Technical Report

Fixed-wing Aeromagnetic Survey over the Frances Lake Area

Yukon, Canada
2016

for

Natural Resources Canada

Sander Geophysics Limited
260 Hunt Club Road
Ottawa, ON Canada K1V 1C1

Tel: +1 613.521.9626
Fax: +1 613.521.0215
www.sgl.com

PROFESSIONAL GEOSCIENTIST
MARTIN P. BATES
PRACTISING MEMBER
2330
ONTARIO

26th July 2016

Martin Bates, Ph.D., P.Geo

Andrew Palmer, Ph.D.

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY 1

2. INTRODUCTION 2

3. SURVEY AREA 4

Survey Area Map 4
Survey Boundary 8

4. SURVEY SPECIFICATIONS 9

Data Recording 9
Technical Specifications 9
Flight Line Specifications 9
Survey Ground Speed 10
Terrain Clearance 10

5. SURVEY EQUIPMENT 11

Airborne Navigation and Data Acquisition System 11
Aerial and Ground Magnetometers 11
Magnetic Compensation System 11
Reference Station Acquisition System 11
Reference Station and Airborne Acquisition System GPS Receivers 12
Digital Video System 12
Altimeters 13
Air Temperature Sensor 13
Survey Aircraft 14
Data Processing Hardware and Software 14

6. SYSTEM TESTS 15

Magnetometer System Tests 15
Magnetometer Heading Test 15
Compensation Calibration 20
Instrumentation Lag 24
Altimeter System, Position And Digital Terrain Model Tests 27
Radar And Laser Altimeter Calibration 27
Altimeter Comparison 31
Stationary Aircraft GPS Position Test 32

7. FIELD OPERATIONS 34

Reference Stations 35
Re-flights 35
Field Personnel 38

8. DIGITAL DATA COMPILATION 39

Magnetometer Data 40
Positional Data 43
Radar, Barometric, and Laser Altimeter Data 44

9. FIELD PRODUCTS 45

Field Delivery 45

10. FINAL PRODUCTS 47

Magnetic Line Data Format 47
Digital Grids 48

LIST OF FIGURES

Figure 1: Survey Area with map sheet boundaries overlayed 5
Figure 2: Survey Area Flight Lines 7
Figure 3: Compensation calibration test, C-GSGR February 18th 2016 21
Figure 4: Compensation calibration test, C-GSGX February 18th 2016 21
Figure 5: Compensation calibration test, C-GSGR March 2nd 2016 22
Figure 6: Compensation calibration test, C-GSGX March 3rd 2016 22
Figure 7: Compensation calibration test, C-GSGR April 10th 2016 23
Figure 8: Compensation calibration test, C-GSGX April 10th 2016 23
Figure 9: Instrumentation lag test, C-GSGR February 5th 2016 25
Figure 10: Instrumentation lag test, C-GSGX February 23rd 2016 25
Figure 11: Instrumentation lag test, C-GSGR March 27th 2016 26
Figure 12: Instrumentation lag test C-GSGX March 28th 2016 26
Figure 13: Magnetic sensor comparison test, March 2nd 2016 27
Figure 14: Altimeter test, C-GSGR March 2nd 2016 28
Figure 15: Altimeter test, C-GSGX February 23rd 2016 29
Figure 16: Altimeter test, C-GSGR April 19th 2016 29
Figure 17: Altimeter test, C-GSGX April 19th 2016 30
Figure 18: Altimeter Comparison Test Line Location Superimposed on Google Earth 31
Figure 19: Altimeter Comparison Test Profile Data, C-GSGR March 2nd 2016 31
Figure 20: Altimeter Comparison Test Profile Data, C-GSGX March 3rd 2016 32
Figure 21: Stationary aircraft GPS position test, UTM-X 32
Figure 22: Stationary aircraft GPS position test, UTM-Y 33
Figure 23: Stationary aircraft GPS position test, GPS-Z 33
Figure 24: Magnetometer data field processing flowchart 39
Figure 25: Second vertical derivative of the levelled magnetic field grid before introduction of pseudo-control lines (left) and the results after introduction of pseudo-control lines (right) 41
Figure 26: Positional data processing flowchart 43

LIST OF TABLES

Table 1: Simplified Survey Boundaries (datum NAD-83, projection UTM 9N) 8
Table 2: Flight line specifications 9
Table 3: Magnetometer heading pre-survey test for C-GSGR 16
Table 4: Magnetometer heading pre-survey test for C-GSGX 17
Table 5: Magnetometer heading post-survey test for C-GSGR 18
Table 6: Magnetometer heading post-survey test for C-GSGX 19
Table 7: Magnetic compensation calibration tests and results 20

Table 8: Aircraft parking locations 35
Table 9: Locations of reference stations 35
Table 10: Re-flight list 36
Table 11: Survey field crew 38
Table 12: Ellipsoid parameters for WGS-84 44
Table 13: Ellipsoid parameters for NAD-83 44
Table 14: Datum conversion parameters from NAD-83 to WGS-84 44
Table 15: Format of aeromagnetic data delivered from the field 45
Table 16: Format of reference station magnetic data delivered from the field 46
Table 17: Format of terrain data delivered during post-processing 46
Table 18: Final Database Channel Description 47
Table 19: Delivered digital grids 48

LIST OF PICTURES

Picture 1: Typical scenery found in the survey area 2
Picture 2: Local wildlife 2
Picture 3: Local scenery 4
Picture 4: View from the survey aircraft 8
Picture 5: Preparing the aircraft for a survey flight 10
Picture 6: Reference station setup 12
Picture 7: GPS antenna 13
Picture 8: C-GSGX at Watson Lake airport 14
Picture 9: View from aircraft of survey block 34
Picture 10: In front of the Watson Lake airport terminal 38

Appendix

I. Sander Geophysics Company Profile
II. Planned Survey Lines
III. Flown Survey Lines
IV. Survey Equipment List
V. Survey Aircraft
VI. Weekly Reports
VII. *Low Pass Filter Charts*

1. EXECUTIVE SUMMARY

Sander Geophysics Limited (SGL) conducted a fixed-wing high resolution aeromagnetic survey in the Yukon Territory for Natural Resources Canada. Please refer to *Appendix I* for a Company Profile of SGL.

The survey was flown using two SGL Britten-Norman BN-2 Islanders, registrations C-GSGR and C-GSGX. Production flights commenced on March 2, 2016 and data acquisition was completed on April 11, 2016. A total of 76 flights were flown during the survey to complete the planned 31,165 line kilometres; 35 were flown with C-GSGR and 41 with C-GSGX. The survey operations were conducted from Watson Lake Airport (CYQH), Watson Lake, Yukon.

The traverse lines are oriented N67.5°E and spaced at 400 m, while the control lines are oriented at N157.5°E and spaced at 2,400 m. A drape surface was created taking into account the terrain and the performance of the aircraft at the modelled altitudes and estimated temperature. The survey was flown with a target clearance of 120 m above ground level. The average ground speed was 127 knots.

2. INTRODUCTION

This report describes the survey that Sander Geophysics Limited (SGL) flew for Natural Resources Canada in the late winter and early spring of 2016 over the Frances Lake area of Yukon.

Magnetic data were gathered during this survey. The instruments used to collect the data are described in this report as well as the tests performed to ensure optimal data quality.

Picture 1: Typical scenery found in the survey area

The Digital Data Compilation section details all processing performed from data acquisition to final product creation.

The Field Operations section contains all information relating to operations at the survey location including the airport used, reference station coordinates and any problems encountered during the survey. Re-flights are listed as well as field crew members.

One page colour maps of all the survey data types which are included in the appendices, give a meaningful overview of the extensive data gathered.

Picture 2: Local wildlife

The following Project Brief gives a quick reference of the details of the survey.

Project Brief

Survey Title	Fixed-wing Aeromagnetic Survey over the Frances Lake Area
Client:	Natural Resources Canada
Survey Location:	Frances Lake Area, Yukon, Canada
Survey Start Date:	March 2, 2016
Survey End Date:	April 11, 2016
Contact:	Frank Kiss (frank.kiss@canada.ca)
Technical Inspector:	Frank Kiss (frank.kiss@canada.ca)
Field Office Location:	Watson Lake, Yukon, Canada
Airport Used:	Watson Lake Airport (CYQH)
Aircraft Type:	Britten-Norman BN-2 Islander
Total line kilometres:	31,165
Survey Flying Particulars	
Traverse Lines	
Line numbers:	1001 to 1523
Line direction:	N67.5°E
Line spacing:	400 m
Control Lines	
Line numbers:	101 to 129
Line direction:	N157.5°E
Line spacing:	2,400 m
Survey Altitude:	smoothed drape with target height of 120 m above ground.
Digital Terrain Source:	CDED (geobase.ca)
Number of Flights (numbers):	76 (1001-1035; 2001-2041)
Average Aircraft Ground Speed	127 knots
Data	
Survey Base Parking Location (WGS-84):	W128°49'18.3317" N60°06'50.2370" 684.80 m W128°49'17.9696" N60°06'51.3293" 684.80 m
Base Station Locations (WGS-84)	GND1: W128°48'38.2813" N60°07'05.0123" 688.340 m GND2: W128°48'38.2236" N60°07'04.9796" 688.357 m
Delivery Datum:	NAD-83
Projection:	UTM-9N

3. SURVEY AREA

The survey area covers Frances Lake and the valley in which it is enshrined. The region is covered by extensive boreal forests, and a network of feeder rivers for the lake. The vegetation cover varies from tall spruce trees along the lake shores to dwarf trees on the steep valley slopes.

The terrain variations within the block are significant; the valley floor is around 700 m above mean sea level (MSL) at its lowest point, and the mountains along the eastern edge of the valley reach higher than 2100 m above MSL.

Picture 3: Local scenery

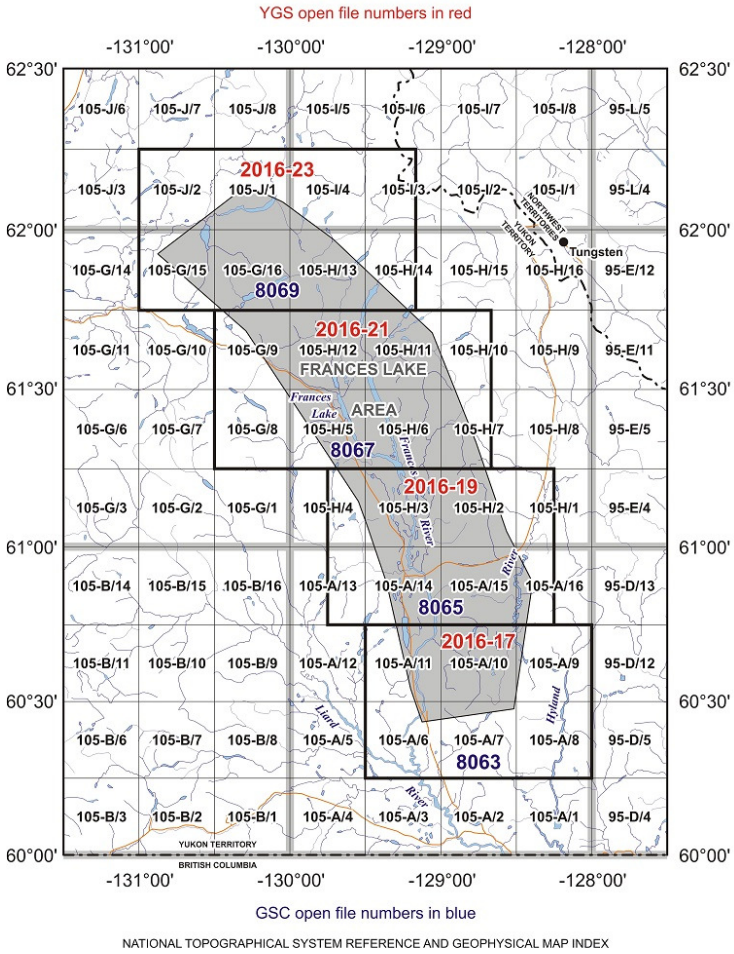
There is limited human presence within the block. The Robert Campbell Highway (Yukon Highway 4) runs through the valley to the West of Frances Lake, and a road maintenance camp is located at the intersection of Highway 4 and the Nahanni Range Road.

At the beginning of the survey the weather in the survey area was cold with occasional snow flurries. Over the course of the survey temperatures warmed up resulting in occasional rain showers. Typical average daily temperatures ranged from around -10° C to 6° C at the lowest altitude.

Survey Area Map

The survey was flown as a single block. *Figure 1* shows the geographical location of the survey area. The planned survey lines are illustrated in *Figure 2* and listed in *Appendix II*. The flown lines are listed in *Appendix III*.

SHADED RESIDUAL TOTAL MAGNETIC FIELD



SHADED FIRST VERTICAL DERIVATIVE OF THE MAGNETIC FIELD

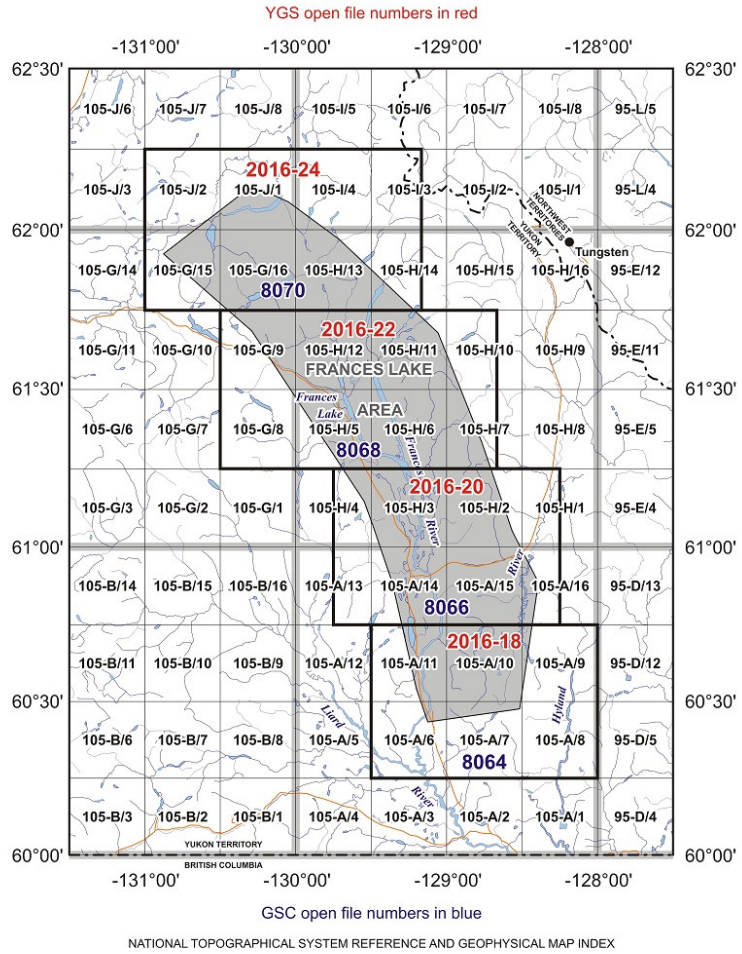


Figure 1: Survey Area with map sheet boundaries overlayed

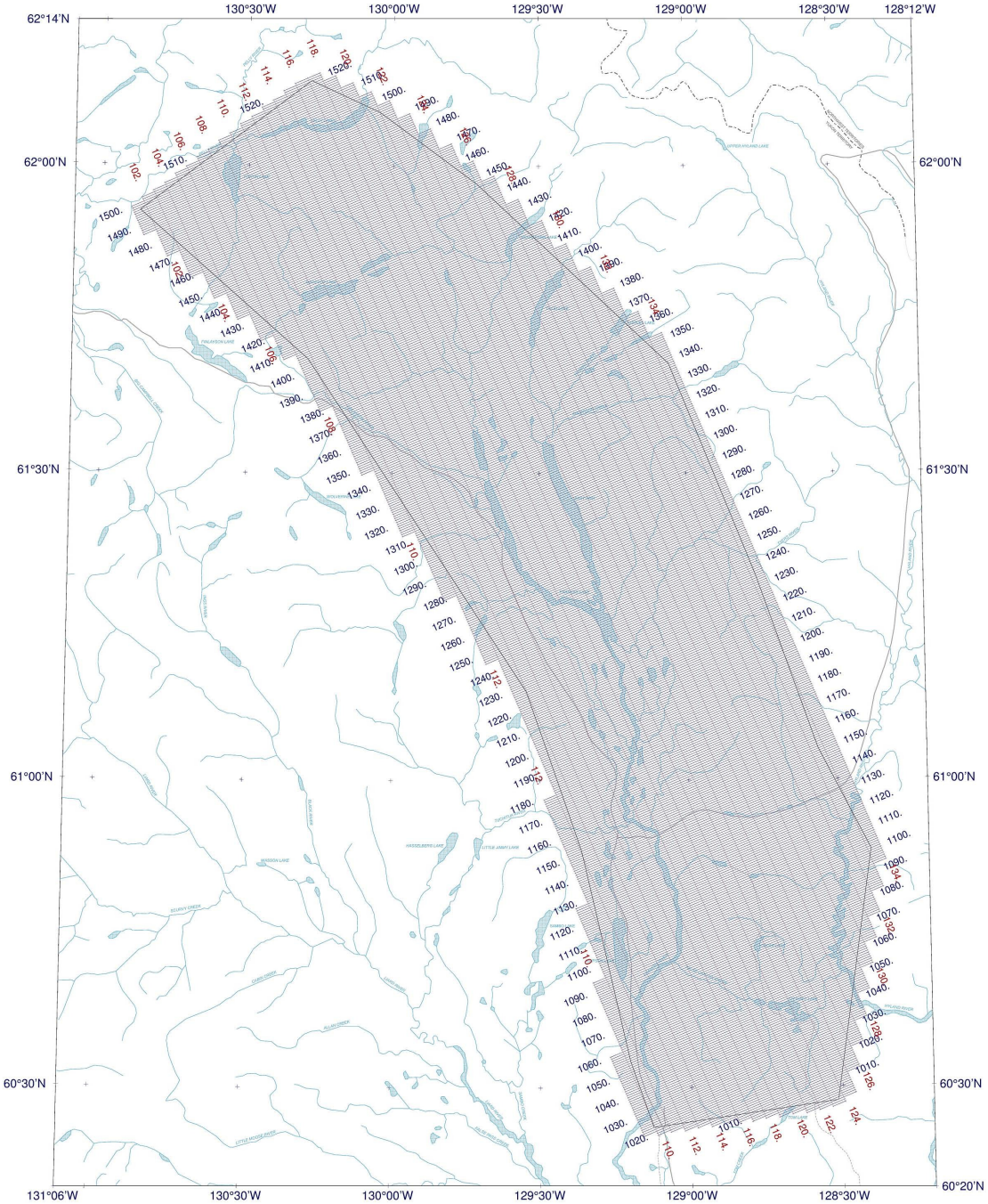


Figure 2: Survey Area Flight Lines

Survey Boundary

The block is bounded by the coordinates provided in *Table 1.*

Table 1: Simplified Survey Boundaries (datum NAD-83, projection UTM 9N)

Easting (m)	Northing (m)
431719	6839887
401633	6867313
432957	6890264
445258	6884373
462616	6871203
497008	6838407
512375	6800083
523466	6768547
532916	6750283
526594	6704670
493100	6699880
488972	6711890
480455	6750043
473537	6770683
470650	6779153
460494	6795017
431719	6839887

Picture 4: View from the survey aircraft

4. SURVEY SPECIFICATIONS

Data Recording

In the aircraft:

- GPS positional data (time, latitude, longitude, altitude and raw range from each satellite being tracked) 10 readings per second (10 Hz);
- Altitude as measured by the barometric altimeter at 10 readings per second (10 Hz);
- Terrain clearance as measured by the radar altimeter at 10 readings per second (10 Hz);
- Terrain clearance as measured by the laser rangefinder at 3.3 readings per second (3.3 Hz);
- Total magnetic field recorded at 160 readings per second (160 Hz);
- Outside air temperature at 10 readings per second (10 Hz);
- Digital video at 30 frames per second (30 Hz).

At the base and remote magnetic/GPS reference stations:

- Total magnetic field at 11 readings per second (11 Hz);
- GPS positional data (time, latitude, longitude, and raw range from each satellite being tracked) at 10 readings per second (10 Hz).

Technical Specifications

The following technical specifications were adhered to:

- The noise level of the airborne magnetometer may not exceed an envelope of +/- 0.10 nT.
- Diurnal variations must not exceed a maximum peak to peak deviation from a linear chord of 3 nT over a period of one (1) minute or less from each base station.
- Continuous or pseudo-continuous micropulsation activity should not exceed a deviation from a linear chord of 0.5 nT over a period of fifteen seconds for each base station.
- Deviation from theoretical lines must not exceed 100 m at any point, subject to safety considerations.
- All traverse lines must intersect a minimum of two control lines.
- All control lines must intersect a minimum of two traverse lines.
- No gaps will be accepted in final products.
- When a traverse line or control line is flown in segments, the amount of segment overlap should be minimized and must intersect a common control or traverse line respectively.
- Aircraft elevation must not deviate from a window of +/-15 meters, subject to safety considerations.

Flight Line Specifications

The survey area flight line specifications are listed in the following table. The line direction is with respect to the UTM zone reference frame.

Table 2: Flight line specifications

	Line Direction	Line Spacing (m)
Traverse Lines	N67.5°E	400
Control Lines	N157.5°E	2,400

Survey Ground Speed

The survey average ground speed was 127 knots.

Terrain Clearance

A pre-planned drape surface was prepared for the survey to guide the aircraft over the topography in a consistent manner, as close to the minimum clearance as possible. The drape surface was prepared with Canadian Digital Elevation Data (CDED) for the area in question (geobase.ca). Spot heights of the mountains in the survey block were obtained from National Topographic System (NTS) maps sheets, available from Natural Resources Canada (http://www.nrcan.gc.ca/earth-sciences/geography/topographic-information/maps/9765). Where the spot heights were higher than the heights indicated on the CDED grid, they were replaced with the NTS spot height for the given peak. The DEM included an extension beyond the survey boundary to allow the aircraft to achieve the drape clearance before coming on line.

The drape surface created used a climb and descent rate of 304 ft/nm at all altitudes. This is equivalent to a 5% climb gradient. The temperature component used for the calculation was based on published weather history. The gentle drape surface created was below the maximum climbing and descending capabilities of the survey aircraft and guided the aircraft as close to the target height of 120 m above the terrain as possible in all locations whilst retaining reasonable safety margins.

Picture 5: Preparing the aircraft for a survey flight

5. SURVEY EQUIPMENT

SGL provided the following instrumentation for this survey; see *Appendix IV* for further details:

Airborne Navigation and Data Acquisition System

Sander Geophysics Data Acquisition System (SGDAS)

The SGDAS is the latest version of airborne navigation and data acquisition computers developed by SGL. It is the data gathering core for all the different types of survey data. The computer incorporates an altimeter analog to digital converter and a NovAtel GPS multi-frequency receiver (see the GNSS and GPS Receivers section below for the details) which automatically provides the UTC time base for the recorded data. The system acquires the different data streams from the sensors and receives and processes GPS signals from the GPS antenna. Navigation information from the navigation side of the computer guides the pilots along the pre-planned flight path in all three dimensions. Profiles of the incoming data are displayed in real-time to the pilots for continuous monitoring. The data are recorded in database format on redundant solid-state data storage modules.

Aerial and Ground Magnetometers

Geometrics G-822A

Both the ground and airborne systems used a non-oriented (strap-down) optically-pumped cesium split-beam sensor. These magnetometers have a sensitivity of 0.005 nT and a range of 20,000 to 100,000 nT with a sensor noise of less than 0.0005 nT. The airborne sensor was mounted in a fibreglass stinger extending from the tail of the aircraft. Total magnetic field measurements were recorded at 160 Hz in the aircraft, then later down sampled to 10 Hz in the processing. The ground systems recorded magnetic data at 11 Hz.

Magnetic Compensation System

Sander Geophysics AIRComp

SGL's own hardware and software system, AIRComp, was used to remove the effects of the aircraft and its manoeuvres from the recorded magnetic data. This system records the magnetic field measured by up to 4 cesium magnetometers, as well as the three axis output of a fluxgate magnetometer. These data are recorded for post-processing. Calibration of the magnetic effects of the aircraft is carried out as described in section 6, System Tests. Coefficients to be used for compensation are derived by processing the calibration flight data. The compensation coefficients are applied to data recorded during normal survey operations to produce compensated magnetic data.

Reference Station Acquisition System

Sander Geophysics MSGRef

The MSGRef (mini SGRef) consists of a data acquisition computer and a GPS receiver (see the GPS Receiver section below for the details). All data are displayed on an LCD flat panel monitor. The GPS data, sampled at 10 Hz, are recorded on the internal hard drive of the computer and the removable hard drive simultaneously for transfer to the processing computers in the field office. The entire reference data acquisition system is fully automatic and was set for unattended recording.

Picture 6: Reference station setup

Reference Station and Airborne Acquisition System GPS Receivers

NovAtel OEM4 receiver boards

The OEM4 is a high performance, high accuracy, dual-frequency GPS receiver that is capable of receiving and tracking the L1 C/A code, L1 and L2 carrier phase, and L2 P-code (or encrypted Y-code) of up to 24 GPS satellites. This receiver was employed on the airborne and reference stations systems. The GPS data are recorded at 10 Hz.

Digital Video System

Sander Geophysics SGDIS - Digital Imaging System

The video camera is mounted in the floor of the aircraft and oriented to look vertically below while in flight. The system automatically records the position, time (fiducials), line and flight number on the video. The data are stored, by flight line, in avi format, viewable by any commercial media player.

Picture 7: GPS antenna

Altimeters

SGLas-P - Riegl LD90-31K-HiP Laser Rangefinder

The Riegl laser altimeter uses a single optical laser beam to measure distance to the ground. It is effective over water and is eye safe. This profilometer has a range of 1500 m, a resolution of 0.01 m with an accuracy of 5 cm and a 3.3 Hz data rate.

TRT ERT 530A Digital Radar Altimeter

The TRT uses radio wave echoing to determine the height above ground. It will generally "see through" foliage. The TRT radar altimeter has a resolution of 0.5 m, an accuracy of 1%, a range of 1 to 2,440 m and a 10 Hz data rate.

Bendix/King KRA-10A Radar Altimeter

The Bendix-King radar altimeter has a resolution of 0.5 m, an accuracy of 5%, a range of 6 to 760 m, and a 10 Hz data rate. This system is employed as a backup system and not actively employed for survey guidance or data processing.

Sensotec Digital Barometric Pressure Sensor

The barometric pressure sensor measures static pressure to an accuracy of ± 4 m and resolution of 2 m over a range up to 30,000 ft above sea level. The barometric altimeter data is sampled at 10 Hz.

Air Temperature Sensor

Omega RTD-805 Outside Air Temperature Probe

The outside air temperature is measured at 10 Hz with a resolution of 0.1 °C. The temperature sensor has a range of +/-100 °C and an accuracy of +/-0.2 °C. The temperature sensor is mounted in an air inlet duct at the point where the wing strut attaches to the right hand wing.

Survey Aircraft

Britten-Norman BN2B-21 Islander (C-GSGR and C-GSGX)

The BN2B Islander is an all metal, high wing, twin-engine, short take-off and landing aircraft powered by two fuel injected engines which drive constant speed, fully feathering propellers. The aircraft has fixed tricycle landing gear, extendable flaps and manually adjustable trim tabs on the rudder and elevator. The aircraft is equipped with de-icing equipment and sufficient avionics for instrument flying. There is a camera hole in the belly of the aircraft and provisions for numerous other survey and navigation systems. The airframe has been extensively modified to reduce the magnetic signature of the aircraft by replacing ferromagnetic parts with those made from special non-magnetic stainless steel or aluminum. Several wiring changes have also been made to the electrical system to reduce the magnetic field variations around the aircraft. Other extensive modifications have been made to allow for gravity, spectrometer, LiDAR and methane sensing surveys. Because of its low take-off speed, high wing, ample propeller clearance, and sturdy fixed landing gear, the Islander is capable of operating from relatively short and rough airstrips. Its excellent low speed capabilities enable it to safely contour much steeper terrain than most other fixed-wing aircraft. All survey modifications are certified to meet the requirements of the Canadian Aviation Regulations (CARs). A complete description of this survey aircraft is given in *Appendix V*.

Picture 8: C-GSGX at Watson Lake airport

Data Processing Hardware and Software

Compilation of the data was performed on high performance desktop and laptop computers optimized for data processing tasks. SGL's proprietary geophysical software was used for data processing. A component of the levelling of the airborne magnetic data, using pseudo-control lines, was carried out by the Geological Survey of Canada, part of the Earth Sciences Sector of Natural Resources Canada using Oasis Montaj software by Geosoft Inc.

6. SYSTEM TESTS

Magnetometer System Tests

Magnetometer Heading Test

Tests were performed to measure the heading and absolute magnetometer reading errors of the magnetic system in both of the survey aircraft. The tests were performed by flying a "cloverleaf" pattern over a known point at survey altitude. The cloverleaf consists of four passes over the known point by flying both backward and forward along two perpendicular test lines that intersect at the point. Heading tests were performed prior to the survey and after the conclusion of the survey. All of the tests were conducted at the Geological Survey of Canada (GSC) test range at Morewood, Ontario.

The pre-survey heading tests were performed on February 18th 2016 and the post-survey heading tests were performed on April 19th 2016. The heading test flight lines were pre-planned, and reference ground magnetic data were provided by Natural Resources Canada from the Ottawa magnetic observatory.

The results of the heading tests are presented in *Tables 3* to *6*. The pre-survey test for the aircraft C-GSGR determined an average northwest-southeast heading error of 0.39 nT, an average northeast-southwest heading error of -0.42 nT and an absolute magnetometer offset from the expected value of -19.74 nT. The post-survey test for the aircraft C-GSGR determined an average northwest-southeast heading error of 1.19 nT, an average northeast-southwest heading error of 0.62 nT and an offset of -18.85 nT.

The pre-survey test for the aircraft C-GSGX determined an average northwest-southeast heading error of 0.83 nT, an average northeast-southwest heading error of 0.05 nT and an absolute magnetometer offset from the expected value of -16.57 nT. The post-survey test for the aircraft C-GSGX determined an average northwest-southeast heading error of 0.78 nT, an average northeast-southwest heading error of -0.01 nT and an offset of -15.89 nT.

The heading error remained consistent through the duration of the survey, and is fully corrected in the normal airborne magnetic data during processing.

The absolute magnetometer reading offsets for both aircraft, which are both of the type BN2B-21 Islander, differed from the expected value by more than 10 nT, but remained consistent throughout the survey.

Table 3: Magnetometer heading pre-survey test for C-GSGR

Aircraft type :	BN2B Islander		
Registration :	C-GSGR	Date:	February 18, 2016
Location:	Morewood Test Range, Ontario	Height flown:	1500 feet
		Magnetometer type :	Geometrics G-822A
Organization :	Sander Geophysics Ltd	Sampling rate :	10 Hz
Pilot :	Katherine Svarckopf	Data acquisition system :	Sander SGDAS
Co-Pilot :	Bret Curtis		

Dir	Time that Survey aircraft was over intersection (GMT)	Total Field Value (nT) Recorded in Survey Aircraft over intersection (T1)	Observatory Diurnal Reading at Previous Minute, i.e. Hours + Minutes (T2) from Printout	Observatory Diurnal Reading at Subsequent Minute, i.e. H hours + (M+1) mins (T3) from Printout	Interpolated Observatory Diurnal Reading at Time H hours + M mins + S sec T4=T2+S (T3-T2) / 60	Calculated Observatory Value T5=T4-C*	Error Value T6=T1-T5
NW	16:22:20	53,729.7	54,389.7	54,389.5	54,389.6	53,749.5	-19.8
SE	16:10:37	53,728.1	54,388.3	54,388.1	54,388.2	53,748.1	-20.0
NE	16:16:30	53,727.9	54,388.3	54,388.1	54,388.2	53,748.1	-20.2
SW	16:27:34	53,732.1	54,392.0	54,391.1	54,391.5	53,751.4	-19.3
NW	16:43:24	53,735.6	54,395.0	54,395.0	54,395.0	53,754.9	-19.3
SE	16:33:02	53,732.0	54,392.0	54,392.6	54,392.0	53,751.9	-19.9
NE	16:38:14	53,732.3	54,392.0	54,392.6	54,392.1	53,752.0	-19.7
SW	16:48:43	53,738.9	54,398.3	54,398.9	54,398.8	53,758.7	-19.8
*C is the difference in the total field between the Blackburn Observatory value (O) and the value (B) at the point above the intersection at a given height. 1000 Feet, C=(O-B)=550 nT; 500 Feet, C=638.7 nT					Total	-157.90 nT	
Number of Passes for Average = 8					Average	-19.74 nT	
Average NW-SE Heading Error (T6 NW - T6 SE)				0.39 nT			
Average NE-SW Heading Error (T6 NE - T6 SW)				-0.42 nT			

Table 4: Magnetometer heading pre-survey test for C-GSGX

Aircraft type :	BN2B Islander	Date:	February 18, 2016
Registration :	C-GSGX	Height flown:	1500 feet
Location:	Morewood Test Range, Ontario	Magnetometer type :	Geometrics G-822A
Organization :	Sander Geophysics Ltd	Sampling rate :	10 Hz
Pilot :	Katherine Svarckopf	Data acquisition system :	Sander SGDAS
Co-Pilot :			

Dir	Time that Survey aircraft was over intersection (GMT)	Total Field Value (nT) Recorded in Survey Aircraft over intersection (T1)	Observatory Diurnal Reading at Previous Minute, i.e. Hours + Minutes (T2) from Printout	Observatory Diurnal Reading at Subsequent Minute, i.e. H hours + (M+1) mins (T3) from Printout	Interpolated Observatory Diurnal Reading at Time H hours + M mins + S sec T4=T2+S (T3-T2) / 60	Calculated Observatory Value T5=T4-C*	Error Value T6=T1-T5
NW	19:15:24	53,761.2	54,417.4	54,416.5	54,417.1	53,777.0	-15.8
SE	19:24:58	53,759.5	54,416.5	54,416.6	54,416.6	53,776.5	-17.0
NE	19:10:26	53,757.6	54,414.4	54,415.9	54,415.0	53,774.9	-17.3
SW	19:20:09	53,759.7	54,416.8	54,416.1	54,416.7	53,773.6	-16.9
NW	19:35:02	53,757.6	54,413.9	54,414.8	54,414.0	53,773.9	-16.2
SE	19:44:24	53,761.4	54,417.6	54,419.0	54,418.1	53,778.0	-16.7
NE	19:30:14	53,762.6	54,418.6	54,419.3	54,418.7	53,778.6	-16.1
SW	19:39:52	53,760.4	54,416.7	54,417.2	54,417.1	53,777.0	-16.6
*C is the difference in the total field between the Blackburn Observatory value (O) and the value (B) at the point above the intersection at a given height. 1000 Feet, C=(O-B)=550 nT; 500 Feet, C=638.7 nT					Total	-132.57 nT	
Number of Passes for Average = 8					Average	-16.57 nT	
Average NW-SE Heading Error (T6 NW - T6 SE)				0.83 nT			
Average NE-SW Heading Error (T6 NE - T6 SW)				0.05 nT			

Table 5: Magnetometer heading post-survey test for C-GSGR

Aircraft type :	BN2B Islander	Date:	April 19, 2016
Registration :	C-GSGR	Height flown:	1500 feet
Location:	Morewood Test Range, Ontario	Magnetometer type :	Geometrics G-822A
Organization :	Sander Geophysics Ltd	Sampling rate :	10 Hz
Pilot :	Katherine Svarckopf	Data acquisition system :	Sander SGDAS
Co-Pilot :			

Dir	Time that Survey aircraft was over intersection (GMT)	Total Field Value (nT) Recorded in Survey Aircraft over intersection (T1)	Observatory Diurnal Reading at Previous Minute, i.e. Hours + Minutes (T2) from Printout	Observatory Diurnal Reading at Subsequent Minute, i.e. H hours + (M+1) mins (T3) from Printout	Interpolated Observatory Diurnal Reading at Time H hours + M mins + S sec T4=T2+S (T3-T2) / 60	Calculated Observatory Value T5=T4-C*	Error Value T6=T1-T5
NW	20:10:23	53,742.6	54,401.3	54,401.2	54,401.3	53,761.2	-18.6
SE	19:58:04	53,742.6	54,402.3	54,402.3	54,402.3	53,762.2	-19.6
NE	20:03:58	53,744.0	54,402.6	54,402.4	54,402.4	53,762.3	-18.4
SW	20:15:39	53,742.0	54,401.2	54,401.2	54,401.2	53,761.1	-19.2
NW	20:31:09	53,741.1	54,399.4	54,399.1	54,399.4	53,759.3	-18.1
SE	20:20:46	53,740.7	54,400.6	54,400.2	54,400.3	53,760.2	-19.5
NE	20:25:53	53,741.0	54,399.6	54,399.5	54,399.5	53,759.4	-18.5
SW	20:36:21	53,739.4	54,398.5	54,398.2	54,398.4	53,758.3	-18.9
*C is the difference in the total field between the Blackburn Observatory value (O) and the value (B) at the point above the intersection at a given height. 1000 Feet, C=(O-B)=550 nT; 500 Feet, C=638.7 nT					Total	-150.79 nT	
Number of Passes for Average = 8					Average	-18.85 nT	
Average NW-SE Heading Error (T6 NW - T6 SE)				1.19 nT			
Average NE-SW Heading Error (T6 NE - T6 SW)				0.62 nT			

Table 6: Magnetometer heading post-survey test for C-GSGX

Aircraft type :	BN2B Islander		
Registration :	C-GSGX	Date:	April 19, 2016
Location:	Morewood Test Range, Ontario	Height flown:	1500 feet
		Magnetometer type :	Geometrics G-822A
Organization :	Sander Geophysics Ltd	Sampling rate :	10 Hz
Pilot :	Bret Curtis	Data acquisition system :	Sander SGDAS
Co-Pilot :			

Dir	Time that Survey aircraft was over intersection (GMT)	Total Field Value (nT) Recorded in Survey Aircraft over intersection (T1)	Observatory Diurnal Reading at Previous Minute, i.e. Hours + Minutes (T2) from Printout	Observatory Diurnal Reading at Subsequent Minute, i.e. H hours + (M+1) mins (T3) from Printout	Interpolated Observatory Diurnal Reading at Time H hours + M mins + S sec T4=T2+S (T3-T2) / 60	Calculated Observatory Value T5=T4-C*	Error Value T6=T1-T5
NW	19:02:49	53,743.1	54,398.7	54,398.6	54,398.6	53,758.5	-15.5
SE	18:52:54	53,741.1	54,397.5	54,397.7	54,397.7	53,757.6	-16.5
NE	18:57:44	53,742.4	54,398.2	54,398.3	54,398.3	53,758.2	-15.7
SW	19:07:31	53,743.0	54,398.9	54,398.8	54,398.8	53,758.7	-15.8
NW	19:20:34	53,743.7	54,399.4	54,399.5	54,399.4	53,759.3	-15.6
SE	19:11:54	53,742.8	54,399.0	54,399.0	54,399.0	53,758.9	-16.2
NE	19:16:19	53,743.1	54,399.1	54,399.2	54,399.1	53,759.0	-16.0
SW	19:24:39	53,743.9	54,399.7	54,399.9	54,399.9	53,759.8	-15.9
*C is the difference in the total field between the Blackburn Observatory value (O) and the value (B) at the point above the intersection at a given height. 1000 Feet, C=(O-B)=550 nT; 500 Feet, C=638.7 nT					Total	-127.09 nT	
Number of Passes for Average = 8					Average	-15.89 nT	
Average NW-SE Heading Error (T6 NW - T6 SE)				0.78 nT			
Average NE-SW Heading Error (T6 NE - T6 SW)				-0.01 nT			

Compensation Calibration

Compensation calibrations determine the magnetic influence of aircraft and its manoeuvres. During the compensation calibration flight, the aircraft performs sets of three pitches (+/-5°), rolls (+/-10°), and yaws (+/-5°), while flying in the four survey line directions at high altitude over a magnetically quiet area. The coefficients calculated from the calibration are applied to the acquired magnetometer data to measure the effectiveness of the compensation system in mitigating the magnetic interference. The total compensated signal noise resulting from the twelve manoeuvres, referred to as the Figure of Merit (FOM), is calculated from the maximum peak-to-peak value resulting from each manoeuvre. A new compensation calibration must be performed after any aircraft or system modifications that may affect the aircraft's magnetic field interference.

In total three compensation calibrations were performed for each aircraft. In addition to being flown prior to mobilization in Ottawa, the compensations were flown prior to data acquisition near to the survey base, and again one month into the survey. The first set of compensation calibrations were performed in Ottawa on February 18th 2016 using the Morewood test headings (NW, SW, SE and NE), the second set were performed from Watson Lake on March 2nd 2016 (C-GSGR) and March 3rd 2016 (C-GSGX) prior to the start of regular survey flights, using the survey line headings. Another set of compensation calibrations were performed on April 10th 2016 using the survey line headings. The third set of compensations were flown with new configurations: both aircraft flew with pulse lights turned off (the pulse lights were on during the earlier compensations), and C-GSGR had a new alternator installed on April 4th 2016. Note that the pulse lights were used for flights 1001-1009 and 2001-2008, but not used in all subsequent flights. When comparing the compensations performed with and without the pulse lights it was found that there were no adverse effects in using the compensations performed with the pulse lights on for the flights on which the pulse lights were not turned on. In addition the results of the compensation performed by C-GSGR on flight 1034, after the replacement of the alternator, were compared with the earlier C-GSGR compensation on flight 9001, and it was found that the new compensation did not result in noticeable improvement. As such, in the interests of consistency, the compensation coefficients obtained on flight 9001 were used for the entire set of C-GSGR flights.

Table 7 shows the compensation calibration tests performed and the results. See *Figures 3* to *8* for an illustration of the compensated and uncompensated data acquired during the compensation calibration.

