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NEB/ONE

NATIONAL ENERGY BOARD  
Exploration and Production

DEC 13 2006

**Final Report**

**HUSKY SUMMIT CREEK AIRBORNE GRAVITY  
PROGRAM 2005  
NORTHWEST TERRITORIES**

**HUSKY OIL OPERATIONS LIMITED  
N.E.B. Authorization # 9228-H006-001E  
Water License # S05L3002**

## **TABLE OF CONTENTS**

TABLE OF CONTENTS.....	2
ENCLOSURES.....	3
1. INTRODUCTION .....	4
2. LOGISTICS & SUMMARY.....	5
3. SAFETY, HEALTH & ENVIRONMENT .....	6
4. CONTRACTORS .....	7
5. RECORDING OPERATIONS.....	8
6. RECORDING PARAMETERS.....	9
7. RECORDING PRODUCTION SUMMARY .....	11
8. PERSONNEL.....	18
9. EQUIPMENT.....	19
10. GRAVITY PROCESSING .....	20
11. GRAVITY INTERPRETATION .....	23

## **ENCLOSURES**

FIGURE 1 PROJECT MAP

FIGURE 2 BOUGUER CORRECTED ( $2.3 \text{ g/CM}^3$ ) GRAVITY MAP

FIGURE 3 BOUGUER CORRECTED ( $2.67 \text{ g/CM}^3$ ) GRAVITY MAP

FIGURE 4 FREE AIR CORRECTED GRAVITY MAP

FIGURE 5 FLIGHTPATH MAP

## 1. INTRODUCTION

During the months of October and November 2005, Sander Geophysics Limited (SGL) conducted a high-definition aero-gravity survey for Husky Oil Operations Ltd (Husky) over EL 397, 423, 416, TDL M36, 37, 38, and 39 in the Central Mackenzie area in the NWT. The survey was flown using SGL's airborne gravity system designated AIRGrav (Airborne Inertially Referenced Gravimeter). Figure 1 shows the geographical position of the survey area. The survey was planned to be a total of 9,297 line kilometers. Some 28 production flights with a helicopter took place from October 28, 2005 to November 28, 2005 to complete the planned survey. The SGL survey aircraft Eurocopter AS-350 B3, registration C-GSGH, was used for this survey. Survey operations were conducted from Keele River Camp, Northwest Territories.

## 2. LOGISTICS & SUMMARY

Helicopter operations were conducted from the Keele River camp site. The helicopter was parked on a clearing in between the camp and the shore of the Mackenzie River. The field office was established inside the Well Site #1 trailer. Antennas for both GPS ground stations (GND1 and GND2) were located a few meters apart on a raised berm at the south end of the camp. The supporting computer equipment was housed inside bedroom # 9 of the adjacent trailer. Positions of the ground stations were determined precisely by applying differential corrections with respect to the International Geodetic Reference Stations at Yellowknife (YELL), Whitehorse (WITH), and Inuvik (INVK), using full day recorded data from Julian Days 298, 299, and 300. The average coordinates of the ground stations with respect to WGS-84 are:

	GND1	GND2
Latitude:	N 64:25:31.48853	N 64:25:31.48075
Longitude:	W 124:47:30.66650	W 124:47:31.14695
Elevation:	60.31m	60.37 m

These ground stations were used to apply post-mission differential corrections to the GPS position of the aircraft. Despite frequent marginal weather conditions and rapidly diminishing daylight hours, the survey was completed safely and efficiently.

### **3. SAFETY, HEALTH & ENVIRONMENT**

Mr. Bob Raina & Mrs. Jenica Von Kuster of Northern Envirosearch Ltd., monitored the application of all environmental regulations on the program.

Morning safety meeting were conducted. Any incidents were recorded and reported on the weekly activity reports (see section 7) which were sent to the NEB.

## **4. CONTRACTORS**

Gravity Surveying - Sander Geophysical Limited  
Air Support - North Wright Air  
Fuel / Fuel Sloops - Norman Wells Petroleum  
ELS Consulting

## 5. RECORDING OPERATIONS

Sander Geophysical conducted the airborne gravity surveying using their proprietary gravimeter. The surveying was done using the Eurocopter AS 350 B3 C-GSGH which is modified to house all the surveying equipment. Sander averaged 450km/day and encountered 5 weather days.

<b>Total Kilometers Surveyed</b>		<b>9297</b>
<b>Number of Surveying Days</b>		<b>31 days excluding weather day</b>
<b>Kilometers Recorded per Day</b>		<b>450</b>
<b>Days Lost Due to Weather</b>		<b>5 day</b>
<b>Days Lost Due to Equipment Failure</b>		<b>none</b>

## 6. RECORDING PARAMETERS

The traverse lines were flown at 600 m spacing and oriented at 45° and control lines at 2.4 km spacing and oriented at 135°. The survey was flown at a height of 150 m above the minimum drapage surface (a smooth flyable surface that has taken into account the adjacent digital terrain model around any given point and the desired performance of the aircraft at that altitude). The survey flying speed was 70 knots indicated air speed.

### Geographical Coordinates in WGS-84

1 64:26.40 N 126:10.04 W  
2 64:38.10 N 125:45.45 W  
3 64:01.41 N 124:16.07 W  
4 63:51.45 N 124:37.41 W  
5 63:52.39 N 125:27.12 W

The following parameters were recorded during the course of the survey:

- Aircraft altitude measured by the barometric altimeter at intervals of 0.25 s;
- Terrain clearance provided by the radar altimeter at intervals of 0.25 s;
- Terrain clearance provided by the laser altimeter at intervals of 0.01 s;
- Airborne GPS positional data: (altitude, longitude, height, time, and raw range from each satellite being tracked) recorded at intervals of 0.1 s;
- Ground based GPS positional data: (latitude, longitude, height, time, and raw range from each satellite being tracked) recorded at intervals of 0.1 s;
- Gravimeter data recorded with a 128 Hz sampling rate.

