data are presented as colour/contour maps on paper, are produced at an appropriate scale. A set of report-sized colour/contour images, on paper, is included in Appendix 5 of the report.

7.1 Maps

The following maps are delivered in two (2) paper copies.

- Flight Path with Topography
- Total Magnetic Field (IGRF Removed)
- Reduced to the Magnetic Pole (IGRF Removed)
- Calculated First Vertical Derivative of TMF (IGRF Removed)
- Calculated Second Vertical Derivative of TMF (IGRF Removed)
- Calculated Analytic Signal of TMF (IGRF Removed)

7.2 Digital Data

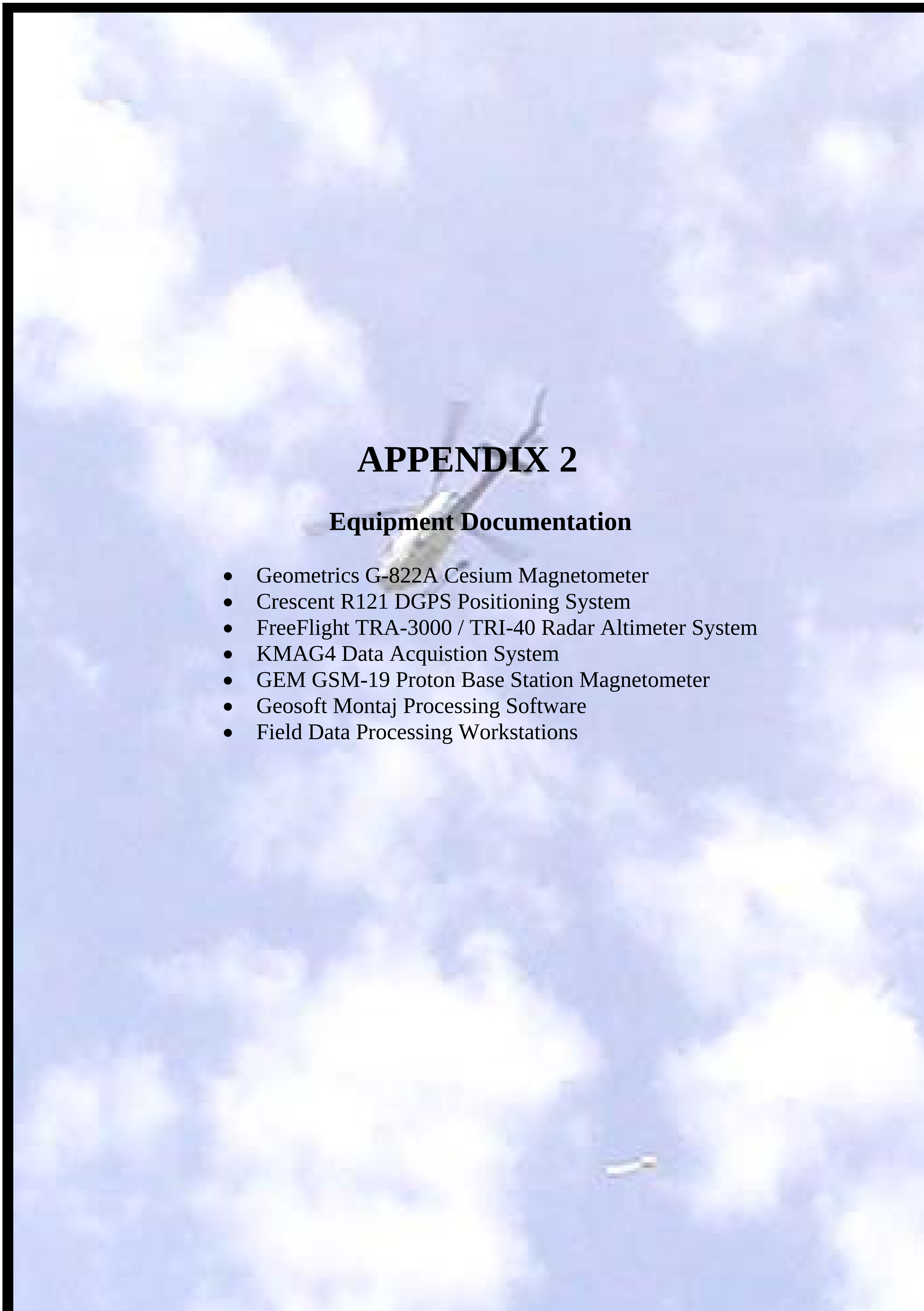
The final processed line and grid data, in GEOSOFT format is also delivered in three (3) copies on DVD-ROM. Full descriptions of the digital data formats are included in this final report.

7.3 Report

Three (3) 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.

Dr. Tomas Grand
Chief Geophysicist



APPENDIX 2

Equipment Documentation

- Geometrics G-822A Cesium Magnetometer
- Crescent R121 DGPS Positioning System
- FreeFlight TRA-3000 / TRI-40 Radar Altimeter System
- KMAG4 Data Acquistion System
- GEM GSM-19 Proton Base Station Magnetometer
- Geosoft Montaj Processing Software
- Field Data Processing Workstations

G-822A CESIUM MAGNETOMETER

- **Airborne and Vehicle Applications with Multi-Sensor Array Capability**
- **Automatic Hemisphere Switching**
- **Highest Sensitivity – 0.0005 nT/√Hz RMS with the G-822A Super-Counter**
- **Highest Versatility – Full Aircraft Compensation with RMS AARC500. Super-Counter option for post acquisition compensation or optional G-823A configuration with CM-221 Internal Mini-Counter**
- **Very low heading error – ±0.15nT over entire 360° Equatorial and Polar spins**
- **Gradiometer arrays offering simultaneous operation of up to four separate sensors with the RMS Instruments AARC500, Geometrics' G-822A Super-Counter or optional CM-221 Internal Mini-counter (up to 8 sensors, see G-823A Data Sheet)**
- **Geometrics offers complete turnkey systems including Birds, Stingers, Wingtip installation accessories as well as Digital Data Acquisition Systems, Flight Path Recovery, GPS Navigation, Gamma Ray Spectrometers, VLF EM , Post Acquisition Data Processing Software and Training**

The G-822A is designed for all airborne or mobile applications where the unique combination of high sensitivity and very rapid sampling of the earth's magnetic field are required. Applications include mapping geologic structure for mining, oil and gas exploration and the detection and delineation of target bodies in environmental, archaeological or military UXO ordnance type surveys. The unit consists of a high performance low heading error cesium vapor sensor with its associated cables and driver electronics Optional internal counter available (see G-823A data sheet).

The G-822A sensor uses a precise well-proven design with carefully selected and tested components to insure the very best specifications in sensitivity, low noise, heading error and absolute accuracy. A proven record of stable and reliable operation over long periods is the hallmark of the industry standard G-822A. A single coaxial cable of up to standard 10 meters length supplies both 28 VDC power and Larmor signal transmission from the sensor driver electronics to a RMS Instruments' AARC500 Automatic Digital Compensator, Geometrics 822A Super-Counter or customer supplied Larmor counter. Internal or external signal/power filter-decoupler assemblies are available to provide extremely low noise operation.

The interconnect cable from the driver/electronics to the sensor may be supplied in various lengths (see specs on reverse) with a standard length of 13.5 ft. Tuning throughout the earth's field range is fully automatic and includes automatic hemisphere switching for equatorial surveys.

The sensor/electronics package is weatherproof, temperature controlled, and delivers full performance under extreme operating conditions. Accessories include special mounting clamps and orientation platforms for installation into a variety of vehicle or aircraft mounting configurations, as well as Birds, Stingers, Wing Tip fairings and complete integrated airborne geophysical survey systems with data logging and display.

MODEL G-822A CESIUM MAGNETOMETER SENSOR SPECIFICATIONS

OPERATING PRINCIPLE:	Self-oscillating split-beam Cesium Vapor (non-radioactive)
OPERATING RANGE:	20,000 to 100,000 nT
OPERATING ZONES:	The earth's field vector should be at an angle greater than 6° from the sensor's equator and greater than 6° away from the sensor's long axis. Automatic hemisphere switching.
SENSITIVITY:	<0.0005 nT/√Hz rms. Typically 0.003 nT P-P at a 0.1 second sample rate using 822A Supercounter, 0.02nT P-P for CM-221
HEADING ERROR:	±0.15 nT (over entire 360° polar and equatorial spin)
ABSOLUTE ACCURACY:	<3 nT throughout range
OUTPUT:	Cycle of Larmor frequency = 3.498572 Hz/nT, 2V P-P coupled through the sensor power input
MECHANICAL:	
Sensor:	2.375" (60.32 mm) dia., 5.75" (146 mm) long, 12 oz (339 g) - any orientation in 7" dia. stinger
Sensor Electronics:	2.5" (63.5 mm) dia., 11" (279.4 mm) long, 22 oz (623 g)
Cables:	
Sensor to electronics:	Standard 162 in. (13 ft 6 inch or4.1 m). Other lengths available from 2.4ft (0.75m) at 40 inch (1m) increments with connector on electronics end. Note: Cable lengths are approximate due to cable dielectric variations
Sensor Electronics to Counter:	Standard 10m, up to 165 ft (50 m) (Coax with signal superimposed on power, requires decoupler board or box.)
OPERATING TEMPERATURE:	-30°F to +122°F (-35°C to +50°C)
STORAGE TEMPERATURE:	-48°F to +158°F (-45°C to +70°C)
ALTITUDE:	Up to 30,000 ft (9,000 m)
WEATHERPROOF:	O-Ring sealed for operation in rain or 100% humidity
POWER:	24 to 32 VDC, 1 amp at turn-on and 0.5 amp thereafter
ACCESSORIES:	
Standard:	Power/Larmor coaxial cable (electronics to counter), standard length 10m, maximum 50m, spare O rings, operation manual and carrying/storage case
Optional:	
Signal/Power Decoupler, board or multi-channel box:	Separates the Larmor signal from the power (28 V) to enable connection to RMS Instruments' AADCII Automatic Aeromagnetic Compensator or Customer supplied counter
Internal Decoupler:	P/N 27504 - up to two sensor installation
External Decoupler:	P/N 27560 - three and four sensor installation
Internal CM-221 Counter	See G-823 A Data Sheet
Stinger, Wingtip, Bird	Contact Factory for complete system integration information
Base Station Accessories	Non-magnetic Tripod, clamps cables

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE **12/06**

GEOMETRICS, INC. 2190 Fortune Drive, San Jose, California 95131 **www.geometrics.com**
408-954-0522 • Fax 408-954-0902 • Email: sales@geometrics.com

GEOMETRICS Europe 20 Eden Way, Pages Industrial Park, Leighton Buzzard, LU7 4TZ
• 44-1525-383438 • Fax 44-1525-328200 • eml: chris@georentals.co.uk

GEOMETRICS China Laurel Technologies - Beijing Office, Suite 1807-1810, Kun Tai International Mansion, #12B Chaowai St., Beijing, China 100020 • Tel 86-10-5879-0099
• Fax (010) 5879-0989 • eml: laurel@lauretech.com.cn

GEOMETRICS

Hemisphere GPS

Crescent® R100 Series DGPS Receiver

High Accuracy, Multipurpose Receivers

Complete your work quickly and accurately with the Crescent R100 series DGPS receiver. Rely on consistent sub-meter performance with standard SBAS differential and Hemisphere GPS' exclusive COAST technology that maintains accuracy during temporary loss of differential signal. The Crescent R100 offers many differential correction options for various environments and worldwide coverage. The simple user interface and extensive software features make the Crescent R100 the ideal solution for professional mapping, guidance and navigation applications.

Powered by **Crescent**

The latest Hemisphere GPS products are powered by Crescent Receiver Technology, the future of precision GPS.