Table 7: Magnetic compensation calibration tests and results

Date	Aircraft	Flight	FOM (nT)	Used for Flights
February 18th, 2016	C-GSGR	9910	1.351	-
February 18th, 2016	C-GSGX	9911	1.158	-
March 2nd, 2016	C-GSGR	9001	1.276	1001-1035
March 3rd, 2016	C-GSGX	8001	0.804	2001-2041
April 10th, 2016	C-GSGR	1034	1.023	-
April 10th, 2016	C-GSGX	2040	0.860	-

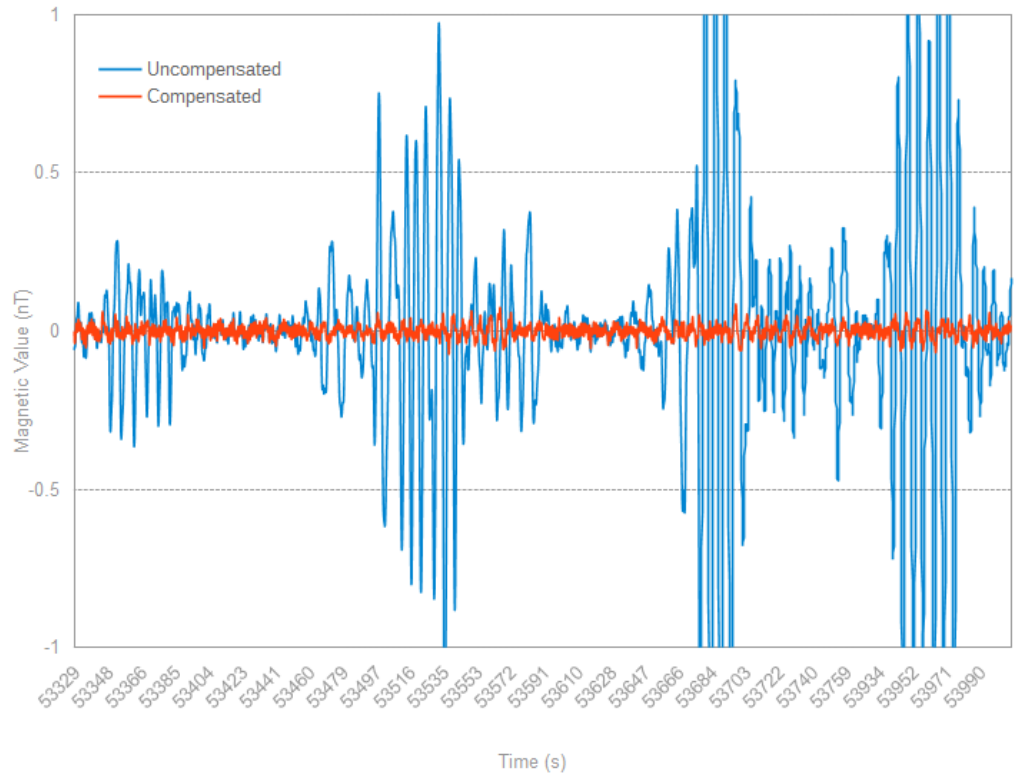


Figure 3: Compensation calibration test, C-GSGR February 18th 2016

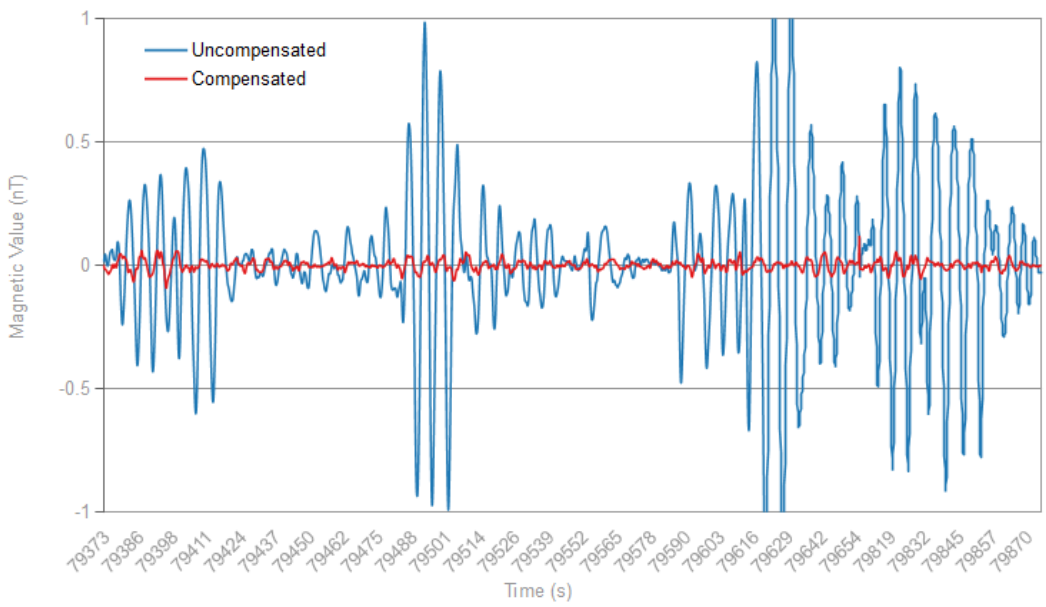


Figure 4: Compensation calibration test, C-GSGX February 18th 2016

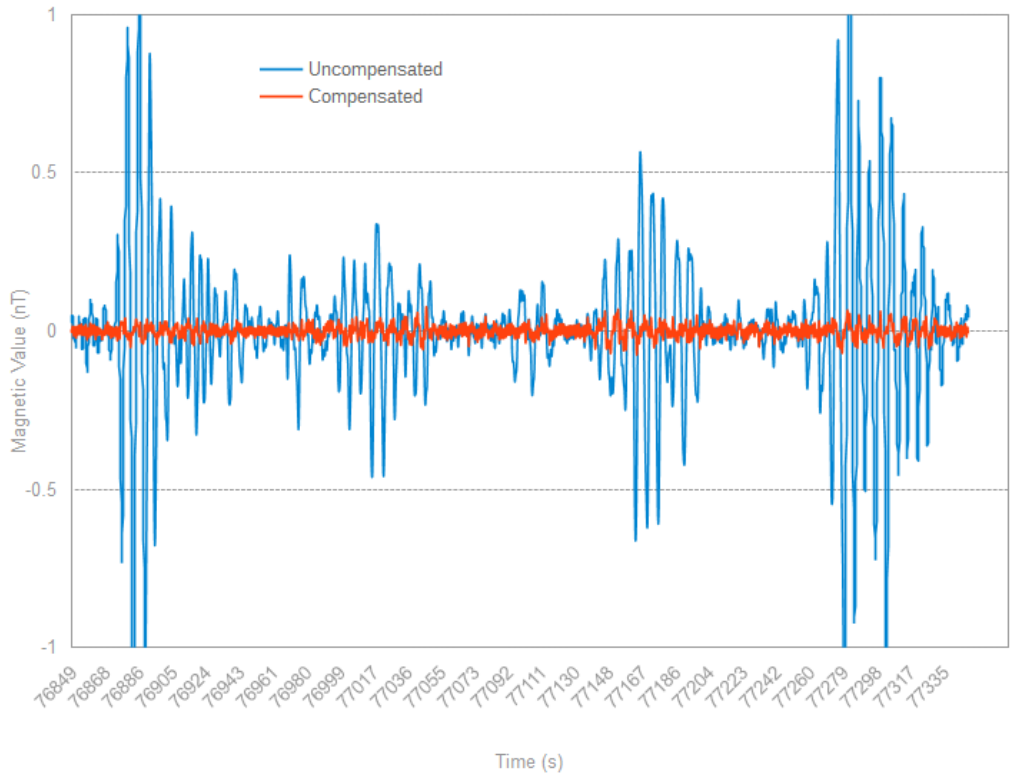


Figure 5: Compensation calibration test, C-GSGR March 2nd 2016

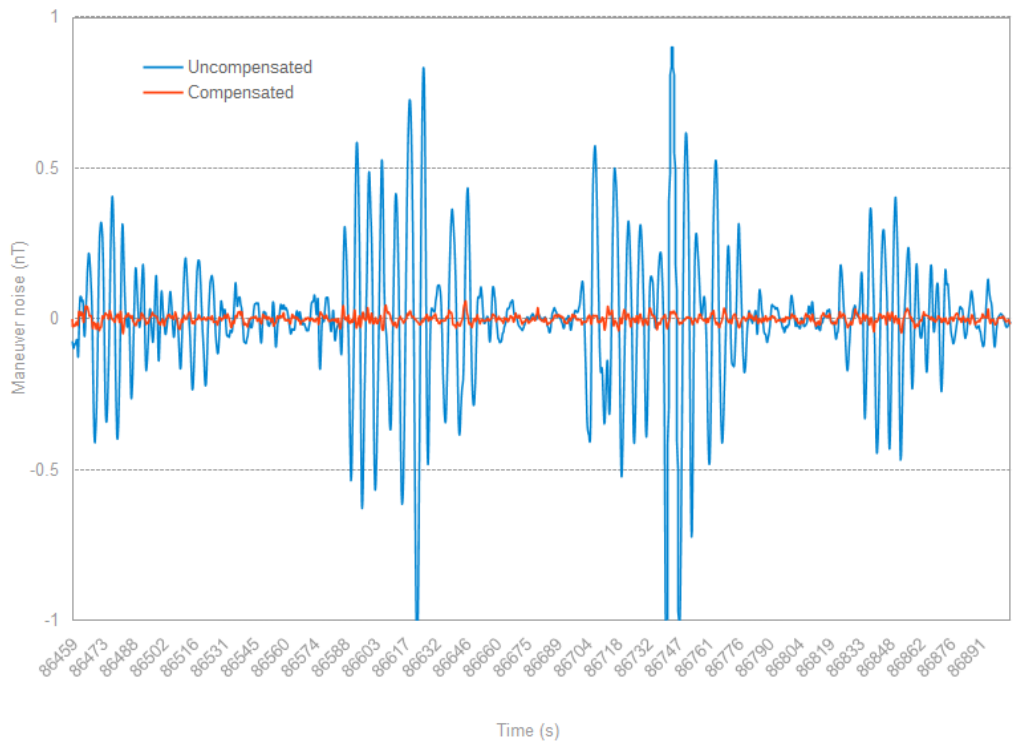


Figure 6: Compensation calibration test, C-GSGX March 3rd 2016

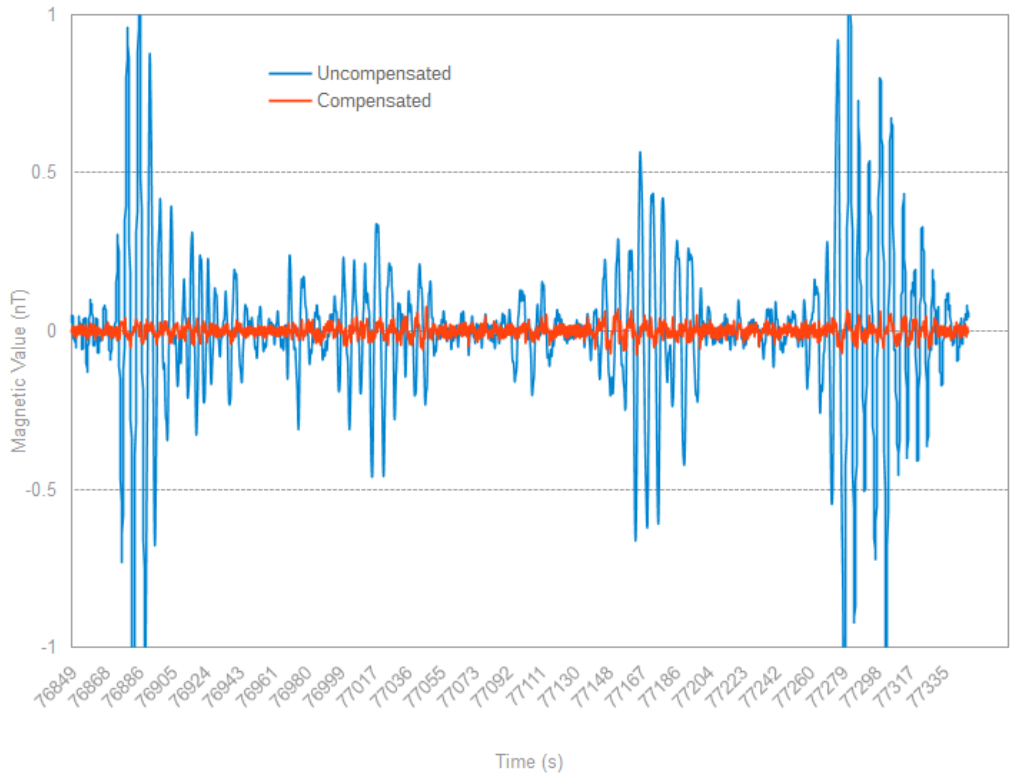


Figure 7: Compensation calibration test, C-GSGR April 10th 2016

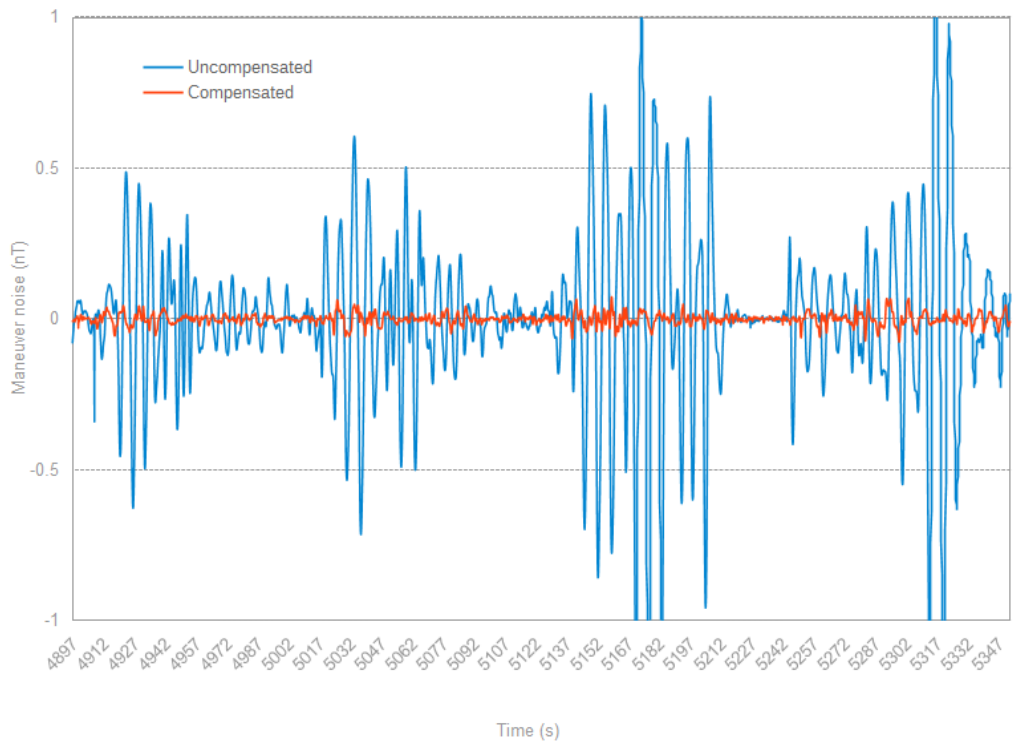


Figure 8: Compensation calibration test, C-GSGX April 10th 2016

Instrumentation Lag

The lag on the geophysical instruments is calculated using an SGL propriety computer program. This program uses a statistical comparison of high-pass filtered data from the same line flown in opposite directions.

The program was developed by SGL because it was found that it is not possible to determine the lag in an airborne system to an accuracy of better than about one second using a visible ground feature which causes a distinct anomaly. It is difficult to find the exact centre of the magnetic anomaly, and to locate the precise time on the video path record. The method calculates the lag between the GPS data and the magnetometer data, rather than the lag between the GPS data and the flight path video.

The known lag for the airborne magnetometer acquisition system is applied to the airborne magnetic data. The lag test is considered successful if the peaks of the lag-corrected magnetic anomaly acquired on passes in opposite directions are not offset by more than one data point as based on the data rate and survey speed (0.1s x 67m/s = 6.7m) plus an allowance for the expected differential GPS accuracy of +/- 0.5m for each data peak, so that the peaks will be within 6.5m along the direction of flight.

The lag in the magnetic data is a function of two components, a static lag due to signal processing and a speed-dependent dynamic lag due to the physical offset of the magnetometer and the GPS antenna. Both elements of the lag are well-known. The static lag is known to be 0.244 s from the filters applied during signal processing. The dynamic lag is equal to the offset of the sensors, known to be 9.4 m, divided by the flying speed.

Two sets of lag tests were performed for each survey aircraft. The first set was performed from Ottawa prior to mobilization, and the second set was performed from Watson Lake during the course of the survey. The pre-survey lag tests were flown on February 5th 2016 (C-GSGR) and February 23rd (C-GSGX) over a railway bridge that crosses the Ottawa River near the township of Pontiac. The on-site lag tests were flown on March 27th 2016 (C-GSGR) and March 28th 2016 (C-GSGX) over a road bridge crossing the Liard River around 12 km west of Watson Lake. The results are shown in *Figures 9* to *12.* The lag correction is applied in the first step of magnetic data compilation.

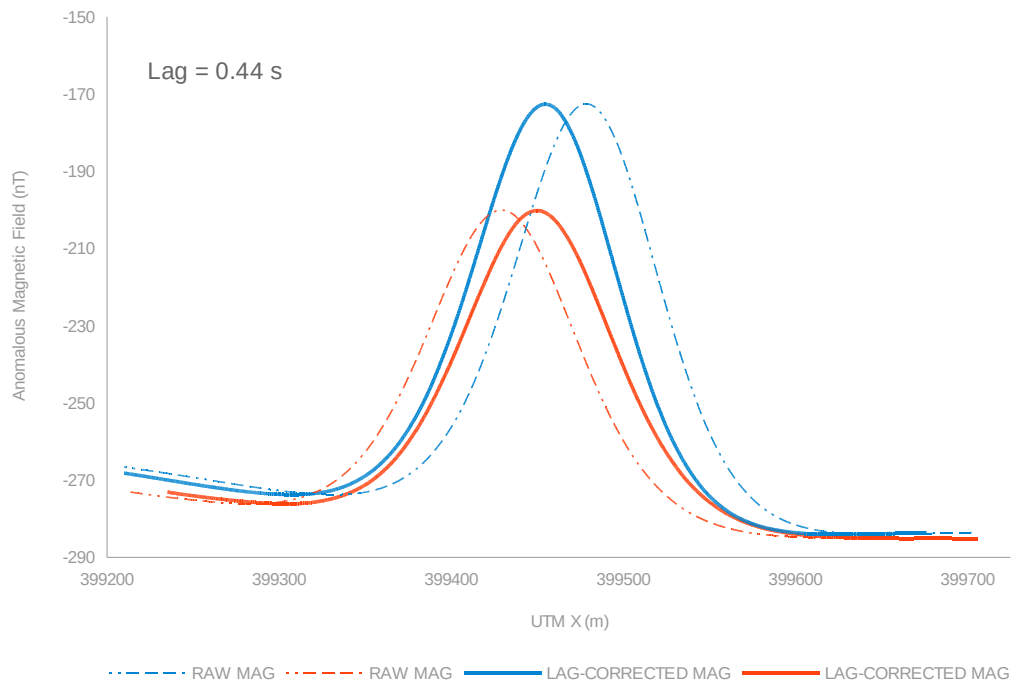


Figure 9: Instrumentation lag test, C-GSGR February 5th 2016

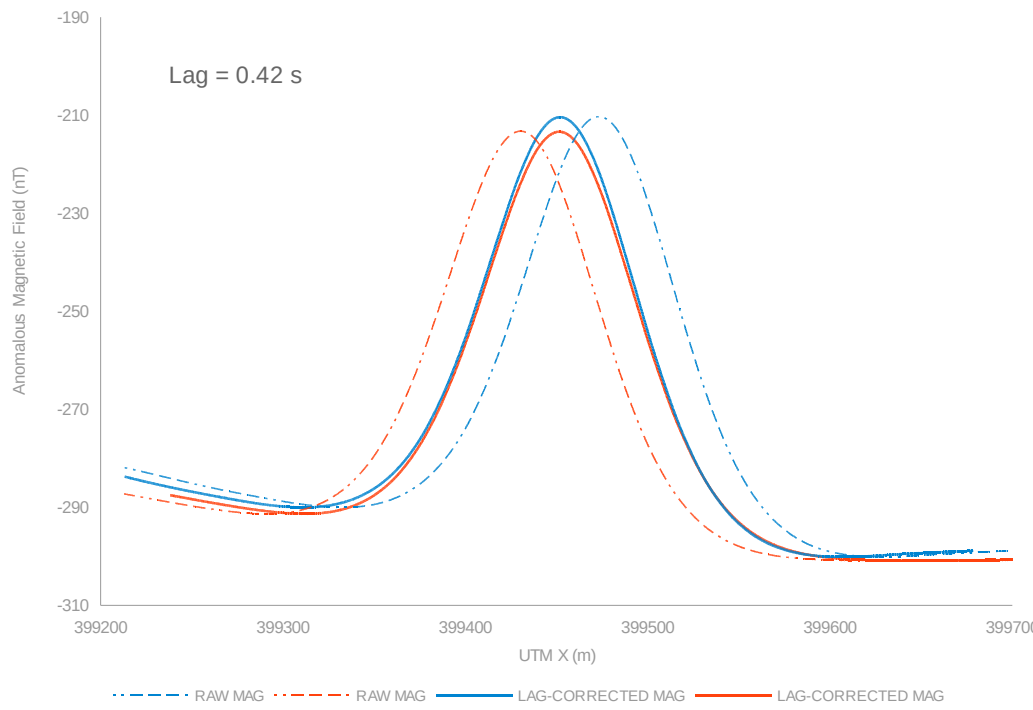


Figure 10: Instrumentation lag test, C-GSGX February 23rd 2016

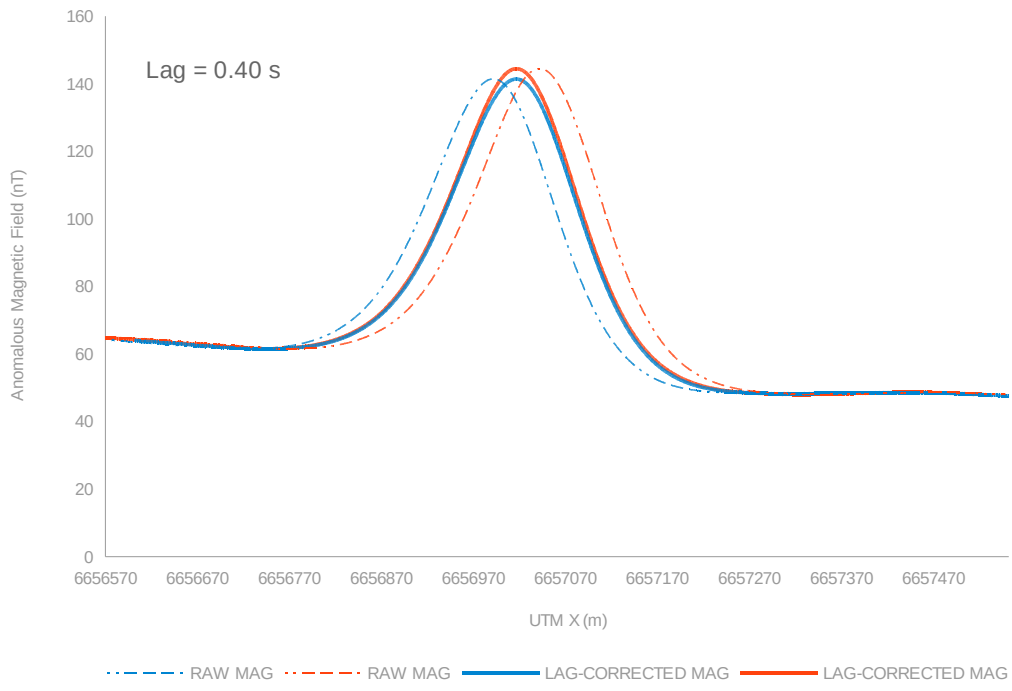


Figure 11: Instrumentation lag test, C-GSGR March 27th 2016

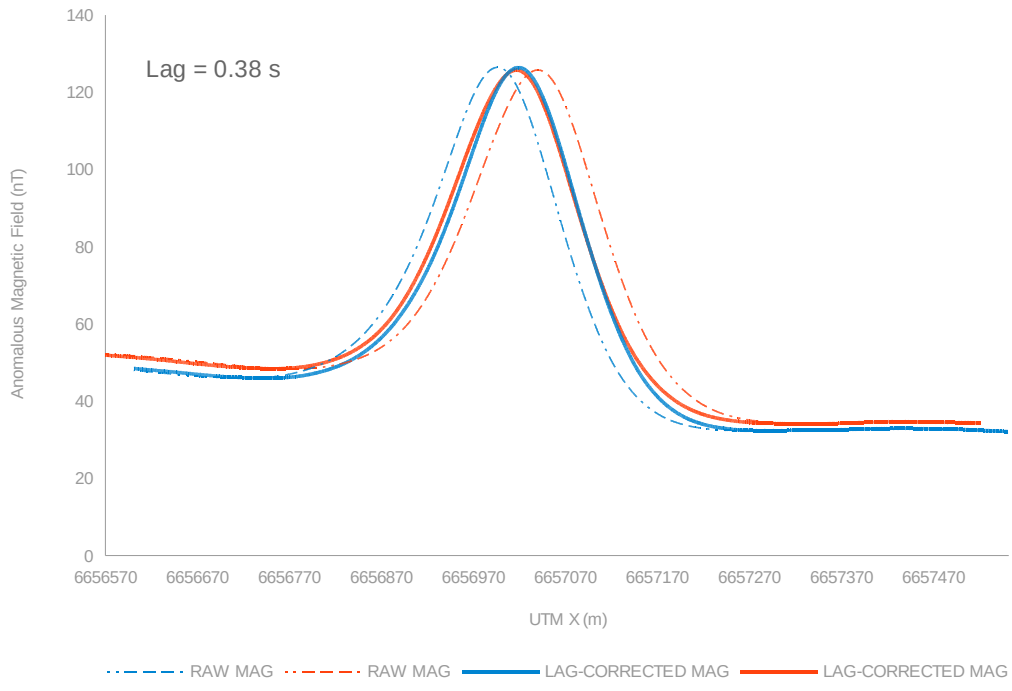


Figure 12: Instrumentation lag test C-GSGX March 28th 2016

Magnetometer Sensor Comparison

The magnetometer sensor comparison test was carried out as part of the stationary aircraft GPS position test. The correlation between the total magnetic field values recorded in the aircraft and those recorded at the reference station is shown in *Figure 13*

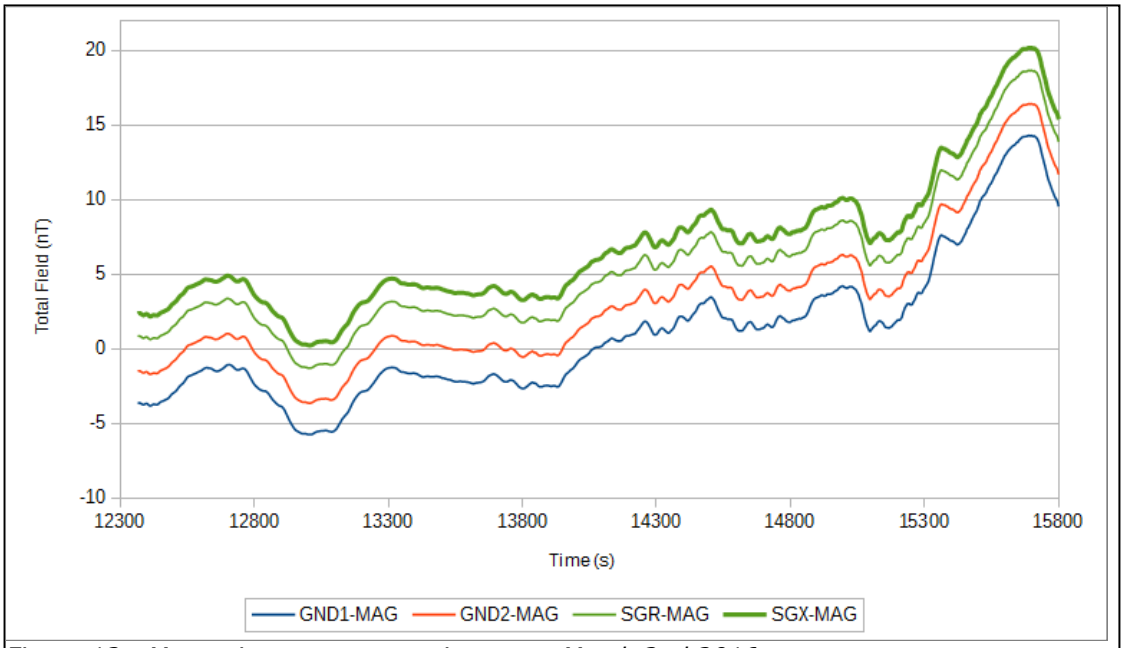


Figure 13: Magnetic sensor comparison test, March 2nd 2016

Altimeter System, Position And Digital Terrain Model Tests

Radar And Laser Altimeter Calibration

Test flights to calibrate the TRT radar, King radar and laser altimeters were flown by each of the survey aircraft both before and after the survey.

The pre-survey altimeter test performed by C-GSGR was conducted at Watson Lake airport on March 2nd 2016. Five passes were flown above the runway at the following altitudes: 75, 375, 675, 975 and 1275 m. An additional line incidentally flown at an altitude of 120 m over the runway was added to the calibration. The pre-survey altimeter test performed by C-GSGX was conducted at Gatineau airport near Ottawa on February 22nd 2016 and February 23rd 2016, taking place over two flights, as the first flight did not use equally spaced runway pass height increments. The two flights were analyzed together to take advantage of the extra data points. The following altitudes were used: 60, 100, 140, 200, 250, 300, 500, 750, 1000 and 1250 m.

The post-survey altimeter tests were conducted by both aircraft at Gatineau airport on April 19th 2016. Five passes were flown above the runway at the following altitudes: 80, 380, 660, 960, 1250 m.

The altimeter values were compared to the post-flight differentially corrected GPS altitude information for calibration. The altimeter test is considered successful if the adjusted data for all passes over the test range fall within accepted accuracy limitations of the altimeter plus an allowance of 0.5 m error in DGPS altitude. Calibration coefficients derived from the altimeter tests are applied to the observed altimeter data if required. An ideal altimeter would yield a slope of 1 and an intercept of 0.

The pre-survey altimeter test of C-GSGR gave a TRT radar altimeter slope of 0.9882 with an intercept of 1.5814 m. The laser altimeter slope was 1.0009 and the intercept was 0.0521 m. The Bendix/King radar altimeter slope was 0.8912 and the intercept was -2.7974 m. For the same aircraft, the post-survey altimeter test at Gatineau airport gave a TRT radar altimeter slope of 1.0022 with an intercept of 0.0354 m. The Bendix/King radar altimeter slope was 1.0279 and the intercept was 3.4537 m. These results are well within the expected accuracy of the altimeters. The laser altimeter did not give reliable returns for all of the passes and therefore the slope and intercept were not calculated. The calibration coefficients of the Bendix/King altimeter were adjusted to take account of the altimeter test results such that the application of the updated coefficients led to a slope of 1 and an intercept of 0.

The pre-mobilization altimeter test of C-GSGX gave a TRT radar altimeter slope of 0.9883 with an intercept of -0.7243 m. The laser altimeter slope was 1.0016 and the intercept was 0.6289 m. The Bendix/King radar altimeter slope was 0.8575 and the intercept was -2.8238 m. For the same aircraft, the post survey altimeter test at Gatineau airport gave a TRT radar altimeter slope of 1.0047 with an intercept of -0.6096 m. The Bendix/King radar altimeter slope was 1.1073 and the intercept was 10.8974 m. These results are well within the expected accuracy of the altimeters. The laser altimeter did not give reliable returns for all of the passes and therefore the slope and intercept were not calculated. The calibration coefficients of the Bendix/King altimeter were adjusted to take account of the altimeter test results such that the application of the updated coefficients led to a slope of 1 and an intercept of 0.

Please refer to *Figures 14* to *17* which illustrate the results of the altimeter tests.

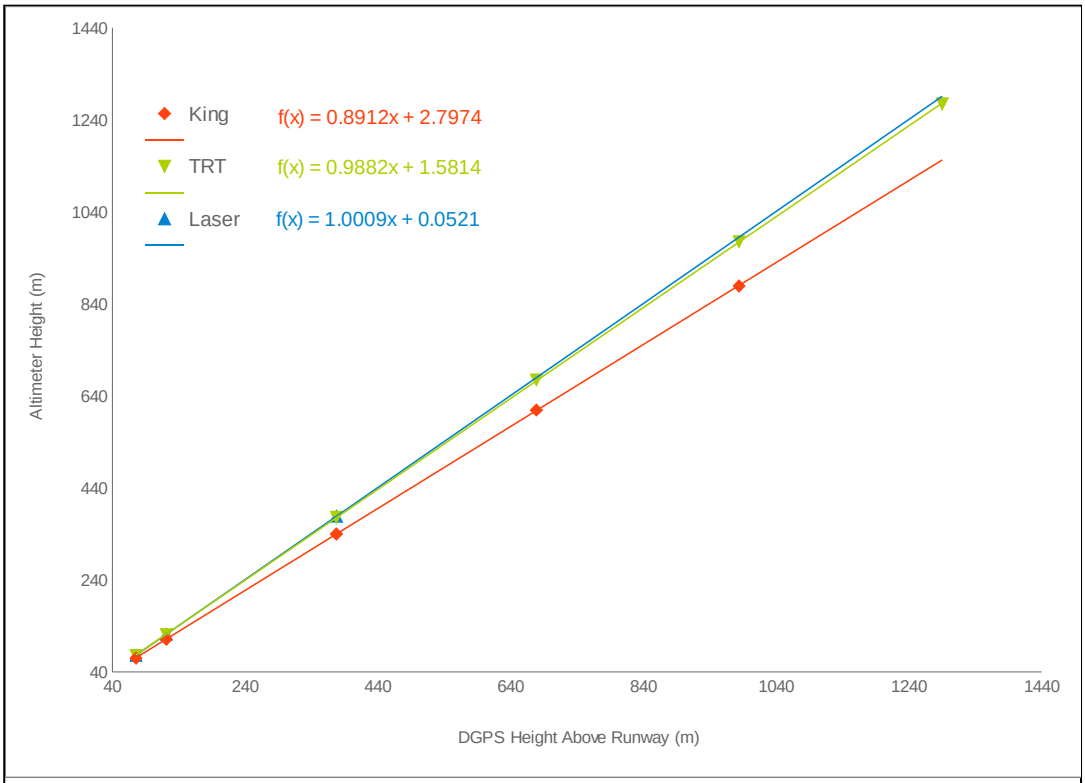


Figure 14: Altimeter test, C-GSGR March 2nd 2016

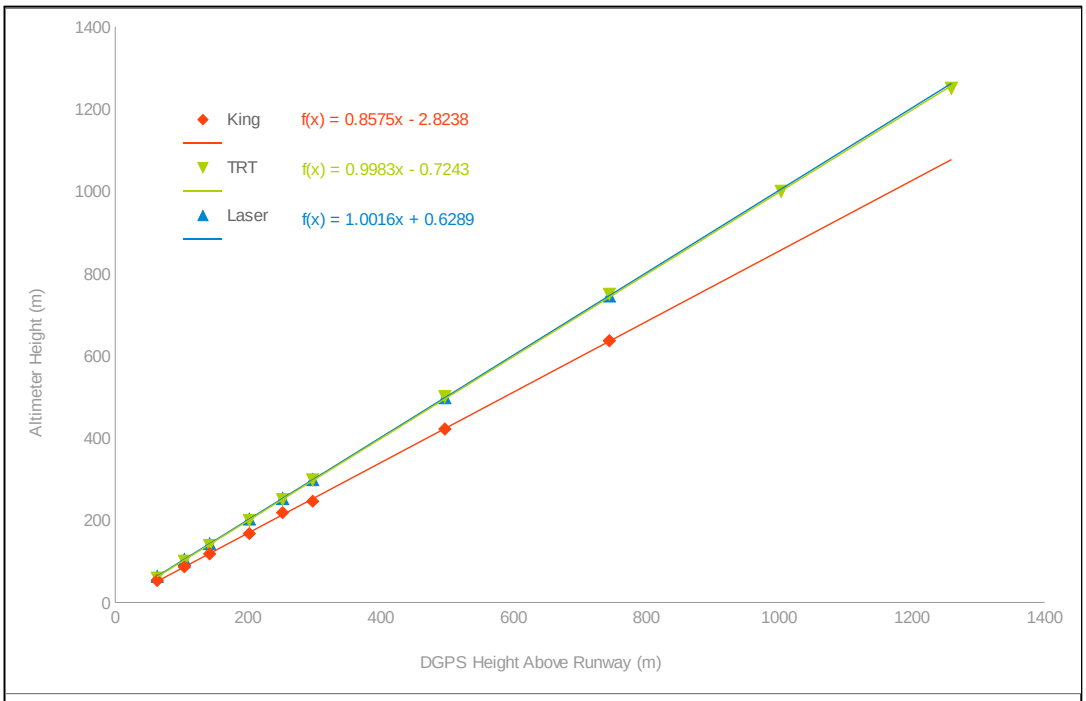


Figure 15: Altimeter test, C-GSGX February 23rd 2016

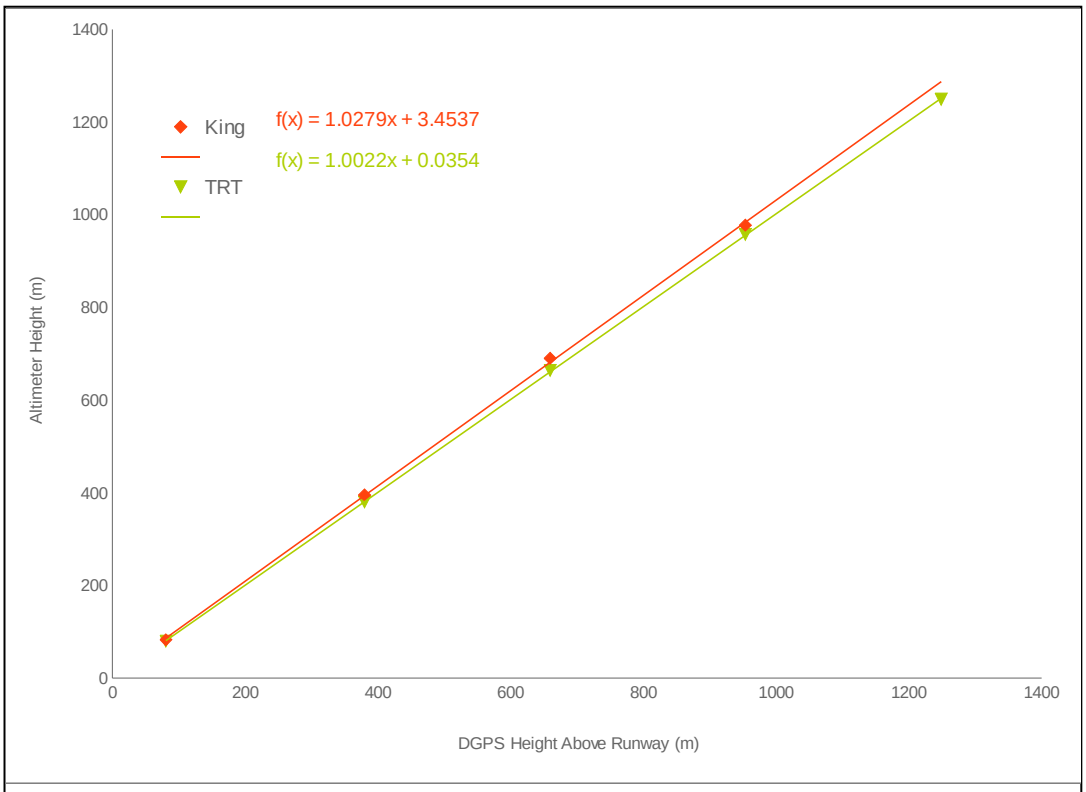


Figure 16: Altimeter test, C-GSGR April 19th 2016

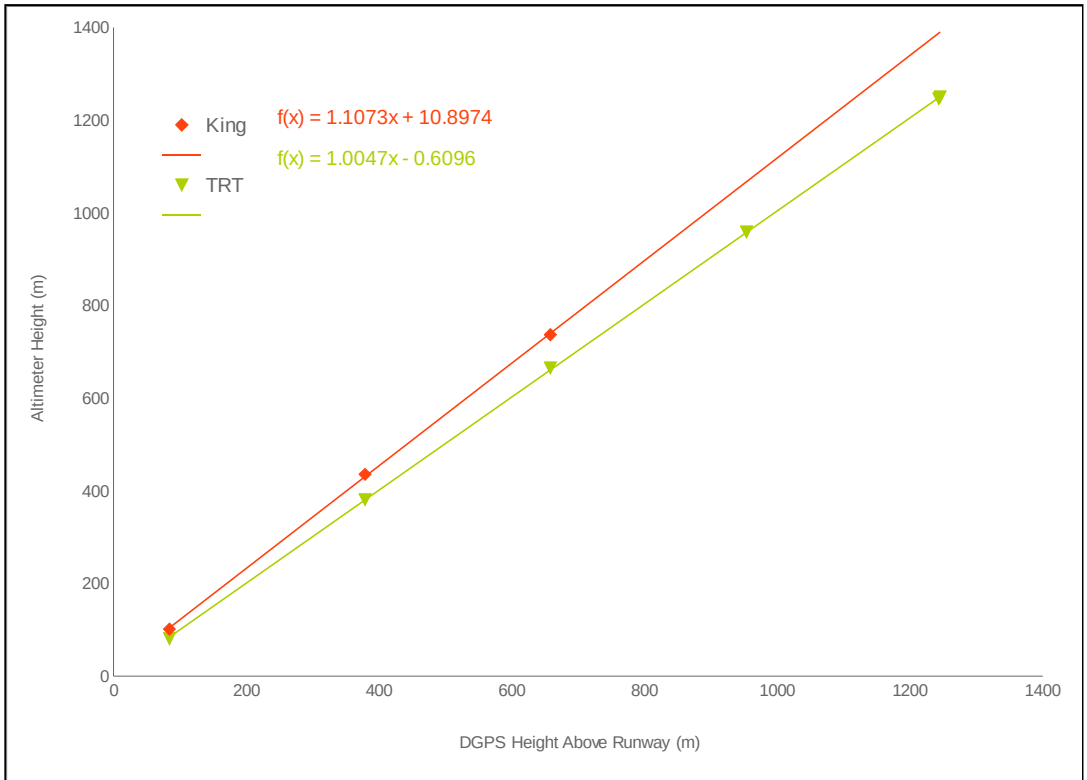


Figure 17: Altimeter test, C-GSGX April 19th 2016

Altimeter Comparison

A test line was flown over Watson Lake airport and beyond onto Watson Lake to compare the effect of flying radar and laser altimeters over both land and frozen lakes. This test line was flown by C-GSGR on March 2nd and by C-GSGX on March 3rd, 2016. *Figure 18* shows the geographic location of the test line while *Figures 19* and *20* present the results of the tests.

Figure 18: Altimeter Comparison Test Line Location Superimposed on Google Earth

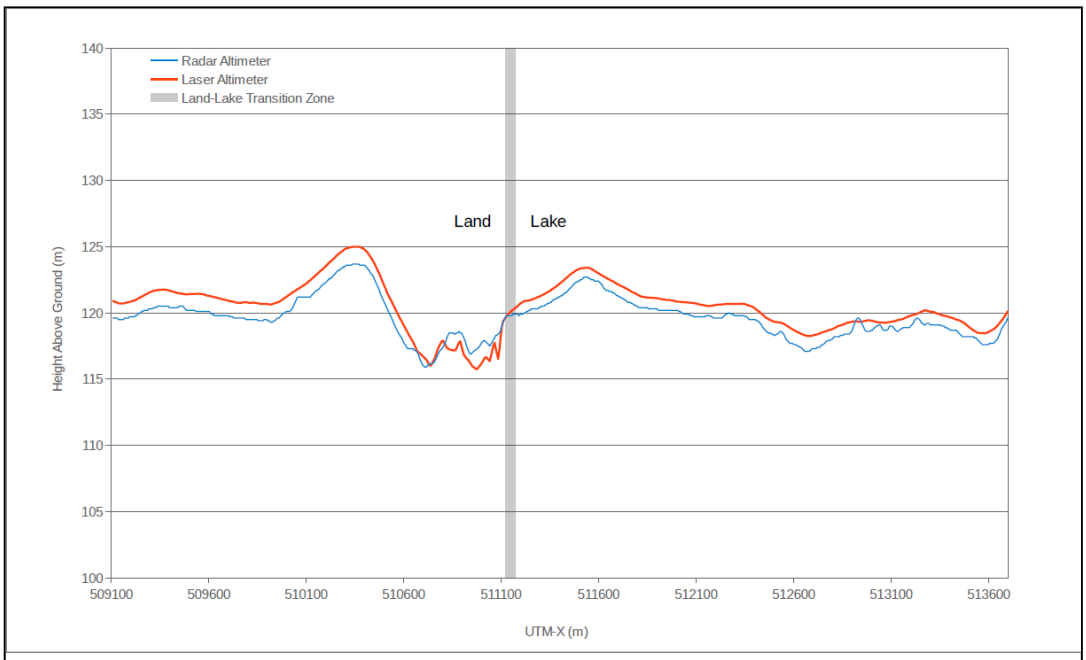


Figure 19: Altimeter Comparison Test Profile Data, C-GSGR March 2nd 2016

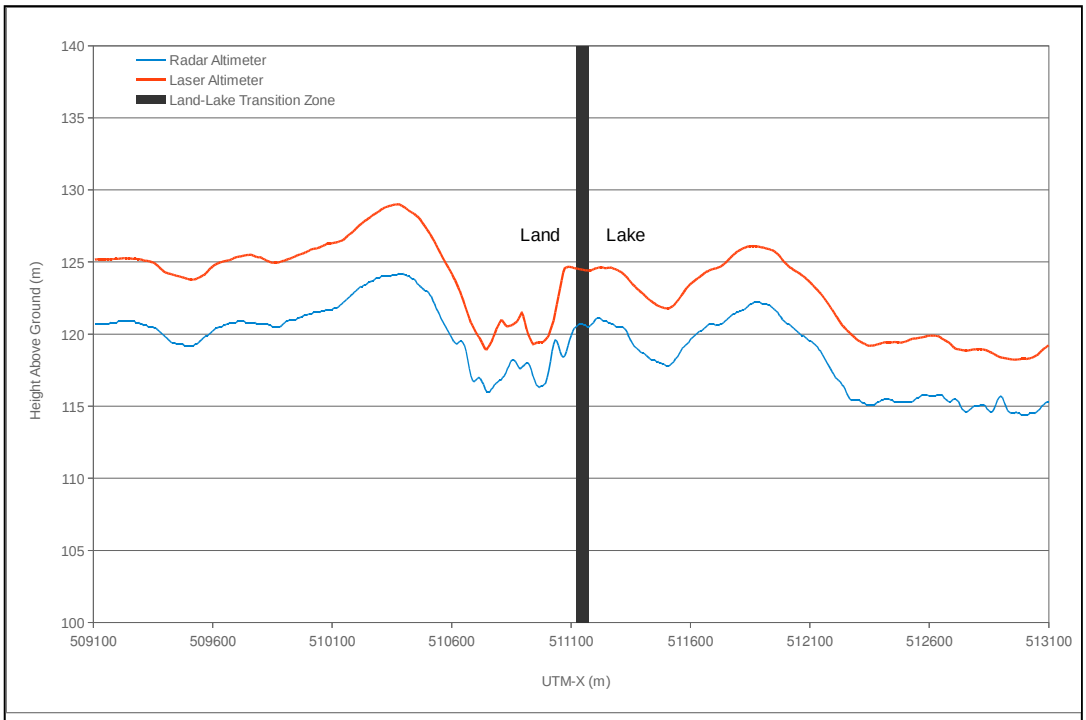


Figure 20: Altimeter Comparison Test Profile Data, C-GSGX March 3rd 2016

Stationary Aircraft GPS Position Test

The stationary aircraft GPS position test was carried out with the two survey aircraft parked on the tarmac at Watson Lake airport. During the test the geophysical systems in both aircraft were operating and recording. The aircraft were parked approximately 25 m apart during the static recording. The results of the stationary aircraft GPS position test are shown in *Figures 21* to *23*.