### Survey Line Specifications

Survey lines were flown with the following specifications:

	Line Direction	Line Spacing (m)
Traverse Lines	45°	600
Control Lines	135°	2400

## **Terrain Clearance**

The survey was flown using a pre-planned drape surface designed to guide the aircraft over the topography in a consistent manner as close to minimum clearance as possible. The drape surface was prepared using digital elevation model (DEM) data from Canadian Digital Elevation Data <http://www.geobase.ca/geobase/en/data/cded1.html>) sampled at 3 arcseconds (approximately 90 m) and supplemented by a 25 m LIDAR grid supplied by Husky that partially covered the block. The DEM included an extension beyond the survey boundary to allow the aircraft to achieve the drape clearance before coming on line. The grid was smoothed using a climb and descent rate of 150 ft/nm. This rate was chosen to create a gentle drape for the gravity system and is below the maximum climbing and descending capabilities of the survey aircraft. The minimum terrain clearance of 150 m was added to the drape surface.

## 7. RECORDING PRODUCTION SUMMARY

SGL WEEKLY PROGRESS REPORT No. 1 (Week of October 17th to October 23rd, 2005)

Page 1 of 2

Block name:	Summit Creek	Total Size of Survey:	9297	km	
Line spacing:	Traverse: 600m Control: 2400m	Total to Date:	0	km	
Client:	Husky Oil Operations Limited	Production this Week:	0	km	
Aircraft:	C-GSGH	Total Remaining:	9297	km	
		% Complete:	0	%	
Date	Day	Flight No.	Flight Time	No. Lines + No. Reflown Lines	Production km (+ Reflight km)
October 17	Monday				
Geomag:	N/A.				
Weather:	N/A.				
Remarks:	Mobilization to Keele River Camp continued.				
October 18	Tuesday				
Geomag:	N/A.				
Weather:	N/A.				
Remarks:	Mobilization to Keele River Camp continued.				
October 12	Wednesday				
Geomag:	N/A.				
Weather:	(Ottawa) Low clouds and rain throughout day.				
Remarks:	Helicopter could not depart Ottawa due to weather.				
October 19	Thursday				
Geomag:	N/A.				
Weather:	(Ottawa) Partly cloudy with light winds.				
Remarks:	Helicopter commenced ferry from Ottawa, ON to Keele River Camp, NT.				
October 20	Friday				
Geomag:	N/A.				
Weather:	N/A.				
Remarks:	Helicopter continued ferry flight. Geophysicists Stefan Elieff and Michael Laneville departed Ottawa for Norman Wells (via Edmonton).				
October 21	Saturday				
Geomag:	N/A.				
Weather:	N/A.				
Remarks:	Helicopter continued ferry flight. Stefan and Michael arrived in Norman Wells, NT.				
October 22	Sunday				
Geomag:	N/A.				
Weather:	(Norman Wells) Warm and clear.				
Remarks:	Helicopter continued ferry flight. Stefan and Michael arrived at Keele River camp with all the equipment for the survey. Ground station set up in the afternoon.				
TOTALS			0	0	0

### Comments:

The crew (two geophysicists and two pilots) mobilized from Ottawa, Ontario to the Keele River camp, NT during the week. Geophysicists Michael Laneville and Stefan Elieff arrived at the camp and started setup. The helicopter is expected to arrive on Monday October 24, 2005.

Block name:	Summit Creek	Total Size of Survey:	9297	km	
Line spacing:	Traverse: 600m Control: 2400m	Total to Date:	395.0	km	
Client:	Husky Oil Operations Limited	Production this Week:	395.0	km	
Aircraft:	C-GSGH	Total Remaining:	9297	km	
		% Complete:	4.2	%	
Date	Day	Flight No.	Flight Time	No. Lines + No. Reflown Lines	Production km (+ Reflight km)
October 24	Monday				
Geomag:	N/A.				
Weather:	N/A.				
Remarks:	C-GSGH arrived at the Keele River camp.				
October 25	Tuesday				
Geomag:	Unsettled.				
Weather:	Low ceiling and cool throughout day.				
Remarks:	Gravimeter calibration conducted in Norman Wells to transfer local g value. Power surge and temporary loss of ground power. Restarted gravimeter. Calibration completed but some survey equipment may have been affected.				
October 26	Wednesday				
Geomag:	Quiet.				
Weather:	Snow with light winds.				
Remarks:	No flight due to poor weather. Verified survey equipment in light of previous day's power issues.				
October 27	Thursday				
Geomag:	Quiet.				
Weather:	Snow with moderate winds.				
Remarks:	No flight due to poor weather. Continued troubleshooting survey equipment.				
October 28	Friday	FLT001	2.6	2T	100.5
Geomag:	Quiet.				
Weather:	Cloudy.				
Remarks:	Test line verification flight. Two survey lines also flown. Laser altimeter not functioning during flight.				
October 29	Saturday				
Geomag:	Quiet.				
Weather:	Cloudy with intermittent snow.				
Remarks:	SGL Engineer Francois Belanger arrived at the Keele River camp to assist with equipment testing. Laser altimeter verified as not functioning. Crew safety meeting in the morning.				
October 30	Sunday	FLT002	3.3	9T	294.5
Geomag:	Quiet.				
Weather:	Cool and clear.				
Remarks:	Production flight in the afternoon. Aborted post flight test line early due to low fuel.				
TOTALS			5.9	11T	

## Comments:

The remainder of the crew arrived at the Keele River camp and commenced set up. A successful gravimeter calibration was completed in Norman Wells, NT. However, a power surge was suspected of occurring in Norman Wells which seemed to have