Key Crescent R100 Series Advantages

- Feature-packed sub-60 cm DGPS Positioning
- Differential options including SBAS (WAAS, EGNOS, etc.), Radio Beacon, OmniSTAR®
- Exclusive e-Dif® option where other differential correction signals are not practical
- COAST™ technology maintains accurate solutions for 40 minutes or more after loss of differential signal
- Fast update rates of up to 20 times per second provide the best guidance and machine control
- Compatible with RTK and our exclusive L-Dif™ technology, for applications requiring higher accuracy
- The status lights and menu system make the R100 series easy to monitor and configure

Crescent® R100 Series DGPS Receiver

GPS Sensor Specifications

Receiver Type:	L1, C/A code, with carrier phase smoothing (Patented COAST™ technology during differential signal outage)
Channels:	12-channel, parallel tracking (10-channel when tracking SBAS)
WAAS Tracking:	2-channel, parallel tracking
Update Rate:	Up to 20 Hz position
Horizontal Accuracy:	<0.02 m 95% confidence (RTK [1,2]) <0.28 m 95% confidence (L-Dif™ [1,2]) <0.6 m 95% confidence (DGPS[1,3]) <2.5 m 95% confidence (autonomous, no SA*)
Cold Start:	60 s (no almanac or RTC)

L-Band Sensor Specifications

Channels:	Single channel
Frequency Range:	1530 to 1560 MHz
Satellite Selection:	Manual or Automatic (based on location)
Startup and Satellite Reacquisition Time:	15 seconds, typical

Beacon Sensor Specifications

Channels:	2-channel, parallel tracking
Frequency Range:	283.5 to 325 kHz
MSK Bit Rates:	50, 100, and 200 bps

Communications

Serial Ports:	2 full duplex
Interface Level:	RS-232C
Baud Rates:	4800, 9600, 19200, 38400, 57600
Correction Input / Output Protocol:	RTCM SC-104
Data Input / Output Protocol:	NMEA 0183
Raw Data:	Proprietary binary (RINEX utility available)
Timing Output:	1 PPS (HCMOS, active high, rising edge sync, 10 kΩ, 10 pF load)
Event Marker:	Yes

[1] Depends on multipath environment, antenna selection, number of satellites in view, satellite geometry, baseline length (for local services) and ionospheric activity
[2] Depends on multipath environment, number of satellites in view, satellite geometry, and ionospheric activity
[3] Depends on baseline length

Environmental

Operating Temperature:	-32°C to +74°C (-25°F to +165°F)
Storage Temperature:	-40°C to +85°C (-40°F to +185°F)
Humidity:	95% non-condensing
Shock and Vibration:	EP 455
EMC:	FCC Part 15, Subpart B, Class B CISPR 22 CE

Power

Input Voltage Range:	8 to 36 VDC
Reverse Polarity Protection:	Yes
Power Consumption:	3 W
Current Consumption:	< 250 mA @ 12 VDC
Antenna Voltage Output:	5.0 VDC
Antenna Short Circuit Protection:	Yes

Mechanical

Enclosure:	Powder-coated aluminum
Dimensions:	160 mm L x 114 mm W x 45 mm H (6.3″ L x 4.5″ W x 1.8″ H)
Weight:	0.54 kg (1.20 lb)
LED Indicators:	Power, GPS lock, DGPS position
Power Connector:	2-pin micro-Conxall
Data Connectors:	DB9-female
Antenna Connector:	TNC-male

R100 Series Configuration Options

	R100	R110	R120	R130
GPS	●	●	●	●
SBAS	●	●	●	●
Beacon		●		●
OmniSTAR®			●	●

Authorized Distributor:

HEMISPHERE GPS INC.
4110 - 9th Street S.E.
Calgary, AB T2G 3C4
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Fax: 403.259.8866
Toll Free: 800.274.9190
precision@hemispheregps.com
www.hemispheregps.com

FreeFlight Radar Altimeter

TRA 3000

Key Features and Benefits

- Increased pilot safety
- Lightweight
- Easy installation
- Highly visible panel display
- 2-year warranty
- NVG (optional)

For critical flying operations, the FreeFlight TRA 3000™ Radar Altimeter, combined with the TRI40 Radar Indicator, provides the pilot with highly accurate altitude-above-ground-level (AGL) information. This real-time system offers an extra measure of operational safety during landing, navigation, or hovering. It is especially useful in flying search and rescue missions, forestry operations, pipeline maintenance, offshore helicopter operations, aeromedical emergency medical services, border patrol, and electronic news gathering operations.

Sending a continuous signal from a single antenna, the TRA 3000 radar altimeter provides precise AGL information from 2,500 feet down to 40 feet. The transmitter/receiver and antenna fit in a single, lightweight, aerodynamic unit that can be easily installed on the fuselage or under the wing. Innovative design reduces the size and weight of the system and significantly increases transmitter efficiency.

The Complete TRA 3000 Radar Altimeter System

TRI40 Radar Indicator

The TRA 3000 radar altimeter is used with the TRI40 indicator. This panel-mounted indicator provides important information when there are no visual clues to the landscape surrounding the airport or your flight path. The indicator displays the AGL and your preselected decision height (DH) in a bright, LED readout and provides an audible warning when you descend below the DH. A test button sends a 40-foot altitude code to the indicator to test the display and warning alerts at any time.

The TRI40 also includes a visual and audible gear-up warning when the aircraft is below 100 feet. A trip-point output allows you to activate additional pilot alerts every 100 feet up to 800 feet.

Whether you are a private or professional pilot, the cost-effective FreeFlight TRA 3000 Radar Altimeter System is the ideal choice where precise, near-ground navigation and safety are key. The system is covered by a two-year warranty.

FreeFlight Radar Altimeter

TRA 3000

TECHNICAL SPECIFICATIONS

TRA 3000/TRI40

Altitude range:	40 to 2500 ft. (12 to 762 m)
Power requirements:	27.5 VDC; ±20%, 600 mA
Environmental:	TRI: -4°F to +131°F (-20°C to +55°C) TRA: -40°F to +158°F (-40°C to +70°C) Alt: -45,000 ft. (13,716 m)
Size (HxWxL):	TRI: 1.375 x 3.5 x 7.5 in. (3.5 x 9.9 x 19 cm) TRA: 1 x 5 x 7.625 in. (2.5 x 12.7 x 19.4 cm)
Weight:	TRI: 0.75 lb. (0.34 kg) TRA: 1.5 lbs. (0.68 kg)
Antenna(s) response angle when mounted ±6° from horizontal:	Dual; ±20° pitch, ±30° roll
Display type:	LED, yellow seven segment, auto dim
Transmitter power:	20 mW typical, 10 mW minimum
Frequency:	100 MHz sweep, within 4.2 to 4.4 GHz
Display update rate:	2 times/sec. min.
Altitude accuracy:	40 to 100 ft ±5 ft (12 to 30.5 m: ±1.5m) 100 to 500 ft ±5% (30.5 to 152.4 m: ±5%) 500 to 2500 ft ±7% (152.4 to 762 m: ±7%)
Decision height selection:	50-ft. increments from 0 to 600 ft. plus 700, 800, 900 ft. (15.2-m increments from 0 to 183 m, plus 213, 244, 274 m)
Flag(s):	Displays "U" when unlocked
Self-test:	Indicates "8's," then DH & gear lights, then 40 ft. (12 m) altitude
Visual DH alert:	Internal DH light; External output
Aural DH alert:	1-kHz tone output
Gear warning:	Internal gear light aural and visual out
ARINC analog outputs:	A: 2.5 mV/ft., 0 V=0 ft. B: 20 mV/ft., 400 mV=0 ft.
Trip point outputs:	Eight fixed trip points; 100 to 800 ft. (30 to 244 m)
Display disable:	Two strut switch inputs—ground or line
Anti-hover circuit:	None

CERTIFICATIONS

PMA Elegible, Cessna 182Q, Mooney M20J, M20M, M20R

Note: Specifications subject to change without notice. Made in the U.S.A.

FreeFlight SYSTEMS

For Sales Information:
FreeFlight Systems
3700 Interstate 35 S.
Waco, TX 76706
USA
+1 (254) 662-0000
www.freeflightsystems.com

KMAG4 - 260MHz Four-Sensor Magnetometer Counter

Features

- 2.6 times better resolution than the counters, using 100MHz reference frequency
- Four decouplers and four counters
- The counters have a common time base. This makes the instrument perfect for gradientometer applications.
- High Speed - The measurement time can be as low as one millisecond
- Precise GPS synchronization. Allows selection of the active PPS pulse edge.
- Two modes of operation - Free Running Mode and Trigger Mode
- The Trigger Mode allows synchronization with another instrument. It is possible for example to measure only during the OFF time of a transmitter.
- Allows including all the GPS data into the output string.
- Easy options setting through its MAIN serial port.
- Compact - 5.25" x 5.25" x 2"

Specifications

- Operating Range
  10KHz - 800KHz (3000nT - 150000nT)
- Counter Resolution
  The resolution depends on the measurement cycle and on the magnetic field. It can be calculated using the following formula:

  $$Res[\text{pT}] = \frac{B[\text{nT}]}{260 \times T[\text{ms}]}$$

  Res - the resolution in pT
  B - The magnetic field in nT
  T - The measurement cycle in ms
  This counter has 2.6 times better resolution than the counters using 100MHz reference frequency.

- Measurement Time
  Any time between 1ms and 1s (multiple of 1ms) can be set.
- MAIN Serial Port Data Rate
  9600, 19200, 38400, 57600, 115200, 128000, 230400, 256000, 460800, 576000 and 768000 bits/sec.
- GPS Serial Port Data Rate
  4800, 9600, 19200, 38400, 57600, 115200, 128000, 230400, 256000, 460800, 576000 and 768000 bits/sec.

Front View

ON

Power Supply LED

SENSOR1-SENSOR4

BNC connectors for the four cesium sensors

OSC

BNC connectors providing buffered outputs from the corresponding cesium sensor

Rear View

28VDC

A plastic circular four-pin power supply connector. The power supply should meet the requirements of the sensors used. The current consumption of the instrument from 30VDC is 150 mA. 16AWG wires should be used for the power cable. Two wires (connected to pin1 and pin3 provide the positive power) and the other two (pin2 and pin4) - the return. Below is the list of the other parts, necessary to prepare the power cable:

Item	Description	AMP Part #	Quantity
1	Plug Standard Sex	206060-1	1
2	Socket Contacts 18AWG-16AWG	66181-1	4
3	Cable Clamp	206062-1	1

MAIN

A 9-pin connector for the main serial port. The main serial port behaves as a Data Terminal Equipment (A null modem cable is needed to connect it to a PC).

It provides a full duplex connection at eleven programmable data rates: - 9600, 19200, 38400, 57600, 115200, 128000, 230400, 256000, 460800, 576000 and 768000 bits/sec.

GPS

A 9-pin connector for connection to a GPS. The GPS port behaves as a Data Terminal Equipment. It can work at 4800, 9600, 19200, 38400, 57600, 115200, 128000, 230400, 256000, 460800, 576000 and 768000 bits/sec. The GPS port has two modes of operation. In one of them all the data coming to the GPS port are passed through to the MAIN port. In the second mode the instrument extracts only the UTC time from the GGA or the GNS string. Everything else is discarded. This connection is optional. The instrument can work without any GPS connected, but the UTC time will not be presented in the output data in such a case.

Pin 9 can be used as an input for the PPS signal. This option is jumper selected.

PPS

Two identical RJ-11 connectors for the PPS signal (pin1) from the GPS and for the synchronization signal (pin4) if the instrument works in Trigger Mode. The PPS signal is optional. The instrument can work without it. The SYNC signal is needed only in Trigger Mode. It is not needed in Free Run Mode. Pin2 and pin3 provide the return path for the signals.