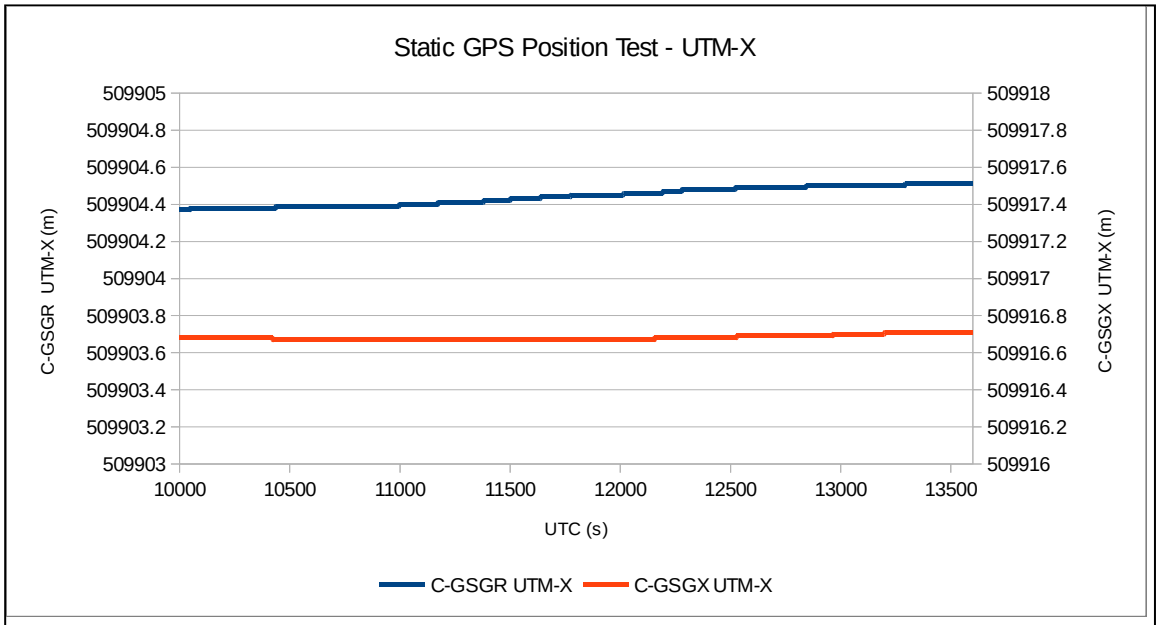


Figure 21: Stationary aircraft GPS position test, UTM-X

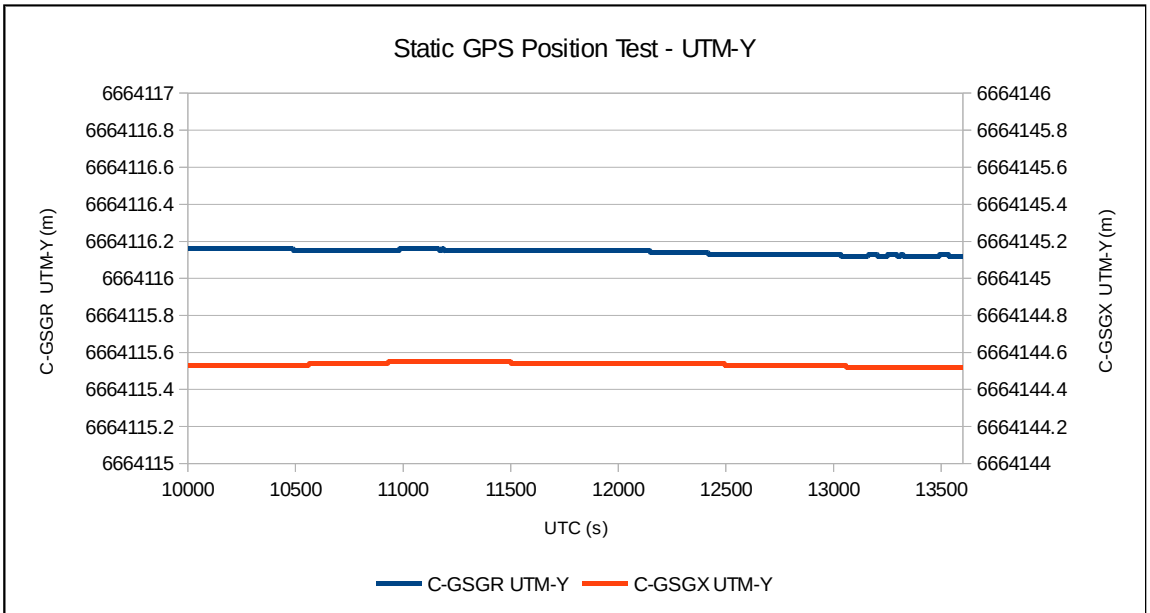


Figure 22: Stationary aircraft GPS position test, UTM-Y

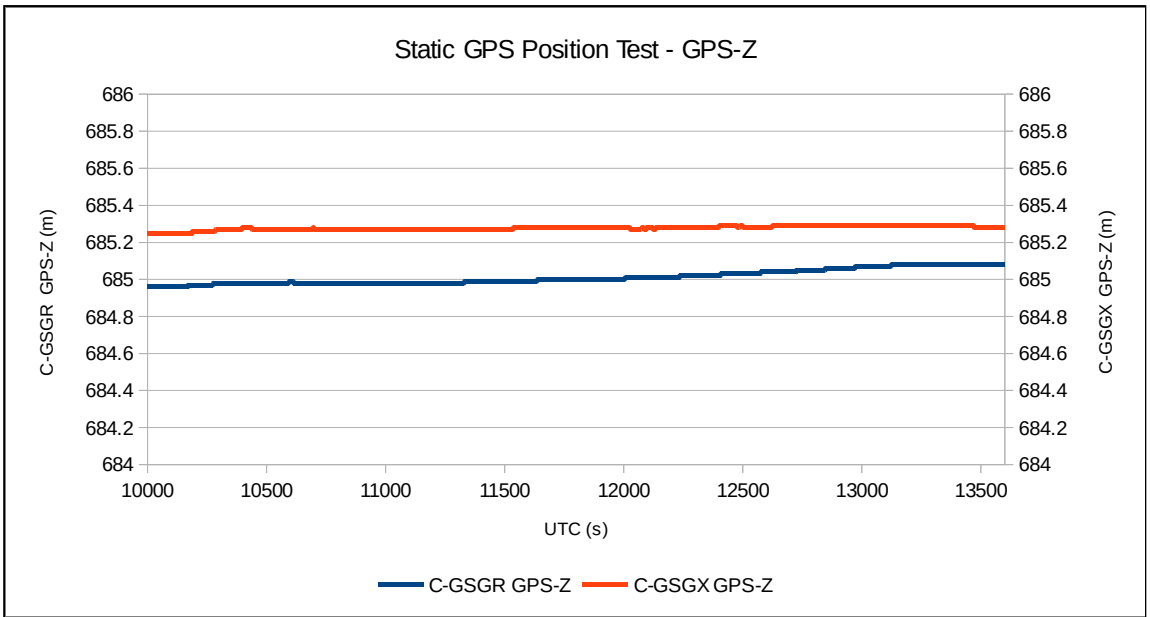


Figure 23: Stationary aircraft GPS position test, GPS-Z

7. FIELD OPERATIONS

Operations were conducted from Watson Lake Airport, Yukon. The survey required 76 production flights, from March 2nd to April 11th, 2016.

Mobilization of the SGL crew and equipment to Watson Lake began with the arrival of the initial two crew members and geophysical equipment on February 23rd 2016. The Islanders C-GSGR and C-GSGX arrived on March 1st and March 2nd respectively. The field office was set up in a room at the Big Horn Hotel at Watson Lake. The Watson Lake Airport features an asphalt runway, 5,500 ft in length with plenty of available parking spaces. Mobilization was completed on March 2nd, with the first magnetometer and GPS reference station installed at the airport on February 25th.

Picture 9: View from aircraft of survey block

Pre-mobilization tests were conducted from Ottawa with altimeter tests taking place on February 8th (C-GSGR) and February 23rd (C-GSGX), heading tests on February 18th, compensation calibrations on February 18th, and lag tests on February 5th (C-GSGR) and February 23rd (C-GSGX). The altimeter tests were carried out over the runway at Gatineau airport. Compensation calibrations were carried out in an area close to Ottawa at an altitude of approximately 10,000 ft. The heading tests were performed at the GSC Morewood test range. The lag tests were performed over a railway bridge that crosses the Ottawa river near the township of Pontiac.

Upon mobilization C-GSGR flew another altimeter test and compensation calibration on March 2nd. C-GSGX flew another compensation flight on March 2nd. Lag tests were performed from Watson Lake on March 27th (C-GSGR) and March 28th (C-GSGX). Compensation calibrations were carried out in an area around 50 km to the southwest of Watson Lake at an altitude of approximately 10,000 ft. The lag tests were performed over a road bridge crossing the Liard River around 12 km west of Watson Lake.

When not survey flying, the two aircraft were parked at one of two parking positions on the apron on the southern side of the airport, by the control tower. The order in which the aircraft returned from their sortie would determine which of the two parking positions the aircraft took. *Table 8* shows the two parking positions of the aircraft in the WGS-84 datum.

Table 8: Aircraft parking locations

Parking Location	Latitude	Longitude	Elevation (m)
1	60:06:50.2370 N	128:49:18.3317 W	684.80 m
2	60:06:51.3293 N	128:49:17.9696 W	684.80 m

Despite a number of days of no flying due to low clouds and snow (typically two or three days per week) a very good rate of production was achieved by performing double flights for each aircraft on days on which the weather was suitable for survey flying.

The alternator on C-GSGR was replaced on April 4th before the survey flight that day. A set of compensation calibrations were performed on April 10th with the following changed configurations: new alternator (C-GSGR) and pulse lights off (C-GSGR and C-GSGX).

Regular production was completed on April 10th and final reflights were completed on April 11th. Authorization to demobilize was granted by Natural Resources Canada on April 13th and the survey aircraft departed Watson Lake the same day.

A set of heading and altimeter tests were performed after demobilization from Watson Lake. The heading tests took place at the GSC Morewood test range and the altimeter test at Gatineau airport on April 19th for C-GSGR and C-GSGX.

Reference Stations

The reference stations were set-up at Watson Lake airport on March 1st. *Table 9* shows the WGS-84 coordinates of the reference stations.

Table 9: Locations of reference stations

Station #	Location	Latitude	Longitude	Elevation
GND1	Watson Lake Airport	60:07:05.0123 N	128:48:38.2813 W	688.340 m
GND2	Watson Lake Airport	60:07:04.9796 N	128:48:38.2236 W	688.357 m

The position of the GND1 reference station GPS antenna was differentially corrected using data from three International GPS Service (IGS) reference stations: YELL (Yellowknife, NWT); WHIT (Whitehorse, Yukon); and ATLI (Atlin, BC), using data recorded on days 61, 62 and 63 of 2016. Reference station GND2's position was differentially corrected using data from GND1 on the same days.

Re-flights

Table 10 shows a list of re-flights and the reasons they were required. Due to persistent magnetically unsettled conditions, not all data that was out of specification for diurnal variations could be reflown, but a list of the more affected lines was agreed to with the NRCan technical inspector.

Table 10: Re-flight list

Original Flight		Re-Flights		
Line	Flight	Line	Flight	Reason
113.00	2003	113.01,113.02	2008, 1010	Strobe lights left on
1097.00	2003	1097.01	2033	Strobe lights left on
1098.00	2003	1098.01	1019	Strobe lights left on
1088.00	2003	1088.01, 1088.02	1006, 2017	Strobe lights left on
1087.00	2003	1087.01, 1087.02	1006, 2017	Strobe lights left on
1086.00	2003	1086.01, 1086.02	1006, 2017	Strobe lights left on
1075.00	2003	1075.01, 1075.02	1006, 2017	Strobe lights left on
1074.00	2003	1074.01	1024	Strobe lights left on
1073.00	2003	1073.01	2026	Strobe lights left on
111.00	1009	111.01	1009	A partial which was reflown in its entirety
111.02	2008			Flown for system comparison test
111.10	2014	111.11, 111.12	2015, 2019	A partial which was reflown in its entirety
112.10	1005	112.11	2012	A partial which was reflown in its entirety
123.00	1004	123.03	2023	A partial which was reflown in its entirety
123.01	2009	123.03	2023	A partial which was reflown in its entirety
123.02	2009	123.03	2023	A partial which was reflown in its entirety
1007.00	1003	1007.01	2002	A partial which was reflown in its entirety
1008.00	1003	1008.01	2017	A partial which was reflown in its entirety
1009.00	1003	1009.01	1003	A partial which was reflown in its entirety
1011.00	1003	1001.01	2004	A partial which was reflown in its entirety
1047.00	1011	1047.01	2020	A partial which was reflown in its entirety
1054.01	1010	1054.02	2020	A partial which was reflown in its entirety
1090.00	1015	1090.01	2033	A partial which was reflown in its entirety
1094.00	1010	1094.01	2033	A partial which was reflown in its entirety
1099.00	1015	1099.01, 1099.02	2017, 1024	A partial which was reflown in its entirety
1170.00	2006	1170.01, 1170.02	2008, 2032	Reflown due to diurnals
1186.00	1015	1186.01	1030	Reflown due to diurnals
1495.00	2013	1495.01	1018	Reflown due to diurnals
1522.00	2001	1522.01	2007	Reflown due to diurnals
1011.02	1003	1011.03	2007	Reflown due to diurnals
123.03	2011	123.04	2023	Reflown due to diurnals
125.00	2007	125.01	2021	Reflown due to diurnals
129.00	1004	129.03	1028	Reflown due to diurnals
129.01	1012	129.03	1028	Reflown due to diurnals
129.02	2018	129.03	1028	Reflown due to diurnals
1015.00	1003	1015.01	1022	Reflown due to diurnals
1325.00	1008	1325.02	1032	Reflown due to diurnals
121.00	2005	121.01	2034	Reflown due to diurnals
115.01	2005	115.02	2034	Reflown due to diurnals
1500.01	1017	1500.02	2034	Reflown due to diurnals

Original Flight		Re-Flights		
Line	Flight	Line	Flight	Reason
1484.00	2007	1484.01	2034	Reflown due to diurnals
1390.00	1012	1390.01	2035	Reflown due to diurnals
1125.00	2010	1125.03	1034	Reflown due to diurnals
1018.00	1008	1018.01	1035	Reflown due to diurnals
1019.00	1011	1019.01	1035	Reflown due to diurnals
1298.00	1029	1298.01	2038	Reflown due to diurnals
128.00	1008	128.02	2038	Reflown due to diurnals
130.01	2017	130.04	2038	Reflown due to diurnals
1193.00	2010	1193.02	2039	Reflown due to diurnals
1166.00	2009	1166.02	2039	Reflown due to diurnals
1167.00	2009	1167.02	2039	Reflown due to diurnals
1138.00	2010	1138.02	2039	Reflown due to diurnals
1135.00	2010	1135.02	2039	Reflown due to diurnals
1124.00	2010	1124.02	2039	Reflown due to diurnals
1089.00	1017	1089.01	2039	Reflown due to diurnals
1076.00	1011	1076.01	2039	Reflown due to diurnals
1010.00	1011	1010.01	2041	Reflown due to diurnals
1049.00	1010	1049.01	2041	Reflown due to diurnals
1050.00	1010	1050.01	2041	Reflown due to diurnals
1056.00	1010	1056.01	2041	Reflown due to diurnals
1057.00	1010	1057.01	2041	Reflown due to diurnals
1059.00	1010	1059.01	2041	Reflown due to diurnals
1066.01	1010	1066.02	2041	Reflown due to diurnals
1122.01	2010, 2032	1122.02	2041	Reflown due to diurnals

Field Personnel

Table 11 shows a list of SGL technical personnel who participated in the field operations.

Table 11: Survey field crew

	Name	Dates in Field
Project Manager	Alex Pritchard	n/a
Crew Chiefs	Kevin Charles	22 February 2016 - 9 April 2016
	Adam Jones	9 April 2016 - 15 April 2016
Data Processor	Lindsay Upiter	22 February 2016 - 15 April 2016
Pilots	Bret Curtis	1 March 2016 - 14 April 2016
	Tomo Nishimura	1 March 2016 - 14 April 2016
	Jean Deschênes	2 March 2016 - 14 April 2016
	Nikhal Behl	2 March 2016 - 29 March 2016
	Alex Faulkner	25 March 2016 - 14 April 2016
Aircraft Maintenance Engineer	John Sevenhuysen	29 February 2016 - 15 April 2016

Picture 10: In front of the Watson Lake airport terminal

8. DIGITAL DATA COMPILATION

Preliminary processing for on-site quality control was performed in the field as each flight was completed. This included verifying the data on the computer screen, profiling all of the data channels, and creating preliminary data grids.

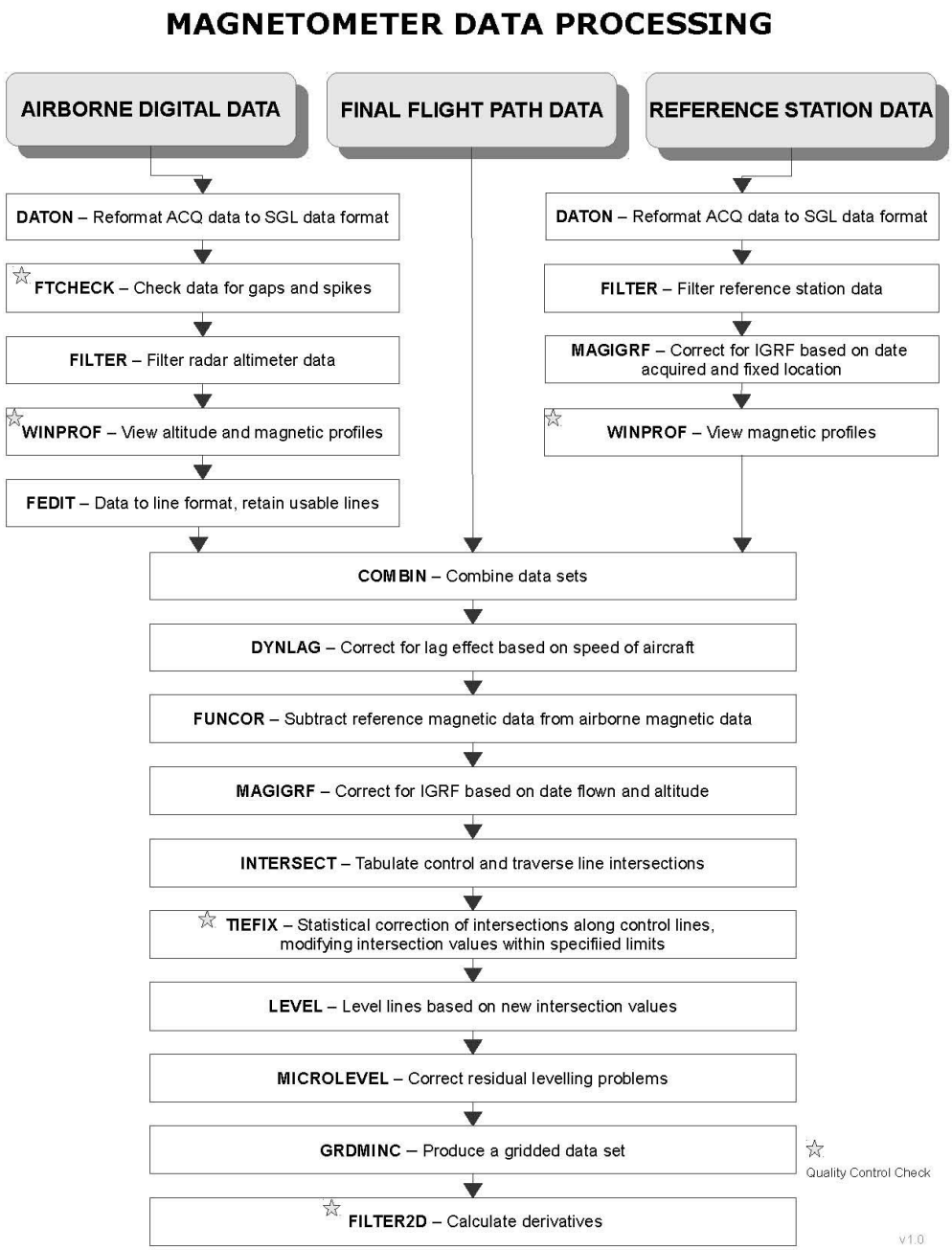


Figure 24: Magnetometer data field processing flowchart

Magnetometer Data

A magnetic data flowchart is presented in *Figure 24.* Ground reference magnetometer data from both stations were inspected for cultural interference and edited where necessary. All reference station magnetometer data were filtered using a 121 point low pass filter (*Appendix VII*) to remove any high frequency signal, but retain the low frequency diurnal variations.

A correction for the International Geomagnetic Reference Field (IGRF) year 2015 model, was extrapolated for all ground magnetometer data using the fixed ground station location (*see Section 7 – FIELD OPERATIONS*) and the recorded date for each flight. The mean residual value of the reference station calculated to be 109.095 nT was subtracted to remove any bias from the local anomalous field.

Diurnal activity in the block and at the reference stations does not correlate well because of the distance between the base of operations and the survey block. This is especially so in the Auroral Zone which encompasses the survey area. Therefore the ground reference data was used to monitor diurnal conditions only, and no diurnal correction based on the reference station data was applied directly to the airborne magnetometer data. The format of the reference magnetic data delivered from the field to the Technical Inspector is described below (*see Section 9. FIELD PRODUCTS*).

The airborne magnetometer data were recorded at 160 Hz, and down sampled to 10 Hz for processing. All magnetic data were plotted and checked for any spikes or noise. A 0.244 s static lag correction due to signal processing, plus a dynamic lag correction averaging 0.14 s but varying from between 0.10 s and 0.23 s depending on the instantaneous velocity of the aircraft was applied to each data point. The aircraft speed dependent dynamic lag was calculated using SGL's Dynlag software.

Magnetic data were levelled in the field for quality control purposes. In the office after the completion of the survey, the lagged, compensated total field magnetic data were examined and edited for low amplitude, spurious and high-frequency noise.

In preparation for the levelling process, differences in the magnetic field values caused by small flight altitude differences between traverse and control lines need to be reduced. To bring the levelling intersections to the same altitude, the magnetic data along the traverse lines and control lines are continued to the intended pre-planned surface height. The continuation is applied to the edited magnetic data profile relative to the drape surface as the datum with a Taylor series expansion consisting of the first and second vertical derivative of the total magnetic field as the first and second term of the series.

The levelling of the total field magnetic data, corrected to the height drape surface, begins with the calculation of all traverse and control total field magnetic value differences at their intersection points. Using these intersection differences, the control lines are levelled to the traverse lines and then the traverse lines are levelled to the control lines by an iterative process that reduces the differences with each cycle. This is a two-stage process that involves the application of a zero order trend adjustments until the process converges, followed by first-order trend adjustments until final convergence. This process removes up to a first order trend of the magnetic diurnal variation at the aircraft location. The higher order trend along the control lines can be estimated from the remaining intersection differences from the numerous traverse lines crossing each of the control lines, providing a series of points culminating in a pattern which is a reliable statistical estimate of the remaining diurnal variation along each control line. These points are carefully smoothed (extreme outlier values must be rejected first) and the results are the levelling corrections that are applied to the first order corrected magnetic control line profile

data. The traverse line data are then tied to the corrected control line data by applying a spline interpolation to the valid intersection differences (excluding extreme values likely encountered over high magnetic gradients) along each traverse line and subtracting these results from the first order levelled traverse line magnetic field profiles. In this survey, 96% of traverse/control intersections achieved total closure. Once the levelling is complete, the entire levelling network is then examined to determine if all adjustments are appropriate in that the adjustments are small, approximating the magnetic diurnal deviation tolerance specification and that adjacent traverse line adjustments vary randomly as the magnetic diurnal activity would be expected to vary.

In this survey, the introduction of pseudo-control lines was also necessary due to the severe micropulsation diurnal activity which persisted throughout all production flights. Microlevelling was not used in order to minimize damage to the weak magnetic trends detected throughout many of the low gradient areas. Also, the use of these pseudo-control lines were limited to very specific areas of very low magnetic gradient. In these areas, the micropulsation diurnal activity had a very short wavelength, well within the distance between control lines and therefore could not be removed by the standard control-line levelling process. Though the amplitude of these micropulsations were within the tolerance of the specifications, there was a significant adverse effect on the quality of the gridded data as shown in the second vertical derivative of the total magnetic field (*Figure 25*).

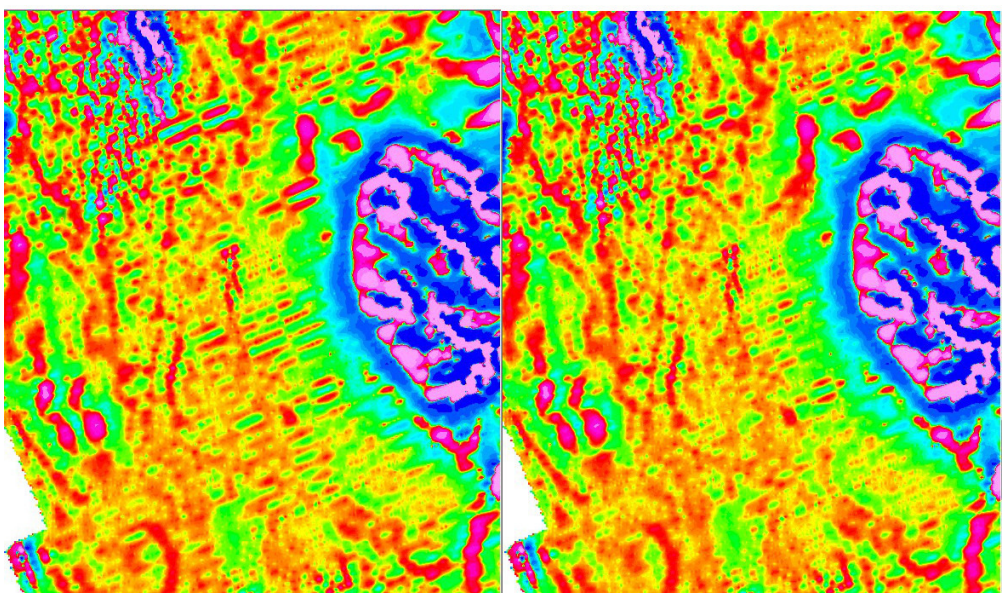


Figure 25: Second vertical derivative of the levelled magnetic field grid before introduction of pseudo-control lines (left) and the results after introduction of pseudo-control lines (right).

In order to minimize the effects of diurnal micropulsation in the gridded data, the levelled total magnetic field grid was re-gridded to a fine mesh of 20 m and profiles from it were extracted along pseudo-control lines which were set mid-way between the flown control lines. A series of filters were designed to isolate oscillations in the total magnetic field at a wavelength equivalent to the distance of two traverse lines but limited to a maximum rms amplitude +/-0.3 nT. This extracted "noise" signal was plotted in profile and examined on a plan map to ensure that no identifiable geological trend was included within the noise. The noise signal was then introduced as a correction to the levelled traverse line data at traverse/pseudo-control line intersection points and spline interpolated together with the original traverse line corrections. As in the

original levelling, the results were subtracted from the first order levelled traverse line magnetic field profiles.

The final levelling procedure, including pseudo-control line corrections to the traverse lines, was verified through inspection of Total Magnetic Intensity (TMI) and vertical derivative grids, plotting profiles of corrections along lines, and examining levelling statistics to check for steep correction gradients.

After levelling the airborne magnetometer data were corrected for the IGRF using the location of each point, the altitude of the drape surface, and a fixed date of 25th March 2016. IGRF values were calculated using the year 2015 IGRF model. The altitude data used for the IGRF corrections are DGPS heights above the GRS-80 ellipsoid. The format of the airborne magnetic data delivered from the field to the Technical Inspector is described below (*see Section 9. FIELD PRODUCTS*).

Final post survey magnetic levelling as described above was carried out by Frank Kiss at the Geological Survey of Canada using the methodologies described in Coyle et al. 2014 (Geological Survey of Canada aeromagnetic surveys: design, quality assurance, and data dissemination, Geological Survey of Canada Open File 7660), with additional levelling of the traverse lines by using pseudo-control lines. The format of the final magnetic data created by the GSC is described below (*see Section 10. FINAL PRODUCTS*).

Positional Data

A positional data flowchart is presented in *Figure 25.* A number of programs were executed for the compilation of navigation data in order to reformat and recalculate positions in differential mode. SGL's GPS data processing package, GPSoft, was used to calculate DGPS positions from raw 10 Hz range data obtained from the moving (airborne) and stationary (ground) receivers using combinations of L1 and L2 phase signal.

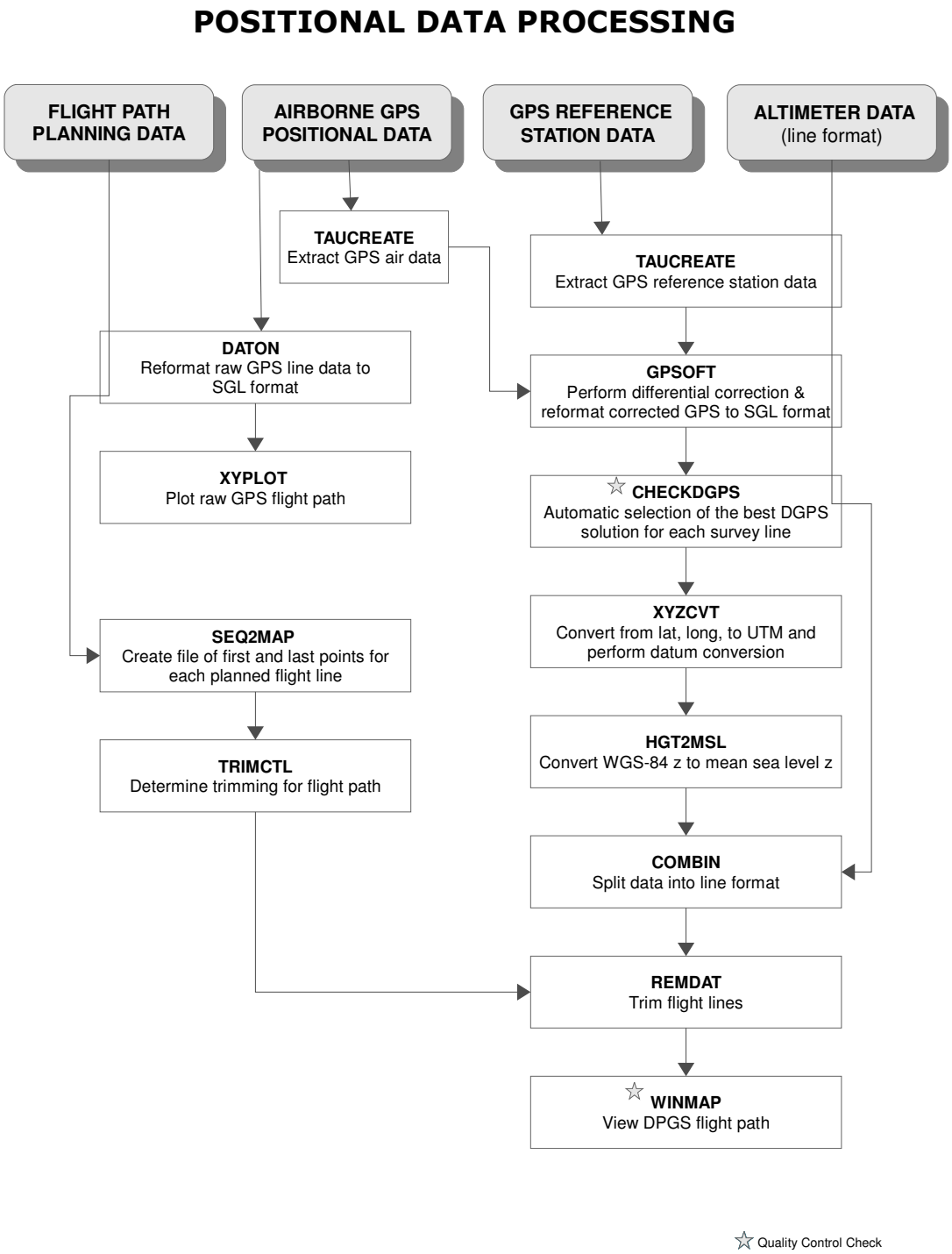


Figure 26: Positional data processing flowchart

Accurate locations of the GPS antenna were determined by differentially correcting the SGL reference station position data using permanent GPS reference stations. This technique provides a final receiver location with an accuracy of better than 5 cm. The entire airborne data set was processed differentially using the calculated reference station location.

Positional data (x, y, z) were recorded and all data processing was performed in the WGS-84 datum. See *Table 12* for the ellipsoid parameters for WGS-84. The delivered data were provided in x, y locations in UTM projection zone 9 North, with respect to the NAD-83 datum. Please see *Table 13* for ellipsoid parameters, and *Table 14* for the conversion parameters.

Table 12: Ellipsoid parameters for WGS-84

Ellipsoid	WGS-84
Semi-major axis	6378137.0
1/flattening	298.257223563

Table 13: Ellipsoid parameters for NAD-83

Ellipsoid	GRS-80
Semi-major axis	6378137.0
1/flattening	298.257222101

Table 14: Datum conversion parameters from NAD-83 to WGS-84

x shift (m)	0.991
y shift (m)	-1.9072
z shift (m)	-0.5129
x rotation (rad)	1.2581×10^{-7}
y rotation (rad)	0.3599×10^{-7}
z rotation (rad)	0.5607×10^{-7}

Elevation data were recorded relative to the GRS-80 ellipsoid and transformed to mean sea level (MSL) using the Canadian Geodetic Vertical Datum 2013 (CGVD 2013).

Radar, Barometric, and Laser Altimeter Data

The terrain clearance measured by the radar altimeter and the barometric altitude were recorded at 10 Hz. The barometric altimeter was recorded but was not used in processing because of the availability of more accurate GPS altitudes.

The laser altimeter proved unreliable during the survey and laser data was not delivered to the client.

The radar data records the first return within the footprint of its signal. The radar altimeter data were filtered to remove high-frequency noise using a 67-point low pass filter (see *Appendix VII*). The final data were plotted and inspected for quality.

A digital elevation model (DEM) was derived by subtracting the radar altimeter data from the differentially corrected DGPS altitude with respect to mean sea level. Sections of the DEM displayed "striping" due to the effects of the footprint size when flying drape in opposite directions over mountains. This directional effect was corrected using microlevelling to generate a levelled DEM channel. Processed barometric and levelled DEM data was provided to the client as described below (see section 9 “FIELD PRODUCTS”).

9. FIELD PRODUCTS

Field Delivery

Table 15: Format of aeromagnetic data delivered from the field

Title	Units	Field Length	Null	Description
LINE	-	8	-	Line Number XXXXY where XXXX is line number and Y is segment number
UTC-SEC	s	10	-	Fiducial Seconds Past Midnight UTC
LONG	degree	13	-	Longitude, NAD-83
LAT	degree	13	-	Latitude, NAD-83
EASTING	m	11	*	Easting, NAD-83 UTM ZONE 9N
NORTHING	m	11	*	Northing, NAD-83 UTM ZONE 9N
SURFACE	m	10	*	Drape surface, (above WGS-84 Ellipsoid)
GPSALT	m	10	*	GPS altitude (above WGS-84 Ellipsoid)
MSL-Z	m	10	*	GPS altitude (above mean sea level, CGVD2013)
RALT	m	10	*	Radar altitude (Terrain Clearance)
DEMRAW	m	10	*	Radar Altimeter Digital Elevation Model / Topography (above mean sea level)
FLUX-X	nT	11	*	Fluxgate X component
FLUX-Y	nT	11	*	Fluxgate Y component
FLUX-Z	nT	11	*	Fluxgate Z component
MAGUNCOM	nT	11	*	Raw Uncompensated, unlagged magnetic total field
MAGCOM	nT	11	*	Raw Compensated, unlagged, magnetic total field
MAGRAW	nT	11	*	Raw magnetic total field (compensated, lagged)
GND1-MAG	nT	11	*	Ground station 1 diurnal / ground magnetics
GND2-MAG	nT	11	*	Ground station 2 diurnal / ground magnetics
MAGTLLEV	nT	11	*	Tie-line levelling corrections to mag
SRVMGLEV	nT	11	*	Magnetic Total field, levelled to survey
IGRF	nT	11	*	IGRF
SRVMGRES	nT	11	*	Residual magnetic field, levelled to survey
DATE	yyyymmdd	10	-	Date of flight line
FLT	-	6	-	Flight number (1001-1999 flown by C-GSGR, 2001-2999 flown by C-GSGX)

Table 16: Format of reference station magnetic data delivered from the field

Title	Units	Field Length	Null	Description
FLT	-	6	-	Flight number (1001-1999 flown by C-GSGR, 2001-2999 flown by C-GSGX)
DATE	yyyymmdd	10	-	Date of flight line
UTC-SEC	s	10	-	Fiducial Seconds Past Midnight UTC
GNDMAG1	nT	11	*	Ground Station 1: Diurnal magnetic total field
GND1-IGRF	nT	11	*	Ground Station 1: Diurnal magnetic total field IGRF corrected
IGRF1	nT	11	*	Ground Station 1: IGRF correction
GNDMAG2	nT	11	*	Ground Station 2: Diurnal magnetic total field
GND2-IGRF	nT	11	*	Ground Station 2: Diurnal magnetic total field IGRF corrected
IGRF2	nT	11	*	Ground Station 2: IGRF correction

Table 17: Format of terrain data delivered during post-processing

Title	Units	Field Length	Null	Description
LINE	-	8	-	Line Number XXXXY where XXXX is line number and Y is segment number
UTC-SEC	s	10	-	Fiducial Seconds Past Midnight UTC
BALT	m	10	*	Barometric altitude
DEMLEV	m	10	*	Levelled Radar Altimeter Digital Elevation Model / Topography (above mean sea level)

10. FINAL PRODUCTS

Magnetic Line Data Format

A listing of the data channels delivered in the final digital archive of the final line data (Geosoft database) can be found in *Table 18*.

Table 18: Final Database Channel Description

GSC Channel Name	Description	Format	Units	Sample Rate
LINE	Line number	I10	-	0.1
TIME	System Time (seconds of the day, dbl prec.& rounded)	F10.2	sec	0.1
GPSTIME	GPS Time (seconds of the day, dbl prec., original)	F10.2	sec	0.1
AIRCRAFT	Aircraft registration, (alpha numeric sting)	A10	-	0.1
LONG	Longitude [NAD83]	F13.6	deg	0.1
LAT	Latitude [NAD83]	F13.6	deg	0.1
EASTING	UTM Easting (NAD83, zone 9N)	F10.2	m	0.1
NORTHING	UTM Northing (NAD83, zone 9N)	F10.2	m	0.1
RALT	Edited Radar Altimeter, lagged, corrected, final	F10.2	m	0.1
BALTRAW	Raw barometric altimeter, lagged	F10.2	m	0.1
BALT	Barometric altimeter corrected for drift and lag	F10.2	m	0.1
SURFACE	Ideal Surface altitude (drape), ellipsoidal	F10.2	m	0.1
GPSALTR	Differentially Corrected GPS Altitude ellipsoidal	F10.2	m	0.1
GPSALT	Differentially Corrected GPS Altitude, orthometric	F10.2	m	0.1
DEMRAW	Raw digital Topography [GPSALT - RALT]	F10.2	m	0.1
DEMLEV	Levelled digital Topography	F10.2	m	0.1
MAGUNCOM	Raw uncompensated, unlagged Mag	F10.2	nT	0.1
MAGCOM	Raw compensated, unlagged Mag	F10.2	nT	0.1
MAGRAW	Raw compensated, lagged Mag	F10.2	nT	0.1
MAGCOR1	Low amplitude, 1.2 Hz A/C pulse-light noise	F10.4	nT	0.1
MAGCOR2	HF_magnetic diurnal, micropulsation corrections	F10.4	nT	0.1
ALTCOR	Taylor series correction factor for height variations	F10.4	nT	0.1
DIUR1RAW	Raw Basemag1 (backup), some gaps	F10.2	nT	0.1
DIUR2RAW	Raw Basemag (main), complete	F10.2	nT	0.1
DIURNAL	Basemag (main) complete, edited, filtered	F10.2	nT	0.1
MAGTLCOR	Tie-line levelling corrections to mag	F10.2	nT	0.1
SRVMGLEV †	Final tie-line levelled mag	F10.2	nT	0.1
IGRF	IGRF correction; Avg. alt (1606 m) , date (2016/03/25)	F10.2	nT	0.1
SRVMGRES	Levelled residual magnetic field	F10.2	nT	0.1
FLUXLONG	Longitudinal Vector Mag (fluxgate)	F10.2	nT	0.1
FLUXTRAN	Transverse Vector Mag (fluxgate)	F10.2	nT	0.1
FLUXVERT	Vertical Vector Mag (fluxgate)	F10.2	nT	0.1
DATE	Local date (YYYYMMDD)	I10	-	0.1
FLIGHT	Flight number	I10	-	0.1
LINENAME	Line name. An alpha-numeric string	A10	-	0.1
LINETYPE	Line type. L=Traverse, T=Tie, B=Background	A10	-	0.1

† SRVMGLEV = MAGRAW - MAGCOR1 – MAGCOR2 + ALTCOR + MAGTLCOR

Digital Grids

The following table lists the grids delivered in the final digital archive

Formats:	Geosoft (GRD & GRD.GI)
Grid Cell Size:	100 m
Datum:	NAD-83
Projection:	UTM9N

Table 19: Delivered digital grids

Grid File Name	Units	Grid Cell Size	Description
DEMLEV	m	100	Levelled Digital Elevation Model
SRVMGLEV	nT	100	Levelled Total Magnetic Intensity
SRVMGRES	nT	100	Residual Magnetic Anomaly
VG1	nT/m	100	1st Vertical Derivative of Residual Magnetic Anomaly
VG2	nT/m^2	100	2nd Vertical Derivative of Residual Magnetic Anomaly

The SRVMGRES and VG1 grids listed above are also provided as Geosoft format digital map files. See *Figure 1* for the map sheet boundaries. The map specifications are as follows:

Datum:	NAD-83
Projection:	UTM9N
Map Scale:	1:100,000

Appendix I

SGL

SANDER GEOPHYSICS

Company Profile

ABOUT US

Sander Geophysics Limited (SGL) provides worldwide airborne geophysical surveys for petroleum and mineral exploration, and geological and environmental mapping. Services offered include high resolution airborne gravity, magnetic, electromagnetic, and radiometric surveys, using fixed-wing aircraft and helicopters.