Block name:	Summit Creek	Total Size of Survey:	9297.0	km	
Line spacing:	Traverse: 600m Control: 2400m	Total to Date:	1412.0	km	
Client:	Husky Oil Operations Limited	Production this Week:	1017.0	km	
Aircraft:	C-GSGH	Total Remaining:	7885.0	km	
		% Complete:	15.2	%	
Date	Day	Flight No.	Flight Time	No. Lines + No. Reflown Lines	Production km (+ Reflight km)
October 31	Monday	FLT003	2.0	2T	104.9
Geomag:	Quiet.				
Weather:	Snow in the morning, clearing by mid afternoon.				
Remarks:	Production flight in the afternoon.				
November 1	Tuesday	FLT004	0.8	1T	35.3
Geomag:	Quiet.				
Weather:	Cloudy in the morning, clearing by mid afternoon.				
Remarks:	Production flight in the afternoon aborted due to accidental reboot of computers in flight. No post flight test line.				
November 2	Wednesday	FLT005	4.9	7T + 1T	300.6 + 35.5
Geomag:	Quiet.				
Weather:	Snow with low ceiling in the morning, partly cloudy in afternoon.				
Remarks:	Production flight aborted due to GPS failure during flight. Reflew line T1010.00 from FLT005.				
November 3	Thursday	FLT006 & FLT007	2.3 & 1.0	2T & 1T	108.2 & 39.9
Geomag:	Quiet.				
Weather:	Intermittent snow.				
Remarks:	Production flight in the morning and the afternoon. Both western test lines completed in FLT006. The second sortie was aborted due to poor visibility.				
November 4	Friday	N/A	N/A	N/A	N/A
Geomag:	Quiet.				
Weather:	Snowing throughout day.				
Remarks:	No flight due to poor weather. Engineer Francois Belanger departed Keele River camp for Ottawa. New laser profiler was successfully installed.				
November 5	Saturday	FLT008	6.0	10T	428.1
Geomag:	Quiet.				
Weather:	Cloudy with light snow throughout day.				
Remarks:	Production flight.				
November 6	Sunday	N/A	N/A	N/A	N/A
Geomag:	Quiet.				
Weather:	Light snow with patchy sky.				
Remarks:	No production flight due to faulty indicated airspeed indicator. AME Gerry McGrath arrived at the Keele River camp.				
TOTALS			17.0 hours	22T + 1T	1017.0

Comments:

Block name:	Summit Creek	Total Size of Survey:	9297.0	km	
Line spacing:	Traverse: 600m Control: 2400m	Total to Date:	4011.3	km	
Client:	Husky Oil Operations Limited	Production this Week:	2599.3	km	
Aircraft:	C-GSGH	Total Remaining:	5285.7	km	
Project Name: Husky Summit Creek Aerogravity Survey 2005 Project ID#: 9328-H006-001E		% Complete:	43.1	%	
Date	Day	Flight No.	Flight Time (hours)	No. Lines + No. Reflown Lines (T=Traverse Lines C=Control Lines)	Production km (+ Reflight km)
November 7	Monday	FLT009	1.8	2T	106.2
Geomag:	Quiet.				
Weather:	Clear and cold.				
Remarks:	AME fixed faulty air speed indicator in the morning. Production flight in the afternoon.				
November 8	Tuesday	FLT010	3.1	2C	212.2
Geomag:	Quiet.				
Weather:	Light snow and low ceiling in the morning.				
Remarks:	Production flight in the afternoon.				
November 9	Wednesday	N/A	N/A	N/A	N/A
Geomag:	Quiet.				
Weather:	Snowing heavily throughout day.				
Remarks:	No flight due to poor weather.				
November 10	Thursday	FLT011	6.3	12T	582.2
Geomag:	Quiet.				
Weather:	Intermittent snow with gusting winds.				
Remarks:	Production flight comprised of two sorties.				
November 11	Friday	FLT012	5.7	10T	542.0
Geomag:	Quiet.				
Weather:	Light snow throughout day.				
Remarks:	Production flight comprised of two sorties.				
November 12	Saturday	FLT013	6.0	11T	620.8
Geomag:	Quiet.				
Weather:	Clear skies.				
Remarks:	Production flight comprised of two sorties.				
November 13	Sunday	FLT014	5.9	10T + 1T	535.9 + 53.9
Geomag:	Unsettled.				
Weather:	Clear skies.				
Remarks:	Production flight comprised of two sorties.				
TOTALS			28.8 hours	45T, 2C + 1T	2599.3 + 53.9

**Comments:**

Block name:	Summit Creek	Total Size of Survey:	9297.0	km	
Line spacing:	Traverse: 600m Control: 2400m	Total to Date:	7546.5	km	
Client:	Husky Oil Operations Limited	Production this Week:	3479.9	km	
Aircraft:	C-GSGH	Total Remaining:	1750.5	km	
Project Name: Husky Summit Creek Aerogravity Survey 2005 Project ID#: 9228-H006-001E		% Complete:	81.2	%	
Date	Day	Flight No.	Flight Time (hours)	No. Lines + No. Reflown Lines (T=Traverse Lines C=Control Lines)	Production km (+ Reflight km)
November 14	Monday	FLT015	6.3	1T, 5C + 3T	482.1 + 123.7
Geomag:	Quiet.				
Weather:	Clear and cold.				
Remarks:	Production flight comprised of two sorties. Reflew 3 lines to improve data quality.				
November 15	Tuesday	FLT016	6.1	12T	603.2
Geomag:	Quiet.				
Weather:	Clear, cold and windy.				
Remarks:	Production flight comprised of two sorties. Geophysicist Stefan Elieff departed Keele River camp for Ottawa.				
November 16	Wednesday	FLT017	6.2	14T	663.6
Geomag:	Quiet.				
Weather:	Clear and cold.				
Remarks:	Production flight comprised of two sorties.				
November 17	Thursday	FLT018	2.5	1T, 1C + 5T	86.6 + 192.0
Geomag:	Quiet.				
Weather:	Snow increasing through day.				
Remarks:	Production flight in the morning. No flight in the afternoon due to poor visibility. Reflew 5 lines to improve data quality.				
November 18	Friday	FLT019	5.6	4T, 6C	548.0
Geomag:	Quiet.				
Weather:	Clear and cold with intermittent snow.				
Remarks:	Production flight comprised of two sorties.				
November 19	Saturday	FLT020	6.1	9T, 2C	608.8
Geomag:	Unsettled.				
Weather:	Cold with low ceiling.				
Remarks:	Production flight comprised of two sorties.				
November 20	Sunday	FLT021	5.0	5T, 3C	487.6
Geomag:	Quiet.				
Weather:	Clear skies.				
Remarks:	Production flight comprised of two sorties. Generator failed during the night. System restarted immediately afterwards and accelerometer calibration performed in the morning.				