These two inputs accept TTL levels or RS232 levels.

Recommended Fuses

Current Rating	Manufacturer	Part #
2.5A	Littelfuse	045202.5MR

Proton Precession

Magnetometer / Gradiometer / VLF (GSM-19 v6.0)

The new v6.0 system is the industry's latest innovation in proton precession design - with many new technologies that deliver significant benefits for geophysical applications.

Key technologies include:

- **Integrated GPS option (the only system with fully built-in GPS)**
- **25% increase in sensitivity over GEM's v5.0 system**
- **Enhanced memory (increased by 8 times to 4 Mbytes standard and expandable to 32 Mbytes)**
- **Programmable base station (for scheduling base stations in one of three modes)**
- **Optional DGPS real-time and post-time processing (for metre to sub-metre positioning accuracy)**
- **Rapid data transfer (using the advanced GEMLinkW software)**
- **Internet-based upgrades (from the office or field)**

And all of these technologies come complete with the most attractive prices and warranty in the business!

QuickTracker (GSM-19T) console with sensor and cable. Can also be configured with additional sensor for gradiometer(simultaneous) readings.

For geophysical survey groups who require a complete solution for end-to-end magnetic data acquisition at an affordable price, the *QuickTracker*^{TM} (GSM-19T) proton precession family is the proven choice - for even the most challenging environments.

From robust field units to efficient survey modes to fast data downloading, *QuickTracker* is carefully designed to deliver the maximum value in a proton precession system.

The GSM-19T also provides numerous technologies that differentiate it from other systems. For example, it is the only proton precession system with ***integrated GPS*** (optional) for high-sensitivity, accurately-positioned ground surveys.

With other v6.0 upgrades, *QuickTracker* also leads in sensitivity, memory, base station technology, and other key areas.

Designed From the Ground Up

Leading the list of advances is GEM's rover unit which features a 25% increase in ***sensitivity*** -- reflecting new processing algorithms and implementation of the latest RISC microprocessors.

In addition, v6.0 ***standard memory*** is 4 Mbytes (expandable in 4 Mybte increments) which translates into 209,715 readings of line / station data or more than 600,000 readings for base station units.

The new memory capacity sets an industry standard, but more importantly, it means that operators can now handle even the largest surveys with ease.

Another important innovation is GEM's unique ***programmable base station*** which you can enable via either a field unit *or* a *Personal Computer* as follows:

Daily scheduling (define working hours and minutes each day). This mode provides economy of memory and battery usage on a daily basis.

Flexible scheduling (up to 30 on / off periods). Simply define a series of intervals and the base station will turn itself on as you need. This mode provides the greatest flexibility for longer surveys where leaving your base station running increases efficiency.

Immediate start. This mode is the traditional mode of starting a base station unit and leaving it until the operator can return to turn off the unit.

Survey Planning and Efficiency

One of the traditional challenges in ground magnetometer / gradiometer surveys is ensuring that surveys are designed and implemented as effectively as possible.

With the v6.0 proton precession system, GEM addresses this challenge through

standard GEM capabilities, such as the Walking Mag option that enables the operator to sample while walking. Though there is some increase in noise, many users find this is balanced by improved field productivity. Having nearly continous data on survey lines also helps increase the accuracy of interpretations.

Another innovation is GPS way ***point pre-programming***. Now you can define a complete survey in the office on your Personal Computer and download this information directly to a rover unit via RS-232. Then, the operator simply performs the survey using the points as their survey guide -- with a resulting decrease in errors and more rapid survey completion.

Survey Operations

QuickTracker also helps the operator on a daily basis while performing surveys. A key feature is the ***easy-to-read LCD*** data display in graphical (or text) format along with a signal quality indicator to determine when readings need to be repeated.

And, although GEM's proton precession unit is very tolerant to gradients, it also provides a warning indicator so that the operator can monitor data quality continuously. Other features operators appreciate include easy-to-use line and station incrementing -- as well as end-of-line indicators.

Fast Data Transfer

Another traditional area in which time is lost in surveys is in data transfer. In v6.0, GEM addressed this in several ways:

Data download is tripled to 115 KBaud (fastest rate possible with RS-232).

PC-based data reduction is now possible using an upgraded version of GEMLinkW, GEM's proprietary data transfer software.

GPS and Other Software

GEM Systems recently became the only manufacturer to provide a ***fully integrated*** GPS option for its line of proton precession products. Along with metre to sub-metre positioning options, the new processing functionality enables users to take advantage of the benefits of GPS.

Some of the capabilities include:

Pre-programming of way points.

Post-processing of GPS data. GEM's DGPS option enables transfer of GPS data for post-processing and merging via 3rd party software.

Precise ***time synchronization*** of field and base station units. This capability is particularly important for working in noisy magnetic conditions and provides the highest accuracy possible.

In addition to its own software, GEM is also pleased to offer a variety of data analysis and processing software from 3rd party developers.

Ongoing Maintenance and Support

As a potential user of a GSM-19T system -- the industry's end-to-end magnetometer / gradiometer solution -- you should also know that we stand by our technologies, products and services.

With a 22-year record of success and new innovations -- plus ***Internet-based upgrades*** that keep your system up-to-date and our ongoing support -- we believe that you will find that GEM offers the best solution in proton precession units today.

Specifications

Performance

Sensitivity: < 0.1 nT
Resolution: 0.01 nT
Absolute Accuracy: 1 nT
Dynamic Range: 10,000 to 120,000 nT
Gradient Tolerance: Over 7000 nT/m
Sampling Rate: 1 reading per 3 to 60 sec
Operating Temperature: -40C to +60C

Operating Modes

Manual: Coordinates, time, date and reading stored automatically at minimum 3 second interval.

Base Station: Time, date and reading stored at 3 to 60 second intervals.

Remote Control: Optional remote control using RS-232 interface.

Input / Output: RS-232 or analog (optional) output using 6-pin weatherproof connector.

Storage - 4Mbytes (# of Readings)

Mobile: 209,715
Base Station: 699,050
Gradiometer: 174,762
Walking Mag: 299,593

Dimensions

Console: 223 x 69 x 240mm
Sensor: 170 x 71mm diameter cylinder

Weights

Console: 2.1 kg
Sensor and Staff Assembly: 2.2 kg

Standard Components

GSM-19T console, GEMLinkW software, batteries, harness, charger, sensor with cable, RS-232 cable, staff, instruction manual and shipping case.

Optional VLF

Frequency Range: Up to 3 stations between 15 to 30.0 kHz

Parameters: Vertical in-phase and out-of-phase components as % of total field. 2 relative components of the horizontal field.

Resolution: 0.1% of toal field

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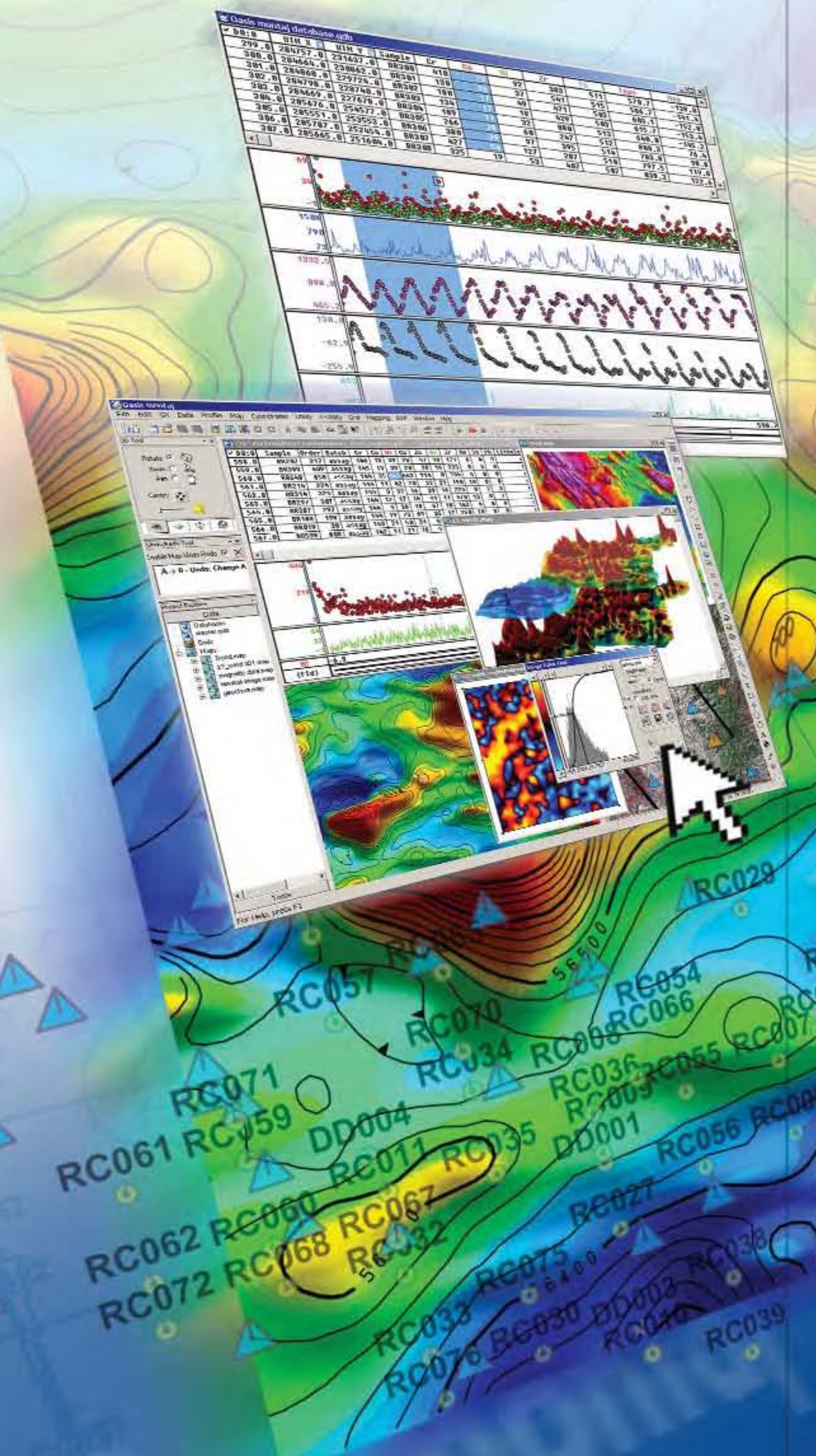
Web: www.gemsys.ca

GEOSOFT
Knowledge from Data

Oasis montaj

Software for Earth Science Mapping and Processing



Oasis montaj

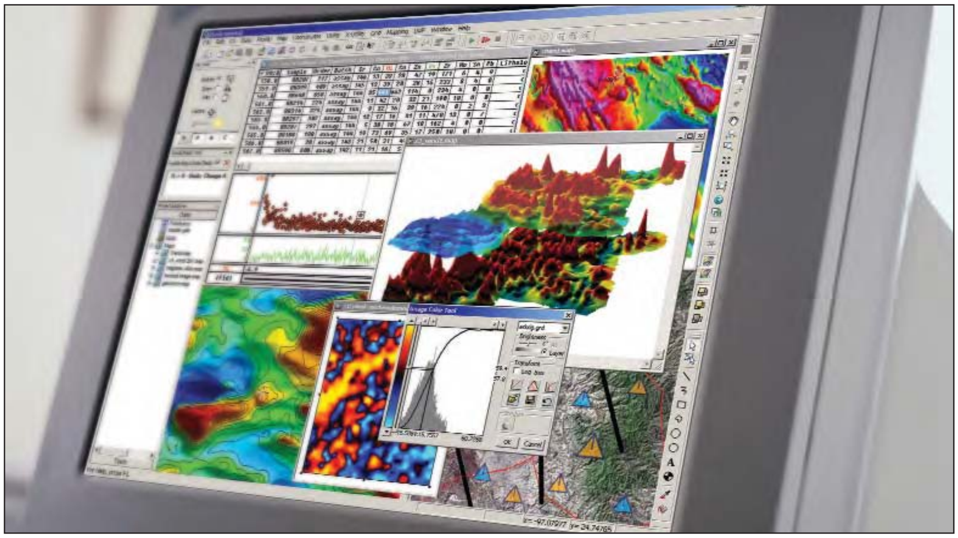
Mapping and Processing Software

Geosoft's Oasis montaj™ is powerful mapping and processing software designed to meet the rigorous demands of earth science investigations and exploration.