SGL head office in Ottawa, Canada

Dr. George W. Sander (1924-2008) founded SGL in 1956 to provide ground geophysical surveys. The first airborne surveys were performed as early as 1958, and by 1967 airborne geophysical surveys were the company's main focus. Operations have expanded steadily since SGL was founded 60 years ago. The company is led by co-Presidents Luise Sander and Stephan Sander.

WORLDWIDE OPERATIONS

SGL's head office and aircraft maintenance hangar are located at the International Airport in Ottawa, Canada. Sander Geophysics has operated on every continent including Antarctica, over diverse conditions ranging from the tropics to deserts, mountains and offshore.

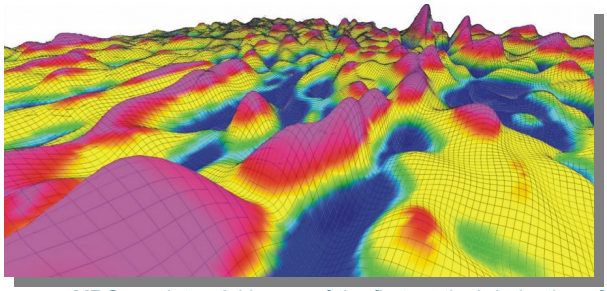
Facilities at the head office include a state of the art data processing department with an integrated digital cartographic department and a fully equipped electronics workshop for research, development and production of geophysical instruments. A Transport Canada Approved Maintenance Organization (AMO) for fixed-wing aircraft and helicopters allows most aircraft maintenance and modifications to be performed in-house.

SERVICES

AIRBORNE SURVEYS

- **Gravity (AIRGrav)**
- **Magnetic Total Field**
- **Magnetic Gradient**
- **Electromagnetic**
- **Gamma-ray Spectrometer**
- **Scanning LiDAR**

SGL offers gravity surveys with **AIRGrav** (Airborne Inertially Referenced Gravimeter), which was designed specifically for the unique characteristics of the airborne environment and is the highest resolution airborne gravimeter available. **AIRGrav** can be flown in an efficient survey aircraft during normal daytime conditions and is routinely flown in combination with magnetometer systems in SGL's airplanes and helicopters.



***AIRGrav** data: 3d image of the first vertical derivative of terrain corrected Bouguer gravity*

DATA PROCESSING

Immediate data processing is part of SGL's standard quality control procedure, and provides clients with rapid results for evaluation while a survey is in progress. Sander Geophysics offers a full range of data enhancement programs and integrated interpretation services by experienced geoscientists. Available products in digital and/or hard copy include:

- **Contour, colour or shaded relief maps of any parameter or combination of parameters**
- **NASVD processed gamma-ray spectrometer data**
- **Filtered line or grid products such as vertical or horizontal gradients, frequency slices,**

- **high/low-pass or band-pass filtered, amplitude of the analytic signal, reduction to the pole, upward or downward continuation**
- **Computed depth to basement**
- **Calculated digital terrain models**
- **Two- or three-dimensional modelling**
- **Cultural editing**
- **Complete geophysical interpretative reports**

ENVIRONMENTAL MONITORING

The company also provides environmental monitoring services using gamma-ray spectrometers and specialized processing to detect and quantify natural and anthropogenic radiation.

HEALTH & SAFETY

Sander Geophysics is a founding and active executive member of the International Airborne Geophysics Safety Association (IAGSA), which promotes the safe operation of helicopters and fixed-wing aircraft on airborne geophysical surveys.

SGL has developed and implemented a Safety Management System (SMS) and comprehensive Health, Safety and Environment (HSE) policies that govern all aspects of company operations. Safety initiatives include:

- **Project-specific Aviation Risk Analysis (ARA) and Personnel Risk Analysis (PRA) for all surveys**
- **Real-time satellite tracking of SGL aircraft**
- **HSE and first aid training for all field personnel**
- **Low-level flight and aircraft simulator training for pilots**
- **Advanced safety training appropriate to the survey location, such as water-egress, wilderness survival, etc.**

SGL's excellent safety record reflects the quality and experience of its survey crews. This, combined with management's ongoing commitment to safety, helps to ensure that Sander Geophysics is a safe and reliable choice for airborne geophysical surveys.

PERSONNEL

Sander Geophysics has over 160 experienced permanent employees, including geophysicists, software and hardware engineers, aircraft maintenance engineers and pilots.

AIRCRAFT

SGL owns and operates seventeen aircraft, including eight Cessna Grand Caravans and a Twin Otter all equipped for geophysical surveys.

The Grand Caravans have been modified to allow the installation of a tri-axial magnetic gradiometer system. The company's fleet also includes three all composite Diamond DA42 Twin Stars, modified for gravity and horizontal magnetic gradient surveys, and two AS350 B3 helicopters equipped for gravity, magnetic and radiometric surveys. Extensive modifications have been made to all of the survey aircraft to accommodate geophysical instruments and to reduce the aircraft's magnetic field. Typical Figures of Merit (FOM) for Sander Geophysics' fixed-wing aircraft are less than 1 nT. The company's aircraft are flown and maintained by licensed and experienced permanent employees of Sander Geophysics.

SGL aircraft

RESEARCH & DEVELOPMENT

Nearly one-third of the company's resources are devoted to developing new and more efficient instrumentation for airborne geophysical surveying, and to further refine its full suite of software for geophysical data processing.

SGL

Appendix II

PLANNED LINES
WGS-84

SEGMENT	START		END		LENGTH	
NO	LAT	LONG	LAT	LONG	NM	KM
C0101.0	N61:52.98	W130:51.50	N61:55.88	W130:54.26	3.19	5.90
C0102.0	N61:50.95	W130:46.57	N61:56.80	W130:52.14	6.43	11.90
C0103.0	N61:48.92	W130:41.66	N61:57.53	W130:49.82	9.45	17.50
C0104.0	N61:46.89	W130:36.76	N61:58.25	W130:47.50	12.47	23.10
C0105.0	N61:44.86	W130:31.86	N61:59.17	W130:45.37	15.71	29.10
C0106.0	N61:42.82	W130:26.98	N61:59.90	W130:43.05	18.74	34.70
C0107.0	N61:40.98	W130:22.29	N62:00.82	W130:40.91	21.76	40.30
C0108.0	N61:35.97	W130:14.70	N62:01.54	W130:38.59	28.02	51.90
C0109.0	N60:25.18	W129:09.36	N60:33.07	W129:16.07	8.59	15.90
C0109.1	N61:29.78	W130:06.08	N62:02.46	W130:36.45	35.80	66.30
C0110.0	N60:25.28	W129:06.61	N60:40.33	W129:19.43	16.36	30.30
C0110.1	N61:23.77	W129:57.68	N62:03.18	W130:34.12	43.14	79.90
C0111.0	N60:25.57	W129:04.03	N60:47.58	W129:22.81	23.92	44.30
C0111.1	N61:17.56	W129:49.17	N62:04.10	W130:31.97	50.92	94.30
C0112.0	N60:25.67	W129:01.28	N60:58.20	W129:29.16	35.37	65.50
C0112.1	N61:11.34	W129:40.71	N62:04.82	W130:29.64	58.48	108.30
C0113.0	N60:25.97	W128:58.69	N62:05.74	W130:27.49	108.80	201.50
C0114.0	N60:26.07	W128:55.94	N62:06.46	W130:25.15	109.45	202.70
C0115.0	N60:26.36	W128:53.36	N62:07.37	W130:23.00	110.10	203.90
C0116.0	N60:26.46	W128:50.61	N62:08.09	W130:20.66	110.75	205.10
C0117.0	N60:26.55	W128:47.86	N62:08.63	W130:18.14	111.20	205.93
C0118.0	N60:26.85	W128:45.27	N62:09.13	W130:15.60	111.39	206.30
C0119.0	N60:26.94	W128:42.52	N62:08.86	W130:12.33	110.96	205.50
C0120.0	N60:27.23	W128:39.93	N62:08.19	W130:08.69	109.88	203.50
C0121.0	N60:27.32	W128:37.18	N62:07.33	W130:04.87	108.80	201.50
C0122.0	N60:27.61	W128:34.59	N62:06.46	W130:01.06	107.51	199.10
C0123.0	N60:27.90	W128:32.00	N62:05.20	W129:56.88	105.78	195.90
C0124.0	N60:28.39	W128:29.57	N62:03.73	W129:52.53	103.62	191.90
C0125.0	N60:29.27	W128:27.48	N62:02.26	W129:48.19	101.03	187.10
C0126.0	N60:31.76	W128:26.69	N62:00.60	W129:43.67	96.49	178.70
C0127.0	N60:34.24	W128:25.90	N61:59.12	W129:39.34	92.17	170.70
C0128.0	N60:36.72	W128:25.11	N61:56.86	W129:34.30	86.99	161.10
C0129.0	N60:39.40	W128:24.48	N61:54.79	W129:29.45	81.80	151.50
C0130.0	N60:41.89	W128:23.69	N61:52.51	W129:24.43	76.62	141.90
C0131.0	N60:44.37	W128:22.89	N61:50.24	W129:19.43	71.44	132.30
C0132.0	N60:46.85	W128:22.09	N61:48.16	W129:14.61	66.47	123.10
C0133.0	N60:49.33	W128:21.29	N61:45.88	W129:09.63	61.29	113.50
C0134.0	N60:52.01	W128:20.66	N61:43.79	W129:04.84	56.10	103.90
T1001.0	N60:27.94	W128:32.21	N60:28.49	W128:29.48	1.46	2.70
T1002.0	N60:27.66	W128:34.80	N60:28.69	W128:29.65	2.75	5.10
T1003.0	N60:27.37	W128:37.39	N60:29.38	W128:27.39	5.35	9.90
T1004.0	N60:27.57	W128:37.56	N60:29.58	W128:27.55	5.35	9.90
T1005.0	N60:27.27	W128:40.14	N60:29.78	W128:27.71	6.64	12.30
T1006.0	N60:26.98	W128:42.73	N60:29.98	W128:27.88	7.94	14.70
T1007.0	N60:27.18	W128:42.90	N60:30.18	W128:28.04	7.94	14.70
T1008.0	N60:26.89	W128:45.48	N60:30.38	W128:28.21	9.23	17.10
T1009.0	N60:26.60	W128:48.07	N60:30.58	W128:28.37	10.53	19.50
T1010.0	N60:26.80	W128:48.24	N60:30.78	W128:28.54	10.53	19.50
T1011.0	N60:26.50	W128:50.82	N60:30.97	W128:28.70	11.83	21.90
T1012.0	N60:26.70	W128:50.99	N60:31.17	W128:28.86	11.83	21.90
T1013.0	N60:26.41	W128:53.57	N60:31.86	W128:26.60	14.42	26.70
T1014.0	N60:26.11	W128:56.16	N60:32.06	W128:26.76	15.71	29.10
T1015.0	N60:26.31	W128:56.32	N60:32.26	W128:26.93	15.71	29.10
T1016.0	N60:26.01	W128:58.91	N60:32.46	W128:27.09	17.01	31.50
T1017.0	N60:25.72	W129:01.49	N60:32.66	W128:27.26	18.30	33.90
T1018.0	N60:25.92	W129:01.66	N60:32.86	W128:27.42	18.30	33.90
T1019.0	N60:25.62	W129:04.24	N60:33.06	W128:27.59	19.60	36.30

PLANNED LINES
WGS-84

SEGMENT	START		END		LENGTH	
NO	LAT	LONG	LAT	LONG	NM	KM
T1020.0	N60:25.32	W129:06.82	N60:33.26	W128:27.75	20.90	38.70
T1021.0	N60:25.52	W129:06.99	N60:33.46	W128:27.91	20.90	38.70
T1022.0	N60:25.22	W129:09.57	N60:33.66	W128:28.08	22.19	41.10
T1023.0	N60:25.42	W129:09.74	N60:34.34	W128:25.81	23.49	43.50
T1024.0	N60:25.62	W129:09.91	N60:34.54	W128:25.97	23.49	43.50
T1025.0	N60:25.81	W129:10.07	N60:34.74	W128:26.14	23.49	43.50
T1026.0	N60:26.01	W129:10.24	N60:34.94	W128:26.30	23.49	43.50
T1027.0	N60:26.21	W129:10.41	N60:35.14	W128:26.47	23.49	43.50
T1028.0	N60:26.41	W129:10.58	N60:35.34	W128:26.63	23.49	43.50
T1029.0	N60:26.61	W129:10.75	N60:35.54	W128:26.80	23.49	43.50
T1030.0	N60:26.81	W129:10.92	N60:35.74	W128:26.96	23.49	43.50
T1031.0	N60:27.01	W129:11.08	N60:35.94	W128:27.13	23.49	43.50
T1032.0	N60:27.21	W129:11.25	N60:36.14	W128:27.29	23.49	43.50
T1033.0	N60:27.40	W129:11.42	N60:36.83	W128:25.02	24.78	45.90
T1034.0	N60:27.60	W129:11.59	N60:37.03	W128:25.18	24.78	45.90
T1035.0	N60:27.80	W129:11.76	N60:37.23	W128:25.35	24.78	45.90
T1036.0	N60:28.00	W129:11.93	N60:37.43	W128:25.51	24.78	45.90
T1037.0	N60:28.20	W129:12.10	N60:37.62	W128:25.68	24.78	45.90
T1038.0	N60:28.40	W129:12.27	N60:37.82	W128:25.84	24.78	45.90
T1039.0	N60:28.60	W129:12.43	N60:38.02	W128:26.01	24.78	45.90
T1040.0	N60:28.80	W129:12.60	N60:38.22	W128:26.17	24.78	45.90
T1041.0	N60:28.99	W129:12.77	N60:38.42	W128:26.34	24.78	45.90
T1042.0	N60:29.19	W129:12.94	N60:38.62	W128:26.50	24.78	45.90
T1043.0	N60:29.39	W129:13.11	N60:38.82	W128:26.67	24.78	45.90
T1044.0	N60:29.59	W129:13.28	N60:39.51	W128:24.39	26.08	48.30
T1045.0	N60:29.79	W129:13.45	N60:39.71	W128:24.56	26.08	48.30
T1046.0	N60:29.99	W129:13.62	N60:39.91	W128:24.72	26.08	48.30
T1047.0	N60:30.19	W129:13.79	N60:40.11	W128:24.89	26.08	48.30
T1048.0	N60:30.39	W129:13.95	N60:40.31	W128:25.05	26.08	48.30
T1049.0	N60:30.58	W129:14.12	N60:40.51	W128:25.22	26.08	48.30
T1050.0	N60:30.78	W129:14.29	N60:40.71	W128:25.38	26.08	48.30
T1051.0	N60:30.98	W129:14.46	N60:40.91	W128:25.55	26.08	48.30
T1052.0	N60:31.18	W129:14.63	N60:41.11	W128:25.71	26.08	48.30
T1053.0	N60:31.38	W129:14.80	N60:41.31	W128:25.88	26.08	48.30
T1054.0	N60:31.58	W129:14.97	N60:41.99	W128:23.60	27.38	50.70
T1055.0	N60:31.78	W129:15.14	N60:42.19	W128:23.76	27.38	50.70
T1056.0	N60:31.98	W129:15.31	N60:42.39	W128:23.93	27.38	50.70
T1057.0	N60:32.17	W129:15.48	N60:42.59	W128:24.09	27.38	50.70
T1058.0	N60:32.37	W129:15.65	N60:42.79	W128:24.26	27.38	50.70
T1059.0	N60:32.57	W129:15.82	N60:42.99	W128:24.42	27.38	50.70
T1060.0	N60:32.77	W129:15.99	N60:43.19	W128:24.59	27.38	50.70
T1061.0	N60:32.97	W129:16.16	N60:43.39	W128:24.75	27.38	50.70
T1062.0	N60:33.67	W129:13.91	N60:43.59	W128:24.92	26.08	48.30
T1063.0	N60:33.87	W129:14.07	N60:43.79	W128:25.08	26.08	48.30
T1064.0	N60:34.07	W129:14.24	N60:44.47	W128:22.80	27.38	50.70
T1065.0	N60:34.26	W129:14.41	N60:44.67	W128:22.97	27.38	50.70
T1066.0	N60:34.46	W129:14.58	N60:44.87	W128:23.13	27.38	50.70
T1067.0	N60:34.66	W129:14.75	N60:45.07	W128:23.30	27.38	50.70
T1068.0	N60:34.86	W129:14.92	N60:45.27	W128:23.46	27.38	50.70
T1069.0	N60:35.06	W129:15.09	N60:45.47	W128:23.63	27.38	50.70
T1070.0	N60:35.26	W129:15.26	N60:45.67	W128:23.79	27.38	50.70
T1071.0	N60:35.46	W129:15.43	N60:45.87	W128:23.96	27.38	50.70
T1072.0	N60:35.65	W129:15.60	N60:46.07	W128:24.12	27.38	50.70
T1073.0	N60:35.85	W129:15.77	N60:46.27	W128:24.29	27.38	50.70
T1074.0	N60:36.05	W129:15.94	N60:46.96	W128:22.00	28.67	53.10
T1075.0	N60:36.25	W129:16.11	N60:47.16	W128:22.17	28.67	53.10
T1076.0	N60:36.45	W129:16.28	N60:47.36	W128:22.33	28.67	53.10

PLANNED LINES
WGS-84

SEGMENT	START		END		LENGTH	
NO	LAT	LONG	LAT	LONG	NM	KM
T1077.0	N60:36.65	W129:16.45	N60:47.55	W128:22.50	28.67	53.10
T1078.0	N60:36.85	W129:16.62	N60:47.75	W128:22.66	28.67	53.10
T1079.0	N60:37.04	W129:16.79	N60:47.95	W128:22.83	28.67	53.10
T1080.0	N60:37.24	W129:16.96	N60:48.15	W128:22.99	28.67	53.10
T1081.0	N60:37.44	W129:17.13	N60:48.35	W128:23.16	28.67	53.10
T1082.0	N60:37.64	W129:17.30	N60:48.55	W128:23.33	28.67	53.10
T1083.0	N60:37.84	W129:17.47	N60:48.75	W128:23.49	28.67	53.10
T1084.0	N60:38.04	W129:17.64	N60:49.44	W128:21.20	29.97	55.50
T1085.0	N60:38.24	W129:17.81	N60:49.64	W128:21.37	29.97	55.50
T1086.0	N60:38.44	W129:17.98	N60:49.84	W128:21.53	29.97	55.50
T1087.0	N60:38.63	W129:18.15	N60:50.04	W128:21.70	29.97	55.50
T1088.0	N60:38.83	W129:18.32	N60:50.24	W128:21.86	29.97	55.50
T1089.0	N60:39.03	W129:18.49	N60:50.44	W128:22.03	29.97	55.50
T1090.0	N60:39.23	W129:18.66	N60:50.64	W128:22.19	29.97	55.50
T1091.0	N60:39.43	W129:18.83	N60:50.84	W128:22.36	29.97	55.50
T1092.0	N60:39.63	W129:19.00	N60:51.04	W128:22.53	29.97	55.50
T1093.0	N60:39.83	W129:19.17	N60:51.24	W128:22.69	29.97	55.50
T1094.0	N60:40.02	W129:19.34	N60:51.44	W128:22.86	29.97	55.50
T1095.0	N60:40.22	W129:19.51	N60:52.12	W128:20.57	31.26	57.90
T1096.0	N60:40.92	W129:17.26	N60:52.32	W128:20.73	29.97	55.50
T1097.0	N60:41.12	W129:17.43	N60:52.52	W128:20.90	29.97	55.50
T1098.0	N60:41.32	W129:17.60	N60:52.72	W128:21.06	29.97	55.50
T1099.0	N60:41.52	W129:17.77	N60:52.92	W128:21.23	29.97	55.50
T1100.0	N60:41.72	W129:17.94	N60:53.12	W128:21.39	29.97	55.50
T1101.0	N60:41.92	W129:18.11	N60:53.32	W128:21.56	29.97	55.50
T1102.0	N60:42.11	W129:18.28	N60:53.52	W128:21.72	29.97	55.50
T1103.0	N60:42.31	W129:18.45	N60:53.72	W128:21.89	29.97	55.50
T1104.0	N60:42.51	W129:18.62	N60:53.92	W128:22.06	29.97	55.50
T1105.0	N60:42.71	W129:18.79	N60:54.12	W128:22.22	29.97	55.50
T1106.0	N60:42.91	W129:18.96	N60:54.32	W128:22.39	29.97	55.50
T1107.0	N60:43.11	W129:19.13	N60:54.52	W128:22.55	29.97	55.50
T1108.0	N60:43.31	W129:19.30	N60:54.72	W128:22.72	29.97	55.50
T1109.0	N60:43.50	W129:19.47	N60:54.92	W128:22.89	29.97	55.50
T1110.0	N60:43.70	W129:19.64	N60:55.12	W128:23.05	29.97	55.50
T1111.0	N60:43.90	W129:19.82	N60:55.32	W128:23.22	29.97	55.50
T1112.0	N60:44.10	W129:19.99	N60:55.52	W128:23.38	29.97	55.50
T1113.0	N60:44.30	W129:20.16	N60:55.72	W128:23.55	29.97	55.50
T1114.0	N60:44.50	W129:20.33	N60:55.91	W128:23.72	29.97	55.50
T1115.0	N60:44.70	W129:20.50	N60:56.11	W128:23.88	29.97	55.50
T1116.0	N60:44.89	W129:20.67	N60:56.31	W128:24.05	29.97	55.50
T1117.0	N60:45.09	W129:20.84	N60:56.51	W128:24.21	29.97	55.50
T1118.0	N60:45.29	W129:21.01	N60:56.71	W128:24.38	29.97	55.50
T1119.0	N60:45.49	W129:21.18	N60:56.91	W128:24.55	29.97	55.50
T1120.0	N60:45.69	W129:21.35	N60:57.11	W128:24.71	29.97	55.50
T1121.0	N60:45.89	W129:21.53	N60:57.31	W128:24.88	29.97	55.50
T1122.0	N60:46.09	W129:21.70	N60:57.51	W128:25.05	29.97	55.50
T1123.0	N60:46.28	W129:21.87	N60:57.71	W128:25.21	29.97	55.50
T1124.0	N60:46.48	W129:22.04	N60:57.91	W128:25.38	29.97	55.50
T1125.0	N60:46.68	W129:22.21	N60:58.11	W128:25.55	29.97	55.50
T1126.0	N60:46.88	W129:22.38	N60:58.31	W128:25.71	29.97	55.50
T1127.0	N60:47.08	W129:22.55	N60:58.51	W128:25.88	29.97	55.50
T1128.0	N60:47.28	W129:22.73	N60:58.71	W128:26.05	29.97	55.50
T1129.0	N60:47.48	W129:22.90	N60:58.91	W128:26.21	29.97	55.50
T1130.0	N60:48.18	W129:20.63	N60:59.11	W128:26.38	28.67	53.10
T1131.0	N60:48.37	W129:20.80	N60:59.31	W128:26.55	28.67	53.10
T1132.0	N60:48.57	W129:20.97	N60:59.51	W128:26.71	28.67	53.10
T1133.0	N60:48.77	W129:21.15	N60:59.71	W128:26.88	28.67	53.10

PLANNED LINES
WGS-84

SEGMENT	START		END		LENGTH	
NO	LAT	LONG	LAT	LONG	NM	KM
T1134.0	N60:48.97	W129:21.32	N60:59.91	W128:27.05	28.67	53.10
T1135.0	N60:49.17	W129:21.49	N61:00.11	W128:27.21	28.67	53.10
T1136.0	N60:49.37	W129:21.66	N61:00.31	W128:27.38	28.67	53.10
T1137.0	N60:49.57	W129:21.83	N61:00.51	W128:27.55	28.67	53.10
T1138.0	N60:49.76	W129:22.00	N61:00.71	W128:27.71	28.67	53.10
T1139.0	N60:49.96	W129:22.18	N61:00.91	W128:27.88	28.67	53.10
T1140.0	N60:50.16	W129:22.35	N61:01.11	W128:28.05	28.67	53.10
T1141.0	N60:50.36	W129:22.52	N61:01.31	W128:28.21	28.67	53.10
T1142.0	N60:50.56	W129:22.69	N61:01.51	W128:28.38	28.67	53.10
T1143.0	N60:50.76	W129:22.86	N61:01.71	W128:28.55	28.67	53.10
T1144.0	N60:50.96	W129:23.03	N61:01.91	W128:28.72	28.67	53.10
T1145.0	N60:51.15	W129:23.21	N61:02.10	W128:28.88	28.67	53.10
T1146.0	N60:51.35	W129:23.38	N61:02.30	W128:29.05	28.67	53.10
T1147.0	N60:51.55	W129:23.55	N61:02.50	W128:29.22	28.67	53.10
T1148.0	N60:51.75	W129:23.72	N61:02.70	W128:29.38	28.67	53.10
T1149.0	N60:51.95	W129:23.89	N61:02.90	W128:29.55	28.67	53.10
T1150.0	N60:52.15	W129:24.07	N61:03.10	W128:29.72	28.67	53.10
T1151.0	N60:52.34	W129:24.24	N61:03.30	W128:29.89	28.67	53.10
T1152.0	N60:52.54	W129:24.41	N61:03.50	W128:30.05	28.67	53.10
T1153.0	N60:52.74	W129:24.58	N61:03.70	W128:30.22	28.67	53.10
T1154.0	N60:52.94	W129:24.75	N61:03.90	W128:30.39	28.67	53.10
T1155.0	N60:53.14	W129:24.93	N61:04.10	W128:30.56	28.67	53.10
T1156.0	N60:53.34	W129:25.10	N61:04.30	W128:30.72	28.67	53.10
T1157.0	N60:53.54	W129:25.27	N61:04.50	W128:30.89	28.67	53.10
T1158.0	N60:53.73	W129:25.44	N61:04.70	W128:31.06	28.67	53.10
T1159.0	N60:53.93	W129:25.62	N61:04.90	W128:31.23	28.67	53.10
T1160.0	N60:54.13	W129:25.79	N61:05.10	W128:31.40	28.67	53.10
T1161.0	N60:54.33	W129:25.96	N61:05.30	W128:31.56	28.67	53.10
T1162.0	N60:54.53	W129:26.13	N61:05.50	W128:31.73	28.67	53.10
T1163.0	N60:54.73	W129:26.31	N61:05.70	W128:31.90	28.67	53.10
T1164.0	N60:54.92	W129:26.48	N61:05.90	W128:32.07	28.67	53.10
T1165.0	N60:55.12	W129:26.65	N61:06.10	W128:32.23	28.67	53.10
T1166.0	N60:55.32	W129:26.82	N61:06.30	W128:32.40	28.67	53.10
T1167.0	N60:55.52	W129:27.00	N61:06.50	W128:32.57	28.67	53.10
T1168.0	N60:55.72	W129:27.17	N61:06.70	W128:32.74	28.67	53.10
T1169.0	N60:55.92	W129:27.34	N61:06.89	W128:32.91	28.67	53.10
T1170.0	N60:56.12	W129:27.51	N61:07.09	W128:33.07	28.67	53.10
T1171.0	N60:56.31	W129:27.69	N61:07.29	W128:33.24	28.67	53.10
T1172.0	N60:56.51	W129:27.86	N61:07.49	W128:33.41	28.67	53.10
T1173.0	N60:56.71	W129:28.03	N61:07.69	W128:33.58	28.67	53.10
T1174.0	N60:56.91	W129:28.21	N61:07.89	W128:33.75	28.67	53.10
T1175.0	N60:57.11	W129:28.38	N61:08.09	W128:33.92	28.67	53.10
T1176.0	N60:57.31	W129:28.55	N61:08.29	W128:34.08	28.67	53.10
T1177.0	N60:57.50	W129:28.73	N61:08.49	W128:34.25	28.67	53.10
T1178.0	N60:57.70	W129:28.90	N61:08.69	W128:34.42	28.67	53.10
T1179.0	N60:57.90	W129:29.07	N61:08.89	W128:34.59	28.67	53.10
T1180.0	N60:58.10	W129:29.24	N61:09.09	W128:34.76	28.67	53.10
T1181.0	N60:58.80	W129:26.97	N61:09.29	W128:34.93	27.38	50.70
T1182.0	N60:59.00	W129:27.14	N61:09.49	W128:35.09	27.38	50.70
T1183.0	N60:59.20	W129:27.31	N61:09.69	W128:35.26	27.38	50.70
T1184.0	N60:59.40	W129:27.49	N61:09.89	W128:35.43	27.38	50.70
T1185.0	N60:59.60	W129:27.66	N61:10.09	W128:35.60	27.38	50.70
T1186.0	N60:59.79	W129:27.83	N61:10.29	W128:35.77	27.38	50.70
T1187.0	N60:59.99	W129:28.01	N61:10.49	W128:35.94	27.38	50.70
T1188.0	N61:00.19	W129:28.18	N61:10.69	W128:36.11	27.38	50.70
T1189.0	N61:00.39	W129:28.35	N61:10.88	W128:36.27	27.38	50.70
T1190.0	N61:00.59	W129:28.53	N61:11.08	W128:36.44	27.38	50.70

PLANNED LINES
WGS-84

SEGMENT	START		END		LENGTH	
NO	LAT	LONG	LAT	LONG	NM	KM
T1191.0	N61:00.79	W129:28.70	N61:11.28	W128:36.61	27.38	50.70
T1192.0	N61:00.98	W129:28.87	N61:11.48	W128:36.78	27.38	50.70
T1193.0	N61:01.18	W129:29.05	N61:11.68	W128:36.95	27.38	50.70
T1194.0	N61:01.38	W129:29.22	N61:11.88	W128:37.12	27.38	50.70
T1195.0	N61:01.58	W129:29.39	N61:12.08	W128:37.29	27.38	50.70
T1196.0	N61:01.78	W129:29.57	N61:12.28	W128:37.46	27.38	50.70
T1197.0	N61:01.98	W129:29.74	N61:12.48	W128:37.63	27.38	50.70
T1198.0	N61:02.17	W129:29.91	N61:12.68	W128:37.79	27.38	50.70
T1199.0	N61:02.37	W129:30.09	N61:12.88	W128:37.96	27.38	50.70
T1200.0	N61:02.57	W129:30.26	N61:13.08	W128:38.13	27.38	50.70
T1201.0	N61:02.77	W129:30.44	N61:13.28	W128:38.30	27.38	50.70
T1202.0	N61:02.97	W129:30.61	N61:13.48	W128:38.47	27.38	50.70
T1203.0	N61:03.17	W129:30.78	N61:13.68	W128:38.64	27.38	50.70
T1204.0	N61:03.36	W129:30.96	N61:13.88	W128:38.81	27.38	50.70
T1205.0	N61:03.56	W129:31.13	N61:14.08	W128:38.98	27.38	50.70
T1206.0	N61:03.76	W129:31.30	N61:14.27	W128:39.15	27.38	50.70
T1207.0	N61:03.96	W129:31.48	N61:14.47	W128:39.32	27.38	50.70
T1208.0	N61:04.16	W129:31.65	N61:14.67	W128:39.49	27.38	50.70
T1209.0	N61:04.36	W129:31.83	N61:14.87	W128:39.66	27.38	50.70
T1210.0	N61:04.55	W129:32.00	N61:15.07	W128:39.83	27.38	50.70
T1211.0	N61:04.75	W129:32.17	N61:15.27	W128:40.00	27.38	50.70
T1212.0	N61:04.95	W129:32.35	N61:15.47	W128:40.17	27.38	50.70
T1213.0	N61:05.15	W129:32.52	N61:15.67	W128:40.34	27.38	50.70
T1214.0	N61:05.35	W129:32.70	N61:15.87	W128:40.50	27.38	50.70
T1215.0	N61:05.55	W129:32.87	N61:16.07	W128:40.67	27.38	50.70
T1216.0	N61:05.74	W129:33.05	N61:16.27	W128:40.84	27.38	50.70
T1217.0	N61:05.94	W129:33.22	N61:16.47	W128:41.01	27.38	50.70
T1218.0	N61:06.14	W129:33.39	N61:16.67	W128:41.18	27.38	50.70
T1219.0	N61:06.34	W129:33.57	N61:16.87	W128:41.35	27.38	50.70
T1220.0	N61:06.54	W129:33.74	N61:17.07	W128:41.52	27.38	50.70
T1221.0	N61:06.73	W129:33.92	N61:17.27	W128:41.69	27.38	50.70
T1222.0	N61:06.93	W129:34.09	N61:17.46	W128:41.86	27.38	50.70
T1223.0	N61:07.13	W129:34.27	N61:17.66	W128:42.03	27.38	50.70
T1224.0	N61:07.33	W129:34.44	N61:17.86	W128:42.20	27.38	50.70
T1225.0	N61:07.53	W129:34.61	N61:18.06	W128:42.37	27.38	50.70
T1226.0	N61:07.73	W129:34.79	N61:18.26	W128:42.54	27.38	50.70
T1227.0	N61:07.92	W129:34.96	N61:18.46	W128:42.71	27.38	50.70
T1228.0	N61:08.12	W129:35.14	N61:18.66	W128:42.88	27.38	50.70
T1229.0	N61:08.32	W129:35.31	N61:18.86	W128:43.05	27.38	50.70
T1230.0	N61:08.52	W129:35.49	N61:19.06	W128:43.22	27.38	50.70
T1231.0	N61:08.72	W129:35.66	N61:19.26	W128:43.39	27.38	50.70
T1232.0	N61:08.92	W129:35.84	N61:19.46	W128:43.56	27.38	50.70
T1233.0	N61:09.11	W129:36.01	N61:19.66	W128:43.74	27.38	50.70
T1234.0	N61:09.31	W129:36.19	N61:19.86	W128:43.91	27.38	50.70
T1235.0	N61:09.51	W129:36.36	N61:20.06	W128:44.08	27.38	50.70
T1236.0	N61:09.71	W129:36.54	N61:20.26	W128:44.25	27.38	50.70
T1237.0	N61:09.91	W129:36.71	N61:20.45	W128:44.42	27.38	50.70
T1238.0	N61:10.10	W129:36.89	N61:20.65	W128:44.59	27.38	50.70
T1239.0	N61:10.30	W129:37.06	N61:20.85	W128:44.76	27.38	50.70
T1240.0	N61:10.50	W129:37.24	N61:21.05	W128:44.93	27.38	50.70
T1241.0	N61:10.70	W129:37.41	N61:21.25	W128:45.10	27.38	50.70
T1242.0	N61:10.90	W129:37.59	N61:21.45	W128:45.27	27.38	50.70
T1243.0	N61:11.10	W129:37.76	N61:21.65	W128:45.44	27.38	50.70
T1244.0	N61:11.29	W129:37.94	N61:21.85	W128:45.61	27.38	50.70
T1245.0	N61:11.49	W129:38.11	N61:22.05	W128:45.78	27.38	50.70
T1246.0	N61:11.69	W129:38.29	N61:22.25	W128:45.95	27.38	50.70
T1247.0	N61:11.38	W129:40.93	N61:22.45	W128:46.12	28.67	53.10

PLANNED LINES
WGS-84

SEGMENT	START		END		LENGTH	
NO	LAT	LONG	LAT	LONG	NM	KM
T1248.0	N61:11.58	W129:41.10	N61:22.65	W128:46.29	28.67	53.10
T1249.0	N61:11.78	W129:41.28	N61:22.85	W128:46.47	28.67	53.10
T1250.0	N61:11.97	W129:41.45	N61:23.05	W128:46.64	28.67	53.10
T1251.0	N61:12.17	W129:41.63	N61:23.24	W128:46.81	28.67	53.10
T1252.0	N61:12.37	W129:41.81	N61:23.44	W128:46.98	28.67	53.10
T1253.0	N61:12.57	W129:41.98	N61:23.64	W128:47.15	28.67	53.10
T1254.0	N61:12.77	W129:42.16	N61:23.84	W128:47.32	28.67	53.10
T1255.0	N61:12.96	W129:42.33	N61:24.04	W128:47.49	28.67	53.10
T1256.0	N61:13.16	W129:42.51	N61:24.24	W128:47.66	28.67	53.10
T1257.0	N61:13.36	W129:42.69	N61:24.44	W128:47.83	28.67	53.10
T1258.0	N61:13.56	W129:42.86	N61:24.64	W128:48.00	28.67	53.10
T1259.0	N61:13.76	W129:43.04	N61:24.84	W128:48.18	28.67	53.10
T1260.0	N61:13.95	W129:43.21	N61:25.04	W128:48.35	28.67	53.10
T1261.0	N61:14.15	W129:43.39	N61:25.24	W128:48.52	28.67	53.10
T1262.0	N61:14.35	W129:43.57	N61:25.44	W128:48.69	28.67	53.10
T1263.0	N61:14.55	W129:43.74	N61:25.63	W128:48.86	28.67	53.10
T1264.0	N61:14.75	W129:43.92	N61:25.83	W128:49.03	28.67	53.10
T1265.0	N61:14.94	W129:44.09	N61:26.03	W128:49.20	28.67	53.10
T1266.0	N61:15.14	W129:44.27	N61:26.23	W128:49.38	28.67	53.10
T1267.0	N61:15.34	W129:44.45	N61:26.43	W128:49.55	28.67	53.10
T1268.0	N61:15.54	W129:44.62	N61:26.63	W128:49.72	28.67	53.10
T1269.0	N61:15.74	W129:44.80	N61:26.83	W128:49.89	28.67	53.10
T1270.0	N61:15.93	W129:44.98	N61:27.03	W128:50.06	28.67	53.10
T1271.0	N61:16.13	W129:45.15	N61:27.23	W128:50.23	28.67	53.10
T1272.0	N61:16.33	W129:45.33	N61:27.43	W128:50.41	28.67	53.10
T1273.0	N61:16.53	W129:45.51	N61:27.63	W128:50.58	28.67	53.10
T1274.0	N61:16.73	W129:45.68	N61:27.83	W128:50.75	28.67	53.10
T1275.0	N61:16.92	W129:45.86	N61:28.02	W128:50.92	28.67	53.10
T1276.0	N61:17.12	W129:46.04	N61:28.22	W128:51.09	28.67	53.10
T1277.0	N61:17.32	W129:46.21	N61:28.42	W128:51.27	28.67	53.10
T1278.0	N61:17.52	W129:46.39	N61:28.62	W128:51.44	28.67	53.10
T1279.0	N61:17.72	W129:46.57	N61:28.82	W128:51.61	28.67	53.10
T1280.0	N61:17.91	W129:46.74	N61:29.02	W128:51.78	28.67	53.10
T1281.0	N61:17.60	W129:49.39	N61:29.22	W128:51.95	29.97	55.50
T1282.0	N61:17.80	W129:49.57	N61:29.42	W128:52.13	29.97	55.50
T1283.0	N61:18.00	W129:49.74	N61:29.62	W128:52.30	29.97	55.50
T1284.0	N61:18.20	W129:49.92	N61:29.82	W128:52.47	29.97	55.50
T1285.0	N61:18.39	W129:50.10	N61:30.02	W128:52.64	29.97	55.50
T1286.0	N61:18.59	W129:50.27	N61:30.22	W128:52.81	29.97	55.50
T1287.0	N61:18.79	W129:50.45	N61:30.41	W128:52.99	29.97	55.50
T1288.0	N61:18.99	W129:50.63	N61:30.61	W128:53.16	29.97	55.50
T1289.0	N61:19.18	W129:50.81	N61:30.81	W128:53.33	29.97	55.50
T1290.0	N61:19.38	W129:50.98	N61:31.01	W128:53.50	29.97	55.50
T1291.0	N61:19.58	W129:51.16	N61:31.21	W128:53.68	29.97	55.50
T1292.0	N61:19.78	W129:51.34	N61:31.41	W128:53.85	29.97	55.50
T1293.0	N61:19.98	W129:51.52	N61:31.61	W128:54.02	29.97	55.50
T1294.0	N61:20.17	W129:51.69	N61:31.81	W128:54.19	29.97	55.50
T1295.0	N61:20.37	W129:51.87	N61:32.01	W128:54.37	29.97	55.50
T1296.0	N61:20.57	W129:52.05	N61:32.21	W128:54.54	29.97	55.50
T1297.0	N61:20.77	W129:52.23	N61:32.41	W128:54.71	29.97	55.50
T1298.0	N61:20.97	W129:52.40	N61:32.60	W128:54.88	29.97	55.50
T1299.0	N61:21.16	W129:52.58	N61:32.80	W128:55.06	29.97	55.50
T1300.0	N61:21.36	W129:52.76	N61:33.00	W128:55.23	29.97	55.50
T1301.0	N61:21.56	W129:52.94	N61:33.20	W128:55.40	29.97	55.50
T1302.0	N61:21.76	W129:53.12	N61:33.40	W128:55.58	29.97	55.50
T1303.0	N61:21.95	W129:53.29	N61:33.60	W128:55.75	29.97	55.50
T1304.0	N61:22.15	W129:53.47	N61:33.80	W128:55.92	29.97	55.50