Block name:	Summit Creek		Total Size of Survey:	9297.0 km	
Line spacing:	Traverse: 600m Control: 2400m		Total to Date:	9297.0 km	
Client:	Husky Oil Operations Limited		Production this Week:	1798.6 km	
Aircraft:	C-GSGH		Total Remaining:	0 km	
Project Name: Husky Summit Creek Aerogravity Survey 2005 Project ID#: 9228-H006-001E			% Complete:	100 %	
Date	Day	Flight No.	Flight Time (hours)	No. Lines + No. Reflown Lines (T=Traverse Lines C=Control Lines)	Production km (+ Reflight km)
November 21	Monday	FLT022	5.6	7T, 3C	566.1
Geomag:	Quiet.				
Weather:	Snowy and windy in the morning.				
Remarks:	Take off delayed by weather. Production flight comprised of two sorties.				
November 22	Tuesday	FLT023	3.3	6T	240.5
Geomag:	Quiet.				
Weather:	Unusually warm with periods of snow.				
Remarks:	One flight aborted due to poor weather. Flight in the afternoon.				
November 23	Wednesday	FLT024	3.2	6T	233.2
Geomag:	Quiet.				
Weather:	Strong winds and unusually warm.				
Remarks:	Low clouds and icing conditions in the morning. Flight in the afternoon.				
November 24	Thursday	FLT025	3.2	6T	225.9
Geomag:	Quiet.				
Weather:	Clear.				
Remarks:	Late start due to fuel from main tanker being empty, requiring setup of fuelling equipment to facilitate working with drums. Flight in the afternoon.				
November 25	Friday	N/A	N/A	N/A	N/A
Geomag:	Quiet.				
Weather:	Unusually warm with low clouds.				
Remarks:	No flight due to low clouds and icing conditions.				
November 26	Saturday	FLT026	5.0	14T	498.7
Geomag:	Quiet.				
Weather:	Cloudy.				
Remarks:	Production flight comprised of two sorties.				
November 27	Sunday	FLT027	4.9	1T + 10T, 1C	34.2 + 425.0
Geomag:	Quiet.				
Weather:	Clear skies.				
Remarks:	Production flight comprised of two sorties. Majority of lines were reflights flown to improve data quality.				

Block name:	Summit Creek	Total Size of Survey:	9297.0	km	
Line spacing:	Traverse: 600m Control: 2400m	Total to Date:	9297.0	km	
Client:	Husky Oil Operations Limited	Production this Week:	1798.6	km	
Aircraft:	C-GSGH	Total Remaining:	0	km	
Project Name: Husky Summit Creek Aerogravity Survey 2005 Project ID#: 9228-H006-001E		% Complete:	100	%	
Date	Day	Flight No.	Flight Time (hours)	No. Lines + No. Reflown Lines (I=Traverse Lines C=Control Lines)	Production km (+ Reflight km)
November 28	Monday	FLT028	3.0	0 + 5	0 + 223.6
Geomag:	Quiet.				
Weather:	Partly cloudy.				
Remarks:	Final flight for the survey. All lines were reflights flown to improve final quality.				
November 29	Tuesday				
Geomag:	Quiet.				
Weather:	Light snow intermittent.				
Remarks:	All data accepted by Erwin Ebner. Demobilization commenced.				
November 30	Wednesday				
Geomag:	N/A.				
Weather:	N/A.				
Remarks:	Helicopter departed Keele River camp. Gerry McGrath, Michael Laneville and survey equipment departed Keele River camp via Norman Wells, NT.				
December 01	Thursday				
Geomag:	N/A.				
Weather:	N/A.				
Remarks:	N/A.				
December 02	Friday				
Geomag:	N/A.				
Weather:	N/A.				
Remarks:	N/A.				
December 03	Saturday				
Geomag:	N/A.				
Weather:	N/A.				
Remarks:	N/A.				
December 04	Sunday				
Geomag:	N/A.				
Weather:	N/A.				

## 8. PERSONNEL

<b>Surveying</b>	<b>1</b>	<b>Party Chief\Geophysicist</b>
	<b>1</b>	<b>Geophysicist</b>
	<b>1</b>	<b>Aircraft Mechanic</b>
	<b>1</b>	<b>Technician</b>
	<b>1</b>	<b>Helicopter Pilot</b>
	<b>1</b>	<b>Helicopter Co-Pilot / Operator</b>
<b>Husky QC</b>	<b>1</b>	<b>ELS Consulting</b>
<b>TOTAL PERSONNEL</b>	<b>7</b>	

## 9. EQUIPMENT

SURVEY AIRCRAFT AND EQUIPMENT	
Aircraft Used:	Helicopter EUROCOPTER AS-350 B3 (C-GSGH)
Radar Altimeter:	King
Laser Altimeter:	Riegl optech scanner (LD90-3i)
Barometric Sensor:	Sensotec
Gravimeter (Air):	Geometrics G-822A Caesium
GPS Receiver (Air):	C-DAC: NovAtel OEM4-G2 GPS Receiver for FLT004 - 028 G-DAC: NovAtel Millennium GPS Receiver
DGPS Receiver (Air):	Omnistar 3000LR GPS Receiver
GPS Receiver (Local Ground):	NovAtel Millennium, 12 channels
GPS Receiver (Local Ground):	NovAtel Millennium, 12 channels