The Oasis montaj software provides an optimal environment for integrating, viewing and comparing large-volume geophysical, geochemical and geological data. It accelerates data analysis to support effective daily problem-solving and decision-making.

Geosoft montaj™ extensions add geophysical and geochemical analysis, 3D drillhole plotting, gravity and magnetic filtering, leveling, interpretation and other functionality to Oasis montaj.

Additionally, montaj plus™ extensions, developed by Geosoft technology partners, utilize the Oasis montaj platform to deliver specialized gravity and magnetics data processing and modeling capabilities within the montaj environment.

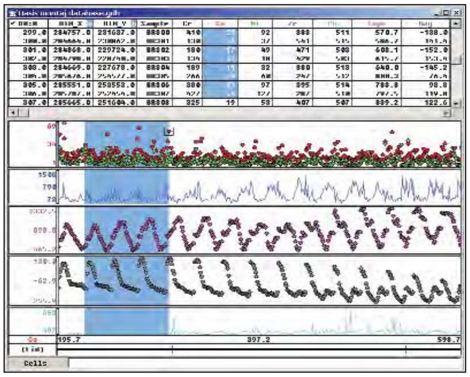


Using montaj, geoscientists can efficiently import, view, process, and share earth science datasets, grids and images within one integrated environment. The Oasis montaj software package includes a rich set of built-in data import, processing, visualization, mapping, and integration capabilities. It features Geosoft's complete library of basic and advanced gridding utilities, and plotting functionality.

A variety of montaj extensions are available for advanced geophysics and geochemical data processing, analysis and quality control, making Oasis montaj one of the most robust and comprehensive geoscience mapping and processing systems in the world.

High-performance database

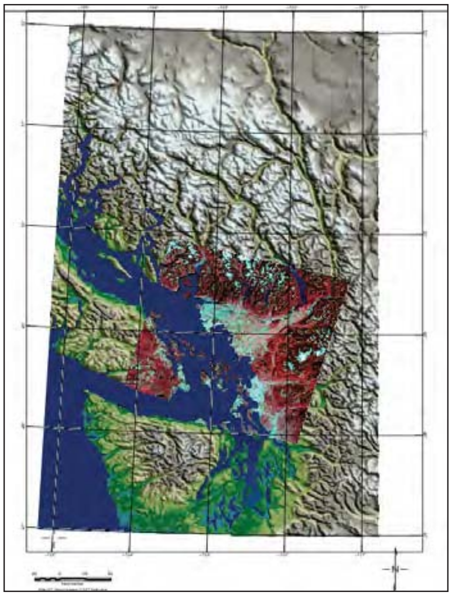
Oasis montaj's high-performance database provides efficient storage for very large geoscientifc data sets. Direct access to data contained in the database is provided through a spreadsheet window and an integrated profile display window. The database provides key advantage for working with large datasets at each stage of the project lifecycle, from acquisition, storage, processing and analysis through to visualization and integration with other data and information.



Database Support for Up To 2 Billion Data Points per Channel

Rapid data processing

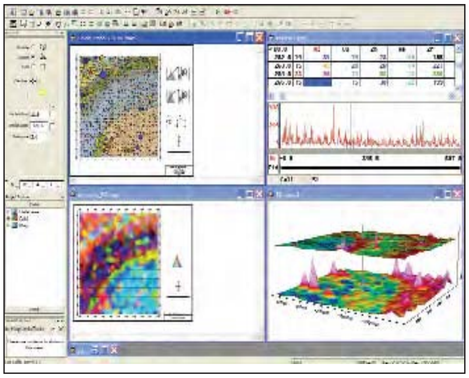
The montaj processing engine enables users to run numerous filters and processes on their data. It provides the ability to rapidly assess and experiment with data in real-time. Users can easily combine data and have multiple profile windows open for comparison with maps. They can work with collections of data points or treat individual points. Geosoft's advanced projection engine provides on-the-fly projection, and can handle over 2000 datums and projections.



On-the-fly Projection

Dynamic linking

Oasis montaj provides all the capabilities required to dynamically interact with data, evaluate results and add value throughout your project lifecycle. Using montaj, geoscientists can edit maps interactively, apply

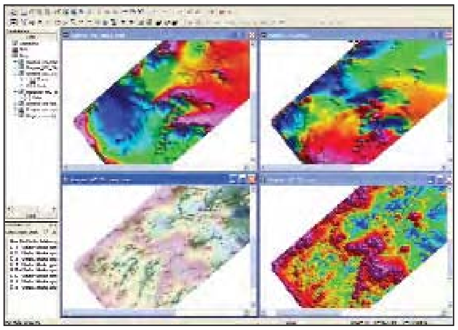


Dynamic Linking of Multiple Data Views in 1D, 2D and 3D

dynamic linking to maps and track map creation processes, all within one mapping environment. The dynamic linking of multiple views of imagery, maps, profiles, data and metadata in Oasis montaj provides a quick point of reference for visually linking common features or areas of interest.

Advanced gridding capabilities

Oasis montaj's gridding algorithms are fast, efficient and optimized for large-volume geoscientific data.

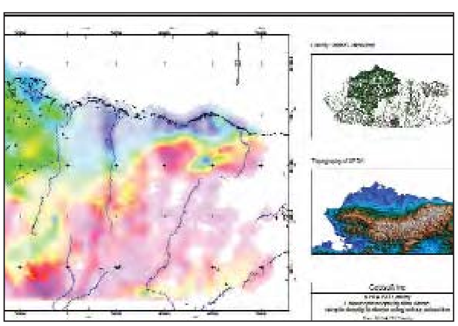


Robust and Varied Gridding Algorithms

The software's advanced gridding capabilities enable users to interpolate data and produce grids using these Geosoft gridding routines: Minimum Curvature, Bi-Directional, Trended, Gradient, Tinning and Kriging. A variety of grid processing tools and advanced grid utilities are provided for grid enhancement and manipulation.

Professional quality map production

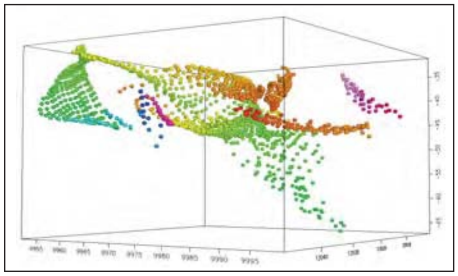
Oasis montaj's rich plotting capabilities enable users to quickly and easily create multiple and varied types of maps, including gridded maps, surface maps, posted value maps, and sub-location maps. The software provides a full featured dynamic contouring algorithm with gradient feathering and extensive labeling control for professional quality presentation results.



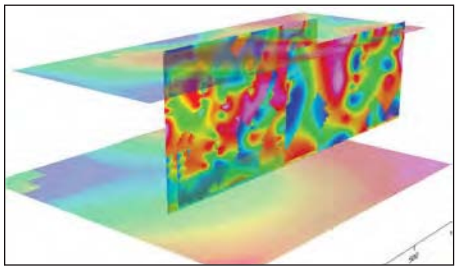
Professional Quality Maps

3D Visualization

The Oasis montaj software provides a range of options for visualizing data in three dimensions. Users can display multiple surfaces, each with own relief and contents, and each with its own orientation in 3D space.



3D Symbols



Stacked 3D Plot

Users can drape a coloured grid or image file over a topographic surface or digital elevation model (DEM) grid. The 3D technology also enables you to display any Geosoft map aggregate, which may contain a number of images, symbols and interpretation features over a topographic surface grid.

Data sharing with GIS and specialized applications

A number of plug-ins and data conversion options provide superior connectivity between your montaj mapping software, and your GIS or specialized modeling applications. Software plug-ins are available for ER Mapper and MapInfo.

The freely available Oasis Montaj Viewer provides a wide variety of grid format conversions, ensuring compatibility with leading GIS and specialized applications, including mine modeling and environmental software.

Oasis montaj also includes a Geosoft DAP client which enables users to search and retrieve geoscientific datasets, imagery and other map data directly form a DAP server on a local network or on the Internet.

Why montaj?

Productivity and Time Savings

"Geosoft's data processing software contributes very significantly to increased productivity in massaging and interpreting exploration data. An outstanding technical support team behind the scenes serves to enhance the client experience with the product."

Russ Fenton, Anglo American Exploration (Canada) Ltd.

Powerful Gridding Routines

"The raw power that Oasis montaj provides for quickly and easily creating and recreating grids, tweaking colour bars, recontouring, doing real-time sun shading with different orientations of lineaments, is not available in any other software program."

Bill Pearson, Pearson Technologies

Interactive Visualization

"Our Oasis montaj system provides a powerful way of viewing and visualizing the data, and it allows you to combine different data sets, in different ways, to make the best use of all the data you have available."

Mark Parker, African Eagle Resources

Data Integration

"In general, I think people don't realize how easy it is to integrate all of their datasets, whether it's seismic and non-seismic, raster and vector. GIS software and Oasis montaj provide some great tools for that."

Dr. Michal Ruder, Wintermoon Geotechnologies

Industry Applications

Geoscientists are using Oasis montaj for:

- Airborne, marine and ground gravity and magnetic survey data processing, analysis and quality control
- Mineral exploration target generation and evaluation
- Oil and Gas potential field exploration
- UXO (Unexploded Ordnance) detection
- Subsurface geologic and hydrologic characterization
- Environmental site characterization
- Archaeological site investigation
- Oceanography

Oasis montaj

Features and Benefits

- Easy to create, import, and export: maps, databases, grids, and point data profiles
- Project Explorer used for browsing and tracking project items, including databases, grids and maps
- Extensive data processing/manipulation capabilities
- Extensive map editing tools - Including CAD tools to draw interpretations on maps
- Support for over 2000 projection/datum combinations
- Support Scripts to automate routine tasks
- E license - management options, include license viewing, updating, parking and transferring between machines
- Project Explorer tools include 3D, edit bar and Map Group editing undo/redo capability
- Metadata access tool to view data file properties
- Create GXs to support your custom methodology or workflow
- Short cut/hot keys

Database Features	• Databases – Optimized for handling very High Volume Data • Easy Profile display and data manipulation capabilities • Variable Data Display options • Line scrolling ability • Line and Group selection options • Array channel support • Math expression capabilities including logical operators • Interactive direct data linking of point data in GDB with displayed grids and maps
Mapping Features	• Symbol and profile plotting options • Contouring • Maps support on-the-fly re-projections for data display • Multiple maps display with linked shadow cursors • Individual transparency settings for grid and vector groups • Full zooming and panning features • Full editing of polygons, lines, polylines and rectangles • Edit/Move/Add vertices of vector groups • Polygon edit bar, exclusion zones and editing of zones • Tools to draw circles/ellipses and n-sided polygons • Unlimited undo/redo map editing

Numerous gridding algorithms	• Minimum Curvature (Random) • Line (Bi-Directional) • Trended gridding • Tinning (Natural Neighbour, Linear and Nearest Neighbour) • Gradient Gridding • Kriging
Grid processing and enhancement tools	• Interactive Shading display • Create shaded relief grids • Display of grid outline • Grid windowing • Standard grid statistics tools
Advanced grid utilities	• Grid Filters • Grid peaks • Grid Boolean operators to merge overlapping grids or display the parts of grids that overlap • Grid math functions • Grid volume • Grid mask

Supported Data Formats

Oasis montaj provides seamless access to both original spatial data and processed information (grids, images and vector plots).