PLANNED LINES
WGS-84

SEGMENT	START		END		LENGTH	
NO	LAT	LONG	LAT	LONG	NM	KM
T1305.0	N61:22.35	W129:53.65	N61:34.00	W128:56.09	29.97	55.50
T1306.0	N61:22.55	W129:53.83	N61:34.20	W128:56.27	29.97	55.50
T1307.0	N61:22.75	W129:54.00	N61:34.40	W128:56.44	29.97	55.50
T1308.0	N61:22.94	W129:54.18	N61:34.59	W128:56.61	29.97	55.50
T1309.0	N61:23.14	W129:54.36	N61:34.79	W128:56.79	29.97	55.50
T1310.0	N61:23.34	W129:54.54	N61:34.99	W128:56.96	29.97	55.50
T1311.0	N61:23.54	W129:54.72	N61:35.19	W128:57.13	29.97	55.50
T1312.0	N61:23.73	W129:54.90	N61:35.39	W128:57.31	29.97	55.50
T1313.0	N61:23.93	W129:55.07	N61:35.59	W128:57.48	29.97	55.50
T1314.0	N61:24.13	W129:55.25	N61:35.79	W128:57.65	29.97	55.50
T1315.0	N61:23.81	W129:57.91	N61:35.99	W128:57.83	31.26	57.90
T1316.0	N61:24.01	W129:58.08	N61:36.19	W128:58.00	31.26	57.90
T1317.0	N61:24.21	W129:58.26	N61:36.39	W128:58.17	31.26	57.90
T1318.0	N61:24.41	W129:58.44	N61:36.58	W128:58.35	31.26	57.90
T1319.0	N61:24.61	W129:58.62	N61:36.78	W128:58.52	31.26	57.90
T1320.0	N61:24.80	W129:58.80	N61:36.98	W128:58.69	31.26	57.90
T1321.0	N61:25.00	W129:58.98	N61:37.18	W128:58.87	31.26	57.90
T1322.0	N61:25.20	W129:59.16	N61:37.38	W128:59.04	31.26	57.90
T1323.0	N61:25.40	W129:59.33	N61:37.58	W128:59.21	31.26	57.90
T1324.0	N61:25.59	W129:59.51	N61:37.78	W128:59.39	31.26	57.90
T1325.0	N61:25.79	W129:59.69	N61:37.98	W128:59.56	31.26	57.90
T1326.0	N61:25.99	W129:59.87	N61:38.18	W128:59.73	31.26	57.90
T1327.0	N61:26.19	W130:00.05	N61:38.38	W128:59.91	31.26	57.90
T1328.0	N61:26.38	W130:00.23	N61:38.57	W129:00.08	31.26	57.90
T1329.0	N61:26.58	W130:00.41	N61:38.77	W129:00.26	31.26	57.90
T1330.0	N61:26.78	W130:00.59	N61:38.97	W129:00.43	31.26	57.90
T1331.0	N61:26.98	W130:00.77	N61:39.17	W129:00.60	31.26	57.90
T1332.0	N61:27.17	W130:00.95	N61:39.37	W129:00.78	31.26	57.90
T1333.0	N61:27.37	W130:01.13	N61:39.57	W129:00.95	31.26	57.90
T1334.0	N61:27.57	W130:01.30	N61:39.77	W129:01.13	31.26	57.90
T1335.0	N61:27.77	W130:01.48	N61:39.97	W129:01.30	31.26	57.90
T1336.0	N61:27.97	W130:01.66	N61:40.17	W129:01.47	31.26	57.90
T1337.0	N61:28.16	W130:01.84	N61:40.36	W129:01.65	31.26	57.90
T1338.0	N61:28.36	W130:02.02	N61:40.56	W129:01.82	31.26	57.90
T1339.0	N61:28.56	W130:02.20	N61:40.76	W129:02.00	31.26	57.90
T1340.0	N61:28.76	W130:02.38	N61:40.96	W129:02.17	31.26	57.90
T1341.0	N61:28.95	W130:02.56	N61:41.16	W129:02.34	31.26	57.90
T1342.0	N61:29.15	W130:02.74	N61:41.36	W129:02.52	31.26	57.90
T1343.0	N61:29.35	W130:02.92	N61:41.56	W129:02.69	31.26	57.90
T1344.0	N61:29.55	W130:03.10	N61:41.76	W129:02.87	31.26	57.90
T1345.0	N61:29.74	W130:03.28	N61:41.96	W129:03.04	31.26	57.90
T1346.0	N61:29.94	W130:03.46	N61:42.16	W129:03.22	31.26	57.90
T1347.0	N61:30.14	W130:03.64	N61:42.35	W129:03.39	31.26	57.90
T1348.0	N61:29.82	W130:06.30	N61:42.55	W129:03.57	32.56	60.30
T1349.0	N61:30.02	W130:06.48	N61:42.75	W129:03.74	32.56	60.30
T1350.0	N61:30.22	W130:06.66	N61:42.95	W129:03.92	32.56	60.30
T1351.0	N61:30.41	W130:06.84	N61:43.15	W129:04.09	32.56	60.30
T1352.0	N61:30.61	W130:07.02	N61:43.35	W129:04.26	32.56	60.30
T1353.0	N61:30.81	W130:07.20	N61:43.55	W129:04.44	32.56	60.30
T1354.0	N61:31.01	W130:07.38	N61:43.75	W129:04.61	32.56	60.30
T1355.0	N61:31.20	W130:07.56	N61:43.45	W129:07.30	31.26	57.90
T1356.0	N61:31.40	W130:07.74	N61:43.65	W129:07.48	31.26	57.90
T1357.0	N61:31.60	W130:07.92	N61:43.84	W129:07.65	31.26	57.90
T1358.0	N61:31.80	W130:08.10	N61:44.04	W129:07.83	31.26	57.90
T1359.0	N61:31.99	W130:08.28	N61:44.24	W129:08.00	31.26	57.90
T1360.0	N61:32.19	W130:08.46	N61:44.44	W129:08.18	31.26	57.90
T1361.0	N61:32.39	W130:08.64	N61:44.64	W129:08.35	31.26	57.90

PLANNED LINES
WGS-84

SEGMENT	START		END		LENGTH	
NO	LAT	LONG	LAT	LONG	NM	KM
T1362.0	N61:32.59	W130:08.82	N61:44.84	W129:08.53	31.26	57.90
T1363.0	N61:32.78	W130:09.00	N61:45.04	W129:08.71	31.26	57.90
T1364.0	N61:32.98	W130:09.18	N61:45.24	W129:08.88	31.26	57.90
T1365.0	N61:33.18	W130:09.36	N61:45.43	W129:09.06	31.26	57.90
T1366.0	N61:33.38	W130:09.55	N61:45.63	W129:09.23	31.26	57.90
T1367.0	N61:33.57	W130:09.73	N61:45.83	W129:09.41	31.26	57.90
T1368.0	N61:33.77	W130:09.91	N61:45.53	W129:12.10	29.97	55.50
T1369.0	N61:33.97	W130:10.09	N61:45.73	W129:12.27	29.97	55.50
T1370.0	N61:34.17	W130:10.27	N61:45.93	W129:12.45	29.97	55.50
T1371.0	N61:34.36	W130:10.45	N61:46.13	W129:12.63	29.97	55.50
T1372.0	N61:34.56	W130:10.63	N61:46.33	W129:12.80	29.97	55.50
T1373.0	N61:34.76	W130:10.81	N61:46.52	W129:12.98	29.97	55.50
T1374.0	N61:34.95	W130:10.99	N61:46.72	W129:13.15	29.97	55.50
T1375.0	N61:35.15	W130:11.17	N61:46.92	W129:13.33	29.97	55.50
T1376.0	N61:35.35	W130:11.35	N61:47.12	W129:13.51	29.97	55.50
T1377.0	N61:35.55	W130:11.54	N61:47.32	W129:13.68	29.97	55.50
T1378.0	N61:35.74	W130:11.72	N61:47.52	W129:13.86	29.97	55.50
T1379.0	N61:35.94	W130:11.90	N61:47.72	W129:14.03	29.97	55.50
T1380.0	N61:36.14	W130:12.08	N61:47.92	W129:14.21	29.97	55.50
T1381.0	N61:36.34	W130:12.26	N61:48.11	W129:14.39	29.97	55.50
T1382.0	N61:36.02	W130:14.93	N61:47.81	W129:17.08	29.97	55.50
T1383.0	N61:36.21	W130:15.11	N61:48.01	W129:17.26	29.97	55.50
T1384.0	N61:36.41	W130:15.29	N61:48.21	W129:17.43	29.97	55.50
T1385.0	N61:36.61	W130:15.47	N61:48.41	W129:17.61	29.97	55.50
T1386.0	N61:36.80	W130:15.65	N61:48.61	W129:17.79	29.97	55.50
T1387.0	N61:37.00	W130:15.84	N61:48.80	W129:17.96	29.97	55.50
T1388.0	N61:37.20	W130:16.02	N61:49.00	W129:18.14	29.97	55.50
T1389.0	N61:37.40	W130:16.20	N61:49.20	W129:18.32	29.97	55.50
T1390.0	N61:37.59	W130:16.38	N61:49.40	W129:18.49	29.97	55.50
T1391.0	N61:37.79	W130:16.56	N61:49.60	W129:18.67	29.97	55.50
T1392.0	N61:37.99	W130:16.74	N61:49.80	W129:18.85	29.97	55.50
T1393.0	N61:38.19	W130:16.93	N61:50.00	W129:19.03	29.97	55.50
T1394.0	N61:38.38	W130:17.11	N61:50.19	W129:19.20	29.97	55.50
T1395.0	N61:38.58	W130:17.29	N61:49.89	W129:21.90	28.67	53.10
T1396.0	N61:38.78	W130:17.47	N61:50.09	W129:22.08	28.67	53.10
T1397.0	N61:38.97	W130:17.66	N61:50.29	W129:22.25	28.67	53.10
T1398.0	N61:39.17	W130:17.84	N61:50.49	W129:22.43	28.67	53.10
T1399.0	N61:39.37	W130:18.02	N61:50.68	W129:22.61	28.67	53.10
T1400.0	N61:39.57	W130:18.20	N61:50.88	W129:22.79	28.67	53.10
T1401.0	N61:39.76	W130:18.38	N61:51.08	W129:22.96	28.67	53.10
T1402.0	N61:39.96	W130:18.57	N61:51.28	W129:23.14	28.67	53.10
T1403.0	N61:40.16	W130:18.75	N61:51.48	W129:23.32	28.67	53.10
T1404.0	N61:40.36	W130:18.93	N61:51.68	W129:23.50	28.67	53.10
T1405.0	N61:40.55	W130:19.11	N61:51.88	W129:23.67	28.67	53.10
T1406.0	N61:40.75	W130:19.30	N61:52.07	W129:23.85	28.67	53.10
T1407.0	N61:40.95	W130:19.48	N61:52.27	W129:24.03	28.67	53.10
T1408.0	N61:41.14	W130:19.66	N61:52.47	W129:24.21	28.67	53.10
T1409.0	N61:41.34	W130:19.84	N61:52.17	W129:26.91	27.38	50.70
T1410.0	N61:41.02	W130:22.52	N61:52.36	W129:27.08	28.67	53.10
T1411.0	N61:41.22	W130:22.70	N61:52.56	W129:27.26	28.67	53.10
T1412.0	N61:41.41	W130:22.88	N61:52.76	W129:27.44	28.67	53.10
T1413.0	N61:41.61	W130:23.07	N61:52.96	W129:27.62	28.67	53.10
T1414.0	N61:41.81	W130:23.25	N61:53.16	W129:27.80	28.67	53.10
T1415.0	N61:42.00	W130:23.43	N61:53.36	W129:27.97	28.67	53.10
T1416.0	N61:42.20	W130:23.61	N61:53.55	W129:28.15	28.67	53.10
T1417.0	N61:42.40	W130:23.80	N61:53.75	W129:28.33	28.67	53.10
T1418.0	N61:42.60	W130:23.98	N61:53.95	W129:28.51	28.67	53.10

PLANNED LINES
WGS-84

SEGMENT	START		END		LENGTH	
NO	LAT	LONG	LAT	LONG	NM	KM
T1419.0	N61:42.79	W130:24.16	N61:54.15	W129:28.69	28.67	53.10
T1420.0	N61:42.99	W130:24.35	N61:54.35	W129:28.87	28.67	53.10
T1421.0	N61:43.19	W130:24.53	N61:54.55	W129:29.04	28.67	53.10
T1422.0	N61:42.86	W130:27.21	N61:54.74	W129:29.22	29.97	55.50
T1423.0	N61:43.06	W130:27.39	N61:54.44	W129:31.92	28.67	53.10
T1424.0	N61:43.26	W130:27.57	N61:54.63	W129:32.10	28.67	53.10
T1425.0	N61:43.45	W130:27.76	N61:54.83	W129:32.28	28.67	53.10
T1426.0	N61:43.65	W130:27.94	N61:55.03	W129:32.46	28.67	53.10
T1427.0	N61:43.85	W130:28.12	N61:55.23	W129:32.64	28.67	53.10
T1428.0	N61:44.04	W130:28.31	N61:55.43	W129:32.82	28.67	53.10
T1429.0	N61:44.24	W130:28.49	N61:55.63	W129:33.00	28.67	53.10
T1430.0	N61:44.44	W130:28.67	N61:55.82	W129:33.18	28.67	53.10
T1431.0	N61:44.63	W130:28.86	N61:56.02	W129:33.36	28.67	53.10
T1432.0	N61:44.83	W130:29.04	N61:56.22	W129:33.53	28.67	53.10
T1433.0	N61:45.03	W130:29.23	N61:56.42	W129:33.71	28.67	53.10
T1434.0	N61:45.23	W130:29.41	N61:56.62	W129:33.89	28.67	53.10
T1435.0	N61:44.90	W130:32.09	N61:56.82	W129:34.07	29.97	55.50
T1436.0	N61:45.10	W130:32.27	N61:56.51	W129:36.78	28.67	53.10
T1437.0	N61:45.29	W130:32.46	N61:56.70	W129:36.96	28.67	53.10
T1438.0	N61:45.49	W130:32.64	N61:56.90	W129:37.14	28.67	53.10
T1439.0	N61:45.69	W130:32.82	N61:57.10	W129:37.31	28.67	53.10
T1440.0	N61:45.88	W130:33.01	N61:57.30	W129:37.49	28.67	53.10
T1441.0	N61:46.08	W130:33.19	N61:57.50	W129:37.67	28.67	53.10
T1442.0	N61:46.28	W130:33.38	N61:57.70	W129:37.85	28.67	53.10
T1443.0	N61:46.47	W130:33.56	N61:57.89	W129:38.03	28.67	53.10
T1444.0	N61:46.67	W130:33.75	N61:58.09	W129:38.21	28.67	53.10
T1445.0	N61:46.87	W130:33.93	N61:58.29	W129:38.39	28.67	53.10
T1446.0	N61:47.06	W130:34.12	N61:58.49	W129:38.57	28.67	53.10
T1447.0	N61:47.26	W130:34.30	N61:58.69	W129:38.75	28.67	53.10
T1448.0	N61:46.93	W130:36.98	N61:58.88	W129:38.93	29.97	55.50
T1449.0	N61:47.13	W130:37.17	N61:59.08	W129:39.11	29.97	55.50
T1450.0	N61:47.33	W130:37.35	N61:58.77	W129:41.82	28.67	53.10
T1451.0	N61:47.52	W130:37.54	N61:58.97	W129:42.00	28.67	53.10
T1452.0	N61:47.72	W130:37.72	N61:59.17	W129:42.18	28.67	53.10
T1453.0	N61:47.92	W130:37.91	N61:59.37	W129:42.36	28.67	53.10
T1454.0	N61:48.11	W130:38.09	N61:59.56	W129:42.54	28.67	53.10
T1455.0	N61:48.31	W130:38.28	N61:59.76	W129:42.72	28.67	53.10
T1456.0	N61:48.51	W130:38.46	N61:59.96	W129:42.90	28.67	53.10
T1457.0	N61:48.70	W130:38.65	N62:00.16	W129:43.08	28.67	53.10
T1458.0	N61:48.90	W130:38.83	N62:00.36	W129:43.26	28.67	53.10
T1459.0	N61:49.10	W130:39.02	N62:00.55	W129:43.44	28.67	53.10
T1460.0	N61:49.29	W130:39.20	N62:00.24	W129:46.15	27.38	50.70
T1461.0	N61:48.96	W130:41.88	N62:00.44	W129:46.33	28.67	53.10
T1462.0	N61:49.16	W130:42.07	N62:00.64	W129:46.51	28.67	53.10
T1463.0	N61:49.36	W130:42.26	N62:00.84	W129:46.69	28.67	53.10
T1464.0	N61:49.56	W130:42.44	N62:01.03	W129:46.87	28.67	53.10
T1465.0	N61:49.75	W130:42.63	N62:01.23	W129:47.06	28.67	53.10
T1466.0	N61:49.95	W130:42.81	N62:01.43	W129:47.24	28.67	53.10
T1467.0	N61:50.15	W130:43.00	N62:01.63	W129:47.42	28.67	53.10
T1468.0	N61:50.34	W130:43.19	N62:01.83	W129:47.60	28.67	53.10
T1469.0	N61:50.54	W130:43.37	N62:02.02	W129:47.78	28.67	53.10
T1470.0	N61:50.74	W130:43.56	N62:02.22	W129:47.96	28.67	53.10
T1471.0	N61:50.93	W130:43.74	N62:01.91	W129:50.67	27.38	50.70
T1472.0	N61:51.13	W130:43.93	N62:02.11	W129:50.85	27.38	50.70
T1473.0	N61:51.33	W130:44.12	N62:02.30	W129:51.03	27.38	50.70
T1474.0	N61:50.99	W130:46.80	N62:02.50	W129:51.22	28.67	53.10
T1475.0	N61:51.19	W130:46.99	N62:02.70	W129:51.40	28.67	53.10

PLANNED LINES
WGS-84

SEGMENT	START		END		LENGTH	
NO	LAT	LONG	LAT	LONG	NM	KM
T1476.0	N61:51.39	W130:47.17	N62:02.90	W129:51.58	28.67	53.10
T1477.0	N61:51.58	W130:47.36	N62:03.10	W129:51.76	28.67	53.10
T1478.0	N61:51.78	W130:47.55	N62:03.29	W129:51.94	28.67	53.10
T1479.0	N61:51.98	W130:47.73	N62:03.49	W129:52.12	28.67	53.10
T1480.0	N61:52.17	W130:47.92	N62:03.69	W129:52.31	28.67	53.10
T1481.0	N61:52.37	W130:48.11	N62:03.37	W129:55.02	27.38	50.70
T1482.0	N61:52.57	W130:48.29	N62:03.57	W129:55.20	27.38	50.70
T1483.0	N61:52.76	W130:48.48	N62:03.77	W129:55.38	27.38	50.70
T1484.0	N61:52.96	W130:48.67	N62:03.97	W129:55.56	27.38	50.70
T1485.0	N61:53.16	W130:48.85	N62:04.17	W129:55.75	27.38	50.70
T1486.0	N61:53.35	W130:49.04	N62:04.36	W129:55.93	27.38	50.70
T1487.0	N61:53.02	W130:51.72	N62:04.56	W129:56.11	28.67	53.10
T1488.0	N61:53.22	W130:51.91	N62:04.76	W129:56.29	28.67	53.10
T1489.0	N61:53.41	W130:52.10	N62:04.96	W129:56.47	28.67	53.10
T1490.0	N61:53.61	W130:52.29	N62:05.15	W129:56.66	28.67	53.10
T1491.0	N61:53.80	W130:52.47	N62:04.84	W129:59.37	27.38	50.70
T1492.0	N61:54.00	W130:52.66	N62:05.04	W129:59.55	27.38	50.70
T1493.0	N61:54.20	W130:52.85	N62:05.23	W129:59.74	27.38	50.70
T1494.0	N61:54.39	W130:53.04	N62:05.43	W129:59.92	27.38	50.70
T1495.0	N61:54.59	W130:53.22	N62:05.63	W130:00.10	27.38	50.70
T1496.0	N61:54.79	W130:53.41	N62:05.83	W130:00.28	27.38	50.70
T1497.0	N61:54.98	W130:53.60	N62:06.02	W130:00.47	27.38	50.70
T1498.0	N61:55.18	W130:53.79	N62:06.22	W130:00.65	27.38	50.70
T1499.0	N61:55.38	W130:53.97	N62:06.42	W130:00.83	27.38	50.70
T1500.0	N61:55.57	W130:54.16	N62:06.10	W130:03.55	26.08	48.30
T1501.0	N61:55.77	W130:54.35	N62:06.30	W130:03.73	26.08	48.30
T1502.0	N61:56.50	W130:52.03	N62:06.50	W130:03.91	24.78	45.90
T1503.0	N61:56.69	W130:52.22	N62:06.69	W130:04.10	24.78	45.90
T1504.0	N61:57.42	W130:49.91	N62:06.89	W130:04.28	23.49	43.50
T1505.0	N61:58.14	W130:47.59	N62:07.09	W130:04.46	22.19	41.10
T1506.0	N61:58.87	W130:45.27	N62:07.29	W130:04.65	20.90	38.70
T1507.0	N61:59.07	W130:45.46	N62:06.97	W130:07.36	19.60	36.30
T1508.0	N61:59.79	W130:43.14	N62:07.17	W130:07.54	18.30	33.90
T1509.0	N62:00.51	W130:40.81	N62:07.36	W130:07.73	17.01	31.50
T1510.0	N62:00.71	W130:41.00	N62:07.56	W130:07.91	17.01	31.50
T1511.0	N62:01.43	W130:38.67	N62:07.76	W130:08.10	15.71	29.10
T1512.0	N62:02.16	W130:36.35	N62:07.95	W130:08.28	14.42	26.70
T1513.0	N62:02.35	W130:36.53	N62:08.15	W130:08.46	14.42	26.70
T1514.0	N62:03.08	W130:34.20	N62:07.83	W130:11.18	11.83	21.90
T1515.0	N62:03.80	W130:31.87	N62:08.03	W130:11.36	10.53	19.50
T1516.0	N62:03.99	W130:32.06	N62:08.23	W130:11.55	10.53	19.50
T1517.0	N62:04.71	W130:29.73	N62:08.42	W130:11.73	9.23	17.10
T1518.0	N62:05.43	W130:27.39	N62:08.62	W130:11.92	7.94	14.70
T1519.0	N62:05.63	W130:27.58	N62:08.82	W130:12.10	7.94	14.70
T1520.0	N62:06.35	W130:25.24	N62:08.50	W130:14.82	5.35	9.90
T1521.0	N62:07.07	W130:22.90	N62:08.70	W130:15.00	4.05	7.50
T1522.0	N62:07.27	W130:23.09	N62:08.89	W130:15.19	4.05	7.50
T1523.0	N62:07.99	W130:20.74	N62:09.09	W130:15.37	2.75	5.10

Total control line length = 2486.95 nautical miles
= 4605.83 kilometers.

Total traverse line length = 14340.87 nautical miles
= 26559.30 kilometers.

Total length of all lines = 16827.83 nautical miles
= 31165.13 kilometers.

SGL

Appendix III

FLOWN LINES
WGS-84, UTM 9N

MLINE	TIME	TIME	MIN X	MAX X	MIN Y	MAX Y	FLIGHT	DAY	YEAR
101.00	66380.30	66465.60	399997.71	402343.93	6862442.39	6868087.12	2011	77	2016
102.00	66046.60	66253.10	401914.59	406557.78	6858563.71	6869748.29	2011	77	2016
103.00	65688.90	65953.90	403973.04	410767.58	6854681.46	6871038.02	2011	77	2016
104.00	65184.00	65561.00	406032.68	414977.12	6850800.58	6872326.66	2011	77	2016
105.00	61863.40	62282.80	407945.68	419185.75	6846919.07	6873983.35	2034	100	2016
106.00	88670.80	89188.10	410004.03	423407.66	6843040.79	6875275.81	1017	84	2016
107.00	61428.80	62005.50	411916.84	427461.55	6839527.22	6876937.83	1018	85	2016
108.00	74812.80	75645.30	413979.66	433979.62	6830104.47	6878228.58	2015	82	2016
109.00	68377.10	68638.70	485274.17	491458.19	6698052.29	6712931.11	1005	70	2016
109.01	78707.00	79730.90	415888.02	441412.80	6818466.66	6879888.66	1017	84	2016
110.00	92102.40	92536.20	482263.80	493981.21	6698234.56	6726408.81	1006	70	2016
110.01	89104.70	90371.70	417949.45	448697.80	6807200.61	6881179.18	2013	77	2016
111.01	84235.30	84887.30	479270.87	496361.32	6698787.11	6739888.91	1009	72	2016
111.04	73673.40	74640.60	419861.60	445454.82	6821194.63	6882836.90	2015	82	2016
111.05	61366.80	61764.40	445403.47	456128.93	6795564.79	6821373.48	2019	85	2016
112.01	80468.90	81457.60	473651.51	498867.40	6698971.59	6759651.13	1005	70	2016
112.02	71867.40	73544.00	421921.19	463554.63	6783924.85	6884126.16	2012	77	2016
113.01	83572.40	86028.30	423825.77	488747.55	6729589.60	6885788.10	2008	72	2016
113.02	64757.60	65292.70	488674.71	501240.52	6699522.41	6729768.33	1010	76	2016
114.00	67787.30	69759.20	453752.69	503763.10	6699702.19	6820075.70	2002	69	2016
114.01	78817.10	79935.50	425888.85	453807.59	6819898.03	6887078.03	2005	71	2016
115.00	65843.60	67715.10	455787.76	506134.09	6700256.98	6821363.42	2002	69	2016
115.01	80615.20	81217.30	427804.89	443444.95	6851106.38	6888739.02	2005	71	2016
115.02	60892.40	61429.70	443368.92	455875.29	6821185.81	6851287.00	2034	100	2016
116.00	75139.80	76744.70	469087.30	508655.06	6700436.37	6795688.76	2002	69	2016
116.01	83314.10	84946.00	429861.59	469145.93	6795511.80	6890030.13	2004	70	2016
117.00	69993.90	70930.00	463148.03	487631.58	6757279.37	6816191.50	1005	70	2016
117.01	2473.90	3353.50	487566.89	511177.96	6700622.34	6757460.57	2006	72	2016
117.02	80231.70	80927.30	445489.70	463231.37	6816010.56	6858668.31	2017	83	2016
117.03	78756.10	79272.50	432074.80	445574.41	6858491.83	6890980.01	1019	85	2016
118.00	81451.00	81707.10	434301.57	440575.55	6876769.62	6891867.50	2001	68	2016
118.01	81988.40	84726.30	446647.73	513551.86	6701169.06	6862173.24	2001	68	2016
118.02	78218.90	78456.40	440507.85	446724.22	6861995.75	6876949.91	2005	71	2016
119.00	80038.10	83118.50	437133.17	516072.55	6701355.68	6891311.01	2004	70	2016
120.00	74780.90	75175.40	508482.27	518437.59	6701904.31	6725870.89	2001	68	2016
120.01	75575.30	77541.40	447543.96	498732.70	6749329.31	6872513.39	2001	68	2016
120.02	77596.00	77813.70	440270.14	446082.70	6876026.57	6890019.22	2001	68	2016
120.03	69211.40	69368.20	505070.89	508552.34	6725692.76	6733988.13	1005	70	2016
120.04	69483.20	69597.60	498664.14	502041.14	6741208.92	6749506.61	1005	70	2016
120.05	76601.40	76723.70	502034.56	505186.37	6733814.33	6741382.70	1012	77	2016
120.06	85309.60	85442.00	445294.32	448349.65	6870483.52	6878054.25	2013	77	2016
121.00	73066.60	74564.30	443556.55	483302.58	6792729.25	6888352.12	2005	71	2016
121.01	58633.70	60239.40	483222.40	520969.49	6702084.85	6792906.17	2034	100	2016
122.00	89444.70	92426.80	446845.24	523330.44	6702642.38	6886689.38	2008	72	2016
123.04	58960.40	62018.40	450445.45	525700.94	6703192.36	6884284.73	2023	88	2016
124.00	81671.30	84585.70	454192.78	527920.01	6704109.90	6881510.60	2005	71	2016
125.01	61482.00	64249.40	457946.80	529830.27	6705770.30	6878742.73	2021	86	2016
126.00	73403.00	76165.70	461848.55	530516.98	6710386.25	6875598.87	2007	72	2016
127.00	66496.50	67541.50	504658.96	531196.44	6715001.48	6778856.85	1008	72	2016
127.01	61580.10	63037.30	465601.71	504730.38	6778680.53	6872828.03	1020	86	2016
128.01	76903.90	78693.30	488139.73	531874.49	6719613.91	6824842.15	1008	72	2016
128.02	70845.10	71631.90	469971.90	488220.97	6824664.38	6868575.26	2038	101	2016
129.03	59864.90	62101.10	474184.98	532396.02	6724602.78	6864692.96	1028	92	2016
130.00	5701.90	6397.70	515167.52	533081.93	6729212.87	6772390.76	2006	72	2016
130.02	65470.50	66158.70	478538.23	497564.18	6814686.19	6860444.82	2034	100	2016
130.03	66188.70	66802.70	498412.68	515214.52	6772212.10	6812647.09	2034	100	2016
130.04	71878.70	71919.90	497481.83	498480.85	6812471.56	6814865.06	2038	101	2016
131.00	84382.40	86415.20	482911.77	533762.94	6733830.56	6856195.73	1007	71	2016
132.00	91034.10	92847.20	487124.91	534444.72	6738445.52	6852314.49	1013	77	2016
133.00	70771.60	71494.00	515490.95	535121.63	6743063.56	6790296.23	2002	69	2016
133.01	71537.00	71598.10	512731.69	514331.94	6793099.97	6796940.30	2002	69	2016
133.02	71618.00	71848.90	505522.90	512180.86	6798269.45	6814304.60	2002	69	2016
133.03	80123.50	81271.80	491352.85	521096.17	6776815.35	6848063.14	2013	77	2016
134.00	88735.00	90253.60	495698.19	535653.04	6748043.56	6844179.07	1007	71	2016
1001.00	79954.90	80001.10	525369.99	528057.15	6703323.67	6704441.31	1001	62	2016

FLOWN LINES
WGS-84, UTM 9N

MLINE	TIME	TIME	MIN X	MAX X	MIN Y	MAX Y	FLIGHT	DAY	YEAR
1002.00	80199.30	80275.30	522999.41	527908.39	6702771.84	6704811.67	1001	62	2016
1003.00	80438.70	80608.40	520633.04	529967.59	6702221.92	6706103.84	1001	62	2016
1004.00	6804.60	6951.20	520482.29	529814.89	6702594.71	6706480.64	2006	72	2016
1005.00	7075.40	7279.40	518107.21	529661.42	6702035.74	6706840.03	2006	72	2016
1006.00	92317.80	92542.00	515741.98	529504.44	6701499.76	6707195.53	1007	71	2016
1007.01	69973.00	70222.70	515588.61	529353.71	6701862.62	6707587.53	2002	69	2016
1008.01	89185.30	89418.90	513215.71	529201.24	6701313.74	6707951.90	2017	83	2016
1009.01	91915.40	92223.60	510846.14	529048.50	6700756.46	6708323.73	1007	71	2016
1010.01	66037.30	66351.20	510690.51	528894.58	6701119.67	6708693.59	2041	102	2016
1011.01	85029.20	85361.90	508325.02	528742.75	6700573.45	6709059.92	2001	68	2016
1012.00	86583.60	86900.30	508171.32	528583.91	6700943.32	6709432.56	2001	68	2016
1013.00	86053.10	86459.30	505797.42	530652.27	6700390.16	6710720.22	2001	68	2016
1014.00	85507.30	85923.80	503428.74	530499.05	6699844.28	6711095.49	2001	68	2016
1015.01	81146.60	81577.50	503279.01	530342.42	6700211.71	6711461.69	1022	87	2016
1016.00	81712.20	82245.50	500906.95	530188.82	6699658.86	6711824.48	1022	87	2016
1017.00	77024.60	77603.20	498539.26	530038.12	6699098.37	6712190.06	2007	72	2016
1018.01	90816.00	91307.70	498383.65	529881.78	6699476.27	6712569.40	1035	101	2016
1019.01	90109.10	90667.10	496014.46	529728.54	6698917.17	6712937.00	1035	101	2016
1020.00	92953.20	93530.40	493643.40	529575.70	6698370.35	6713297.98	2016	82	2016
1021.00	86005.10	86629.50	493489.05	529420.39	6698735.55	6713672.62	2016	82	2016
1022.00	86753.40	87356.10	491123.30	529270.84	6698189.04	6714038.92	2016	82	2016
1023.00	87464.90	88186.60	490969.22	531334.11	6698560.49	6715336.68	2016	82	2016
1024.00	88289.80	88932.70	490811.96	531178.06	6698930.40	6715704.04	2016	82	2016
1025.00	89038.40	89748.00	490661.88	531024.28	6699300.23	6716072.42	2016	82	2016
1026.00	89867.10	90517.40	490508.16	530871.06	6699667.72	6716441.41	2016	82	2016
1027.00	90639.70	91331.70	490351.52	530716.15	6700036.18	6716813.71	2016	82	2016
1028.00	91437.10	92065.40	490203.39	530563.00	6700407.59	6717175.86	2016	82	2016
1029.00	92182.10	92844.60	490048.64	530411.69	6700776.22	6717549.63	2016	82	2016
1030.00	89847.90	90521.20	489894.33	530258.31	6701145.91	6717921.47	2022	86	2016
1031.00	72424.40	73144.90	489741.56	530100.99	6701512.60	6718290.90	1031	95	2016
1032.00	89295.10	89955.10	489583.75	529949.37	6701882.88	6718655.52	1035	101	2016
1033.00	69685.30	70447.80	489433.50	532013.03	6702255.00	6719949.09	1031	95	2016
1034.00	68884.40	69561.20	489277.75	531860.08	6702625.36	6720318.37	1031	95	2016
1035.00	67984.30	68756.60	489125.19	531704.15	6702989.05	6720692.49	1031	95	2016
1036.00	67164.90	67855.30	488969.88	531548.97	6703362.32	6721056.56	1031	95	2016
1037.00	66268.60	67056.40	488817.13	531397.76	6703732.26	6721426.94	1031	95	2016
1038.00	65469.70	66151.90	488666.35	531243.58	6704105.81	6721793.99	1031	95	2016
1039.00	64586.50	65355.70	488511.17	531092.91	6704469.46	6722164.66	1031	95	2016
1040.00	63814.30	64464.40	488357.32	530937.94	6704844.78	6722534.07	1031	95	2016
1041.00	86190.00	86837.00	488207.18	530781.82	6705208.47	6722907.17	2030	92	2016
1042.00	79694.60	80368.90	488048.55	530627.13	6705576.46	6723275.46	1016	83	2016
1043.00	78794.10	79551.20	487899.36	530479.27	6705942.74	6723643.77	1016	83	2016
1044.00	85279.90	86111.30	487742.07	532540.54	6706316.16	6724931.63	2030	92	2016
1045.00	77053.20	77822.20	487592.03	532386.70	6706683.95	6725302.30	1016	83	2016
1046.00	89845.10	90575.80	487435.37	532231.50	6707055.91	6725669.86	2020	85	2016
1047.01	90712.20	91372.30	487280.20	532077.01	6707420.13	6726041.55	2020	85	2016
1048.00	77955.30	78666.30	487128.47	531924.92	6707798.89	6726410.00	1016	83	2016
1049.01	63351.50	64050.50	486979.17	531772.56	6708168.09	6726782.41	2041	102	2016
1050.01	62281.90	63133.30	486822.35	531621.04	6708536.18	6727153.30	2041	102	2016
1051.00	70057.40	70801.00	486668.11	531463.14	6708900.62	6727521.37	1010	76	2016
1052.00	69135.00	69931.70	486516.85	531313.83	6709275.25	6727898.62	1010	76	2016
1053.00	62867.90	63691.50	486360.48	531158.18	6709624.78	6728252.25	1031	95	2016
1054.00	72785.20	73476.30	495221.40	533222.49	6713761.92	6729550.22	1010	76	2016
1054.02	92453.60	92604.00	486209.36	495400.96	6710009.28	6713832.12	2020	85	2016
1055.00	73761.20	74548.60	486057.15	533066.71	6710379.23	6729917.37	1010	76	2016
1056.01	60440.30	61327.00	485904.84	532913.01	6710747.94	6730283.28	2041	102	2016
1057.01	61458.90	62182.40	485745.95	532763.08	6711115.81	6730652.97	2041	102	2016
1058.00	76505.50	77377.70	485597.84	532605.12	6711489.68	6731024.68	1010	76	2016
1059.01	59217.80	59908.80	485444.07	532453.47	6711857.71	6731392.91	2041	102	2016
1060.00	75190.80	76022.10	485285.69	532298.14	6712236.58	6731765.64	2029	92	2016
1061.00	83387.10	83608.90	485132.61	498754.78	6712587.88	6718260.91	1011	76	2016
1061.01	88111.50	88719.10	498576.19	532143.21	6718182.55	6732141.27	1024	88	2016
1062.00	86339.30	87213.00	487194.67	531993.38	6713877.09	6732504.43	1024	88	2016
1063.00	87306.20	87992.00	487046.22	531841.91	6714255.79	6732876.43	1024	88	2016
1064.00	91004.30	91198.00	486889.16	498297.96	6714623.43	6719372.01	1015	82	2016

FLOWN LINES
WGS-84, UTM 9N

MLINE	TIME	TIME	MIN X	MAX X	MIN Y	MAX Y	FLIGHT	DAY	YEAR
1064.01	91560.90	92168.80	498118.57	533904.51	6719289.86	6734160.14	2020	85	2016
1065.00	83677.10	84185.20	502395.73	533751.79	6721483.24	6734531.93	1011	76	2016
1065.01	76106.40	76347.00	486739.90	502577.51	6714993.50	6721575.48	2029	92	2016
1066.00	67377.00	68149.10	486582.56	526802.03	6715368.46	6732078.90	1010	76	2016
1066.02	60069.00	60198.70	526621.55	533594.28	6731998.98	6734896.51	2041	102	2016
1067.00	68256.10	68941.10	486431.17	528863.30	6715726.71	6733369.06	1010	76	2016
1067.01	84650.30	84733.50	528686.55	533439.53	6733291.64	6735269.12	1011	76	2016
1068.00	66539.80	67211.90	486274.16	528709.26	6716096.33	6733733.77	1010	76	2016
1068.01	84270.00	84349.00	528533.73	533287.82	6733665.69	6735639.97	1011	76	2016
1069.00	84348.20	85074.40	486120.87	533134.68	6716478.88	6736014.18	2030	92	2016
1070.00	91031.30	91746.10	485970.08	532982.67	6716844.40	6736376.26	1006	70	2016
1071.00	89064.80	89850.00	485816.49	532828.50	6717208.87	6736756.22	2003	69	2016
1072.00	88176.30	88930.30	485661.15	532673.17	6717586.94	6737119.41	2003	69	2016
1073.00	87811.30	88015.40	521114.16	532523.31	6732746.17	6737485.83	2003	69	2016
1073.01	88495.50	89031.70	485509.46	521291.47	6717948.19	6732814.54	2026	90	2016
1074.01	84315.40	85225.00	485354.60	534581.33	6718319.02	6738765.96	1024	88	2016
1075.01	68749.20	68791.40	485201.86	487745.70	6718681.65	6719739.41	1005	70	2016
1075.02	85360.30	86115.80	485199.10	534430.61	6718680.67	6739149.17	1024	88	2016
1076.00	85031.90	85914.10	485048.66	534276.31	6719061.88	6739514.21	1011	76	2016
1076.01	89376.20	89950.60	485046.97	518615.74	6719059.60	6733014.29	2039	101	2016
1077.00	90441.30	90780.30	484893.72	505167.71	6719426.58	6727849.47	1015	82	2016
1077.01	76549.40	76974.70	504986.06	534120.77	6727773.57	6739883.87	2029	92	2016
1078.00	83316.50	84256.60	484740.04	533968.90	6719796.43	6740263.71	2030	92	2016
1079.00	88567.50	89378.00	484587.57	533814.55	6720158.81	6740619.67	1015	82	2016
1080.00	87626.30	88448.30	484434.51	533661.40	6720538.23	6741000.54	1015	82	2016
1081.00	86699.70	87527.50	484277.57	533509.37	6720901.70	6741374.70	1015	82	2016
1082.00	89471.90	90298.60	484125.15	533357.09	6721273.52	6741736.11	1015	82	2016
1083.00	82541.10	83252.90	483970.53	533203.72	6721634.16	6742102.76	2030	92	2016
1084.00	90069.10	90925.70	483820.98	535263.81	6722013.33	6743382.22	2003	69	2016
1085.00	91054.20	91904.70	483663.34	535108.84	6722377.02	6743759.56	2003	69	2016
1086.01	89443.20	89984.30	501387.52	534959.22	6730184.33	6744135.22	1006	70	2016
1086.02	76641.10	76957.60	483511.62	501568.50	6722759.88	6730256.08	2017	83	2016
1087.01	88724.80	89303.90	503450.66	534806.15	6731467.58	6744497.02	1006	70	2016
1087.02	76096.30	76457.20	483360.23	503630.73	6723130.32	6731547.66	2017	83	2016
1088.01	87862.90	88403.70	498866.56	534648.48	6730001.94	6744874.05	1006	70	2016
1088.02	75684.60	75964.30	483204.54	499043.79	6723490.82	6730071.82	2017	83	2016
1089.00	77051.70	77959.40	483052.33	534497.36	6723862.16	6745236.34	2017	83	2016
1089.01	88579.50	89125.50	483053.13	516618.37	6723862.87	6737809.09	2039	101	2016
1090.01	56819.00	57629.10	482896.28	534340.93	6724229.93	6745604.49	2033	95	2016
1091.00	90262.30	90817.70	502837.81	534192.64	6732946.90	6745976.25	1006	70	2016
1091.01	88525.60	88837.30	482745.54	503017.37	6724596.29	6733023.52	1019	85	2016
1092.00	78038.20	78877.60	482591.15	534033.48	6724967.90	6746340.27	2017	83	2016
1093.00	57771.40	58686.40	482437.11	533881.19	6725332.44	6746711.74	2033	95	2016
1094.01	58860.30	59672.00	482286.86	533730.82	6725712.07	6747085.39	2033	95	2016
1095.00	65608.90	65900.90	482133.27	500188.70	6726079.08	6733577.10	1010	76	2016
1095.01	89199.70	89762.10	500009.12	535795.13	6733500.98	6748374.99	1019	85	2016
1096.00	90371.20	91241.10	484194.54	535641.21	6727368.15	6748725.64	1007	71	2016
1097.01	59828.20	60797.30	484040.54	535486.94	6727737.91	6749117.58	2033	95	2016
1098.01	89889.00	90767.90	483886.67	535333.13	6728104.55	6749483.16	1019	85	2016
1099.01	75135.90	75460.70	483733.21	501790.95	6728515.02	6735974.78	2017	83	2016
1099.02	83596.40	84106.50	501611.95	535178.42	6735905.81	6749850.37	1024	88	2016
1100.00	92063.30	92513.80	508101.06	535024.70	6739036.61	6750224.75	2003	69	2016
1100.01	85560.50	85780.50	483581.18	497201.47	6728850.55	6734504.44	1015	82	2016
1100.02	89262.80	89453.20	497023.14	508281.98	6734427.14	6739110.04	2028	91	2016
1101.00	86766.10	87727.00	483427.88	534871.23	6729213.28	6750592.27	1006	70	2016
1102.00	60899.40	61684.00	483270.27	534717.29	6729588.85	6750965.36	2033	95	2016
1103.00	61827.10	62112.20	483120.52	498960.35	6729947.13	6736533.20	2033	95	2016
1103.01	62767.40	63392.30	498777.95	534562.64	6736460.42	6751334.18	2033	95	2016
1104.00	63540.10	64342.70	482968.05	534412.99	6730318.25	6751694.68	2033	95	2016
1105.00	81877.00	82660.00	482817.46	534254.17	6730689.33	6752067.45	1024	88	2016
1106.00	69117.40	69890.90	482661.62	534101.71	6731062.06	6752442.27	2033	95	2016
1107.00	88396.00	89224.10	482505.78	533951.06	6731410.92	6752808.50	2022	86	2016
1108.00	71049.90	71849.20	482354.52	533794.88	6731796.51	6753177.15	1031	95	2016
1109.00	85217.40	85441.60	482197.10	495820.42	6732161.76	6737826.96	1015	82	2016
1109.01	78612.20	79224.70	495644.67	533644.44	6737755.82	6753550.53	2032	94	2016