## 10. GRAVITY PROCESSING

### Gravity Data

Gravity data are recorded at 128 Hz. Accelerations are filtered and decimated to match GPS measurements using specially designed filters to avoid biasing the data. Gravity is calculated by subtracting the GPS derived aircraft accelerations from the inertial accelerations. In survey flying, accelerations in an aircraft can reach 0.1 G, equivalent to 100,000 mGal. Data processing must extract gravity data from this very noisy environment. This is achieved by modeling the movements of the aircraft in flight by extremely accurate GPS measurement. The calculated gravity is corrected for the Eötvös effect and normal gravity and the sample interval is reduced to 2 Hz. These operations are all performed by SGL's proprietary GRAVGPS software.

The following standard corrections were applied to the gravity data to calculate the Bouguer anomaly data:

- a) Eötvös correction,  $g_{\text{Eötvös}} = -v_x^2 \cos \Phi / [(r + h) \cos \Phi] - 2 \cdot 0.00007292115 \cos \Phi v_x - v_y^2 / (r + h)$ , where  $\Phi$  is the latitude of the aircraft,  $v_x$  and  $v_y$  are the velocities of the aircraft in the x (north) and y (east) direction,  $r$  is the Earth's radius at the latitude  $\Phi$ , and  $h$  is the altitude of the plane above the GRS-80;
- b) Normal gravity,  $g = 9.7803267714(1 + 0.00193185138639 \sin^2 \Phi) / \sqrt{1 - 0.00669437999013 \sin^2 \Phi}$ , where  $\Phi$  is the latitude of the aircraft;
- c) Free air correction,  $g_{\text{fa}} = -0.3086h$ , where  $h$  is height of the aircraft in meters;
- d) Bouguer,  $g_{\text{sb}} = 2\pi\gamma\rho h = 0.041925\rho h$ , where  $\gamma$  is the Universal Gravity constant,  $\rho$  is density for this project (2.3, and 2.67 g/cm<sup>3</sup>), and  $h$  is height of the ground below the aircraft in meters;
- e) Curvature of the earth,  $g_{\text{ec}} = 1.464 h - 0.3533 h^2 + 0.000045 h^3$ , where  $h$  is height of the ground in kilometers;
- f) Terrain,  $g_{\text{t}}$ . See below for a description of the terrain correction technique;
- g) Static correction,  $g_{\text{sc}}$ , based on static ground recordings and repeat lines;
- h) Level correction,  $g_{\text{lc}}$ , based on line intersections.

Thus Bouguer anomaly =  $G - g_{fa} - g_{sb} - g_{ec} + g_t - g_{sc} - g_{lc}$ , where  $G$  is the calculated gravity adjusted for Eötvös effect and normal gravity.

### **Terrain Corrections**

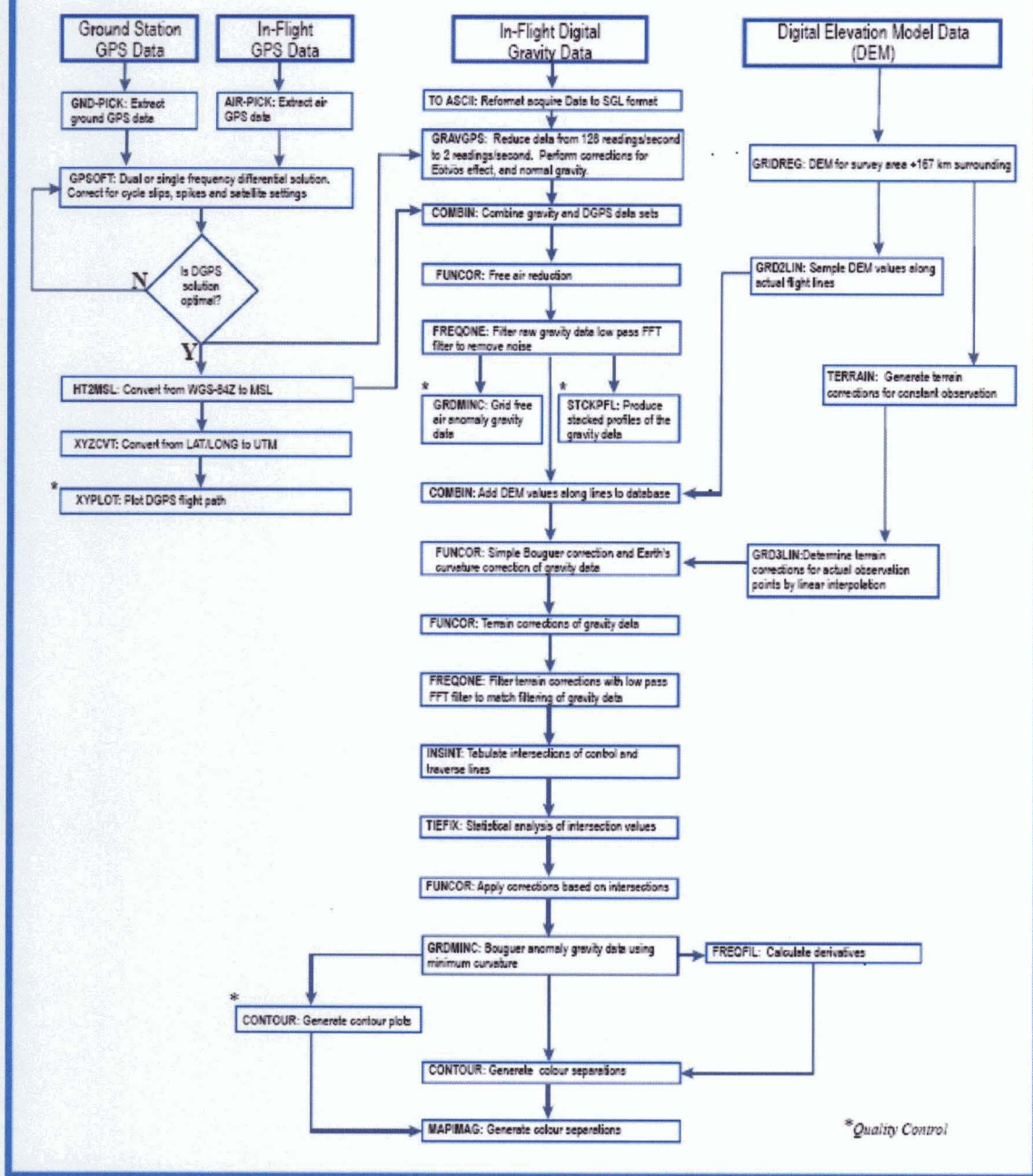
Terrain corrections were computed using terrain derived by joining the high-resolution LIDAR grid supplied by Husky, the computed terrain from the merged radar and laser altimeter data, and Canadian Digital Elevation Data grids (<http://www.geobase.ca/geobase/en/data/cded1.html>) for coverage outside the survey area up to 160 km from the survey block for accurate regional corrections. Terrain corrections were computed using software developed for SGL by the University of Calgary Geomatics department. The algorithm calculates terrain corrections using 2D FFT methods with a constant density. The terrain and Bouguer corrections were calculated using densities of 2.3 g/cm<sup>3</sup>, and 2.67 g/cm<sup>3</sup>. Paper maps were created using the same densities.