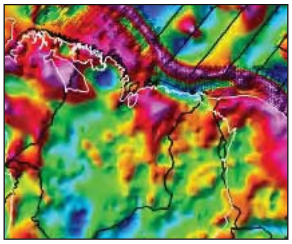
Spatial data import formats include:	Processed data import formats include:	Common Grid Formats (GRD) including:	Common image formats (IMG) including:
ASCII data files, CSV Database table files (single or all tables) Excel Spreadsheets Geosoft XYZ data files Geosoft binary data files Flat archive data files Blocked binary data files ODBC data files ASEG GDF files RMS data files Picodas PDAS data files USGS data files AMIRA format files	MapInfo TAB files ArcView shape files Microstation DGN files Maxwell Plate files AutoCAD DXF (DXF) Geosoft plot (PLT) Grid and Image Formats	Geosoft grid files Surfer grid file (GRD) USGS (.ddf, .dem) DEM files Earth Resource Mapper (ERM) Grid eXchange Format (GXF)	Windows Bitmap (BMP) Uncompressed PC Paintbrush (PCX) GeoTIFF Image (TIF) Tagged Image File Format (TIFF) Targa Image (TGA) IMG Image (IMG) JPEG File Interchange Format (JPG) J2K JPEG 2000 Image Draw Perfect (WPG) PCIDSK Format (GIX) Kodak Photo CD Format (PCD) Portable Network Graphics Format (PNG) EOSAT MSS (Old 4 Band BIL) Landsat MSS (4 band BSQ) and Landsat TM

System Requirements

Operating System:	Windows XP recommended, Windows 2000
CPU:	(INTEL) A Pentium CPU required.
RAM Memory:	512 MB or more recommended, 128 MB minimum (get as much RAM as you can afford)
Graphics:	24-bit graphics card with 3-D acceleration is recommended and required for full colour imaging. Recommend 64MB RAM on card.
Printer/Plotters:	Any Windows supported colour printer. Hewlett Packard large-format inkjet plotters are recommended.
Installation Disk Space:	400 MB (depending upon software configuration)
Data Disk Space:	40 – 100 GB (Your business requirements will dictate your disk size.)

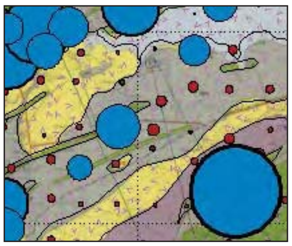
montaj Extensions

Advanced Geophysical, Geological and Geochemical Analysis



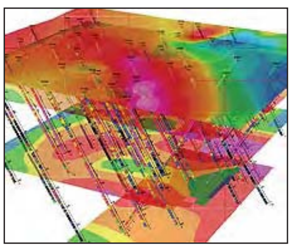
montaj Geophysics

The **montaj™ Geophysics** extension provides a range of filters and statistical tools for working with large-volume geophysical data. Spatial 1D Filters enable field geophysicists to process data by applying a variety of space-domain filters (linear and non-linear). The 1D FFT Filter enables you to apply a variety of Fourier domain filters to one-dimensional (line) potential field and other data. A variety of geostatistical tools provide the ability for summary and advanced statistics, including histogram, scatter and triplot analysis, and the ability to subset data based on code or map group classification.



montaj Geochemistry

The **montaj™ Geochemistry** extension provides QA/QC and analysis capabilities to ensure that your geochemical data is of the highest quality. Geochemical assay data typically includes standards and duplicate samples that must be extracted and analyzed to ensure that all results fall within statistical limits. This extension includes easy-to-use standard and duplicate handling capabilities that simplify the quality control process, and help to confirm the validity of the data you receive from the labs that you

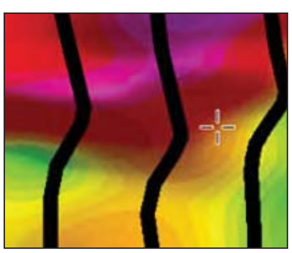


montaj Drillhole Plotting

The **montaj™ Drillhole Plotting** extension enables quick, easy and accurate production of presentation-quality drillhole section and plan maps. Drillhole data is presented in a 3D space within the Oasis montaj environment. This extension enables geologists to set up drill projects, manage results dynamically, and interpret results for follow-up drilling and decision-making. The extension includes plan, section, stacked section and 3D visualization. Also included is a Strip Log and Compositing tool for displaying up to 16 strip log plots per map, and for calculating and annotating composite intervals on plotted strip logs.

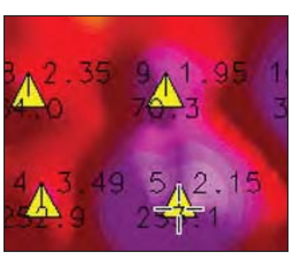
montaj Airborne Quality Control

The **montaj™ Airborne Quality Control** extension provides essential tools for planning an airborne survey, and meeting basic tender specifications. The extension includes flight path planning tools, the ability to monitor the survey progress, and streamlined quality control (QC) tools. A built-in mapping wizard automatically displays QC results. Quality control functions provide the ability to perform tests for altitude deviation, flight path deviation, flight line separation, sample spacing, diurnal drift and magnetic noise.



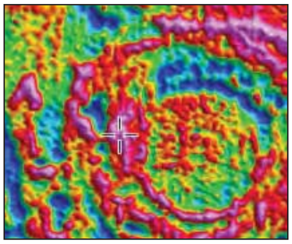
montaj Geophysics Levelling

The **montaj™ Geophysics Levelling** extension includes advanced tools for processing and enhancing airborne magnetic and other geophysical data. It provides a step-by-step methodology for accomplishing a variety of levelling and correction tasks. The Microlevelling toolkit enables you to perform microlevelling corrections on line-based data.



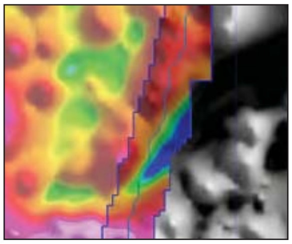
montaj UX-Detect

The **montaj™ UX-Detect** extension provides unique capabilities for locating and analyzing UXO targets, based on magnetic (total field and gradiometer) and electromagnetic data. Use UX-Detect to quickly locate the ground position of potential UXO targets in large volumes of data and narrow these selections to a final target list. Geophysical correction tools identify and remove noise in data from sources such as background geology or instrument-inherent sources. Depth, size and apparent weight calculations further characterize UXO targets for informed decisions.



montaj MAGMAP Filtering

The **montaj™ MAGMAP Filtering** extension provides a 2D-FFT filter library to allow the application of common Fourier domain filters to gridded data in Oasis montaj. MAGMAP rapidly processes and enhances gridded datasets by applying a wide range of robust geophysical and mathematical filters. The extension lets you apply multiple filters together, modify selected filter parameters, and define and apply your own filters.

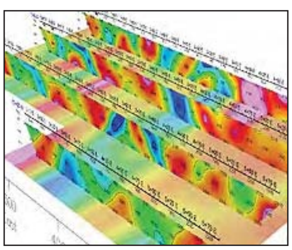


montaj Gridknit

The **montaj™ GridKnit** extension delivers two advanced methods for rapidly and accurately merging virtually any pair of geophysical grids. The blending method quickly merges grids via standard smoothing functions. The suturing method enables you to automatically or manually define a join path, then applies a proprietary multi-frequency correction to eliminate differences between the grids along the path. "Postage stamp" stitching allows easy insertion of high-resolution grids into regional backgrounds.

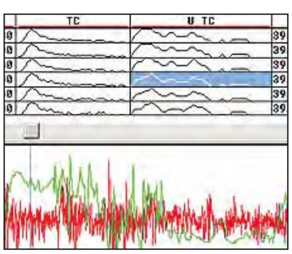
montaj Grav/Mag Interpretation

The **montaj™ Grav/Mag Interpretation** extension includes Euler 3D Deconvolution processing routines to automatically locate and determine depth for gridded magnetic and gravity data. Euler 3D automates 3D geologic interpretation by delineating magnetic and gravimetric boundaries and calculating source depths. The extension also includes the Keating Magnetic Correlation Coefficients tool for Kimberlite Exploration. This tool uses a simple pattern recognition technique to locate magnetic anomalies that resemble the response of modeled Kimberlite pipes. A Source Edge Detection (SED) tool is included for locating edges ((e.g. geological contacts) or peaks from potential field data by analyzing the local gradients. The Source Parameter Imaging (SPI) tool quickly and easily calculates the depth of magnetic sources.



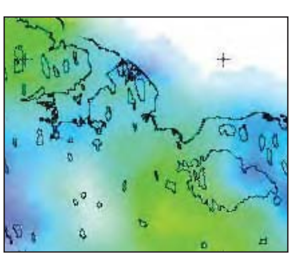
montaj Induced Polarization

The **montaj™ Induced Polarization** extension performs a variety of tasks on your IP data including import, quality control, processing, gridding, and plotting. This extension is designed for both contractors and in-house geophysicists. Import, perform basic quality control, process, and present data from both time and frequency domain surveys. Import time-domain or frequency-domain data in Zonge, Iris, Scintrex, Phoenix and Geosoft formats. Process data from dipole-dipole, pole-dipole, pole-pole, or gradient surveys. Automatically calculate apparent resistivity, metal factor, IP, Self Potential and individual time slices. Evaluate duplicate samples with the unique quality control tool. Filter your data using standard pant-leg filters. Produce pseudo-section presentations, including stacked sections, and instantly convert your stacked sections to display in three dimensions.



montaj 256-Channel Radiometrics Processing

The **montaj™ 256-Channel Radiometrics Processing** extension provides the capability to visualize and process 256 channel spectrometer data. From a data handling and processing perspective, there are three main phases in airborne spectrometer surveying — acquisition, processing and presentation. This extension is designed specifically for processing raw data collected from airborne surveys.



montaj Gravity and Terrain Correction

The **montaj™ Gravity and Terrain Correction** extension provides a complete system for processing and reducing gravity data from conventional ground surveys. Apply terrain corrections from digital elevation models (DEMs) or gridded elevation data. With the streamlined menu system, perform all the standard gravity processing steps quickly and easily. In addition, the uniquely optimized terrain reduction algorithm delivers accurate corrections quickly, even for very large data sets.

Expand your capabilities with montaj plus partner extensions

A variety of montaj plus™ extensions have been developed by Geosoft technology partners to deliver specialized capabilities, such as 3D gravity and magnetics modeling to your integrated Oasis montaj environment. These extensions take full advantage of montaj's 3D environment, database and processing engine capabilities. All montaj plus extensions require Oasis montaj.

montaj plus™ Extensions

PotentQ Modeling Lite

GM-SYS Basic Profile Modeling

GM-SYS Intermediate Profile Modeling

GM-SYS Advanced Profile Modeling

GM-SYS 3D Modeling

Depth To Basement

Isostatic Residual

Grav/Mag Filtering

Compudrape

For more information on Geosoft's software and solutions contact software@geosoft.com. Visit www.geosoft.com.

Geosoft Inc.

Established in 1986, Geosoft is a leading provider of earth science mapping and exploration software that supports essential decision-making in mineral exploration, oil and gas exploration, government, and in environmental investigations including UXO (Unexploded Ordnance) detection.

The company's core software platform, Oasis montaj, delivers proven, industry-standard technology for mapping and processing large-volume geoscientific data, including geophysical, geological and geochemical datasets.