FLOWN LINES
WGS-84, UTM 9N

MLINE	TIME	TIME	MIN X	MAX X	MIN Y	MAX Y	FLIGHT	DAY	YEAR
1110.00	82743.90	83258.80	506568.30	533487.19	6742729.29	6753910.88	1024	88	2016
1110.01	64479.60	64937.70	482046.03	506749.72	6732539.32	6742805.91	2033	95	2016
1111.00	85136.70	86061.60	481893.00	533338.61	6732910.48	6754287.85	1009	72	2016
1112.00	80660.40	81597.50	481737.46	533184.30	6733276.19	6754651.56	1024	88	2016
1113.00	79723.80	80530.40	481582.85	533031.55	6733638.62	6755030.24	1024	88	2016
1114.00	87453.70	88309.70	481433.07	532876.27	6734017.50	6755396.93	2022	86	2016
1115.00	84468.30	85293.10	481279.43	532723.96	6734389.77	6755765.17	2032	94	2016
1116.00	83499.80	84339.40	481123.29	532569.20	6734755.99	6756139.86	2032	94	2016
1117.00	78633.60	79443.20	480973.84	532415.85	6735124.36	6756495.26	2026	90	2016
1118.00	87276.50	88167.00	480815.85	532261.32	6735491.82	6756872.18	2026	90	2016
1119.00	86564.70	87389.00	480662.58	532109.22	6735861.49	6757243.08	2022	86	2016
1120.00	85558.90	86430.80	480508.49	531955.13	6736230.01	6757609.49	2022	86	2016
1121.00	84567.60	85403.00	480356.84	531802.76	6736601.09	6757985.27	2022	86	2016
1122.01	79370.40	79863.30	502511.12	531649.22	6746250.28	6758347.47	2032	94	2016
1122.02	64666.40	65127.50	480202.08	504908.57	6736969.46	6747233.09	2041	102	2016
1123.00	84806.10	85161.90	480051.30	502539.12	6737279.23	6746682.74	2010	76	2016
1123.01	80063.90	80528.20	502357.84	531494.21	6746614.68	6758726.74	2032	94	2016
1124.01	79537.60	80078.60	502203.20	531340.91	6746981.10	6759076.96	2026	90	2016
1124.02	87929.90	88268.00	479896.60	502385.98	6737708.42	6747052.90	2039	101	2016
1125.01	77977.40	78252.30	499834.98	515532.07	6746437.68	6752955.86	1021	86	2016
1125.02	80349.60	80581.10	515348.40	531184.92	6752875.41	6759454.80	2026	90	2016
1125.03	74578.50	74913.40	479743.86	500012.50	6738075.05	6746503.91	1034	101	2016
1126.00	91963.60	92752.80	479588.26	531035.24	6738441.87	6759830.52	1009	72	2016
1127.00	91204.30	91813.30	497312.89	530878.07	6746249.07	6760192.51	1009	72	2016
1127.01	68440.10	68735.30	479435.23	497492.25	6738815.13	6746321.28	2009	76	2016
1128.00	90542.30	91082.60	494943.42	530725.03	6745701.94	6760559.09	1009	72	2016
1128.01	68062.50	68327.70	479280.26	495120.35	6739183.26	6745766.11	2009	76	2016
1129.00	89783.50	90395.80	497006.74	530571.33	6746985.15	6760935.58	1009	72	2016
1129.01	67582.30	67870.50	479129.53	497185.17	6739547.01	6747058.27	2009	76	2016
1130.00	89132.60	89672.00	494633.56	530417.25	6746433.43	6761305.35	1009	72	2016
1130.01	67221.40	67438.70	481188.79	494812.98	6740853.12	6746511.15	2009	76	2016
1131.00	88380.70	88999.70	496697.87	530264.98	6747726.12	6761677.09	1009	72	2016
1131.01	66806.80	67051.80	481035.44	496873.24	6741209.61	6747796.14	2009	76	2016
1132.00	87690.60	88256.70	494329.95	530109.77	6747177.17	6762034.28	1009	72	2016
1132.01	66486.30	66715.10	480884.32	494506.06	6741588.27	6747249.42	2009	76	2016
1133.00	86933.00	87585.10	496391.47	529959.32	6748459.57	6762413.40	1009	72	2016
1133.01	66058.30	66308.20	480731.22	496560.83	6741952.53	6748535.10	2009	76	2016
1134.00	86258.80	86808.70	494019.09	529808.16	6747910.88	6762777.96	1009	72	2016
1134.01	65726.40	65951.30	480578.45	494196.23	6742323.65	6747989.65	2009	76	2016
1135.01	87928.60	88327.60	504951.01	529650.82	6752887.02	6763150.15	2017	83	2016
1135.02	87209.40	87619.80	480424.26	505128.45	6742701.77	6752950.11	2039	101	2016
1136.00	83394.80	83748.00	480270.74	502765.36	6743058.81	6752394.07	2010	76	2016
1136.01	87318.10	87755.60	502576.97	529498.41	6752331.59	6763521.16	2017	83	2016
1137.00	83882.30	84239.40	480117.84	502601.85	6743426.09	6752790.35	2010	76	2016
1137.01	86721.30	87113.00	502424.30	529343.57	6752702.59	6763891.21	2026	90	2016
1138.01	78631.80	79126.10	500057.97	529189.27	6752156.33	6764252.02	1021	86	2016
1138.02	86815.20	87133.60	479962.49	500233.63	6743799.27	6752231.07	2039	101	2016
1139.00	81713.90	82078.70	479810.74	500081.66	6744171.28	6752592.88	1014	80	2016
1139.01	81473.80	81925.90	499900.47	529036.34	6752522.68	6764635.03	2026	90	2016
1140.00	82167.70	82487.40	479653.84	497708.21	6744538.38	6752044.42	1014	80	2016
1140.01	80761.70	81304.90	497532.77	528882.71	6751966.19	6764997.35	2026	90	2016
1141.00	82697.30	83052.30	479501.31	499774.32	6744908.52	6753334.35	1014	80	2016
1141.01	85362.30	85826.10	499594.19	528731.01	6753255.79	6765363.05	2026	90	2016
1142.00	83147.10	83478.70	479351.04	497403.01	6745281.21	6752777.25	1014	80	2016
1142.01	85954.10	86505.20	497223.54	528578.39	6752702.65	6765738.35	2026	90	2016
1143.00	83616.70	83970.30	479195.38	499464.82	6745648.39	6754074.66	1014	80	2016
1143.01	88726.30	89180.90	499290.83	528422.80	6753992.27	6766108.53	2020	85	2016
1144.00	84070.70	84382.70	479043.23	497096.84	6746018.89	6753525.47	1014	80	2016
1144.01	88019.80	88559.20	496916.96	528268.05	6753442.68	6766469.64	2020	85	2016
1145.00	84511.80	84871.20	478886.32	499160.22	6746381.70	6754808.13	1014	80	2016
1145.01	84107.40	84559.30	498978.82	528116.54	6754735.80	6766846.23	2026	90	2016
1146.00	84971.50	85288.70	478732.60	496790.14	6746759.46	6754263.68	1014	80	2016
1146.01	83389.20	83930.40	496611.08	527962.19	6754184.48	6767216.71	2026	90	2016
1147.00	85411.10	85767.10	478580.77	498852.52	6747126.50	6755551.73	1014	80	2016
1147.01	82799.70	83266.10	498673.69	527810.69	6755479.03	6767592.69	2026	90	2016

FLOWN LINES
WGS-84, UTM 9N

MLINE	TIME	TIME	MIN X	MAX X	MIN Y	MAX Y	FLIGHT	DAY	YEAR
1148.00	85881.60	86201.90	478426.62	496481.33	6747488.57	6754993.83	1014	80	2016
1148.01	82019.40	82573.90	496302.61	527657.76	6754920.74	6767955.74	2026	90	2016
1149.00	86338.10	86686.50	478274.81	498543.69	6747860.82	6756282.38	1014	80	2016
1149.01	79376.80	79866.20	498364.52	527501.92	6756213.47	6768318.11	1021	86	2016
1150.00	86774.10	87082.80	478121.29	496174.66	6748235.07	6755770.67	1014	80	2016
1150.01	84627.60	85155.40	495999.69	527347.28	6755661.93	6768673.87	2026	90	2016
1151.00	87212.40	87558.40	477970.82	498236.68	6748601.81	6757023.39	1014	80	2016
1151.01	87465.40	87928.80	498057.74	527198.42	6756956.91	6769061.32	2020	85	2016
1152.00	87657.60	87966.70	477815.55	495871.79	6748973.57	6756471.88	1014	80	2016
1152.01	86769.90	87296.80	495689.12	527040.00	6756397.68	6769437.45	2020	85	2016
1153.00	88080.50	88436.30	477661.68	497933.07	6749346.41	6757764.95	1014	80	2016
1153.01	86182.60	86651.80	497751.97	526887.83	6757701.76	6769802.54	2020	85	2016
1154.00	88537.30	88847.30	477507.17	495564.05	6749710.64	6757229.75	1014	80	2016
1154.01	85498.00	86002.10	495381.99	526735.33	6757140.17	6770169.88	2020	85	2016
1155.00	88979.00	89336.20	477356.34	497622.37	6750080.67	6758500.93	1014	80	2016
1155.01	84870.90	85345.60	497445.77	526579.68	6758432.79	6770539.62	2020	85	2016
1156.00	89431.60	89742.90	477197.87	495253.09	6750446.75	6757948.95	1014	80	2016
1156.01	84191.10	84700.10	495075.43	526426.60	6757876.54	6770910.89	2020	85	2016
1157.00	89868.40	90214.60	477046.02	497317.01	6750812.17	6759247.91	1014	80	2016
1157.01	83584.00	84055.90	497136.97	526273.11	6759166.83	6771277.07	2020	85	2016
1158.00	90310.10	90625.60	476891.81	494944.41	6751186.22	6758674.30	1014	80	2016
1158.01	82875.00	83386.20	494768.82	526119.96	6758622.72	6771645.13	2020	85	2016
1159.00	90756.90	91109.00	476741.76	497010.04	6751558.18	6759979.47	1014	80	2016
1159.01	82283.00	82756.40	496830.86	525965.21	6759902.72	6772017.55	2020	85	2016
1160.00	91229.00	91532.10	476584.63	494638.28	6751921.28	6759429.18	1014	80	2016
1160.01	79989.20	80490.70	494462.87	525815.11	6759362.11	6772380.39	1021	86	2016
1161.00	91629.80	92059.40	476431.49	501137.81	6752293.16	6762564.66	1014	80	2016
1161.01	65360.60	65799.70	500958.96	525662.87	6762488.54	6772751.66	2033	95	2016
1162.00	92147.70	92517.40	476278.90	498764.84	6752665.38	6762013.21	1014	80	2016
1162.01	92363.00	92787.60	498586.33	525507.37	6761934.88	6773125.40	2018	84	2016
1163.00	81221.80	81369.40	476129.88	485312.13	6753061.71	6756857.48	2010	76	2016
1163.01	79622.10	80275.80	485138.45	525353.93	6756778.80	6773492.45	2020	85	2016
1164.00	74608.40	74927.30	475974.34	496240.47	6753404.40	6761831.22	2009	76	2016
1164.01	80400.10	80888.60	496066.63	525200.68	6761750.12	6773862.26	2020	85	2016
1165.00	74092.00	74450.20	475816.60	498313.21	6753764.89	6763119.37	2009	76	2016
1165.01	81067.80	81502.70	498125.23	525049.53	6763049.58	6774237.63	2020	85	2016
1166.01	80833.70	81277.80	497972.05	524891.01	6763417.60	6774599.60	2032	94	2016
1166.02	85507.30	85880.80	475663.67	498151.91	6754146.89	6763487.40	2039	101	2016
1167.01	81475.50	81899.50	497817.96	524739.50	6763787.45	6774981.12	2032	94	2016
1167.02	86018.50	86401.80	475509.52	497999.94	6754511.69	6763858.53	2039	101	2016
1168.00	72755.70	73055.80	475358.77	493411.55	6754882.42	6762389.34	2009	76	2016
1168.01	81584.50	82097.20	493231.70	524584.18	6762309.09	6775339.45	2020	85	2016
1169.00	72292.40	72623.10	475209.11	495469.99	6755255.56	6763676.93	2009	76	2016
1169.01	82687.10	83147.80	495295.75	524431.17	6763603.33	6775710.06	2032	94	2016
1170.01	71862.00	72191.90	475051.48	495323.50	6755621.12	6764044.46	2009	76	2016
1170.02	82011.10	82477.60	495143.35	524277.40	6763973.55	6776083.36	2032	94	2016
1171.00	4868.00	5353.10	494992.41	524125.83	6764339.11	6776453.90	2006	72	2016
1171.01	65020.60	65339.00	474901.52	495170.26	6755997.30	6764418.76	2009	76	2016
1172.00	4167.00	4724.80	490408.69	523969.53	6762873.45	6776816.78	2006	72	2016
1172.01	63867.90	64136.90	474745.89	490584.42	6756371.62	6762944.67	2009	76	2016
1173.00	3443.90	4038.10	488034.21	523817.33	6762291.96	6777188.07	2006	72	2016
1173.01	64293.80	64468.00	476954.12	488214.62	6757711.77	6762389.36	2009	76	2016
1173.02	72053.10	72095.30	474592.71	477132.31	6756738.42	6757788.23	2034	100	2016
1174.00	64668.20	64932.10	474439.04	488060.85	6757115.52	6762763.81	2009	76	2016
1174.01	81328.10	81920.10	487881.68	523662.47	6762690.71	6777561.20	1021	86	2016
1175.00	69567.40	69923.90	474282.60	496768.95	6757453.02	6766819.31	2009	76	2016
1175.01	80767.10	81214.00	496593.06	523512.18	6766736.77	6777920.87	1021	86	2016
1176.00	69158.00	69481.60	474130.39	494400.24	6757843.82	6766265.60	2009	76	2016
1176.01	82779.80	83272.90	494225.22	523359.91	6766189.66	6778300.40	1021	86	2016
1177.00	70455.60	70828.30	473977.92	496465.72	6758202.09	6767541.99	2009	76	2016
1177.01	82215.90	82676.20	496284.31	523201.87	6767482.84	6778666.53	1021	86	2016
1178.00	70076.20	70368.70	473822.16	491875.04	6758586.68	6766074.39	2009	76	2016
1178.01	84171.60	84678.10	491697.38	523049.23	6766003.62	6779030.71	1021	86	2016
1179.00	71384.20	71624.80	473671.80	489515.48	6758947.68	6765521.34	2009	76	2016
1179.01	83458.80	84056.20	489330.02	522896.81	6765455.01	6779407.97	1021	86	2016

FLOWN LINES
WGS-84, UTM 9N

MLINE	TIME	TIME	MIN X	MAX X	MIN Y	MAX Y	FLIGHT	DAY	YEAR
1180.00	70934.30	71272.30	473513.49	493784.16	6759315.75	6767744.60	2009	76	2016
1180.01	72263.00	72767.30	493611.78	522745.53	6767665.13	6779744.84	2027	91	2016
1181.00	83026.30	83290.00	475580.21	491420.24	6760606.79	6767188.41	1015	82	2016
1181.01	84848.70	85370.70	491240.98	522588.51	6767112.47	6780140.06	1021	86	2016
1182.00	82612.00	82889.40	475425.04	491262.00	6760972.54	6767543.47	1015	82	2016
1182.01	65975.10	66472.40	491085.18	522436.24	6767481.58	6780512.75	2033	95	2016
1183.00	82213.30	82516.50	475272.62	493328.20	6761341.54	6768849.61	1015	82	2016
1183.01	66768.10	67287.10	493146.96	522285.44	6768769.09	6780883.08	2033	95	2016
1184.00	81814.60	82086.90	475119.03	490953.46	6761714.52	6768283.18	1015	82	2016
1184.01	67419.00	67909.00	490775.30	522128.62	6768217.24	6781242.80	2033	95	2016
1185.00	81407.20	81709.00	474964.04	493019.47	6762079.19	6769585.57	1015	82	2016
1185.01	68084.20	68574.70	492840.91	521980.08	6769515.41	6781618.99	2033	95	2016
1186.01	84420.40	85193.70	474808.39	521822.61	6762444.87	6781982.66	1030	94	2016
1187.00	80624.40	80921.00	474656.91	492715.09	6762821.14	6770328.95	1015	82	2016
1187.01	83750.80	84241.00	492533.55	521669.73	6770257.89	6782363.86	1030	94	2016
1188.00	80211.20	80495.90	474501.77	490338.95	6763200.61	6769758.95	1015	82	2016
1188.01	82996.90	83516.00	490164.86	521517.15	6769694.44	6782724.81	1030	94	2016
1189.00	79811.70	80114.50	474353.56	492406.80	6763558.13	6771063.36	1015	82	2016
1189.01	82376.30	82881.60	492225.25	521366.03	6770987.27	6783097.57	1030	94	2016
1190.00	83426.90	83709.10	474198.28	490034.57	6763931.54	6770508.84	1015	82	2016
1190.01	81631.60	82160.30	489856.68	521208.13	6770433.28	6783459.21	1030	94	2016
1191.00	83830.80	84158.60	474042.20	494314.22	6764302.89	6772719.19	1015	82	2016
1191.01	81052.80	81502.60	494138.20	521058.08	6772655.92	6783838.42	1030	94	2016
1192.00	84264.60	84585.80	473891.40	491943.35	6764664.16	6772169.54	1015	82	2016
1192.01	71754.50	72222.60	491770.95	520902.71	6772096.93	6784190.60	2031	94	2016
1193.01	72472.60	72841.50	498263.17	520746.13	6775230.16	6784573.75	2031	94	2016
1193.02	84684.40	85103.60	473736.77	498438.74	6765033.39	6775301.71	2039	101	2016
1194.00	85483.40	86259.40	473582.20	520593.27	6765407.42	6784942.06	1021	86	2016
1195.00	73621.50	74344.00	473429.26	520441.09	6765764.77	6785312.31	2029	92	2016
1196.00	70039.80	70797.90	473275.22	520285.16	6766138.80	6785681.67	2031	94	2016
1197.00	70916.80	71670.70	473123.73	520132.59	6766520.78	6786051.70	2031	94	2016
1198.00	67276.40	68094.10	472967.26	519980.67	6766878.21	6786420.36	2034	100	2016
1199.00	68236.90	69005.30	472817.90	519830.89	6767255.58	6786788.03	2034	100	2016
1200.00	69121.80	69900.30	472663.84	519676.41	6767624.23	6787157.70	2034	100	2016
1201.00	69999.60	70794.30	472510.26	519523.18	6767990.16	6787533.75	2034	100	2016
1202.00	70950.40	71780.90	472353.43	519368.03	6768359.24	6787897.00	2034	100	2016
1203.00	82922.00	83664.80	472203.30	519214.46	6768728.43	6788270.06	2039	101	2016
1204.00	83791.90	84562.50	472047.02	519061.30	6769100.05	6788639.73	2039	101	2016
1205.00	72299.80	73084.20	471898.13	518908.20	6769478.96	6789007.28	1034	101	2016
1206.00	73201.30	73970.80	471739.67	518755.93	6769845.58	6789375.14	1034	101	2016
1207.00	70528.40	71322.40	471589.12	518598.90	6770209.29	6789745.44	1034	101	2016
1208.00	71453.70	72217.60	471436.46	518449.16	6770577.36	6790109.71	1034	101	2016
1209.00	68736.80	69517.30	471284.10	518291.34	6770955.78	6790479.36	1034	101	2016
1210.00	69633.80	70401.20	471124.69	518141.02	6771320.12	6790848.43	1034	101	2016
1211.00	66960.20	67747.90	470976.32	517987.15	6771691.55	6791226.90	1034	101	2016
1212.00	67875.50	68639.10	470819.29	517831.71	6772055.80	6791589.01	1034	101	2016
1213.00	65186.60	65963.00	470666.55	517680.35	6772428.30	6791960.91	1034	101	2016
1214.00	66093.10	66845.10	470514.43	517524.95	6772799.43	6792327.85	1034	101	2016
1215.00	63400.70	64175.00	470357.90	517279.31	6773163.78	6792661.89	1034	101	2016
1216.00	64317.50	65093.90	470206.22	517220.51	6773531.51	6793066.02	1034	101	2016
1217.00	69111.60	69878.30	470051.18	517063.96	6773907.32	6793437.09	2031	94	2016
1218.00	85992.60	86842.50	469898.97	516911.19	6774272.58	6793804.81	2024	88	2016
1219.00	85092.90	85817.30	469745.49	516758.12	6774643.92	6794171.33	2024	88	2016
1220.00	84139.60	84989.90	469591.55	516604.39	6775010.45	6794533.41	2024	88	2016
1221.00	83175.20	83967.00	469439.52	516448.55	6775381.53	6794920.57	2024	88	2016
1222.00	82236.10	83062.80	469286.45	516299.46	6775751.79	6795282.39	2024	88	2016
1223.00	81358.60	82101.80	469134.00	516144.94	6776110.05	6795661.80	2024	88	2016
1224.00	80386.90	81244.10	468980.32	515989.47	6776490.57	6796024.15	2024	88	2016
1225.00	79492.70	80244.60	468826.02	515838.00	6776855.12	6796396.40	2024	88	2016
1226.00	87267.30	88053.30	468671.90	515683.39	6777225.85	6796763.61	1035	101	2016
1227.00	85430.80	86222.00	468518.29	515530.26	6777590.03	6797134.69	1035	101	2016
1228.00	86366.40	87149.10	468363.27	515374.88	6777965.20	6797498.67	1035	101	2016
1229.00	83003.40	83786.90	468211.97	515220.60	6778334.02	6797874.58	1035	101	2016
1230.00	84512.80	85335.30	468056.38	515069.36	6778703.28	6798247.94	1035	101	2016
1231.00	67288.20	68053.10	467901.11	514915.38	6779077.04	6798607.96	2031	94	2016

FLOWN LINES
WGS-84, UTM 9N

MLINE	TIME	TIME	MIN X	MAX X	MIN Y	MAX Y	FLIGHT	DAY	YEAR
1232.00	68190.80	68965.60	467749.80	514764.38	6779442.80	6798967.99	2031	94	2016
1233.00	87196.80	87956.10	467594.61	514606.95	6779817.52	6799347.23	1027	91	2016
1234.00	82081.20	82894.90	467443.00	514456.48	6780185.54	6799719.30	1035	101	2016
1235.00	85298.00	86053.40	467288.64	514301.41	6780554.24	6800094.46	1027	91	2016
1236.00	86260.70	87101.40	467135.65	514145.74	6780919.65	6800460.17	1027	91	2016
1237.00	83342.30	84128.10	466980.37	513992.06	6781291.11	6800828.88	1027	91	2016
1238.00	84282.50	85142.50	466831.33	513843.98	6781658.25	6801198.17	1027	91	2016
1239.00	81483.50	82248.10	466672.45	513684.40	6782029.14	6801570.86	1027	91	2016
1240.00	82596.90	83231.70	466524.47	502304.32	6782399.38	6797260.41	1027	91	2016
1240.01	83926.70	84117.80	502127.36	513535.77	6797193.94	6801938.70	1035	101	2016
1241.00	83239.60	83983.00	466370.33	513378.45	6782764.29	6802307.14	1025	90	2016
1242.00	82323.00	83111.20	466213.87	513228.46	6783142.48	6802672.50	1025	90	2016
1243.00	81429.90	81593.30	466062.25	477464.62	6783509.87	6788245.98	1025	90	2016
1243.01	81622.80	82168.00	479503.68	513073.63	6789093.90	6803050.07	1025	90	2016
1243.02	91197.80	91235.90	477288.06	479681.41	6788175.32	6789168.17	1033	100	2016
1244.00	80477.50	81302.00	465908.19	512918.09	6783871.12	6803420.42	1025	90	2016
1245.00	79595.40	80321.80	465753.96	512765.97	6784251.82	6803787.30	1025	90	2016
1246.00	78631.80	79454.20	465602.75	512616.01	6784620.44	6804153.98	1025	90	2016
1247.00	77694.70	78466.80	463231.37	512459.97	6784062.29	6804530.54	1025	90	2016
1248.00	76650.00	77528.00	463079.21	512306.24	6784438.52	6804891.42	1025	90	2016
1249.00	75703.30	76479.40	462925.90	512150.10	6784805.06	6805259.00	1025	90	2016
1250.00	84124.00	84988.80	462768.43	512000.82	6785173.67	6805629.62	1025	90	2016
1251.00	85150.80	85914.10	462617.18	511847.45	6785534.10	6806005.09	1025	90	2016
1252.00	86094.70	86938.10	462466.44	511692.93	6785908.87	6806373.11	1025	90	2016
1253.00	80235.10	81003.80	462310.08	511539.65	6786278.27	6806735.91	2028	91	2016
1254.00	81119.80	81958.50	462159.96	511387.59	6786653.10	6807109.23	2028	91	2016
1255.00	82063.30	82837.40	462002.36	511229.90	6787015.26	6807475.13	2028	91	2016
1256.00	82954.70	83801.20	461852.12	511077.28	6787387.54	6807841.98	2028	91	2016
1257.00	83910.10	84678.10	461693.48	510923.68	6787746.32	6808223.29	2028	91	2016
1258.00	84795.00	85608.60	461544.52	510773.68	6788130.11	6808583.89	2028	91	2016
1259.00	85700.30	86452.30	461388.07	510618.90	6788493.99	6808956.24	2028	91	2016
1260.00	86555.30	87370.80	461237.81	510462.70	6788862.13	6809315.05	2028	91	2016
1261.00	87474.50	88215.10	461080.45	510310.31	6789239.45	6809700.48	2028	91	2016
1262.00	67975.80	68793.60	460932.36	510156.63	6789610.51	6810060.68	1029	94	2016
1263.00	68916.80	69724.50	460775.47	510004.14	6789974.87	6810433.26	1029	94	2016
1264.00	69966.50	70778.90	460620.79	509850.87	6790340.71	6810795.60	1029	94	2016
1265.00	70949.70	71741.40	460466.90	509698.59	6790712.94	6811168.55	1029	94	2016
1266.00	71846.70	72627.40	460313.84	509544.78	6791081.40	6811537.10	1029	94	2016
1267.00	72787.30	73604.00	460160.82	509387.84	6791445.77	6811908.44	1029	94	2016
1268.00	72094.50	72745.50	460005.70	498010.31	6791818.76	6807601.33	2025	90	2016
1268.01	73782.70	73972.10	497829.34	509236.35	6807530.68	6812275.90	1029	94	2016
1269.00	86185.90	87008.20	459855.68	509082.00	6792197.48	6812645.37	1033	100	2016
1270.00	72214.40	73001.00	459700.31	508927.32	6792562.88	6813019.47	2002	69	2016
1271.00	73131.20	73942.80	459546.81	508772.30	6792906.72	6813388.64	2002	69	2016
1272.00	90089.50	90891.00	459396.09	508619.22	6793294.91	6813762.76	1033	100	2016
1273.00	84217.30	85065.70	459242.32	508467.87	6793667.23	6814132.88	1033	100	2016
1274.00	74104.70	74917.20	459086.42	508313.37	6794038.37	6814485.44	2002	69	2016
1275.00	66624.50	67447.50	458933.81	508159.19	6794410.48	6814863.00	1029	94	2016
1276.00	65645.50	66470.10	458777.66	508010.37	6794776.54	6815235.80	1029	94	2016
1277.00	71402.10	72017.70	458627.09	496626.11	6795143.87	6810932.27	2025	90	2016
1277.01	74184.50	74376.10	496446.25	507855.09	6810861.01	6815602.79	1029	94	2016
1278.00	87121.10	87938.80	458470.63	507698.83	6795505.85	6815969.38	1033	100	2016
1279.00	85288.20	86155.60	458320.19	507549.07	6795881.47	6816342.22	2004	70	2016
1280.00	86271.90	86640.40	482690.68	507396.51	6806445.31	6816706.57	2004	70	2016
1280.01	62490.00	62914.20	458163.71	482867.67	6796251.81	6806521.37	2025	90	2016
1281.00	86818.30	87280.10	482534.79	507242.45	6806812.44	6817081.00	2004	70	2016
1281.01	60454.70	60872.80	455795.95	482717.77	6795699.99	6806890.16	2025	90	2016
1282.00	87418.80	87841.10	480170.31	507087.61	6806259.12	6817448.92	2004	70	2016
1282.01	61044.50	61476.80	455641.83	480346.78	6796063.89	6806332.63	2025	90	2016
1283.00	87934.30	88155.90	482231.69	493486.75	6807575.64	6812237.43	2004	70	2016
1283.01	61877.10	62288.20	455488.05	482407.48	6796433.83	6807624.74	2025	90	2016
1283.02	89743.50	89979.50	493311.74	506934.97	6812156.13	6817820.39	1033	100	2016
1284.00	85189.30	86047.20	455332.66	506782.16	6796809.20	6818189.40	1033	100	2016
1285.00	82164.10	83026.70	455183.49	506626.02	6797182.27	6818558.12	1033	100	2016
1286.00	83161.00	84042.80	455026.63	506475.13	6797550.12	6818929.22	1033	100	2016

FLOWN LINES
WGS-84, UTM 9N

MLINE	TIME	TIME	MIN X	MAX X	MIN Y	MAX Y	FLIGHT	DAY	YEAR
1287.00	64650.80	65430.60	454873.59	501739.08	6797916.49	6817393.28	1029	94	2016
1287.01	89263.10	89341.70	501559.22	506321.41	6817316.24	6819293.33	1033	100	2016
1288.00	81188.90	82064.70	454719.74	506166.87	6798287.31	6819665.78	1033	100	2016
1289.00	80164.40	81041.80	454565.62	506012.22	6798654.63	6820035.50	1033	100	2016
1290.00	72209.10	72895.50	461211.49	505860.09	6801849.81	6820404.94	2038	101	2016
1290.01	73166.20	73283.40	454414.47	461384.65	6799023.22	6801925.60	2038	101	2016
1291.00	63044.00	63366.20	454261.97	474533.67	6799388.93	6807818.72	2025	90	2016
1291.02	61112.10	61655.80	474350.29	505702.85	6807738.84	6820771.32	2037	101	2016
1292.00	70748.90	71254.60	454104.52	483249.03	6799763.54	6811849.49	2025	90	2016
1292.01	62473.30	62866.50	483063.09	505554.48	6811793.68	6821139.68	2038	101	2016
1293.00	88120.50	88985.20	453955.31	505400.96	6800131.04	6821509.90	1033	100	2016
1294.00	64081.80	64890.70	453803.49	505246.71	6800505.22	6821882.09	2038	101	2016
1295.00	65014.70	65843.80	453645.18	505086.95	6800876.33	6822247.14	2038	101	2016
1296.00	66412.30	67275.60	453495.57	504939.87	6801238.60	6822616.83	2038	101	2016
1297.00	67395.80	68266.40	453338.57	504781.44	6801609.06	6822987.19	2038	101	2016
1298.01	68950.20	69742.30	453188.21	504628.67	6801976.70	6823356.64	2038	101	2016
1299.00	63011.20	63696.00	453030.40	493247.02	6802345.81	6819065.72	1029	94	2016
1299.01	68650.70	68830.00	493070.66	504480.03	6818982.61	6823724.35	2038	101	2016
1300.00	88440.80	89291.30	452882.22	504326.82	6802715.70	6824101.52	2036	100	2016
1301.00	82130.50	82897.20	452726.44	497373.81	6803089.38	6821642.93	1016	83	2016
1301.01	63889.70	63995.30	497196.86	504169.34	6821569.70	6824466.55	2025	90	2016
1302.00	66199.70	66795.70	452569.41	490575.95	6803457.67	6819246.02	2031	94	2016
1302.01	90375.60	90590.70	490395.88	504013.43	6819178.43	6824832.56	2036	100	2016
1303.00	89407.80	90155.60	452422.59	497067.40	6803828.93	6822376.26	2036	100	2016
1303.02	63861.50	63975.00	496889.74	503860.76	6822305.15	6825205.92	2038	101	2016
1304.00	69489.10	70363.90	452265.85	503708.58	6804201.69	6825576.71	1032	100	2016
1305.00	64229.60	65000.30	452111.57	496764.15	6804565.25	6823126.36	1032	100	2016
1305.01	66205.00	66318.20	496584.62	503555.02	6823048.71	6825945.46	2038	101	2016
1306.00	65360.00	66206.00	451956.94	503402.94	6804938.31	6826319.54	1032	100	2016
1307.00	70217.50	70632.60	451803.81	478721.95	6805298.37	6816487.67	2025	90	2016
1307.01	63137.80	63549.60	478543.25	503252.17	6816410.02	6826684.26	2038	101	2016
1308.00	63280.00	64116.50	451649.08	500733.73	6805680.51	6826073.97	1032	100	2016
1308.01	65965.60	66001.60	500556.55	503097.93	6825998.15	6827055.11	2038	101	2016
1309.00	87452.80	88316.80	451498.29	502944.85	6806043.41	6827426.24	2036	100	2016
1310.00	86539.50	87342.20	451341.74	502786.75	6806416.57	6827790.53	2036	100	2016
1311.00	85554.80	86404.90	451190.07	502635.26	6806785.96	6828156.44	2036	100	2016
1312.00	71439.10	72291.50	451036.62	502482.62	6807153.03	6828530.89	1032	100	2016
1313.00	66341.40	67190.50	450881.51	502328.19	6807518.35	6828902.19	1032	100	2016
1314.00	70495.00	71324.90	450729.13	502175.40	6807889.04	6829265.40	1032	100	2016
1315.00	70754.60	71564.80	448358.66	502020.70	6807321.37	6829635.89	2029	92	2016
1316.00	67418.70	68324.10	448206.97	501868.60	6807710.64	6830010.53	1032	100	2016
1317.00	75837.10	76398.10	468145.88	501712.81	6816431.45	6830369.44	1008	72	2016
1317.01	69346.50	69646.70	448055.11	468321.54	6808076.99	6816499.49	2025	90	2016
1318.00	75186.20	75743.60	465775.34	501563.86	6815873.34	6830749.33	1008	72	2016
1318.01	69804.20	70109.30	447898.37	465955.35	6808442.60	6815950.24	2025	90	2016
1319.00	74492.20	75065.00	467837.08	501407.25	6817167.93	6831118.90	1008	72	2016
1319.01	70427.10	70736.40	447747.69	468016.63	6808837.64	6817241.01	1020	86	2016
1320.00	73848.20	74384.40	465472.59	501255.64	6816612.47	6831488.18	1008	72	2016
1320.01	70944.10	71280.20	447592.62	465649.30	6809185.79	6816690.09	1020	86	2016
1321.00	73163.00	73727.40	467533.82	501099.00	6817910.86	6831860.57	1008	72	2016
1321.01	72254.70	72563.50	447441.44	467712.85	6809559.06	6817975.21	2019	85	2016
1322.00	72477.00	73047.30	465163.39	500949.55	6817356.12	6832224.65	1008	72	2016
1322.01	72728.70	73045.70	447283.69	465341.50	6809923.44	6817424.05	2019	85	2016
1323.00	71781.50	72355.40	467223.59	500795.86	6818642.94	6832598.89	1008	72	2016
1323.01	88958.90	89292.00	447132.64	467405.51	6810294.44	6818717.82	1016	83	2016
1324.00	71107.30	71670.70	464853.09	500640.35	6818091.18	6832968.47	1008	72	2016
1324.01	79881.20	80211.00	446977.90	465033.83	6810655.22	6818162.30	2015	82	2016
1325.02	68438.70	69293.70	446827.86	500485.99	6811034.32	6833334.12	1032	100	2016
1326.00	78703.20	79574.80	446671.03	500332.66	6811395.25	6833705.74	1005	70	2016
1327.00	77984.80	78583.70	466612.03	500176.49	6820120.61	6834065.12	1005	70	2016
1327.01	78347.80	78703.00	446517.03	466789.09	6811772.59	6820193.82	2015	82	2016
1328.00	77303.00	77829.20	466459.34	500026.08	6820492.94	6834441.74	1005	70	2016
1328.01	78922.50	79301.90	446363.87	466636.70	6812139.14	6820561.46	2015	82	2016
1329.00	76540.80	77154.40	466302.37	499873.56	6820856.57	6834807.24	1005	70	2016
1329.01	77388.10	77744.90	446209.93	466481.25	6812503.70	6820932.95	2015	82	2016

FLOWN LINES
WGS-84, UTM 9N

MLINE	TIME	TIME	MIN X	MAX X	MIN Y	MAX Y	FLIGHT	DAY	YEAR
1330.00	75855.40	76431.10	463935.85	499716.88	6820309.07	6835181.91	1005	70	2016
1330.01	77949.60	78275.90	446059.33	464110.16	6812880.61	6820384.20	2015	82	2016
1331.00	75199.80	75743.40	470430.99	499562.13	6823442.46	6835547.79	1005	70	2016
1331.01	76337.40	76732.70	445903.27	470606.59	6813253.44	6823512.93	2015	82	2016
1332.00	74567.20	75077.00	468058.81	499411.25	6822891.74	6835910.49	1005	70	2016
1332.01	76914.50	77302.40	445748.89	468235.88	6813624.03	6822954.26	2015	82	2016
1333.00	68651.70	69503.80	445599.40	499259.84	6813940.18	6836288.45	2029	92	2016
1334.00	76573.30	76772.10	485482.05	499103.31	6831002.41	6836660.75	1008	72	2016
1334.01	74551.60	75215.30	445444.27	485661.98	6814354.27	6831074.33	1012	77	2016
1335.00	66648.80	67524.20	445292.38	498949.62	6814725.21	6837020.34	2029	92	2016
1336.00	68383.40	69178.00	445137.61	492001.17	6815095.34	6834572.14	2025	90	2016
1336.01	73349.70	73465.70	491825.21	498799.81	6834494.47	6837398.39	1026	91	2016
1337.00	63940.10	64806.20	444980.67	498643.10	6815463.76	6837765.51	2029	92	2016
1338.00	71762.80	72681.30	444827.81	498490.06	6815834.43	6838132.36	2029	92	2016
1339.00	72268.10	73182.20	444676.33	498336.30	6816206.60	6838502.36	1026	91	2016
1340.00	69604.90	70541.30	444523.16	498181.43	6816570.98	6838875.38	2029	92	2016
1341.00	70109.50	70993.10	444370.46	498027.77	6816945.41	6839237.66	1026	91	2016
1342.00	72414.60	73184.80	451012.93	497872.80	6820129.85	6839605.17	1005	70	2016
1342.01	73267.70	73309.70	444216.41	446755.99	6817316.03	6818367.65	1005	70	2016
1342.02	76072.90	76191.40	444214.20	451189.15	6817316.67	6820208.40	2015	82	2016
1343.00	67438.40	68180.80	444065.15	490927.02	6817686.34	6837162.37	2025	90	2016
1343.01	65413.80	65536.60	490747.87	497722.42	6837082.55	6839971.46	2029	92	2016
1344.00	67632.70	68518.80	443908.17	497570.43	6818057.27	6840335.15	2029	92	2016
1345.00	71423.10	72340.50	443756.50	497414.17	6818420.18	6840716.41	1005	70	2016
1346.00	65630.70	66537.20	443600.94	497261.78	6818794.94	6841084.92	2029	92	2016
1347.00	73421.80	74141.80	443448.09	483665.28	6819155.65	6835874.41	1005	70	2016
1347.01	64920.80	65154.60	483489.52	497109.44	6835800.24	6841456.57	2029	92	2016
1348.00	71145.20	72101.10	441076.11	496954.78	6818605.26	6841825.20	1026	91	2016
1349.00	67224.10	68124.60	440928.80	496800.34	6818977.96	6842197.56	1026	91	2016
1350.00	68984.50	69969.80	440772.90	496649.89	6819350.21	6842576.12	1026	91	2016
1351.00	65009.30	65970.80	440617.50	496497.38	6819712.90	6842937.38	1026	91	2016
1352.00	66149.00	67134.60	440465.81	496343.88	6820082.39	6843303.85	1026	91	2016
1353.00	62845.80	63757.80	440313.96	496190.66	6820453.60	6843676.41	1026	91	2016
1354.00	66527.70	67328.00	440157.57	489240.24	6820819.87	6841216.20	2025	90	2016
1354.01	68258.30	68378.30	489060.45	496034.41	6841146.84	6844042.96	1026	91	2016
1355.00	65432.90	66166.90	440006.37	486867.41	6821194.05	6840669.14	2025	90	2016
1355.01	68708.80	68832.90	486689.31	493665.00	6840595.37	6843493.55	1026	91	2016
1356.00	64447.00	65334.80	439849.73	493508.32	6821557.58	6843837.67	2025	90	2016
1357.00	89901.60	90759.40	439700.27	493355.83	6821938.96	6844233.79	1013	77	2016
1358.00	88945.40	89797.20	439542.05	493202.20	6822297.34	6844601.27	1013	77	2016
1359.00	87951.90	88829.80	439388.84	493048.51	6822674.42	6844974.80	1013	77	2016
1360.00	86909.10	87825.00	439238.66	492894.50	6823042.93	6845336.98	1013	77	2016
1361.00	85870.00	86766.20	439084.62	492746.92	6823411.01	6845713.87	1013	77	2016
1362.00	84846.40	85750.60	438931.46	492593.11	6823784.59	6846086.09	1013	77	2016
1363.00	83822.60	84729.80	438777.40	492438.91	6824145.59	6846450.27	1013	77	2016
1364.00	63939.10	64849.80	438621.50	492282.70	6824523.25	6846813.99	1026	91	2016
1365.00	73252.60	74146.40	438468.29	492132.31	6824886.06	6847184.88	1012	77	2016
1366.00	72201.00	73125.80	438314.40	491974.59	6825261.91	6847556.14	1012	77	2016
1367.00	71176.00	72066.70	438162.43	491823.13	6825624.51	6847925.13	1012	77	2016
1368.00	70217.60	71055.60	438006.72	489454.16	6825993.00	6847374.64	1012	77	2016
1369.00	79749.70	80611.40	437852.89	489301.00	6826357.87	6847745.29	2035	100	2016
1370.00	63221.20	64054.70	437702.83	489148.67	6826730.87	6848107.61	2019	85	2016
1371.00	65005.60	65636.10	437545.63	475546.47	6827097.01	6842886.49	2031	94	2016
1371.01	62310.90	62546.30	475367.56	488992.25	6842818.68	6848480.87	1032	100	2016
1372.00	83467.10	84273.10	437392.22	488835.48	6827476.27	6848851.45	1016	83	2016
1373.00	63776.10	64268.40	437239.19	468591.70	6827839.37	6840871.60	2031	94	2016
1373.01	82263.50	82629.30	468417.32	488684.23	6840801.43	6849218.51	2035	100	2016
1374.00	64406.50	64906.80	437087.49	464016.71	6828206.81	6839389.97	2031	94	2016
1374.01	61729.60	61969.90	463826.95	479521.50	6839322.44	6845844.06	1032	100	2016
1374.02	84490.10	84898.20	463835.47	488530.70	6839330.35	6849582.12	2036	100	2016
1375.00	62633.50	63123.90	436934.32	468287.08	6828571.88	6841611.69	2031	94	2016
1375.01	83979.50	84351.80	468108.48	488378.81	6841535.09	6849959.81	2036	100	2016
1376.00	63199.60	63704.30	436777.91	465919.80	6828952.35	6841055.79	2031	94	2016
1376.02	83445.50	83793.80	465734.08	488225.23	6840995.21	6850336.39	2036	100	2016
1377.00	70598.20	71461.40	436627.19	488068.69	6829315.67	6850695.08	1028	92	2016