### **Leveling and Gridding**

The gravimetric data were leveled to compensate for instrument variations in two steps. A single constant shift determined from ground static recordings was applied on a flight-by flight basis. Control line intersection statistics were then used to calculate shifts for individual lines. The AIRGrav system is very stable so the control line leveling adjustments are small, typically within +/-0.5 mGal. Grids of the free air and Bouguer anomaly were generated by filtering the line data to remove high frequency noise, gridding using minimum curvature algorithm and filtering using a 2-d FFT based grid filter.

A gravity processing flowchart is presented below

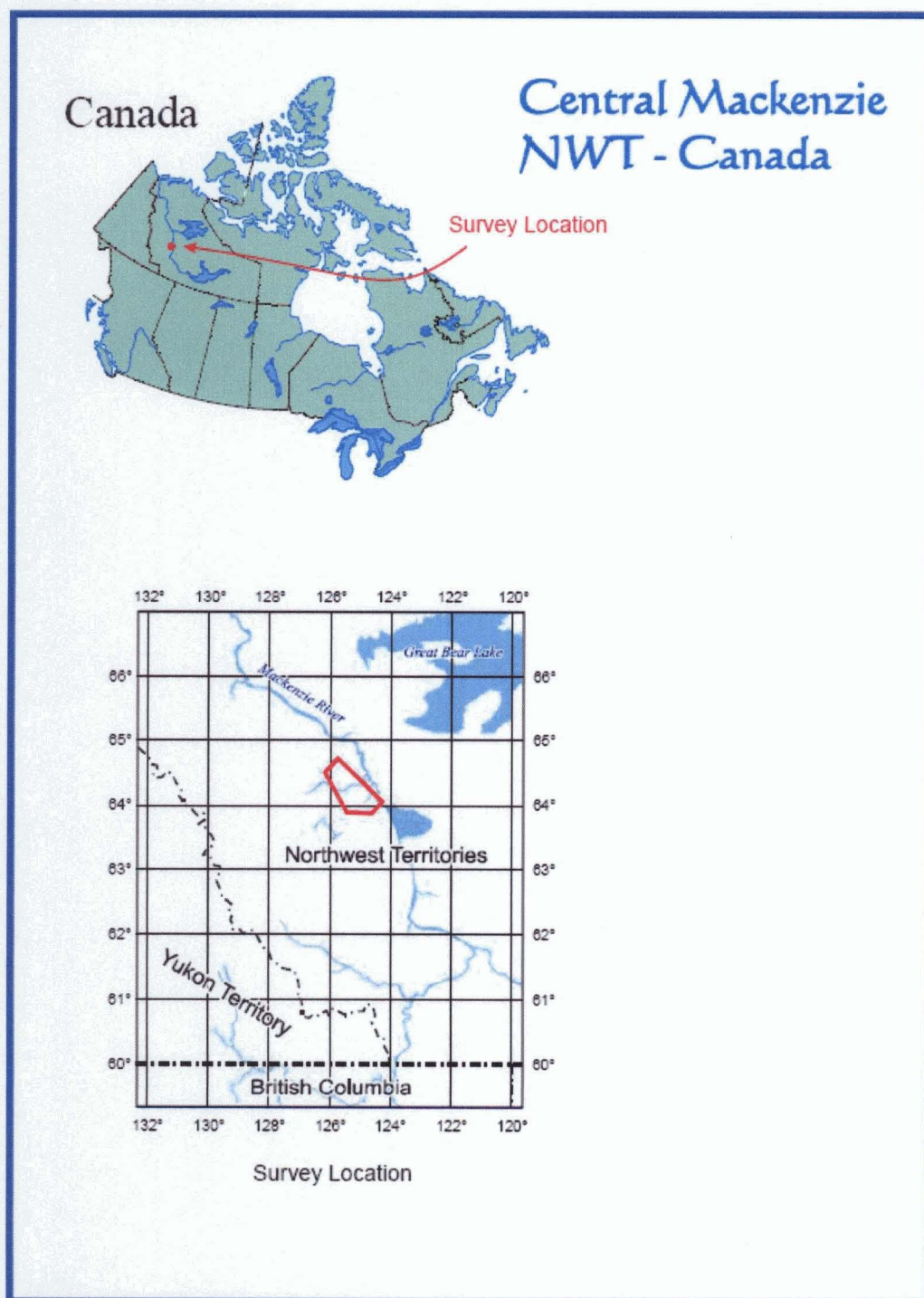
## GRAVITY DATA PROCESSING



## 11. GRAVITY INTERPRETATION

The survey was designed to better map the structural trends within the Summit-Keele-Redstone area. The gravity data is very good quality and has helped define the major structural features of the area. The Bouguer gravity (Fig 2) clearly defines a regional low to the north getting progressively higher to the south. The sub-basin (A) narrows as it goes south, with a significant narrowing at the Keele river. The northern end of this sub-basin is expected to coincide with the Gambil Mountains, which were not covered by this survey. The high gravity feature on the west side of the program (B) correlates well to the Red Dog structural anticline, which places Hume and Bear Rock at outcrop. On the SE side of the program there is a large high gravity feature (C). This may be an expression of the paleo-Keele arch. The narrow feature to the south (D) appears to be the north plunging end of the Dahadinni - Haywood structural trend.