Global technical support

Geosoft provides global technical support through its offices in North America, South America, Europe, South Africa and Australia. The company's global presence ensures responsive support for Geosoft's international customer base, which is comprised of multi-national mining and oil and gas companies, large government and educational institutions, and a diverse geoscience consultant community.

Research and development strength

Geosoft's in-house team of dedicated developers and geo-scientists support a strong software development program with regular software upgrades, responsive bug fixes and enhancements. The company also develops and implements customized technology projects for its customers through its Custom Solutions services.

Wide-ranging Custom Solution projects have helped to solve data access, distribution and management problems for companies with large geoscientific data assets. Projects have also addressed software integration and interoperability issues, and have met unique company requirements for data processing, analysis, quality control and quality assurance.

Industry-standard formats for geophysical datasets

Geosoft's GRD grid and GDB database formats are the industry standards for geophysical datasets. The GDB and GRD have been adopted by international government geological surveys, and survey contractors as the standard formats for distributing and sharing geophysical survey data.

Open development standards

Geosoft's GX development library enables geoscientists to edit and create their own custom GXs for Oasis montaj. Earth science consultants have leveraged GX tools to support and enhance their unique methodology, adding value to the services they deliver to their customers. Companies have utilized GX development tools to build customized technology solutions that fit their user workflow and user interface needs.

Geosoft supports the Microsoft .NET development environment. With .NET, a GX developer can build single functions or suites of functions into a .NET DLL that is run directly from Oasis montaj.

Industry-leading core technology

Geosoft's Oasis montaj database technology, processing engine and development libraries are licensed and utilized by world leaders in exploration and other earth science markets, as part of scaleable, enterprise technology solutions.

Oasis montaj delivers the same industry-leading technology in an affordable commercial configuration designed for geoscientists.

GEOSOFT

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Geosoft Europe Ltd.
Geosoft Latinoamerica Ltda

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500 Cochrane Dr., Unit A., Markham
Ontario, Canada L3R 8E2
Tel: (905) 948-8060, Fax: (905) 948-1823
E-Mail: info@mgssurveys.com
WebSite: www.mgssurveys.com

FIELD DATA PROCESSING WORKSTATIONS

Our Field Data Processing Workstations (FWS) are dedicated PC-based microcomputer systems for use at the technical base in the field. The workstations are designed for use with Geosoft OASIS, MPS and MONTAJ, ENCOM, and other data processing software, as well as in-house developed software and utilities.

The FWS has a data replot capability, and may be used to produce pseudo analog 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 in either black-line contours on Mylar or full colour contours on paper.

FWS FEATURES

- **Portability** - the workstations can be packaged and transported to the field with a minimum of effort
- **Digital Data Verification** - flight data quality and completeness can be assured by both statistical and graphical means
- **Flight Path Plots** - flight path plots can be quickly generated from the GPS satellite data to verify the completeness and accuracy of a day's flying
- **Versatility** - the FWS can be used in both the field and the office. Data pre-processed in the field can be up-loaded to the computers at the Data Processing Centre to speed data turnaround.
- **QC and Preliminary Maps** - the software will permit preliminary maps of the magnetic and gamma-ray spectrometer data to be quickly and efficiently created in the field, providing a quick and efficient method to undertake QC Verification of newly acquired data.

THE HARDWARE

The workstations are PC-compatible PENTIUM microcomputers with a 2GHz or faster processor, 512 MB of memory, a large capacity hard disk drive, an extended VGA graphics card with VGA monitor and a colour inkjet plotter for generating maps and/or profiles, and ZIP, JAZZ and writeable CD-ROM drives to backup data.

THE SOFTWARE

The FWS software enables the user to read the FLASH cards, ZIP cartridges or PCMCIA removable hard disks from the airborne system, check the data for gaps, spikes or other defects and permits editing where necessary.

The base station GPS/magnetometer data is checked and edited, and where necessary merged with the airborne data. Post-survey differential GPS corrections are made using either C³NAV and/or WAYPOINT software. GPS flight path plots may be created and plotted. Multi-channel stacked profiles of the recorded and edited data may be produced on the dot-matrix printer.

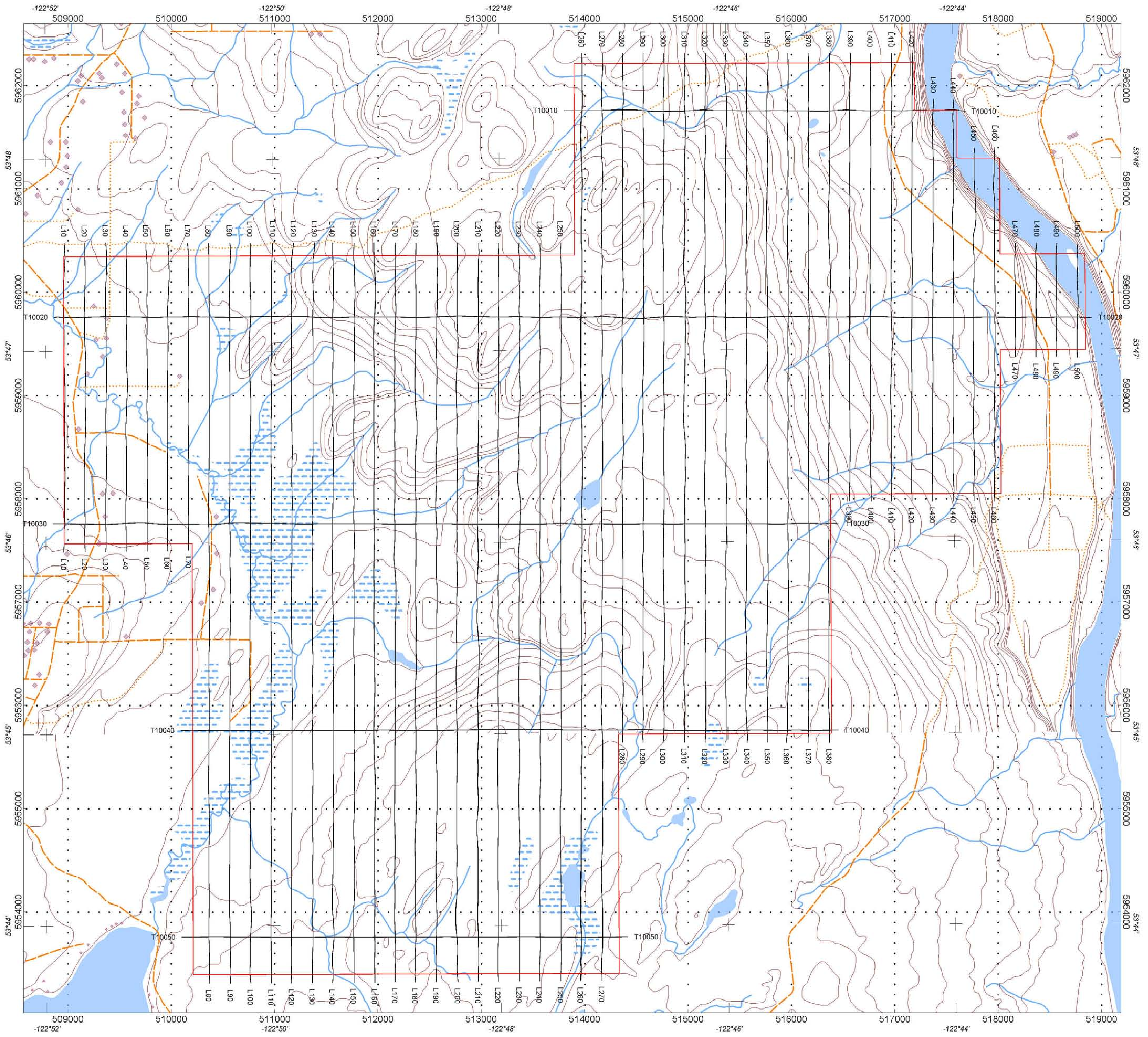
The Software includes:

- Geosoft OASIS/Montaj Airborne Processing Software
- PC-based airborne data compilation and binary database system for in-field processing and compilation of large volumes of time or fiducial based airborne data
- Proprietary data for processing HEM data
- GrafNAV GPS processing/differential GPS correction software
- McPhar's proprietary software and utilities
- General Utility software (WINDOWS 200 PRO, Norton Utilities, Norton Anti-virus, Xtree Gold, LapLink, etc.)

APPENDIX 5

Page Size Maps

- Flight Path with Topography
- Total Magnetic Field (IGRF Removed)
- Reduced to the Magnetic Pole (IGRF Removed)
- Calculated First Vertical Derivative of TMF (IGRF Removed)
- Calculated Second Vertical Derivative of TMF (IGRF Removed)
- Calculated Analytic Signal of TMF (IGRF Removed)



LEGEND

SURVEY PARAMETERS:

Helicopter Type : Robinson R44 Raven II
Helicopter Registration : C-FTPG
Survey Period : November, 2007
Mean Terrain Clearance : 50 metre
Traverse Line Spacing : 200 metre
Traverse Line Direction : 0º
Control Line Spacing : 2000 metre
Control Line Direction : 90º

AIRBORNE SYSTEMS:

KMAG4 Data Acquisition System
OmniSTAR DGPS Positioning System

FreeFlight TRA-3000/TRI-40 Radar Altimeter System

Geometrics G-822A Cesium Magnetometer
Sensor Location: Mounted in the bird
Sampling Rate : 10 readings/second

BASE STATION SYSTEM:

GEM GSM-19T Base station Proton Magnetometer
Sampling Interval: 1 reading/second

TOPOGRAPHIC LEGEND

Road
Small Road
Survey Polygon
Wetland Areas
Contour
Urban Area
Streams
Water Body