FLOWN LINES
WGS-84, UTM 9N

MLINE	TIME	TIME	MIN X	MAX X	MIN Y	MAX Y	FLIGHT	DAY	YEAR
1378.00	71649.20	72516.10	436475.46	487916.03	6829690.99	6851062.04	1028	92	2016
1379.00	62018.20	62883.20	436322.40	487767.09	6830052.62	6851440.94	2019	85	2016
1380.00	69533.10	70418.30	436166.16	487609.31	6830424.80	6851809.19	1028	92	2016
1381.00	84393.40	85284.90	436015.43	487456.62	6830800.25	6852171.25	1016	83	2016
1382.00	69593.50	70370.00	433643.48	478290.40	6830243.22	6848803.77	1023	88	2016
1382.01	68972.20	69089.70	478116.71	485089.29	6848727.83	6851622.85	1028	92	2016
1383.00	68713.10	69454.70	433489.73	480357.88	6830622.24	6850093.60	1023	88	2016
1383.01	68704.20	68782.70	480177.91	484934.28	6850019.02	6852004.26	1028	92	2016
1384.00	67886.00	68605.20	433336.27	473555.26	6830984.75	6847691.21	1023	88	2016
1384.01	68269.00	68444.40	473375.22	484777.82	6847622.74	6852367.42	1028	92	2016
1385.00	67113.60	67789.40	433183.89	475614.51	6831345.78	6848984.99	1023	88	2016
1385.01	67096.60	67257.30	475437.27	484627.58	6848912.97	6852737.02	1028	92	2016
1386.00	66309.70	67002.60	433030.25	473246.06	6831728.09	6848444.14	1023	88	2016
1386.01	66590.40	66783.50	473068.23	484474.04	6848358.39	6853100.94	1028	92	2016
1387.00	87636.50	88490.00	432879.07	484321.41	6832087.47	6853472.22	1007	71	2016
1388.00	86650.80	87516.90	432719.40	484169.92	6832463.84	6853838.43	1007	71	2016
1389.00	65547.50	66221.80	432567.83	475001.80	6832830.66	6850462.80	1023	88	2016
1389.01	67984.10	68144.30	474824.24	484014.50	6850389.56	6854209.97	1028	92	2016
1390.01	80813.80	81639.30	432418.27	483859.69	6833199.03	6854578.16	2035	100	2016
1391.00	65266.10	66127.70	432264.12	483709.10	6833568.33	6854950.36	1012	77	2016
1392.00	66262.20	67097.20	432111.34	483555.66	6833940.03	6855316.03	1012	77	2016
1393.00	63547.60	64357.80	431954.81	483401.20	6834311.46	6855693.39	1023	88	2016
1394.00	64564.10	65464.70	431802.34	483247.96	6834679.69	6856051.44	1023	88	2016
1395.00	61704.30	62468.90	431646.30	480875.66	6835048.66	6855507.53	1023	88	2016
1396.00	62558.20	63447.20	431491.31	480722.64	6835418.35	6855937.92	1023	88	2016
1397.00	67181.90	68000.20	431340.01	480571.41	6835778.03	6856241.21	1012	77	2016
1398.00	68169.30	68977.30	431187.77	480414.73	6836159.28	6856612.38	1012	77	2016
1399.00	69113.60	69705.50	431032.42	466820.07	6836525.77	6851397.19	1012	77	2016
1399.01	67448.70	67686.10	466642.47	480264.19	6851317.46	6856983.18	1028	92	2016
1400.00	85672.70	86456.60	430877.30	480109.72	6836894.76	6857347.81	1016	83	2016
1401.00	86586.40	87408.80	430726.47	479952.82	6837260.97	6857723.06	1016	83	2016
1402.00	87573.50	88352.70	430574.16	479802.35	6837635.92	6858096.31	1016	83	2016
1403.00	65432.90	66220.60	430416.48	479648.31	6837998.26	6858463.62	1028	92	2016
1404.00	69287.50	70099.40	430268.00	479495.30	6838380.47	6858832.70	2027	91	2016
1405.00	70216.90	70981.90	430112.93	479343.68	6838734.30	6859195.49	2027	91	2016
1406.00	64428.80	65038.50	445619.47	479185.54	6845617.21	6859564.02	1028	92	2016
1406.01	65116.00	65315.80	429957.02	441364.50	6839109.58	6843851.09	1028	92	2016
1406.02	62254.90	62332.30	441189.27	445795.92	6843777.54	6845694.84	2031	94	2016
1407.00	63413.40	63584.60	429805.96	438996.68	6839477.94	6843295.07	1028	92	2016
1407.01	63688.40	64217.50	445463.78	479037.05	6845984.93	6859938.06	1028	92	2016
1407.02	61890.00	62001.20	438815.38	445644.75	6843220.68	6846056.57	2031	94	2016
1408.00	62379.00	63256.80	429654.08	478879.41	6839849.36	6860301.53	1028	92	2016
1409.00	64345.70	65099.50	429495.51	476511.08	6840216.70	6859752.17	2019	85	2016
1410.00	67483.20	68298.50	427128.83	476358.41	6839661.26	6860130.69	2027	91	2016
1411.00	69548.70	70326.70	426975.77	476203.95	6840029.72	6860491.93	2023	88	2016
1412.00	68586.20	69454.20	426821.92	476049.59	6840412.77	6860870.73	2023	88	2016
1413.00	68381.30	69154.70	426668.77	475896.63	6840773.69	6861231.07	2027	91	2016
1414.00	70853.50	71641.30	426513.56	475742.06	6841146.23	6861611.27	2019	85	2016
1415.00	69909.30	70719.50	426363.01	475591.23	6841513.84	6861974.16	2019	85	2016
1416.00	69000.90	69805.40	426206.05	475434.00	6841885.34	6862346.51	2019	85	2016
1417.00	67967.40	68797.50	426053.35	475282.27	6842253.09	6862705.56	2019	85	2016
1418.00	67029.30	67824.70	425901.73	475132.09	6842626.83	6863081.21	2019	85	2016
1419.00	66109.50	66894.30	425745.67	474973.44	6843025.11	6863439.56	2019	85	2016
1420.00	65203.00	66014.50	425596.39	474821.23	6843360.78	6863804.49	2019	85	2016
1421.00	67699.40	68464.30	425441.14	474669.14	6843731.47	6864191.50	2023	88	2016
1422.00	72342.00	73200.30	423068.68	474514.15	6843174.60	6864554.47	2021	86	2016
1423.00	71321.30	72144.90	422916.77	472143.12	6843541.56	6864003.05	2021	86	2016
1424.00	70372.60	71233.20	422762.23	471989.15	6843916.85	6864379.73	2021	86	2016
1425.00	69424.30	70256.10	422610.91	471841.06	6844284.41	6864752.74	2021	86	2016
1426.00	68451.20	69291.30	422457.51	471684.60	6844653.82	6865108.12	2021	86	2016
1427.00	67417.30	68238.50	422305.29	471528.56	6845023.33	6865482.87	2021	86	2016
1428.00	66526.20	67315.50	422147.88	471377.18	6845391.03	6865851.16	2021	86	2016
1429.00	65585.20	66414.70	421997.92	471225.05	6845762.48	6866220.80	2021	86	2016
1430.00	64621.10	65445.30	421843.55	471069.39	6846137.69	6866592.62	2021	86	2016
1431.00	90122.30	90880.80	421687.61	470917.40	6846502.94	6866957.41	2018	84	2016

FLOWN LINES
WGS-84, UTM 9N

MLINE	TIME	TIME	MIN X	MAX X	MIN Y	MAX Y	FLIGHT	DAY	YEAR
1432.00	80196.80	81011.50	421535.50	470766.72	6846875.38	6867327.46	2018	84	2016
1433.00	77728.50	78078.90	421384.04	443867.31	6847238.05	6856589.88	2005	71	2016
1433.01	81146.60	81605.90	443692.76	470612.01	6856515.82	6867703.49	2017	83	2016
1434.00	81734.50	82509.70	421226.01	470456.71	6847609.06	6868066.44	2017	83	2016
1435.00	82628.80	83472.20	418857.98	470301.92	6847059.24	6868436.44	2017	83	2016
1436.00	83570.10	84361.80	418704.19	467932.77	6847432.85	6867886.33	2017	83	2016
1437.00	84458.30	85260.00	418555.19	467778.85	6847805.03	6868257.11	2017	83	2016
1438.00	66231.30	67142.30	418396.38	467628.04	6848171.06	6868628.63	2023	88	2016
1439.00	88346.60	89131.30	418249.07	467473.41	6848536.77	6868994.28	2018	84	2016
1440.00	85499.00	86316.20	418091.60	467321.49	6848906.60	6869363.45	1019	85	2016
1441.00	86608.80	87379.10	417941.92	467163.96	6849276.05	6869736.89	2018	84	2016
1442.00	89214.90	89999.90	417784.84	467009.08	6849643.63	6870095.29	2018	84	2016
1443.00	81144.90	81934.10	417629.84	466860.96	6850002.65	6870472.34	2018	84	2016
1444.00	87472.10	88281.30	417474.76	466704.79	6850382.67	6870830.26	2018	84	2016
1445.00	85655.20	86464.00	417322.18	466552.77	6850749.43	6871215.38	2018	84	2016
1446.00	83871.50	84693.20	417168.28	466400.83	6851121.22	6871580.33	2018	84	2016
1447.00	84793.50	85569.30	417019.43	466246.48	6851484.28	6871941.35	2018	84	2016
1448.00	82007.00	82844.90	414648.65	466089.11	6850939.09	6872317.39	2018	84	2016
1449.00	82958.20	83772.00	414492.10	465939.49	6851304.65	6872683.45	2018	84	2016
1450.00	81881.20	82664.80	414342.94	463570.82	6851678.12	6872142.35	2013	77	2016
1451.00	65316.10	66076.40	414186.73	463417.22	6852053.49	6872506.89	2023	88	2016
1452.00	65446.70	66269.90	414030.25	463264.13	6852419.61	6872872.29	2027	91	2016
1453.00	66380.90	67147.90	413882.36	463110.82	6852785.85	6873242.82	2027	91	2016
1454.00	63709.90	64521.50	413724.42	462956.29	6853156.67	6873612.33	2027	91	2016
1455.00	63338.70	64105.20	413571.66	462802.80	6853525.34	6873982.17	2023	88	2016
1456.00	64291.80	65210.80	413420.59	462647.04	6853890.93	6874346.88	2023	88	2016
1457.00	82731.70	83521.20	413267.96	462496.33	6854265.70	6874724.38	2013	77	2016
1458.00	62354.50	63273.20	413112.95	462339.28	6854636.36	6875099.98	2023	88	2016
1459.00	64591.60	65354.60	412957.39	462188.60	6855006.93	6875454.73	2027	91	2016
1460.00	68687.90	69445.20	412805.77	459818.02	6855379.06	6874909.11	1020	86	2016
1461.00	62830.00	63585.10	410436.91	459662.21	6854823.28	6875277.46	2027	91	2016
1462.00	66884.20	67688.10	410281.86	459508.11	6855189.36	6875648.77	1020	86	2016
1463.00	67785.90	68594.80	410125.82	459355.49	6855556.52	6876010.09	1020	86	2016
1464.00	83627.70	84417.40	409974.21	459201.10	6855927.77	6876386.00	2013	77	2016
1465.00	65981.80	66793.20	409822.55	459045.05	6856293.81	6876750.95	1020	86	2016
1466.00	65064.40	65883.00	409665.33	458894.11	6856665.27	6877124.12	1020	86	2016
1467.00	64150.50	64942.60	409516.16	458739.59	6857037.70	6877487.40	1020	86	2016
1468.00	63191.80	64033.60	409359.07	458590.44	6857405.62	6877856.82	1020	86	2016
1469.00	84355.90	85150.20	409207.91	458437.22	6857774.44	6878236.88	1019	85	2016
1470.00	83433.40	84250.50	409052.05	458283.82	6858152.17	6878604.07	1019	85	2016
1471.00	84526.00	85152.60	408901.34	446903.99	6858512.37	6874298.63	2013	77	2016
1471.01	85605.10	85791.00	444505.33	455910.66	6873303.63	6878050.41	2013	77	2016
1472.00	81586.50	82368.00	408746.94	455759.80	6858883.11	6878425.39	1019	85	2016
1473.00	80691.10	81458.80	408596.33	455601.73	6859240.48	6878791.73	1019	85	2016
1474.00	68897.50	69696.60	406225.94	455449.20	6858703.15	6879160.06	1018	85	2016
1475.00	82523.30	83317.70	406069.06	455297.46	6859072.01	6879529.55	1019	85	2016
1476.00	67059.20	67855.70	405919.55	455147.19	6859439.77	6879899.73	1018	85	2016
1477.00	67972.20	68770.30	405763.87	454992.49	6859805.02	6880270.69	1018	85	2016
1478.00	85861.90	86625.80	405610.34	454837.37	6860177.81	6880637.71	2013	77	2016
1479.00	66146.90	66937.10	405455.46	454683.45	6860546.32	6881009.37	1018	85	2016
1480.00	65208.00	66019.60	405300.92	454530.94	6860917.46	6881378.62	1018	85	2016
1481.00	84364.30	85134.40	405147.35	452162.31	6861286.72	6880828.42	1017	84	2016
1482.00	87514.90	88291.10	404994.44	452007.34	6861655.71	6881193.35	2013	77	2016
1483.00	82499.30	83274.20	404840.51	451853.14	6862022.25	6881566.11	1017	84	2016
1484.01	63473.70	64259.40	404689.20	451697.25	6862392.47	6881935.01	2034	100	2016
1485.00	86701.50	87442.00	404536.24	451549.59	6862763.69	6882297.71	2013	77	2016
1486.00	76501.80	77328.20	404378.24	451391.71	6863128.70	6882672.12	2005	71	2016
1487.00	75613.10	76376.50	402010.23	451243.19	6862584.72	6883034.39	2005	71	2016
1488.00	85240.10	86067.30	401859.16	451088.38	6862951.52	6883407.39	1017	84	2016
1489.00	62439.90	63234.10	401706.69	450933.68	6863327.05	6883777.53	1018	85	2016
1490.00	83369.80	84213.80	401550.75	450778.40	6863688.60	6884144.64	1017	84	2016
1491.00	86201.30	86944.30	401397.45	448408.27	6864065.66	6883595.47	1017	84	2016
1492.00	81410.60	82209.30	401243.40	448258.41	6864425.71	6883963.40	1017	84	2016
1493.00	80509.20	81281.10	401087.72	448103.39	6864795.51	6884341.26	1017	84	2016
1494.00	63322.00	64112.10	400936.59	447952.02	6865163.77	6884704.12	1018	85	2016

FLOWN LINES
WGS-84, UTM 9N

MLINE	TIME	TIME	MIN X	MAX X	MIN Y	MAX Y	FLIGHT	DAY	YEAR
1495.01	64250.50	65014.40	400780.49	447793.40	6865530.91	6885066.72	1018	85	2016
1496.00	87026.30	87826.80	400631.72	447641.87	6865900.52	6885437.15	1017	84	2016
1497.00	70383.40	71135.30	400473.29	447485.59	6866268.53	6885803.47	2012	77	2016
1498.00	71275.70	71641.90	424847.08	447333.28	6876837.65	6886177.84	2012	77	2016
1498.01	87934.90	88335.20	400322.84	425023.78	6866637.61	6876909.65	1017	84	2016
1499.00	68160.80	68894.40	400169.53	447179.71	6867010.55	6886556.57	2011	77	2016
1500.00	68989.40	69432.50	417890.39	444812.07	6874807.85	6886025.66	2011	77	2016
1500.02	62559.30	62835.10	400017.69	418068.13	6867379.14	6874881.04	2034	100	2016
1501.00	66546.50	67286.20	399863.53	444656.34	6867747.67	6886371.03	2011	77	2016
1502.00	74705.70	75429.60	401924.93	444506.09	6869048.75	6886744.14	2005	71	2016
1503.00	80336.80	81095.40	401770.64	444350.26	6869413.04	6887109.30	2001	68	2016
1504.00	79438.00	80139.40	403831.69	444199.94	6870704.92	6887475.54	2001	68	2016
1505.00	78650.60	79317.30	405895.22	444046.92	6871988.60	6887845.90	2001	68	2016
1506.00	71772.70	72334.30	407958.90	443890.38	6873282.18	6888239.53	2007	72	2016
1507.00	88771.50	89348.20	407803.56	441524.04	6873671.52	6887666.31	2008	72	2016
1508.00	67374.10	67886.10	409871.71	441366.67	6874955.98	6888037.10	2011	77	2016
1509.00	87417.10	87945.40	411931.00	441210.26	6876220.84	6888410.86	2008	72	2016
1510.00	86819.80	87296.00	411780.50	441057.68	6876606.80	6888766.78	2008	72	2016
1511.00	72516.80	72991.30	413842.68	440909.06	6877892.93	6889129.60	2007	72	2016
1512.00	88051.60	88444.00	415904.12	440756.18	6879182.36	6889514.25	2008	72	2016
1513.00	86283.70	86703.40	415748.30	440601.39	6879552.81	6889884.69	2008	72	2016
1514.00	64595.80	64941.20	417814.26	438227.42	6880844.86	6889325.74	2011	77	2016
1515.00	68811.70	69114.80	419878.48	438075.28	6882131.70	6889698.73	2007	72	2016
1516.00	70210.60	70511.70	419720.65	437922.77	6882507.99	6890066.76	2007	72	2016
1517.00	70605.40	70858.10	421784.94	437772.63	6883803.99	6890432.55	2007	72	2016
1518.00	71003.30	71246.00	423846.10	437616.82	6885082.62	6890803.11	2007	72	2016
1519.00	71386.80	71593.80	423693.54	437459.67	6885456.60	6891171.56	2007	72	2016
1520.00	69677.10	69849.90	425758.92	435090.49	6886739.66	6890625.65	2007	72	2016
1521.00	69990.10	70096.00	427820.96	434939.64	6888033.38	6890993.01	2007	72	2016
1522.01	69228.40	69359.20	427664.12	434785.53	6888399.08	6891352.99	2007	72	2016
1523.00	69507.90	69575.50	429728.61	434630.44	6889699.11	6891732.36	2007	72	2016

SGL

Appendix IV

Equipment List

Part	Serial No.	Description	Manufacturer
Aircraft C-GSGR	2107	Britten-Norman Islander BN2B-21 2 Lycoming IO-540 Engines	Britten-Norman
Aircraft C-GSGX	596	Britten-Norman Islander BN2B-21 2 Lycoming IO-540 Engines	Britten-Norman
Barometric Sensor	1366226	Barometric Altimeter Absolute Pressure Sensor	Honeywell
Data acquisition computer	CDAC-13	CPCI Data Acquisition computer	SGL
Data acquisition computer	CDAC-21	CPCI Data Acquisition computer	SGL
Fluxgate Magnetometer	126	model TFM100G2-1E	Billingsley Magnetics
Fluxgate Magnetometer	877	model TFM100G2-1E, Three Axis Magnetic Field Sensor	Billingsley Magnetics
GPS Antenna	6686.502	model 512C, L1/L2	Antcom Corp
GPS Antenna	512C-7484	model 512C, rev. 1, L1/L2	Antcom Corp
GPS Antenna	NZT07180017	Model 702L, w OMNISTAR, L1/L2 Kinematic GPS Antenna	Novatel
Laser Profilometer	9996755	LD90-31K-HiP, 11-28VDC laser rangefinder	Riegl
Laser Profilometer	9995444	LD90-31K-HiP, 11-28VDC laser rangefinder	Riegl
Magnetometer Sensor	75535-C2478	model G-822A, Sensor S/N C2478	Geometrics
Magnetometer Sensor	75299-C954	model G-822A, Sensor S/N C954	Geometrics
Magnetometer Sensor	75369-C1557	model G-822A, Sensor S/N C1557	Geometrics
Magnetometer Sensor	75270-C643	model G-822A, Sensor S/N C643	Geometrics
Magnetometer Sensor	75297-C985	model G-822A, Sensor S/N C985	Geometrics
RA Transceiver - KING	13497	Radar Altimeter, model KRA 10A	Bendix/King
RA Transceiver - TRT	10422	Radar Altimeter, model ERT-530A	Thomson TRT Defense SA
RA Transceiver - TRT	10014	Radar Altimeter, model ERT-530A	Thomson TRT Defense SA
SGRef Station	M-SGREF-70	CPCI ground station - 28Vdc input	SGL
SGRef Station	M-SGREF-63	CPCI ground station - 28Vdc input	SGL

SGL

Appendix V

GEOPHYSICAL SURVEY AIRCRAFT

Britten-Norman BN2B-21 Islander

Registration	C-GSGX	C-GSGR
Serial #	596	2107

The BN2B Islander is an all metal, high wing, twin-engine, short take-off and landing aircraft powered by two fuel injected engines which drive constant speed, fully feathering propellers. The aircraft has fixed tricycle landing gear, extendable flaps and manually adjustable trim tabs on the rudder and elevator. The aircraft is equipped with de-icing equipment and sufficient avionics for instrument flying. Because of its low take-off speed, high wing, ample propeller clearance, and sturdy fixed landing gear, the Islander is capable of operating from relatively short and rough airstrips. Its excellent low speed capabilities enable it to safely contour much steeper terrain than most other fixed-wing aircraft. Supplementary fuel can be added for transoceanic flight.

GEOPHYSICAL SURVEYING

The aircraft has an aluminium and composite 2.5 m tail stinger designed to accommodate the magnetometer sensor and wiring. The stinger can be easily removed and the aircraft returned to its original configuration. There is a camera hole in the belly and provisions for numerous other survey and navigation systems. The electrical system has been modified to reduce the magnetic field variations around the aircraft.

BRITTEN-NORMAN BN2B-21 ISLANDER SPECIFICATIONS

Crew Capacity:
- 2 pilots, 1 operator (optional)

Fuselage:
- semi-monocoque

Wings:
- cantilever, high wing
- outboard ailerons
- single-slotted inboard flaps

Tail:
- conventional stabilizers
- elevator and rudder with trim tabs

Power Plant:
- 2 Lycoming IO-540, 300 hp, six cylinder, horizontally-opposed air-cooled, fuel-injected, reciprocating engines, overhaul 2,000 hours
- Hartzell two-blade, fully-feathering, constant-speed propellers, overhaul 2,400 hours or 10 years

Systems:
- dual flight controls, IFR instruments and avionics
- full airframe and propeller de-icing
- 2-axis autopilot

Dimensions:

Wing span	53 ft	16.15 m
Exterior length (plus stinger)	35 ft 8 in	10.90 m
Exterior height	13 ft 9 in	4.18 m
Interior usable length	15 ft 2 in	4.62 m
Interior usable width	3 ft 7 in	1.09 m
Interior height	4 ft 2 in	1.26 m

Weights:

Empty	4,190 lb	1,901 kg
Maximum take-off	6,600 lb	2,994 kg

Performance (sea level, standard day, maximum take-off weight):

Range at 60% power (plus reserve)	760 nm	1,408 km
Cruise airspeed at 60% power	121 kt	224 km/h
Fuel flow at 60% power	25.5 US gal/h	97 l/h
Stall airspeed, landing configuration	40 kt	74 km/h
Service ceiling	17,200 ft	5,242 m
Minimum required runway length	2,000 ft	610 m
Two engine rate of climb	1,130 ft/min	344 m/min
Maximum sustained climb gradient	700 ft/nm	115 m/km
Single engine rate of climb	223 ft/min	69 m/min
Usable fuel capacity	189 US gal	715 l

Type of Aviation Fuel: 100LL Avgas

Maximum Endurance: 6 hours, 40 minutes plus 45 minutes reserve at 60% power

GEOPHYSICAL CAPABILITIES

AIRGrav, SGL airborne gravimeter

Magnetic total field

Gamma-ray spectrometer, up to 42 litres (2560 in^3) of detector crystals

SGMethane, methane gas sensing

Additional Features:
- Tail stinger, 2.5 m long, 21 cm in diameter, capable of housing a 5.5 kg sensor
- HF radio
- Video camera mount with glass covered opening in the aircraft belly
- Two instrument racks, standard 48 cm (19 in) width
- Radar altimeter, 0-3,000 m
- Electrical power capacity, 28 VDC at 140 amp
- GPS receiver and antenna plus data link for real-time corrections

V2.2

SGL

Appendix VI

SANDER GEOPHYSICS AIRBORNE GEOPHYSICAL SURVEY

260 Hunt Club Road, Ottawa, ON K1V 1C1 Canada Tel: +1 613-521-9626 Fax: +1 613-521-0215 www.sgl.com

SURVEY DETAILS

Survey Name	Fixed-wing aeromagnetic survey over the Frances Lake area, Yukon	**Client Name**	Natural Resources Canada
Survey Location	Frances Lake area, Yukon	**Contact Name**	Frank Kiss
Project Code	NRCan_16.YT	**Contact Phone**	
Total km	31165	**Client Address**	Natural Resources Canada, 558 Booth Street, Ottawa, Ontario, K1A 0Y7
Line Spacing	400		
Survey Type	Aeromagnetic	**Email**	Frank.Kiss@canada.ca

SURVEY PRODUCTION SUMMARY

Production This Week (km)	0.0	**Total km Flown to Date**	0.0
Total Remaining (km)	31165.0	**km Reflown This Week**	0.0
Percent Complete (%)	0.0	**Flight Time This Week (h)**	0.0
Prod km/Day This Week	0.0	**Prod km/Flt Hour This Week**	

WEEKLY PRODUCTION

Week 1		Flight No.	Flight Time	No. of Lines Flown	No. Reflight Lines Flown	Production (km)	Reflown (km)
TOTALS			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
22-Feb	**Monday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather Geomag			**Remarks**	Kevin Charles and Lindsay Upiter arrive in Whitehorse. The survey aircraft C-GSGR is enroute from Ottawa to Watson Lake.			
23-Feb	**Tuesday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather Geomag			**Remarks**	Kevin Charles and Lindsay Upiter travel from Whitehorse to Watson Lake with ground geophysical equipment.			
24-Feb	**Wednesday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather Geomag			**Remarks**	Commenced survey base set up in Watson Lake.			
25-Feb	**Thursday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather Geomag			**Remarks**	Ground Monitoring stations set up at Watson Lake airport.			
26-Feb	**Friday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather Geomag			**Remarks**	Survey aircraft C-GSGX departs Ottawa and commences ferry to Watson Lake. Survey start up logistics in Watson Lake.			
27-Feb	**Saturday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather Geomag			**Remarks**	Survey start up logistics in Watson Lake.			
28-Feb	**Sunday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather Geomag			**Remarks**	Survey start up logistics in Watson Lake.			

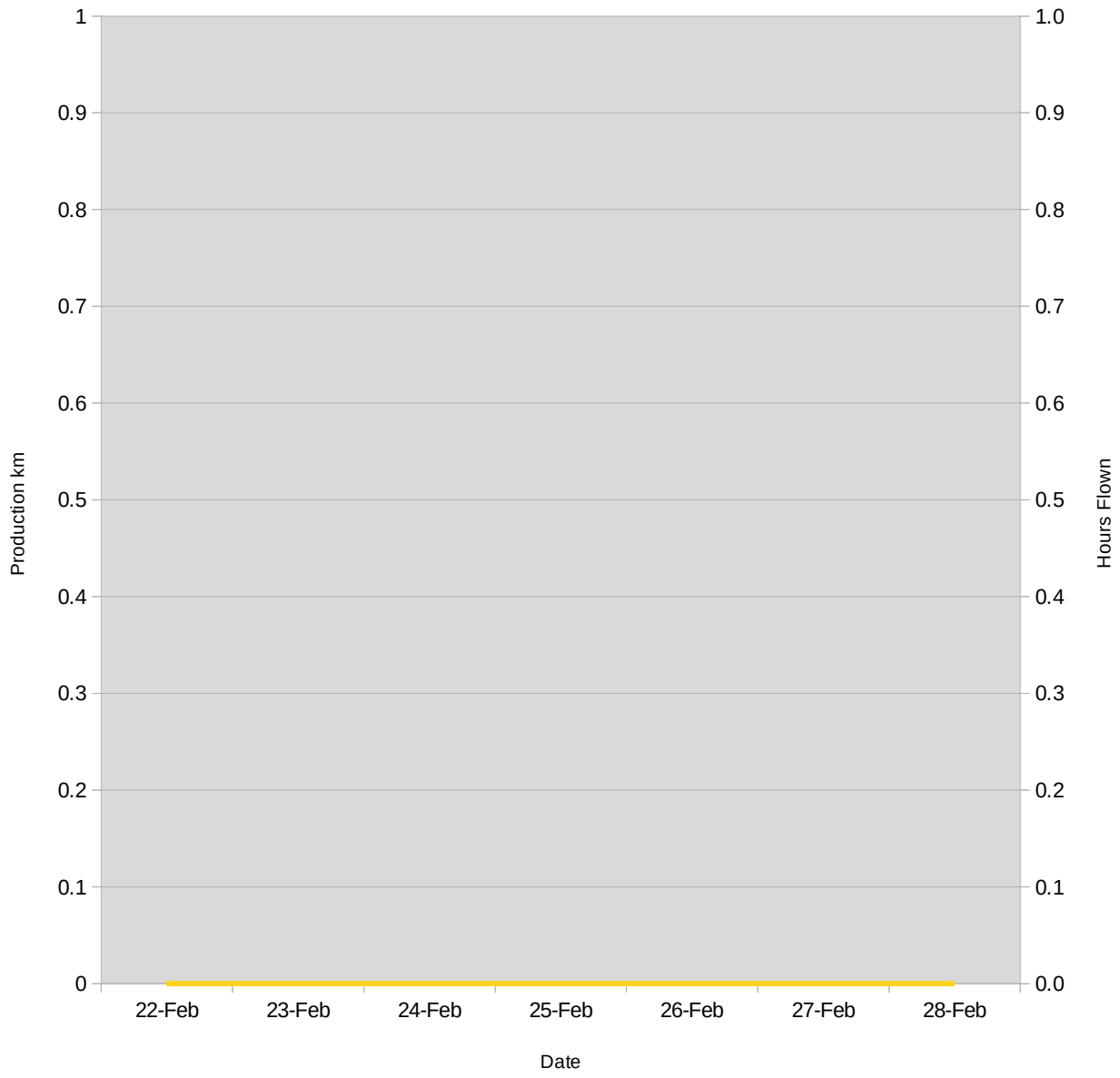
Comments Initial crew members arrive in Watson Lake and commence setup of survey base. Survey aircraft C-GSGR continues it's ferry from Ottawa to Watson Lake. Survey aircraft C-GSGX commences it's ferry to Watson Lake.

Signed

PERSONNEL ON SITE THIS WEEK

Name	Position	Arrival This Week	Departure This Week	On Site?	No. of Days On Site This Week	No. of Days on Site To Date
Kevin Charles	Field Manager	22-Feb-16		ON SITE	7	7
Lindsay Upiter	ɜld Quality Control	22-Feb-16		ON SITE	7	7

WEEKLY PRODUCTION KILOMETRES AND HOURS FLOWN



SANDER GEOPHYSICS AIRBORNE GEOPHYSICAL SURVEY

260 Hunt Club Road, Ottawa, ON K1V 1C1 Canada Tel: +1 613-521-9626 Fax: +1 613-521-0215 www.sgl.com

SURVEY DETAILS

Survey Name	Fixed-wing aeromagnetic survey over the Frances Lake area, Yukon	**Client Name**	Natural Resources Canada
Survey Location	Frances Lake area, Yukon	**Contact Name**	Frank Kiss
Project Code	NRCan_16.YT	**Contact Phone**	
Total km	31165	**Client Address**	Natural Resources Canada, 558 Booth Street, Ottawa, Ontario, K1A 0Y7
Line Spacing	400		
Survey Type	Aeromagnetic	**Email**	Frank.Kiss@canada.ca

SURVEY PRODUCTION SUMMARY

Production This Week (km)	43.6	**Total km Flown to Date**	43.6
Total Remaining (km)	31121.4	**km Reflown This Week**	0.0
Percent Complete (%)	0.1	**Flight Time This Week (h)**	10.2
Prod km/Day This Week	6.2	**Prod km/Flt Hour This Week**	4.3

WEEKLY PRODUCTION

Week 2		Flight No.	Flight Time	No. of Lines Flown	No. Reflight Lines Flown	Production (km)	Reflown (km)
TOTALS			**10.2**	**4.0**	**0.0**	**43.6**	**0.0**
29-Feb	**Monday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather			**Remarks**	Survey start up logistics.			
Geomag							
1-Mar	**Tuesday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather	Partially cloudy		**Remarks**	C-GSGR arrived in Watson Lake flown by pilots Bret Curtis and Tomo Nishimura. Aircraft Maintenance engineer John Sevenhyusen arrived in Watson Lake from Whitehorse.			
Geomag							
2-Mar	**Wednesday**		**5.3**	**3.0**	**0.0**	**17.7**	**0.0**
	C-GSGR	9001, 1001	2.5	3.0	0.0	17.7	0.0
	C-GSGX	8001	2.8	0.0	0.0	0.0	0.0
Weather	Partially cloudy		**Remarks**	C-GSGX arrived in Watson Lake flown by pilots Jean Deschenes and Nikhal Behl. C-GSGR flew magnetic compensation and altimeter tests, as well as a few survey lines. C-GSGX flew a magnetic compensation test.			
Geomag	moderate						
3-Mar	**Thursday**		**4.9**	**1.0**	**0.0**	**25.9**	**0.0**
	C-GSGR	1002	1.1	1.0	0.0	25.9	0.0
	C-GSGX	8002	3.8	0.0	0.0	0.0	0.0
Weather	low clouds		**Remarks**	C-GSGR attempted production but had to abort early due to low clouds obstructing the survey area. C-GSGX flew all but the highest two altitudes of an altimeter test as well as did some training flights.			
Geomag	Moderate						
4-Mar	**Friday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather	low clouds		**Remarks**	No flights due to low clouds in survey area.			
Geomag	Moderate						
5-Mar	**Saturday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather	Light snow		**Remarks**	No flights due to low clouds and light snow.			
Geomag	Moderate						

6-Mar	**Sunday**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR	0.0	0.0	0.0	0.0	0.0
	C-GSGX	0.0	0.0	0.0	0.0	0.0

Weather low clouds

Remarks A production flight was attempted but was aborted due to weather without accomplishing any production.

Geomag Active

Comments Both survey aircraft arrived on site in Watson Lake. Pre-production calibration flights mostly completed and production flying commenced.

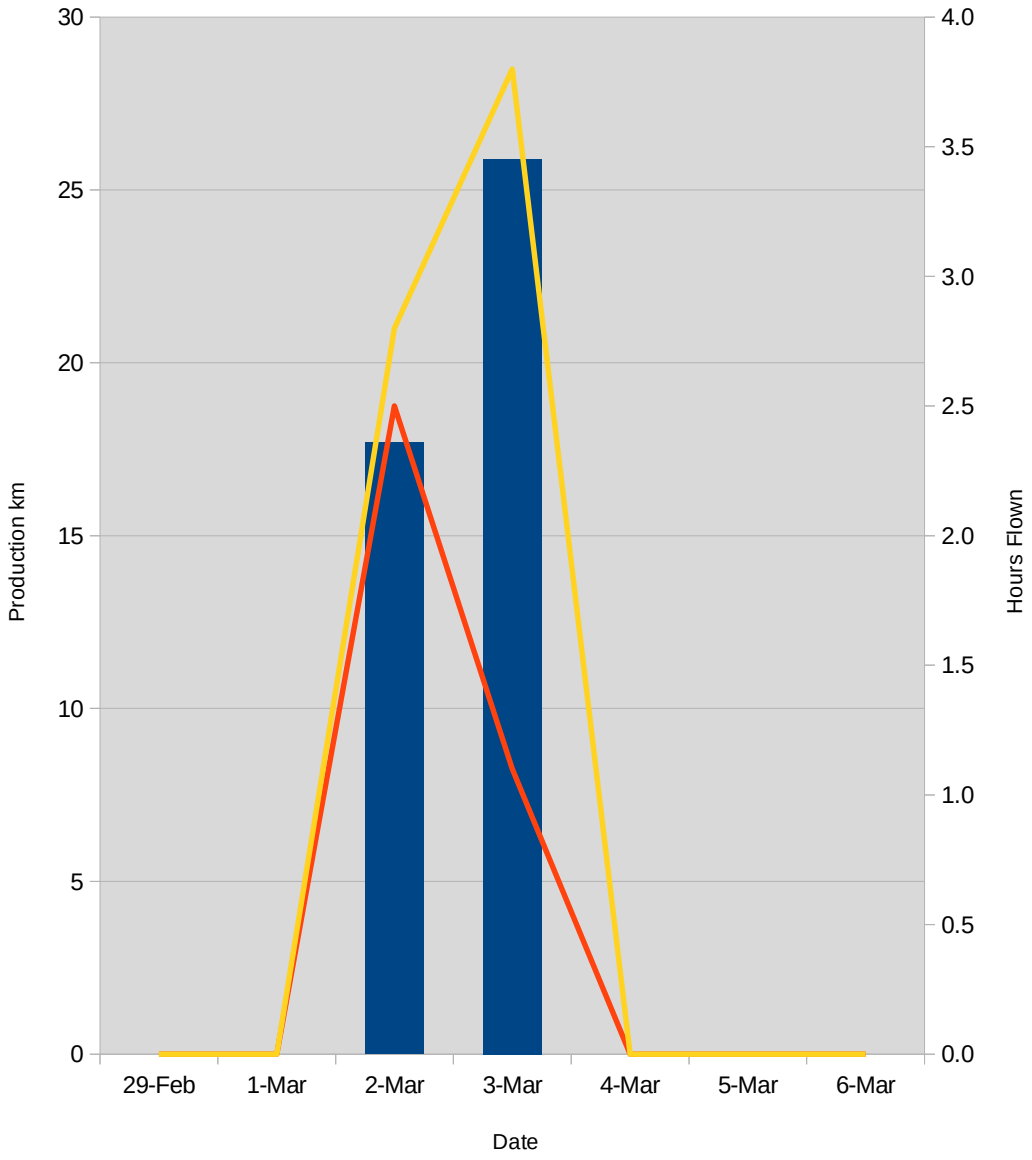
Signed Kevin Charles

Week 2 Page 2

PERSONNEL ON SITE THIS WEEK

Name	Position	Arrival This Week	Departure This Week	On Site?	No. of Days On Site This Week	No. of Days on Site To Date
Kevin Charles	Field Manager			ON SITE	7	14
Lindsay Upiter	ld Quality Control			ON SITE	7	14
John Sevenhyusen	AME	29-Feb-16		ON SITE	7	7
Bret Curtis	Pilot	1-Mar-16		ON SITE	6	6
Tomo Nishimura	Pilot	1-Mar-16		ON SITE	6	6
Jean Deschenes	Pilot	2-Mar-16		ON SITE	5	5
Nikhal Behl	Pilot	2-Mar-16		ON SITE	5	5

WEEKLY PRODUCTION KILOMETRES AND HOURS FLOWN



SANDER GEOPHYSICS AIRBORNE GEOPHYSICAL SURVEY

260 Hunt Club Road, Ottawa, ON K1V 1C1 Canada Tel: +1 613-521-9626 Fax: +1 613-521-0215 www.sgl.com

SURVEY DETAILS

Survey Name	Fixed-wing aeromagnetic survey over the Frances Lake area, Yukon	**Client Name**	Natural Resources Canada
Survey Location	Frances Lake area, Yukon	**Contact Name**	Frank Kiss
Project Code	NRCan_16.YT	**Contact Phone**	
Total km	31165	**Client Address**	Natural Resources Canada, 558 Booth Street, Ottawa, Ontario, K1A 0Y7
Line Spacing	400		
Survey Type	Aeromagnetic	**Email**	Frank.Kiss@canada.ca

SURVEY PRODUCTION SUMMARY

Production This Week (km)	6741.9	**Total km Flown to Date**	6785.5
Total Remaining (km)	24379.5	**km Reflown This Week**	138.9
Percent Complete (%)	21.8	**Flight Time This Week (h)**	48.4
Prod km/Day This Week	963.1	**Prod km/Flt Hour This Week**	139.3

WEEKLY PRODUCTION

Week 3		Flight No.	Flight Time	No. of Lines Flown	No. Reflight Lines Flown	Production (km)	Reflown (km)
TOTALS			**48.4**	**102.6**	**5.3**	**6741.9**	**138.9**
7-Mar	**Monday**		**1.3**	**3.6**	**0.0**	**73.5**	**0.0**
	C-GSGR	1003	1.3	3.6	0.0	73.5	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather	cloudy		**Remarks**	Production flight aborted due to low clouds			
Geomag	stormy						
8-Mar	**Tuesday**		**5.5**	**9.5**	**0.9**	**660.4**	**19.5**
	C-GSGR	1004	1.5	0.4	0.0	62.6	0.0
	C-GSGX	2001	4.0	9.1	0.9	597.8	19.5
Weather	partially cloudy		**Remarks**	C-GSGR flight aborted early due to weather. Richard Fortin from NRCan arrived in Watson Lake.			
Geomag	active						
9-Mar	**Wednesday**		**7.4**	**11.2**	**0.7**	**864.9**	**9.9**
	C-GSGR			0.0	0.0	0.0	0.0
	C-GSGX	2002,2003	7.4	11.2	0.7	864.9	9.9
Weather	clear		**Remarks**	Maintenance on C-GSGR. C-GSGX flew production flights.			
Geomag	calm						
10-Mar	**Thursday**		**9.9**	**19.8**	**0.0**	**1342.1**	**0.0**
	C-GSGR	1005, 1006	6.6	15.5	0.0	886.5	0.0
	C-GSGX	2004	3.3	4.2	0.0	455.6	0.0
Weather	clear		**Remarks**	Production flights. Richard Fortin departed Watson lake.			
Geomag	unsettled						
11-Mar	**Friday**		**9.2**	**18.1**	**0.8**	**1412.6**	**14.7**
	C-GSGR	1007	3.0	7.0	0.8	436.9	14.7
	C-GSGX	2005,2006	6.2	11.1	0.0	975.7	0.0
Weather	clear		**Remarks**	Maintenance on C-GSGR and C-GSGX in the morning, production flights in the afternoon			
Geomag	active						
12-Mar	**Saturday**		**15.1**	**40.5**	**2.9**	**2388.4**	**94.8**
	C-GSGR	1008,1009	7.4	17.7	0.6	1173.8	25.9
	C-GSGX	2007,2008	7.7	22.8	2.4	1214.6	68.9
Weather	partially cloudy		**Remarks**	Both aircraft flew production flights			
Geomag	stormy						

13-Mar	**Sunday**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR	0.0	0.0	0.0	0.0	0.0
	C-GSGX	0.0	0.0	0.0	0.0	0.0

Weather overcast and snowing

Remarks No production flights due to low clouds and snow

Geomag

Comments Favourable weather this week allowed for good production. Richard Fortin visited the survey operation in Watson Lake.

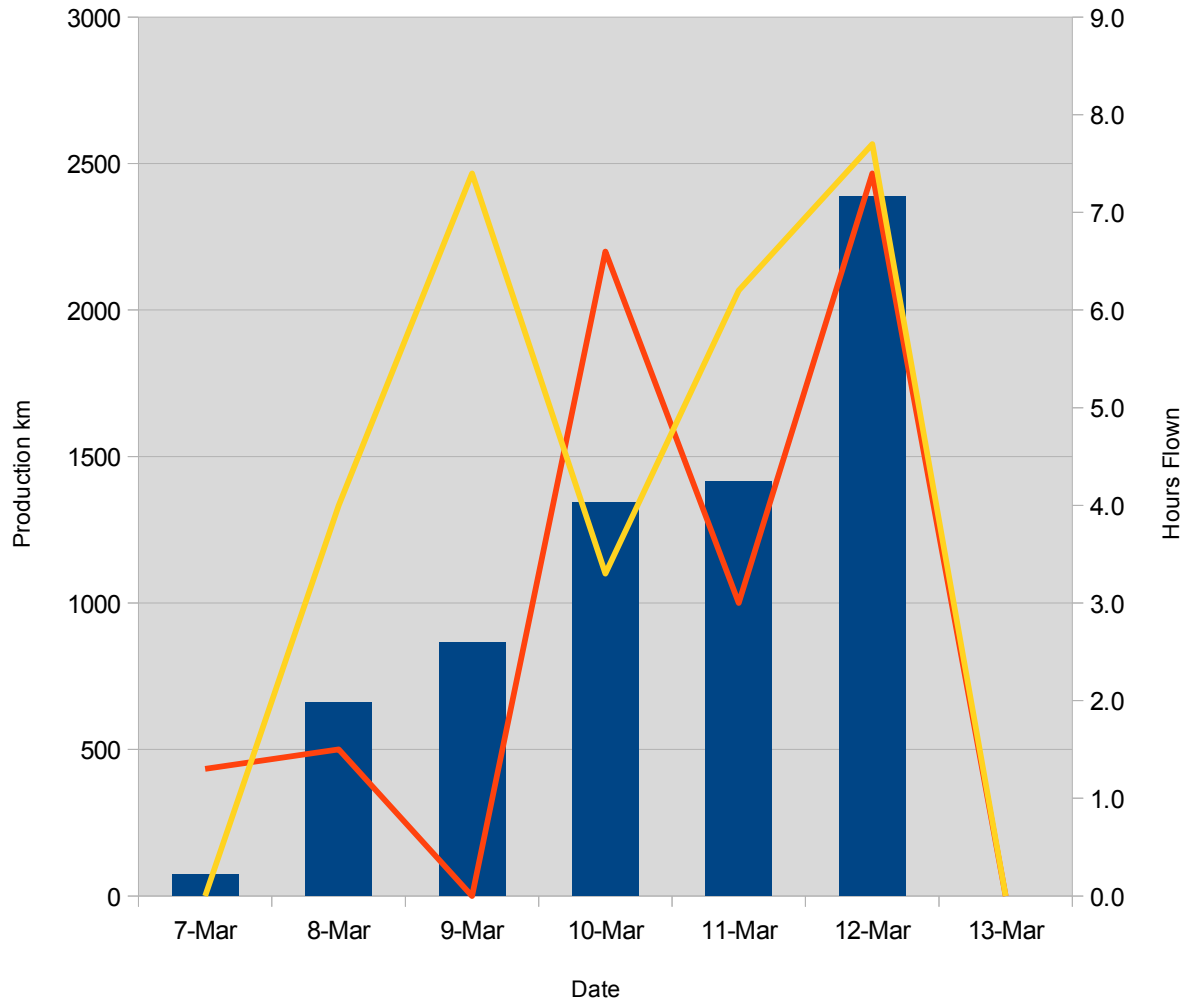
Signed Kevin

Week 3 Page 2

PERSONNEL ON SITE THIS WEEK

Name	Position	Arrival This Week	Departure This Week	On Site?	No. of Days On Site This Week	No. of Days on Site To Date
Kevin Charles	Field Manager			ON SITE	7	21
Lindsay Upiter	ld Quality Contro			ON SITE	7	21
John Sevenhyusen	AME			ON SITE	7	14
Bret Curtis	Pilot			ON SITE	7	13
Tomo Nishimura	Pilot			ON SITE	7	13
Jean Deschenes	Pilot			ON SITE	7	12
Nikhal Behl	Pilot			ON SITE	7	12

WEEKLY PRODUCTION KILOMETRES AND HOURS FLOWN



SANDER GEOPHYSICS AIRBORNE GEOPHYSICAL SURVEY

260 Hunt Club Road, Ottawa, ON K1V 1C1 Canada Tel: +1 613-521-9626 Fax: +1 613-521-0215 www.sgl.com

SURVEY DETAILS

Survey Name	Fixed-wing aeromagnetic survey over the Frances Lake area, Yukon	**Client Name**	Natural Resources Canada
Survey Location	Frances Lake area, Yukon	**Contact Name**	Frank Kiss
Project Code	NRCan_16.YT	**Contact Phone**	
Total km	31165	**Client Address**	Natural Resources Canada, 558 Booth Street, Ottawa, Ontario, K1A 0Y7
Line Spacing	400		
Survey Type	Aeromagnetic	**Email**	Frank.Kiss@canada.ca

SURVEY PRODUCTION SUMMARY

Production This Week (km)	4558.2	**Total km Flown to Date**	11348.8
Total Remaining (km)	19816.2	**km Reflown This Week**	174.5
Percent Complete (%)	36.4	**Flight Time This Week (h)**	32.6
Prod km/Day This Week	651.2	**Prod km/Flt Hour This Week**	139.8

WEEKLY PRODUCTION

Week 4		Flight No.	Flight Time	No. of Lines Flown	No. Reflight Lines Flown	Production (km)	Reflown (km)
TOTALS			**32.6**	**81.7**	**1.1**	**4558.2**	**174.5**
14-Mar	**Monday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather	Low clouds		**Remarks**	No production due to low clouds.			
Geomag							
15-Mar	**Tuesday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather	Low clouds		**Remarks**	No production due to low clouds.			
Geomag							
16-Mar	**Wednesday**		**13.6**	**31.7**	**0.2**	**1659.5**	**31.9**
	C-GSGR	1010, 1011	6.4	17.9	0.0	880.8	0.0
	C-GSGX	2009, 2010	7.2	13.8	0.2	778.7	31.9
Weather	Partially cloudy		**Remarks**	Both aircraft flew production flights. First flights with pulse lights turned off.			
Geomag	Unsettled to Active						
17-Mar	**Thursday**		**14.9**	**40.4**	**0.9**	**2389.9**	**142.6**
	C-GSGR	1012, 1013	8.5	19.1	0.0	1216.2	0.0
	C-GSGX	2011, 2012, 2013	6.4	21.3	0.9	1173.7	142.6
Weather	Partially cloudy		**Remarks**	Both aircraft flew production flights. C-GSGX's first flight of the day was processed as two separate flights (2011 & 2012).			
Geomag	Active decreasing to unsettled						
18-Mar	**Friday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather	Snow and low clouds		**Remarks**	No production due to snow and low clouds.			
Geomag							
19-Mar	**Saturday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather	Snow and low clouds		**Remarks**	No production due to snow and low clouds.			
Geomag							
20-Mar	**Sunday**		**4.1**	**9.6**	**0.0**	**508.8**	**0.0**
	C-GSGR	1014	4.1	9.6	0.0	508.8	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather	Mostly cloudy		**Remarks**	Mostly cloudy conditions permitted only one production flight.			
Geomag	Active decreasing to calm						

Comments Challenging weather conditions limited production this week.