Figure 1: Map of Survey Area Showing Survey Block



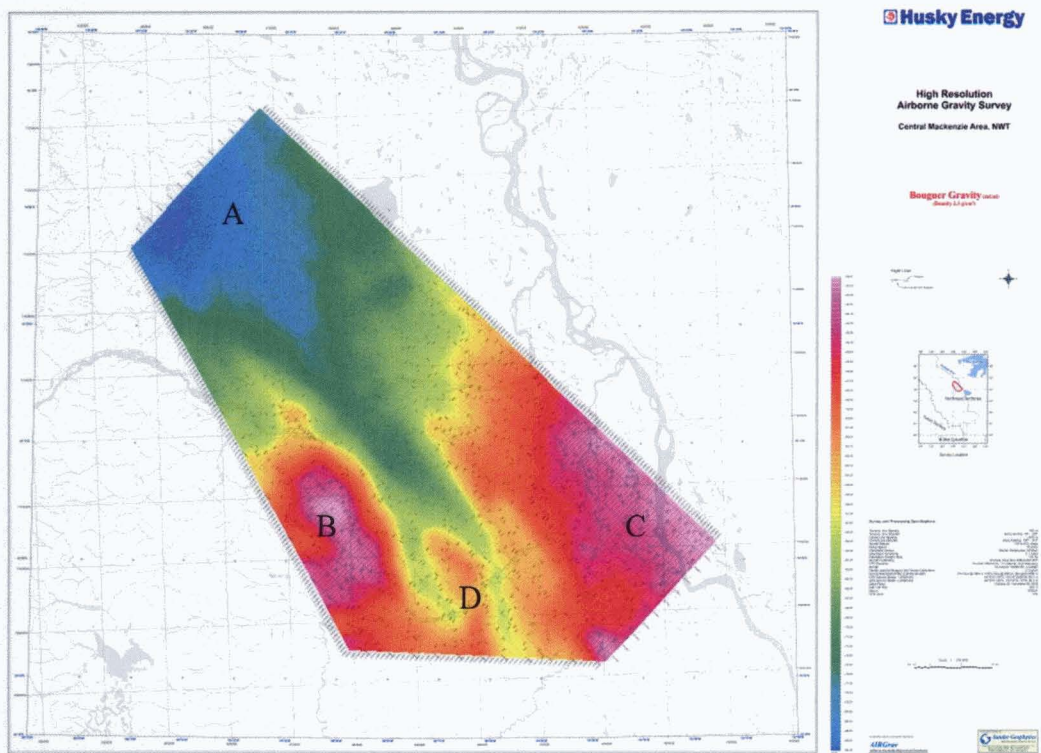
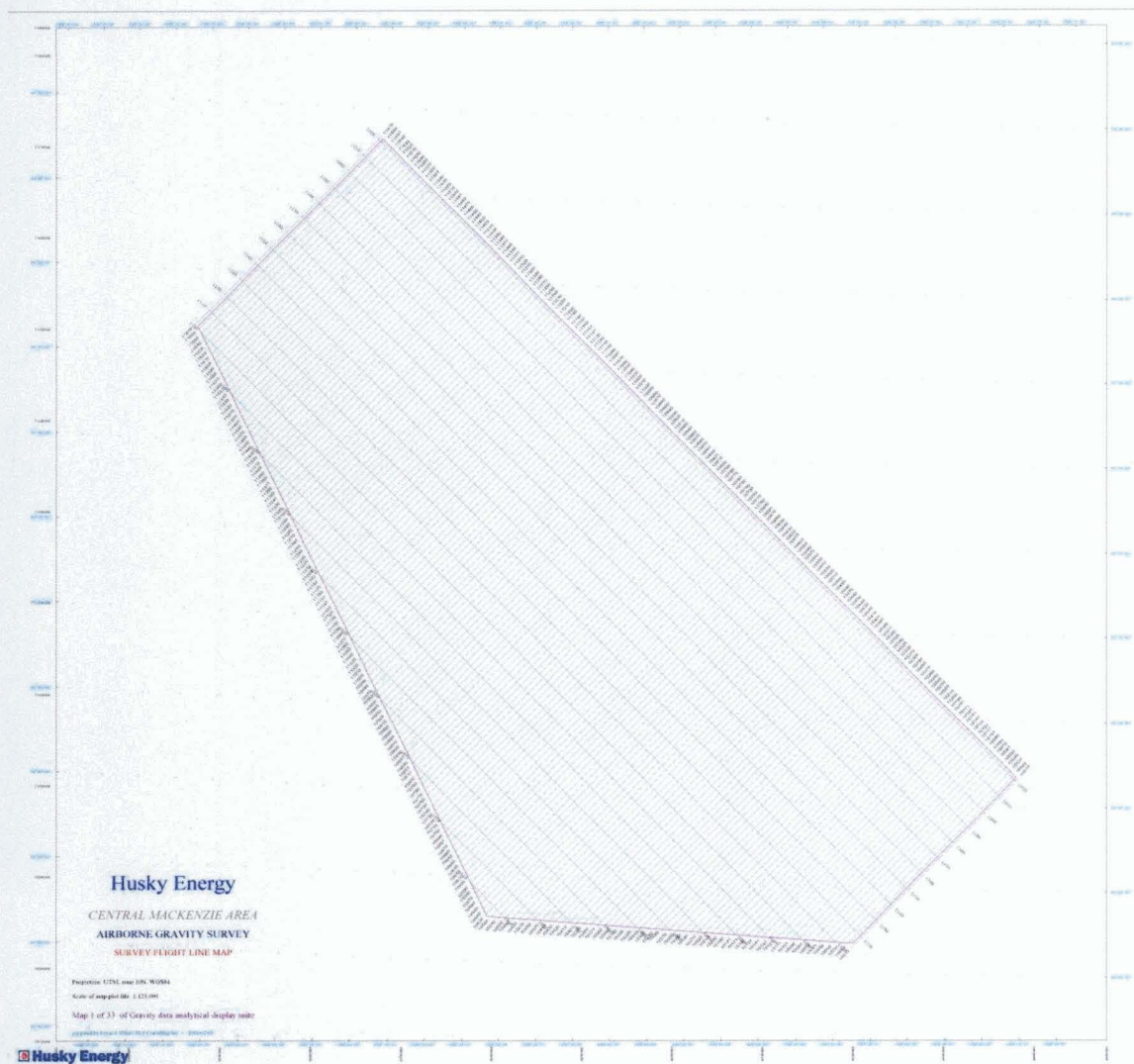