Scale 1:25000
500 0 500 1000 1500
(meters)
WGS 84 / UTM zone 10N

McPHAR

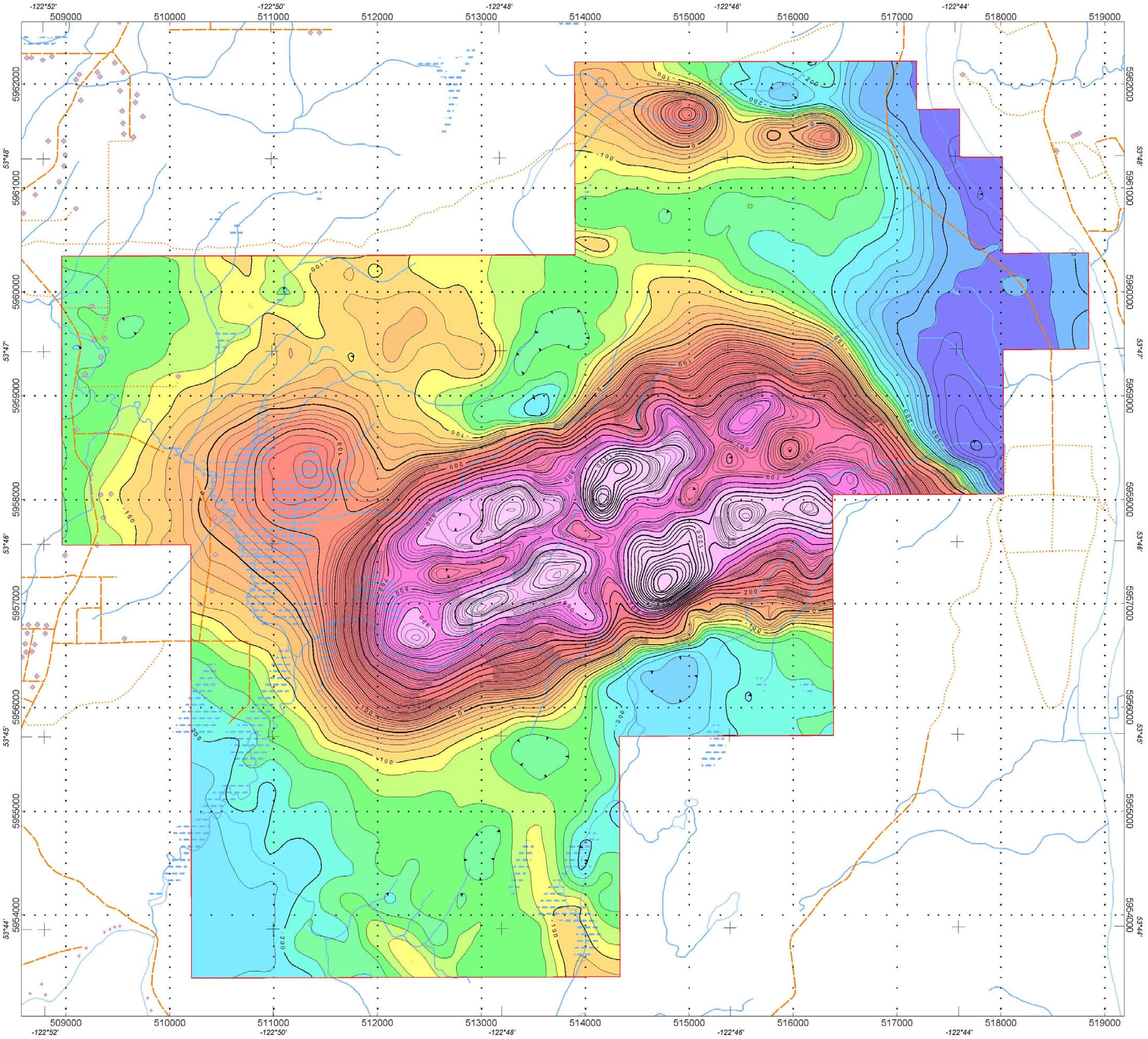
Rimfire Minerals Corp.

Flight Path with Topography

Calculated from Corrected GPS Data

Block 7, Quesnal Trough Survey Area, B.C.
High Resolution Airborne Magnetic Survey

McPhar Geosurveys Ltd.



LEGEND

SURVEY PARAMETERS:

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TOPOGRAPHIC LEGEND

Road
Small Road
Survey Polygon
Wetland Areas
Urban Area
Streams
Water Body

CONTOUR LEGEND

20 nT
100 nT
500 nT

2212
1060
900
780
700
580
440
240
120
60
20
0
-40
-60
-80
-100
-120
-140
-160
-180
-200
-220
-240
-280
-320
-406
nT

Scale 1:25000
500 0 500 1000 1500
(meters)
WGS 84 / UTM zone 10N

McPHAR

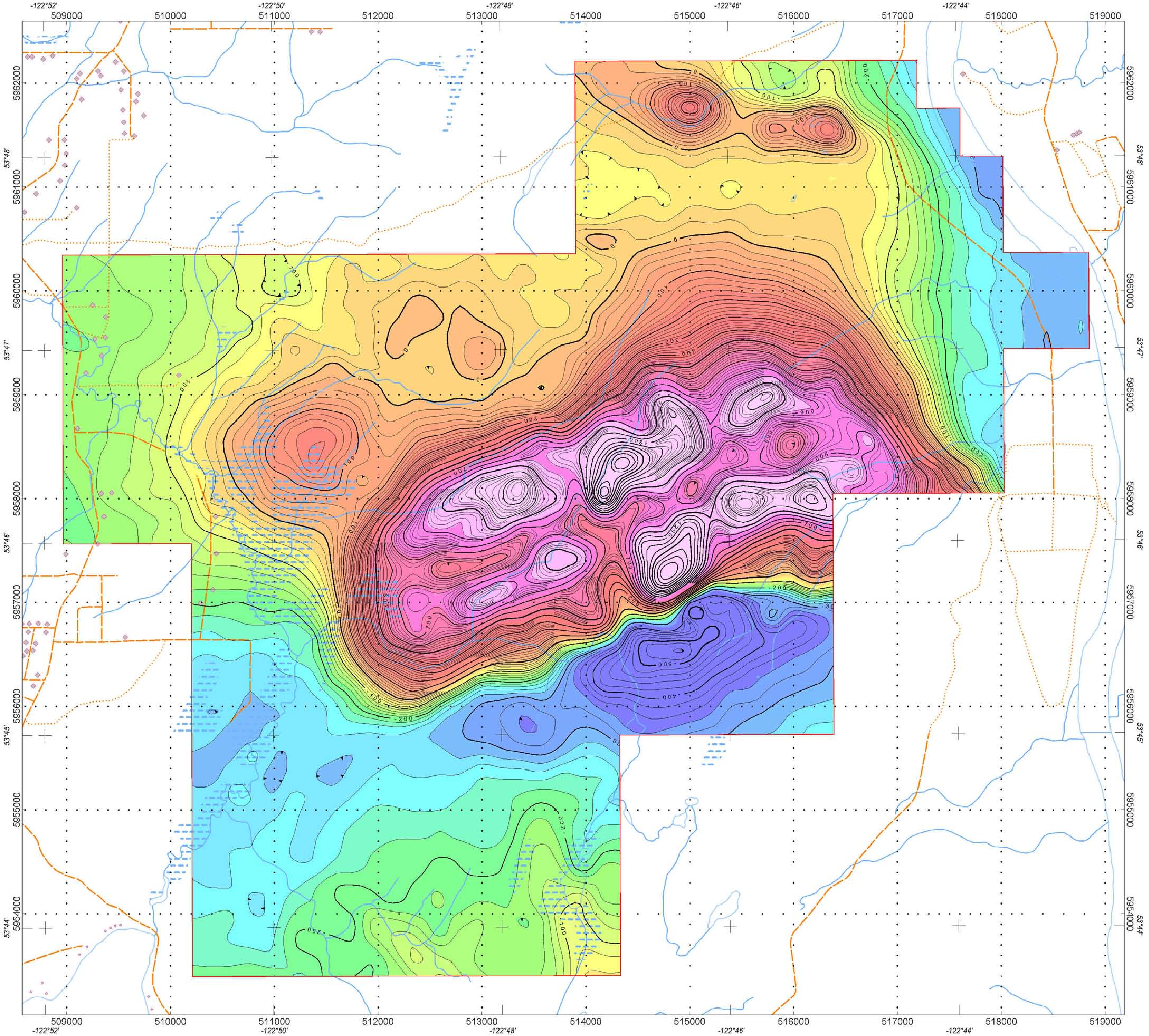
Rimfire Minerals Corp.

Total Magnetic Field

IGRF Corrected; IGRF 2005 Model

Block 7, Quesnal Trough Survey Area, B.C.
High Resolution Airborne Magnetic Survey

McPhar Geosurveys Ltd.



LEGEND

SURVEY PARAMETERS:

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Helicopter Registration : C-FTPG
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Control Line Direction : 90º

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OmniSTAR DGPS Positioning System

FreeFlight TRA-3000/TRI-40 Radar Altimeter System

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Sampling Rate : 10 readings/second

BASE STATION SYSTEM:

GEM GSM-19T Base station Proton Magnetometer
Sampling Interval: 1 reading/second

TOPOGRAPHIC LEGEND

Road
Small Road
Survey Polygon
Wetland Areas
Urban Area
Streams
Water Body

CONTOUR LEGEND

20 nT
100 nT
500 nT

1931
1060
920
820
720
600
440
280
160
100
60
20
0
-20
-40
-60
-80
-100
-120
-140
-160
-180
-200
-220
-240
-260
-280
-300
-340
-557
nT

Scale 1:25000
500 0 500 1000 1500
(meters)
WGS 84 / UTM zone 10N

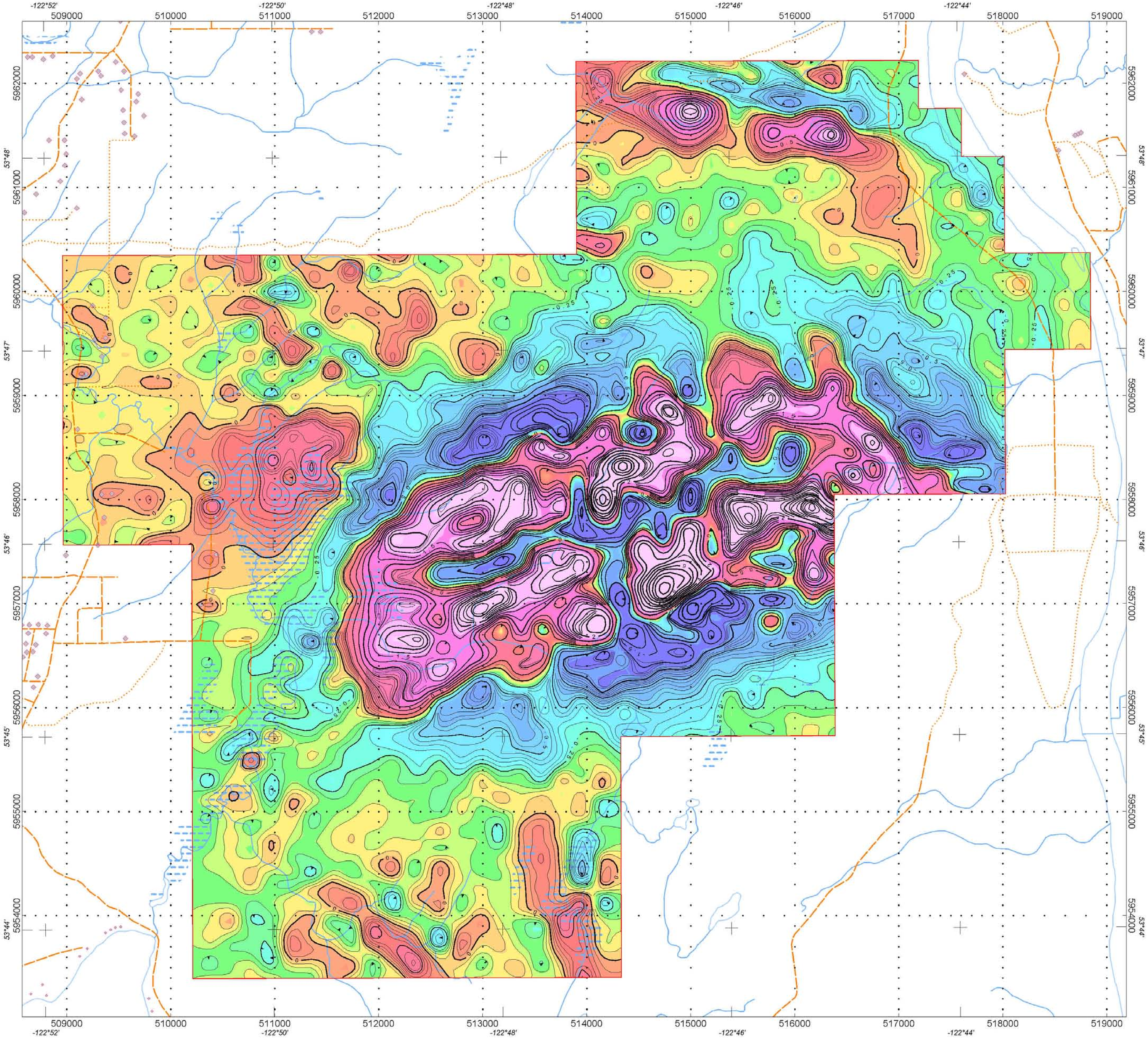
McPHAR

Rimfire Minerals Corp.