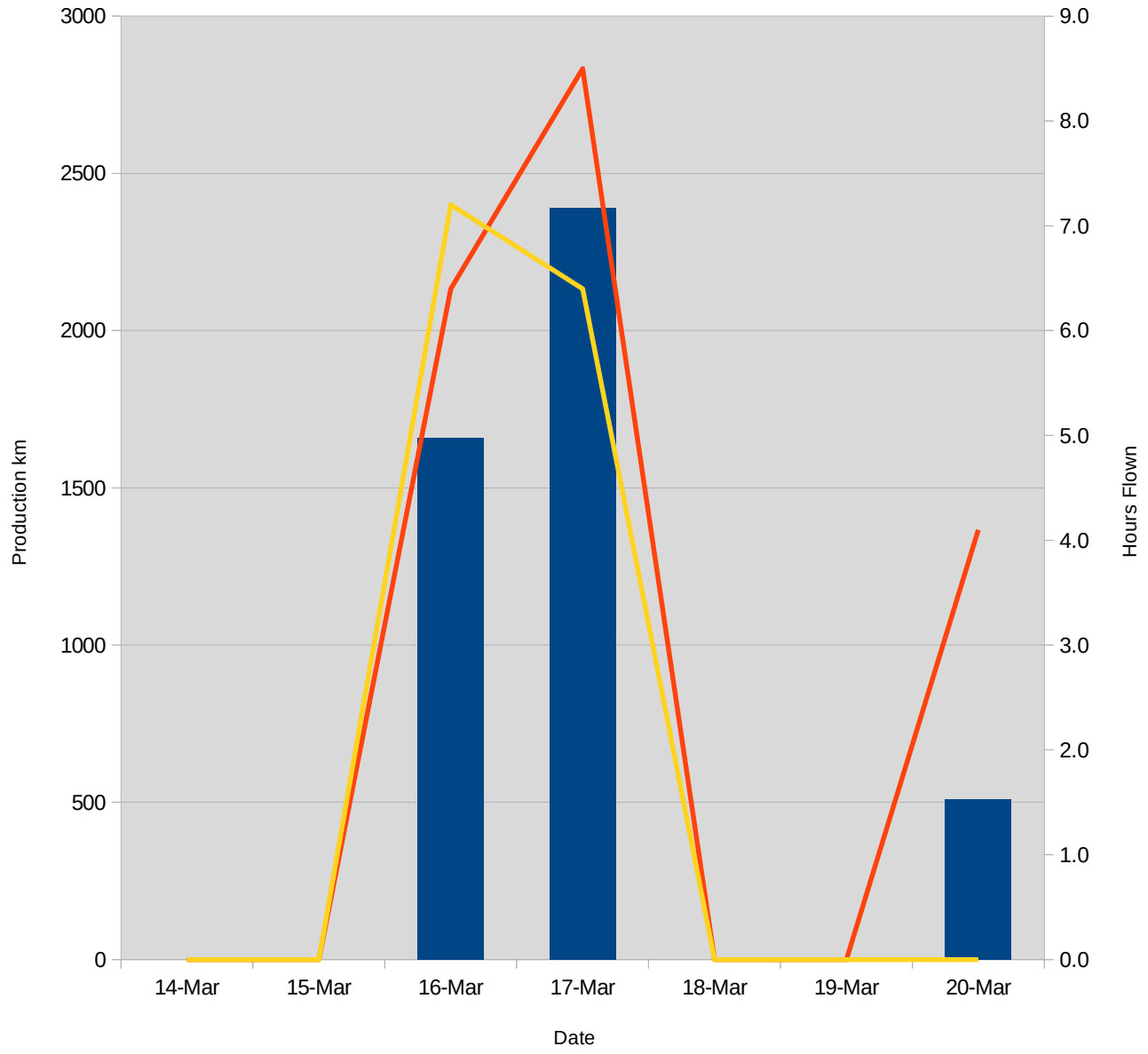
Signed Kevin Charles

Week 4 Page 2

PERSONNEL ON SITE THIS WEEK

Name	Position	Arrival This Week	Departure This Week	On Site?	No. of Days On Site This Week	No. of Days on Site To Date
Kevin Charles	Field Manager			ON SITE	7	28
Lindsay Upiter	ld Quality Control			ON SITE	7	28
John Sevenhyusen	AME			ON SITE	7	21
Bret Curtis	Pilot			ON SITE	7	20
Tomo Nishimura	Pilot			ON SITE	7	20
Jean Deschenes	Pilot			ON SITE	7	19
Nikhal Behl	Pilot			ON SITE	7	19

WEEKLY PRODUCTION KILOMETRES AND HOURS FLOWN



SANDER GEOPHYSICS AIRBORNE GEOPHYSICAL SURVEY

260 Hunt Club Road, Ottawa, ON K1V 1C1 Canada Tel: +1 613-521-9626 Fax: +1 613-521-0215 www.sgl.com

SURVEY DETAILS

Survey Name	Fixed-wing aeromagnetic survey over the Frances Lake area, Yukon	**Client Name**	Natural Resources Canada
Survey Location	Frances Lake area, Yukon	**Contact Name**	Frank Kiss
Project Code	NRCan_16.YT	**Contact Phone**	
Total km	31165	**Client Address**	Natural Resources Canada, 558 Booth Street, Ottawa, Ontario, K1A 0Y7
Line Spacing	400		
Survey Type	Aeromagnetic	**Email**	Frank.Kiss@canada.ca

SURVEY PRODUCTION SUMMARY

Production This Week (km)	7819.2	**Total km Flown to Date**	19168.0
Total Remaining (km)	11997.0	**km Reflown This Week**	401.4
Percent Complete (%)	61.5	**Flight Time This Week (h)**	63.9
Prod km/Day This Week	1117.0	**Prod km/Flt Hour This Week**	122.4

WEEKLY PRODUCTION

Week 5		**Flight No.**	**Flight Time**	**No. of Lines Flown**	**No. Reflight Lines Flown**	**Production (km)**	**Reflown (km)**
TOTALS			**63.9**	**144.1**	**4.3**	**7819.2**	**401.4**
21-Mar	**Monday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather	overcast, snow		**Remarks**	No flights due to low clouds and snow			
Geomag							
22-Mar	**Tuesday**		**11.1**	**25.3**	**0.1**	**1280.0**	**2.7**
	C-GSGR	1015	4.6	10.2	0.0	534.0	0.0
	C-GSGX	2014, 2015, 2016	6.5	15.1	0.1	746.0	2.7
Weather	partially cloudy		**Remarks**	Both aircraft flew production flights. C-GSGX's first flight of the day was processed as two separate flights (2014 & 2015).			
Geomag	calm						
23-Mar	**Wednesday**		**9.3**	**21.1**	**1.0**	**1174.7**	**27.1**
	C-GSGR	1016	4.6	10.2	0.0	528.6	0.0
	C-GSGX	2017	4.7	10.9	1.0	646.1	27.1
Weather	partially cloudy		**Remarks**	Both aircraft flew production flights in the afternoon			
Geomag	unsettled to active						
24-Mar	**Thursday**		**9.7**	**23.6**	**0.0**	**1252.7**	**0.0**
	C-GSGR	1017	4.7	10.9	0.0	557.0	0.0
	C-GSGX	2018	5.0	12.7	0.0	695.7	0.0
Weather	partially cloudy		**Remarks**	Both aircraft flew production flights in the afternoon			
Geomag	calm to active						
25-Mar	**Friday**		**18.3**	**40.4**	**1.1**	**2160.2**	**65.4**
	C-GSGR	1018, 1019	9.1	17.2	0.5	923.7	26.7
	C-GSGX	2019 , 2020	9.2	23.2	0.5	1236.5	38.7
Weather	clear		**Remarks**	Both aircraft flew production flights			
Geomag	calm						
26-Mar	**Saturday**		**14.5**	**31.7**	**1.6**	**1891.0**	**289.1**
	C-GSGR	1020 , 1021	7.5	15.7	0.6	902.6	102.0
	C-GSGX	2021, 2022	7.0	16.0	1.0	988.4	187.1
Weather	clear		**Remarks**	Both aircraft flew production flights			
Geomag	calm						
27-Mar	**Sunday**		**1.0**	**2.0**	**0.6**	**60.6**	**17.1**
	C-GSGR	1022	1.0	2.0	0.6	60.6	17.1
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather	Overcast, snow, partially cloudy		**Remarks**	Production attempted but aborted due to weather. CGSGR flew lag test complete.			
Geomag	calm						

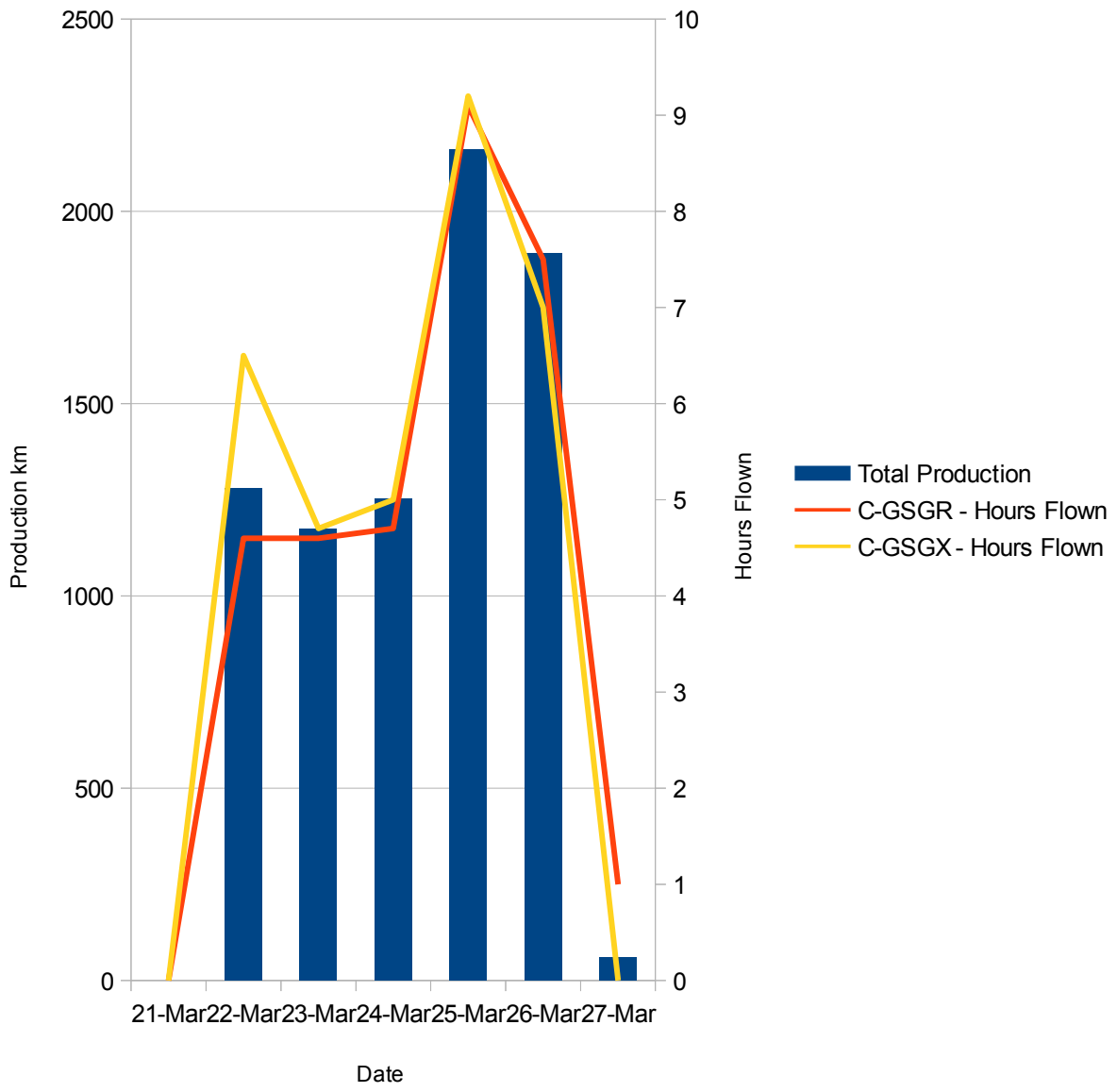
Comments	Favourable weather allowed for good production
Signed	Kevin

Week 5 Page 2

PERSONNEL ON SITE THIS WEEK

Name	Position	Arrival This Week	Departure This Week	On Site?	No. of Days On Site This Week	No. of Days on Site To Date
Kevin Charles	Field Manager			ON SITE	7	35
Lindsay Upiter	ld Quality Contro			ON SITE	7	35
John Sevenhyusen	AME			ON SITE	7	28
Bret Curtis	Pilot			ON SITE	7	27
Tomo Nishimura	Pilot			ON SITE	7	27
Jean Deschenes	Pilot			ON SITE	7	26
Nikhal Behl	Pilot			ON SITE	7	26

WEEKLY PRODUCTION KILOMETRES AND HOURS FLOWN



SANDER GEOPHYSICS AIRBORNE GEOPHYSICAL SURVEY

260 Hunt Club Road, Ottawa, ON K1V 1C1 Canada Tel: +1 613-521-9626 Fax: +1 613-521-0215 www.sgl.com

SURVEY DETAILS

Survey Name	Fixed-wing aeromagnetic survey over the Frances Lake area, Yukon	**Client Name**	Natural Resources Canada
Survey Location	Frances Lake area, Yukon	**Contact Name**	Frank Kiss
Project Code	NRCan_16.YT	**Contact Phone**	
Total km	31165	**Client Address**	Natural Resources Canada, 558 Booth Street, Ottawa, Ontario, K1A 0Y7
Line Spacing	400		
Survey Type	Aeromagnetic	**Email**	Frank.Kiss@canada.ca

SURVEY PRODUCTION SUMMARY

Production This Week (km)	8750.8	**Total km Flown to Date**	27918.8
Total Remaining (km)	3246.2	**km Reflown This Week**	376.9
Percent Complete (%)	89.6	**Flight Time This Week (h)**	71.6
Prod km/Day This Week	1250.1	**Prod km/Flt Hour This Week**	122.2

WEEKLY PRODUCTION

Week 6		**Flight No.**	**Flight Time**	**No. of Lines Flown**	**No. Reflight Lines Flown**	**Production (km)**	**Reflown (km)**
TOTALS			**71.6**	**158.5**	**2.6**	**8750.8**	**376.9**
28-Mar	**Monday**		**15.6**	**34.9**	**1.0**	**1992.3**	**198.2**
	C-GSGR	1023, 1024	7.7	17.9	0.0	966.0	2.3
	C-GSGX	2023, 2024	7.9	17.0	1.0	1026.3	195.9
Weather	clear		**Remarks**	Both aircraft flew production flights. Pilot Alex Faulkner arrived in Watson Lake.			
Geomag	unsettled						
29-Mar	**Tuesday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather	clear		**Remarks**	No production due to forecasts of heavy turbulence in survey area. Pilot Nikhal Behl departed Watson Lake.			
Geomag							
30-Mar	**Wednesday**		**13.2**	**32.2**	**0.0**	**1734.1**	**0.0**
	C-GSGR	1025	4.4	12.0	0.0	620.9	0.0
	C-GSGX	2025, 2026	8.8	20.2	0.0	1113.2	0.0
Weather	clear		**Remarks**	Both aircraft flew production flights			
Geomag	periodically active						
31-Mar	**Thursday**		**16.3**	**35.0**	**0.0**	**1898.6**	**0.0**
	C-GSGR	1026, 1027	8.1	16.2	0.0	900.1	0.0
	C-GSGX	2027, 2028	8.2	18.8	0.0	998.5	0.0
Weather	clear		**Remarks**	Both aircraft flew production flights			
Geomag	calm						
1-Apr	**Friday**		**11.8**	**25.3**	**1.0**	**1473.3**	**151.5**
	C-GSGR	1028	4.8	9.0	1.0	588.3	151.5
	C-GSGX	2029, 2030	7.0	16.3	0.0	885.0	0.0
Weather	clear		**Remarks**	Maintenance on C-GSGR in the afternoon			
Geomag	calm						
2-Apr	**Saturday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather	partially cloudy to overcast		**Remarks**	No production due to freezing rain in survey area			
Geomag							
3-Apr	**Sunday**		**14.7**	**31.1**	**0.5**	**1652.5**	**27.2**
	C-GSGR	1029,1030	7.1	14.9	0.3	788.9	17.2
	C-GSGX	2031,2032	7.6	16.2	0.2	863.6	10.0
Weather	clear		**Remarks**	Both aircraft flew production flights			
Geomag	unsettled						

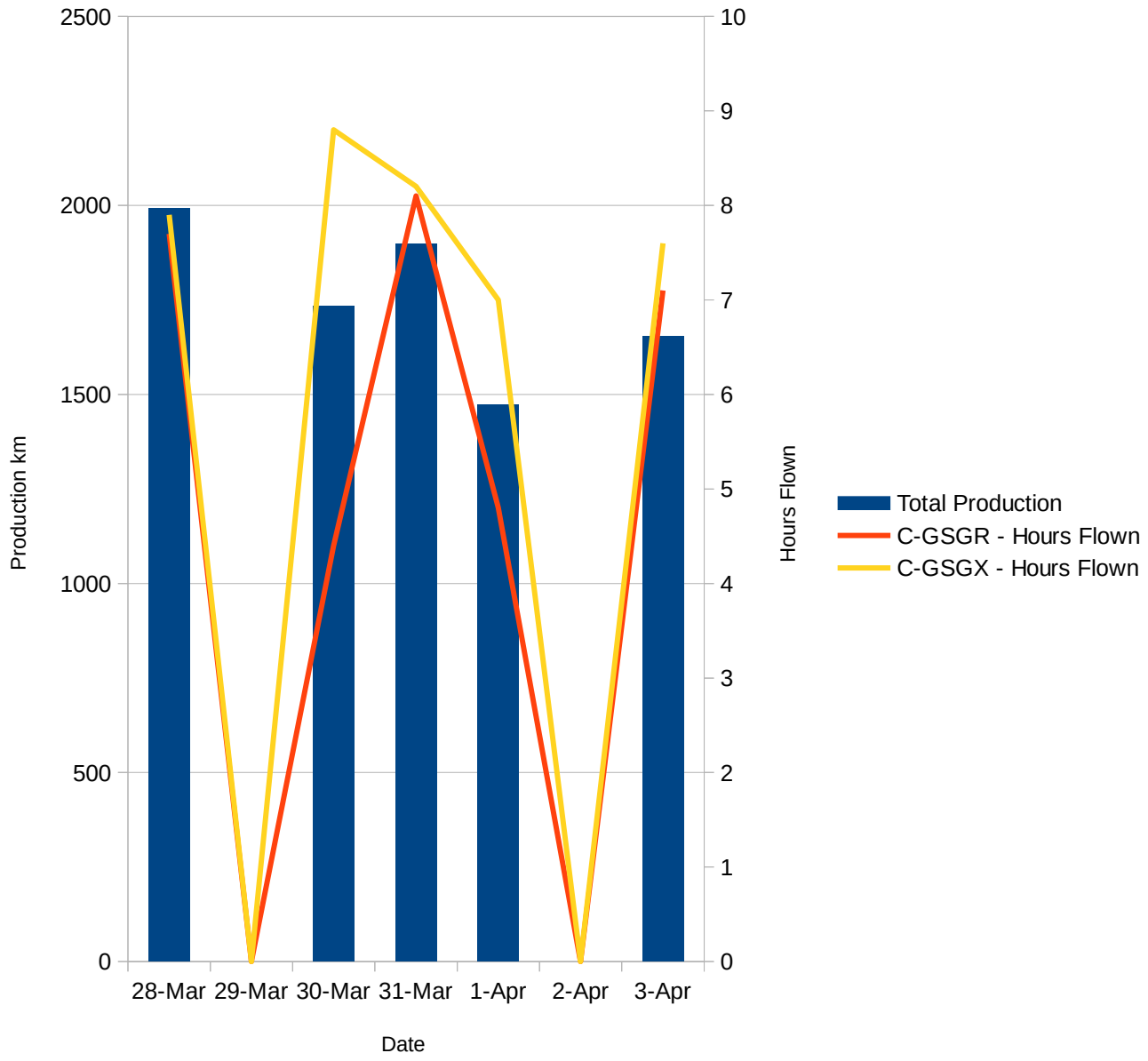
Comments	Favourable weather most of the week allowed for good production
Signed	Kevin

Week 6 Page 2

PERSONNEL ON SITE THIS WEEK

Name	Position	Arrival This Week	Departure This Week	On Site?	No. of Days On Site This Week	No. of Days on Site To Date
Kevin Charles	Field Manager			ON SITE	7	42
Lindsay Upiter	ld Quality Control			ON SITE	7	42
John Sevenhyusen	AME			ON SITE	7	35
Bret Curtis	Pilot			ON SITE	7	34
Tomo Nishimura	Pilot			ON SITE	7	34
Jean Deschenes	Pilot			ON SITE	7	33
Nikhal Behl	Pilot		29-Mar-16	ON SITE	2	28
Alex Faulkner	Pilot			ON SITE	7	10

WEEKLY PRODUCTION KILOMETRES AND HOURS FLOWN



SANDER GEOPHYSICS AIRBORNE GEOPHYSICAL SURVEY

260 Hunt Club Road, Ottawa, ON K1V 1C1 Canada Tel: +1 613-521-9626 Fax: +1 613-521-0215 www.sgl.com

SURVEY DETAILS

Survey Name	Fixed-wing aeromagnetic survey over the Frances Lake area, Yukon	**Client Name**	Natural Resources Canada
Survey Location	Frances Lake area, Yukon	**Contact Name**	Frank Kiss
Project Code	NRCan_16.YT	**Contact Phone**	
Total km	31165	**Client Address**	Natural Resources Canada, 558 Booth Street, Ottawa, Ontario, K1A 0Y7
Line Spacing	400		
Survey Type	Aeromagnetic	**Email**	Frank.Kiss@canada.ca

SURVEY PRODUCTION SUMMARY

Production This Week (km)	3246.2	**Total km Flown to Date**	31165.0
Total Remaining (km)	0.0	**km Reflown This Week**	882.7
Percent Complete (%)	100.0	**Flight Time This Week (h)**	39.1
Prod km/Day This Week	463.7	**Prod km/Flt Hour This Week**	83.0

WEEKLY PRODUCTION

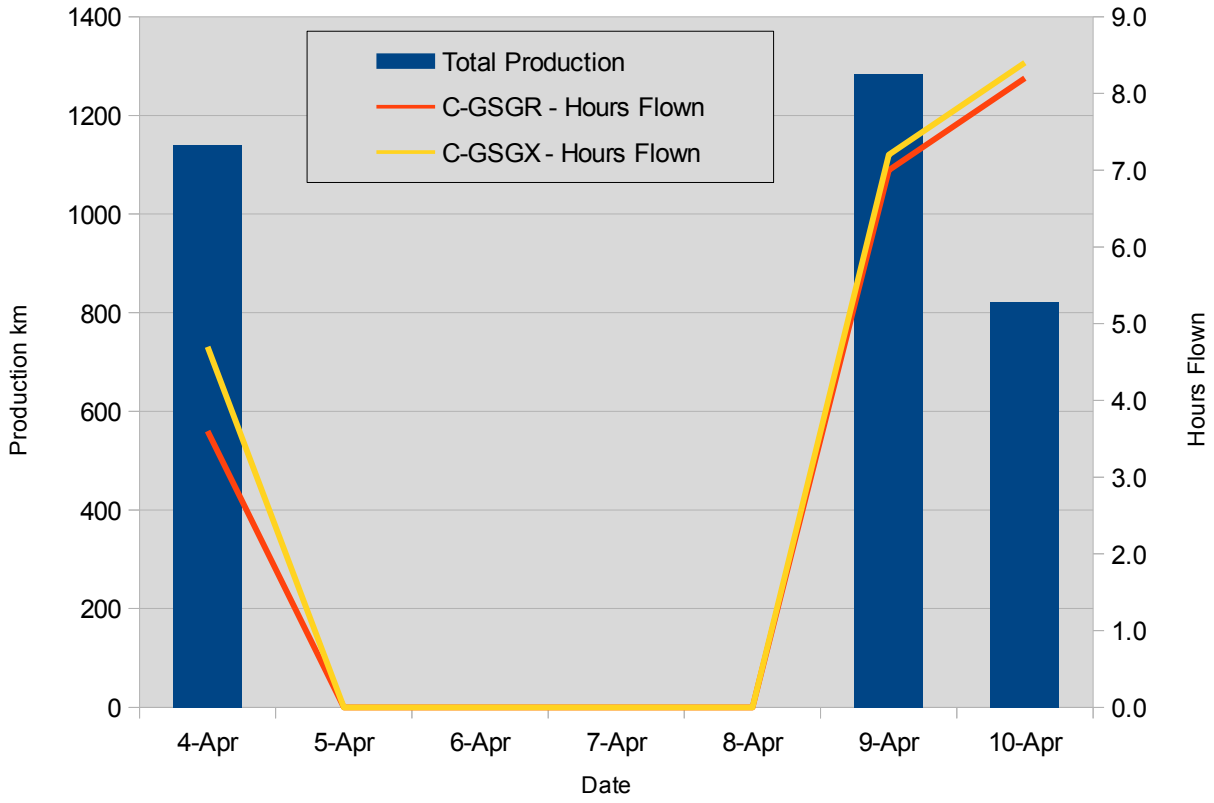
Week 7		**Flight No.**	**Flight Time**	**No. of Lines Flown**	**No. Reflight Lines Flown**	**Production (km)**	**Reflown (km)**
TOTALS			**39.1**	**78.5**	**19.3**	**3246.2**	**882.7**
4-Apr	**Monday**		**8.3**	**22.5**	**0.7**	**1140.3**	**36.8**
	C-GSGR	1031	3.6	11.0	0.0	514.5	0.0
	C-GSGX	2033	4.7	11.5	0.7	625.8	36.8
Weather	Snow and rain in afternoon		**Remarks**	Production flights in morning. Snow and rain during the afternoon.			
Geomag	Calm						
5-Apr	**Tuesday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather	Snow		**Remarks**	No production due to snow			
Geomag							
6-Apr	**Wednesday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather	partially cloudy to overcast		**Remarks**	No production due to forcasted icing and turbulence in the block			
Geomag							
7-Apr	**Thursday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather	overcast		**Remarks**	No production due to low cloud coverage			
Geomag							
8-Apr	**Friday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather	overcast, rainy		**Remarks**	No production due to rain and low cloud coverage			
Geomag							
9-Apr	**Saturday**		**14.2**	**26.0**	**5.3**	**1283.6**	**437.6**
	C-GSGR	1032, 1033	7.0	12.0	1.1	566.6	63.0
	C-GSGX	2034, 2035, 2036	7.2	14.0	4.2	717.0	374.6
Weather	clear to partially cloudy		**Remarks**	Both aircraft flew production flights			
Geomag	calm to unsettled						
10-Apr	**Sunday**		**16.6**	**30.0**	**13.4**	**822.3**	**408.3**
	C-GSGR	1034, 1035	8.2	19.0	2.4	630.3	92.1
	C-GSGX	2037, 2038, 2039, 2040	8.4	11.0	11.0	192.0	316.2
Weather	mainly clear		**Remarks**	Both aircraft flew production flights. Both aircraft flew magnetic compensation tests.			
Geomag	calm						
Comments	Initial production complete, reflights underway.						

Signed A.Jones

PERSONNEL ON SITE THIS WEEK

Name	Position	Arrival This Week	Departure This Week	On Site?	No. of Days On Site This Week	No. of Days on Site To Date
Kevin Charles	Field Manager		9-Apr-16	ON SITE	6	48
Lindsay Upiter	Field Quality Controller			ON SITE	7	49
John Sevenhyusen	AME			ON SITE	7	42
Bret Curtis	Pilot			ON SITE	7	41
Tomo Nishimura	Pilot			ON SITE	7	41
Jean Deschenes	Pilot			ON SITE	7	40
Nikhal Behl	Pilot				0	28
Alex Faulkner	Pilot			ON SITE	7	17
Adam Jones	Field Manager	9-Apr-16		ON SITE	2	2

WEEKLY PRODUCTION KILOMETRES AND HOURS FLOWN



SANDER GEOPHYSICS AIRBORNE GEOPHYSICAL SURVEY

260 Hunt Club Road, Ottawa, ON K1V 1C1 Canada Tel: +1 613-521-9626 Fax: +1 613-521-0215 www.sgl.com

SURVEY DETAILS

Survey Name	Fixed-wing aeromagnetic survey over the Frances Lake area, Yukon	**Client Name**	Natural Resources Canada
Survey Location	Frances Lake area, Yukon	**Contact Name**	Frank Kiss
Project Code	NRCan_16.YT	**Contact Phone**	
Total km	31165	**Client Address**	Natural Resources Canada, 558 Booth Street, Ottawa, Ontario, K1A 0Y7
Line Spacing	400		
Survey Type	Aeromagnetic	**Email**	Frank.Kiss@canada.ca

SURVEY PRODUCTION SUMMARY

Production This Week (km)	0.0	**Total km Flown to Date**	31165.0
Total Remaining (km)	0.0	**km Reflown This Week**	302.4
Percent Complete (%)	100.0	**Flight Time This Week (h)**	2.7
Prod km/Day This Week	0.0	**Prod km/Flt Hour This Week**	0.0

WEEKLY PRODUCTION

Week 8		Flight No.	Flight Time	No. of Lines Flown	No. Reflight Lines Flown	Production (km)	Reflown (km)
TOTALS			**2.7**	**0.0**	**6.6**	**0.0**	**302.4**
11-Apr	**Monday**		**2.7**	**0.0**	**6.6**	**0.0**	**302.4**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX	2041	2.7	0.0	6.6	0.0	302.4
Weather	Partly overcast		**Remarks**	Maintenance performed on C-GSGR. Reflight lines flown with C-GSGX.			
Geomag	Calm to unsettled						
12-Apr	**Tuesday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather	Overcast		**Remarks**	Maintenance performed on C-GSGX.			
Geomag	unsettled						
13-Apr	**Wednesday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather	snow, overcast		**Remarks**	Demobilization authorization received from NRC.			
Geomag	N/A						
14-Apr	**Thursday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR	Ferry	0.0	0.0	0.0	0.0	0.0
	C-GSGX	Ferry	0.0	0.0	0.0	0.0	0.0
Weather			**Remarks**	Both aircraft depart Watson Lake. Ground transport of equipment to Ontario arranged.			
Geomag							
15-Apr	**Friday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR	Ferry	0.0	0.0	0.0	0.0	0.0
	C-GSGX	Ferry	0.0	0.0	0.0	0.0	0.0
Weather			**Remarks**	All crew depart Yukon.			
Geomag							
16-Apr	**Saturday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather			**Remarks**				
Geomag							
17-Apr	**Sunday**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	C-GSGR		0.0	0.0	0.0	0.0	0.0
	C-GSGX		0.0	0.0	0.0	0.0	0.0
Weather			**Remarks**				
Geomag							
Comments	Reflights completed this week.						

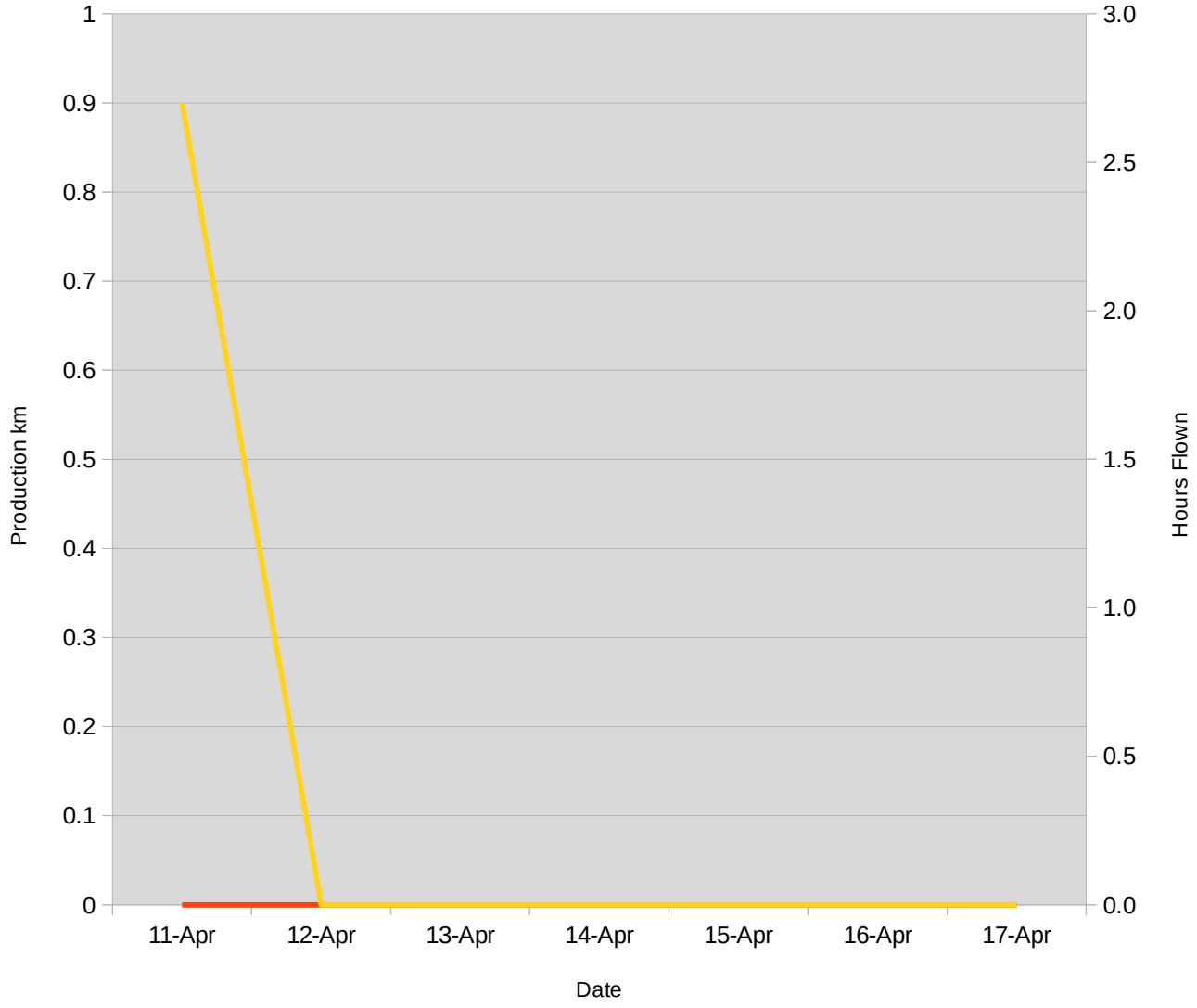
Signed A.Jones

Week 8 Page 2

PERSONNEL ON SITE THIS WEEK

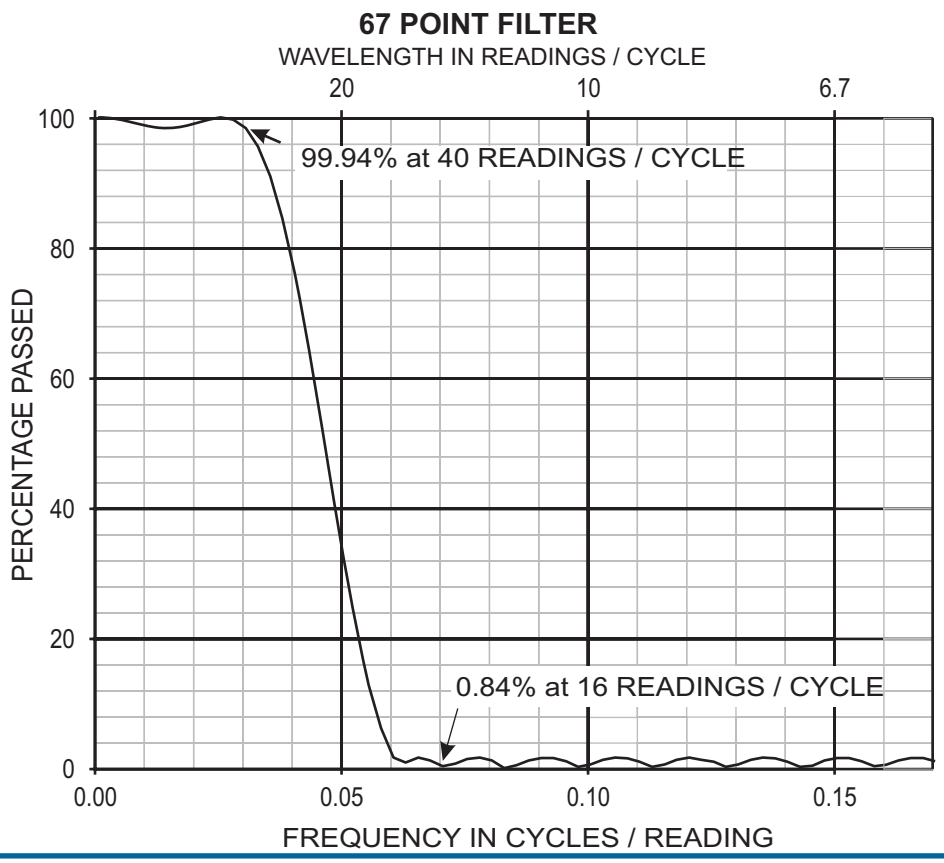
Name	Position	Arrival This Week	Departure This Week	On Site?	No. of Days On Site This Week	No. of Days on Site To Date
Kevin Charles	Field Manager				0	48
Lindsay Upiter	ɜld Quality Control		15-Apr-16	ON SITE	5	54
John Sevenhyusen	AME		15-Apr-16	ON SITE	5	47
Bret Curtis	Pilot		14-Apr-16	ON SITE	4	45
Tomo Nishimura	Pilot		14-Apr-16	ON SITE	4	45
Jean Deschenes	Pilot		14-Apr-16	ON SITE	4	44
Nikhal Behl	Pilot				0	28
Alex Faulkner	Pilot		14-Apr-16	ON SITE	4	21
Adam Jones	Field Manager		15-Apr-16	ON SITE	5	7

WEEKLY PRODUCTION KILOMETRES AND HOURS FLOWN



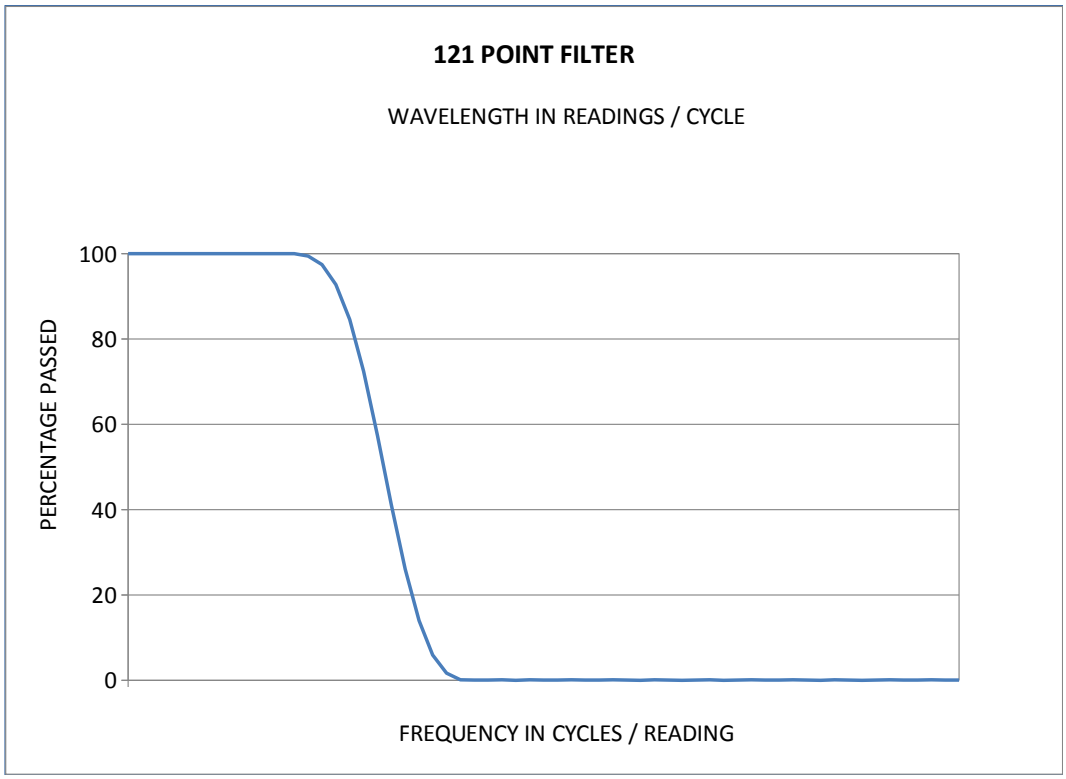
SGL

Appendix VII



FILTER 67 COEFFICIENTS

-.0073813819
.0017786870
.0022008393
.0028708524
.0036799926
.0044552023
.0050366484
.0052816825
.0050482578
.0042355750
.0028043608
.0007561474
.0018169265
-.0047570802
-.0078405226
-.010776499
-.013235446
-.014878507
-.015358825
-.014386294
-.011729066
-.0072475690
-.0009241524
.0071362499
.016706382
.027417007
.038819272
.050368667
.061476381
.071564890
.080079578
.086310541
.090552829
.091944844


121 POINT FILTER
WAVELENGTH IN READINGS / CYCLE
PERCENTAGE PASSED
100
80
60
40
20
0
FREQUENCY IN CYCLES / READING