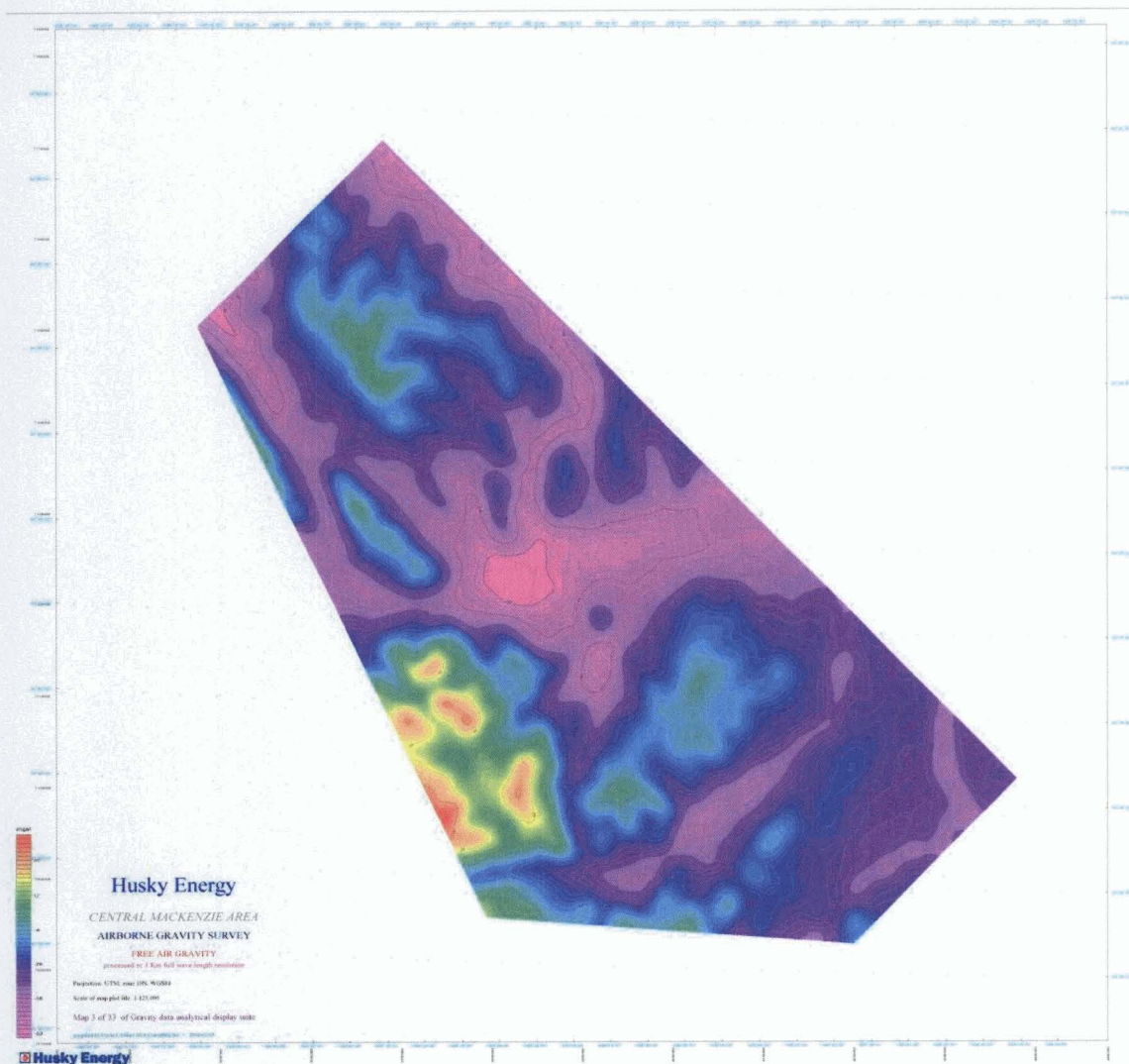


Figure 2 (Bouguer Gravity, Density 2.3 g/cm<sup>3</sup>)





**Figure 4 (Flightpath)**



**Figure 5 (Free Air Gravity)**