Total Magnetic Field Reduced to the Magnetic Pole

IGRF Corrected; IGRF 2005 Model
Block 7, Quesnal Trough Survey Area, B.C.
High Resolution Airborne Magnetic Survey

McPhar Geosurveys Ltd.



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Sampling Interval: 1 reading/second

TOPOGRAPHIC LEGEND

Road
Small Road
Survey Polygon
Wetland Areas
Urban Area
Streams
Water Body

CONTOUR LEGEND

0.05 nT/m
0.25 nT/m
1.0 nT/m

12.29
2.20
1.60
1.20
0.80
0.50
0.25
0.15
0.10
0.05
0.00
-0.05
-0.10
-0.15
-0.20
-0.25
-0.30
-0.35
-0.40
-0.50
-0.60
-0.80
-1.10
-5.17

nT/m

Scale 1:25000

500 0 500 1000 1500

(meters)

WGS 84 / UTM zone 10N

McPHAR

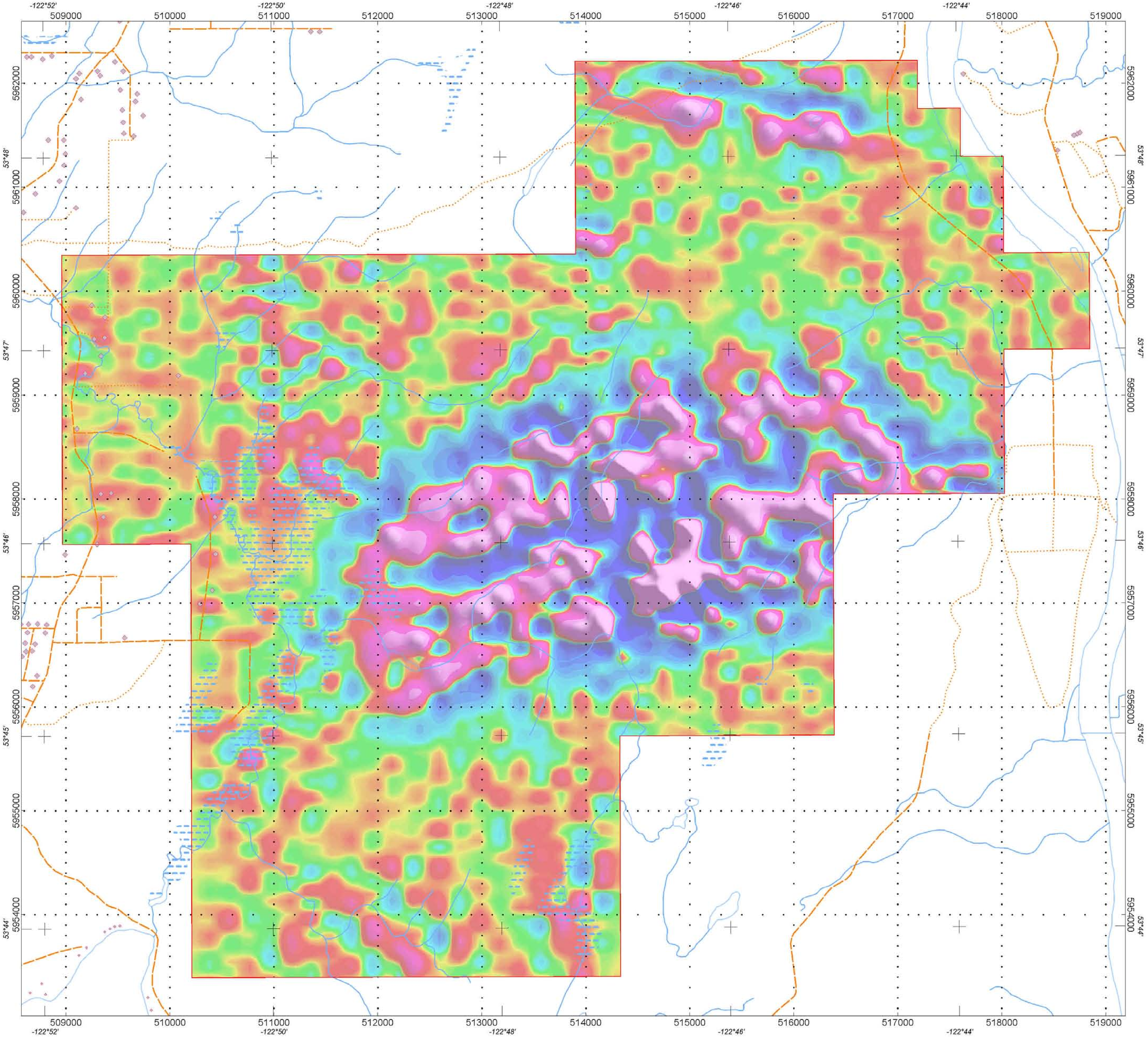
Rimfire Minerals Corp.

Calculated First Vertical Derivative of TMF

IGRF Corrected; IGRF 2005 Model

Block 7, Quesnal Trough Survey Area, B.C.
High Resolution Airborne Magnetic Survey

McPhar Geosurveys Ltd.



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TOPOGRAPHIC LEGEND

Road
Small Road
Survey Polygon
Wetland Areas
Urban Area
Streams
Water Body

0.16977
0.01418
0.00812
0.00484
0.00288
0.00205
0.00151
0.00119
0.00095
0.00077
0.00062
0.00049
0.00038
0.00028
0.00020
0.00013
0.00006
-0.00000
-0.00006
-0.00012
-0.00019
-0.00026
-0.00033
-0.00040
-0.00049
-0.00058
-0.00069
-0.00081
-0.00093
-0.00108
-0.00124
-0.00144
-0.00174
-0.00212
-0.00272
-0.00363
-0.00509
-0.00760
-0.01255
-0.07986
nT/m²

Scale 1:25000

500 0 500 1000 1500
(meters)
WGS 84 / UTM zone 10N

McPHAR

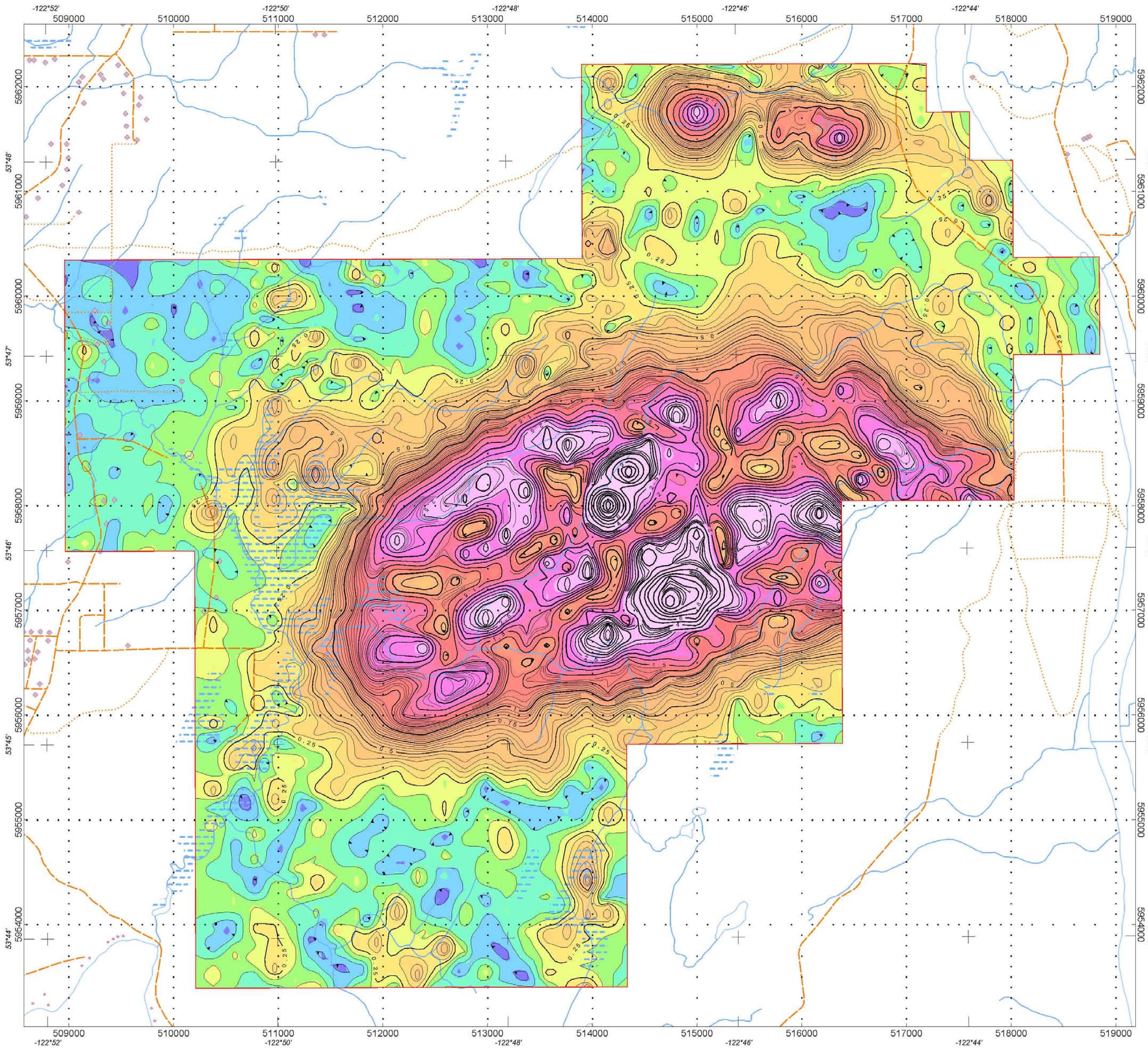
Rimfire Minerals Corp.

Calculated Second Vertical Derivative of TMF

IGRF Corrected; IGRF 2005 Model

Block 7, Quesnal Trough Survey Area, B.C.
High Resolution Airborne Magnetic Survey

McPhar Geosurveys Ltd.



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TOPOGRAPHIC LEGEND

Road
Small Road
Survey Polygon
Wetland Areas
Urban Area
Streams
Water Body

CONTOUR LEGEND

0.05 nT/m
0.25 nT/m
1.0 nT/m

14.017
3.050
2.450
2.100
1.850
1.650
1.450
1.300
1.150
1.000
0.850
0.700
0.600
0.500
0.400
0.350
0.300
0.250
0.200
0.150
0.100
0.050
0.002

nT/m

Scale 1:25000

500 0 500 1000 1500

(meters)

WGS 84 / UTM zone 10N

McPHAR

Rimfire Minerals Corp.

Calculated Analytic Signal of TMF

IGRF Corrected; IGRF 2005 Model

Block 7, Quesnal Trough Survey Area, B.C.
High Resolution Airborne Magnetic Survey

McPhar Geosurveys Ltd.

Appendix D - Statement of Qualifications

STATEMENT OF QUALIFICATIONS

I, Daniel K. Lui, of 201 – 2211 Wall St., Vancouver, in the Province of British Columbia, DO HEREBY CERTIFY:

1. THAT I am a Project Geologist with Rimfire Minerals Corporation, in the offices at 700 – 700 West Pender Street, Vancouver, British Columbia.
2. THAT I am a graduate of the University of British Columbia with a Bachelor of Science degree in Geology in 2002, and a graduate of the University of Western Ontario with a Master of Science degree in Geology in 2005.
3. THAT I have practiced my profession since graduation, primarily in a variety of exploration projects in British Columbia and Nunavut.
4. THAT this report is based on fieldwork carried out by me in August to September 2007, and on publicly available reports and data.

DATED at Vancouver, British Columbia, this ___________ day of _________________ , 2006.

____
Daniel K. Lui, M.Sc.
Rimfire Minerals Corporation
Vancouver, B.C.