THOMSON AVIATION

Airborne Geophysical Survey

Tanami, NT (GA Survey # P1312 – NTGS Tanami EW)

TA Job # F18039-A

Geophysical Survey Final Report

July 2018- August 2019

Table of Contents

1. Survey Details

Traverse Line Direction	090º
Traverse Line Spacing	200 meters
Tie Line Direction	180º
Tie Line Spacing	2000 meters
Survey Total Traverse Line Kilometres	88,671 km's
Survey Total Tie Line Kilometres	9,046 km's
Survey Total Line Kilometres	97,718 km's
Main Terrain Clearance	60 meters above ground level
Time Base – Magnetics	20 Hz
Time Base – Radiometrics	1 Hz

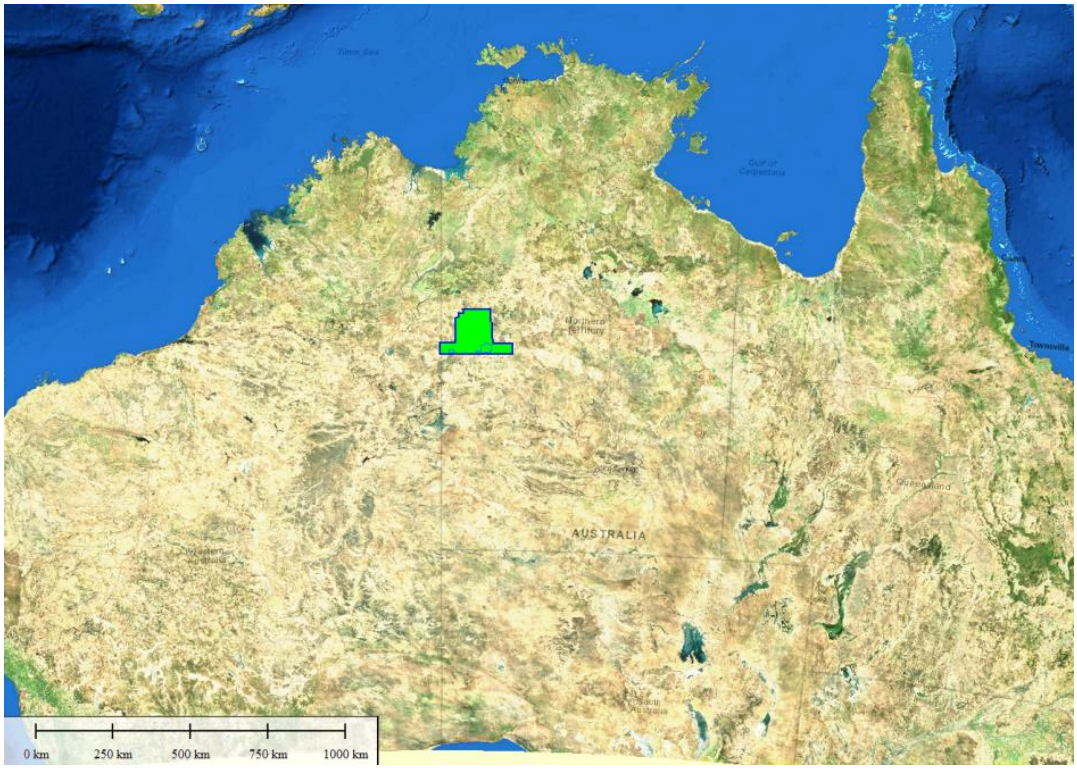


Figure 1. Survey Location Map.

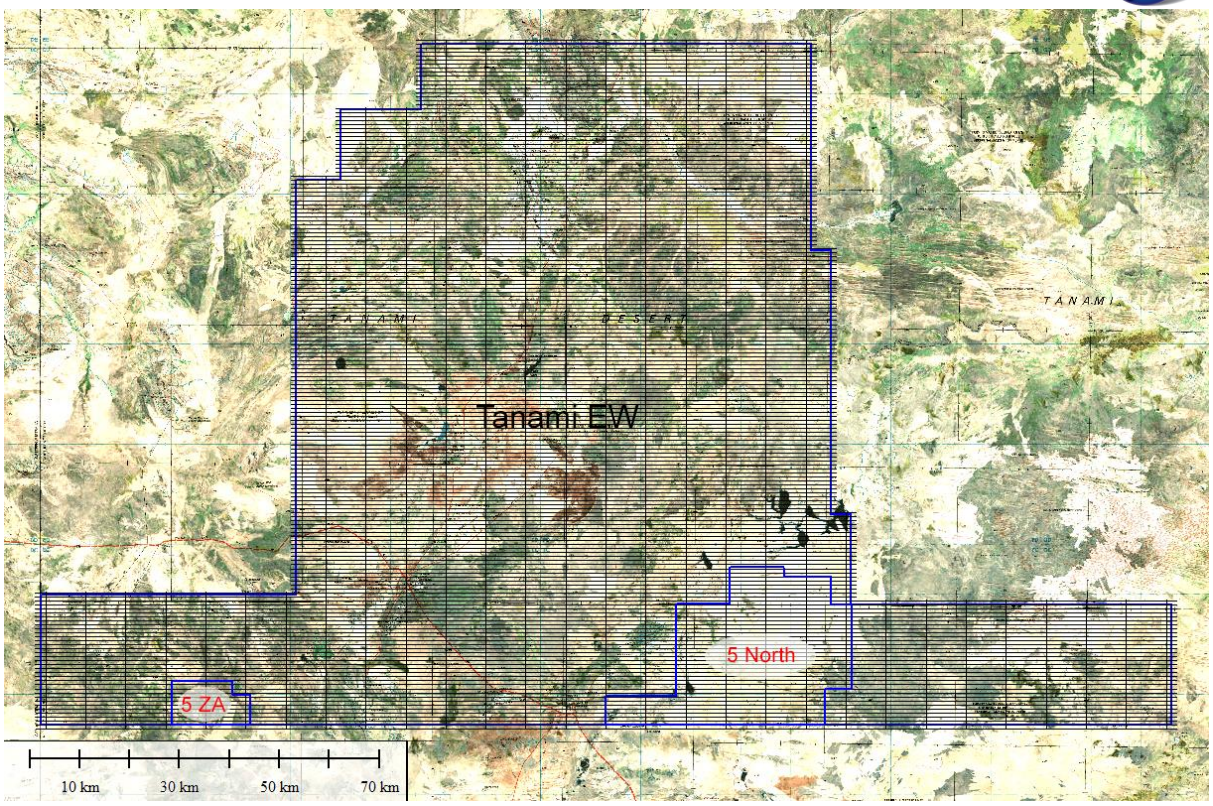


Figure 2. Block Map (Note: only every 4th line displayed for clarity)

Longitude	Latitude
129°	-20.2°
129°	-20°
129.5°	-20°
129.5°	-19.2°
129.6°	-19.2°
129.6°	-19.1°
129.7°	-19.1°
129.7°	-19°
130.5°	-19°
130.5°	-19.3°
130.5°	-19.9°
130.6°	-19.8°
130.6°	-20°
131.2°	-20°
131.2°	-20.2°

Table 1. Survey Boundary Coordinates

1.1 Survey Summary

Survey Acquisition Mobilisation Date	13/07/2018
Survey Acquisition Demobilisation Date	23/10/2018
Processing Start Date	20/07/2018
Processing End Date	15/08/2019

Survey Base	YTMN Tanami Mine Airport (Lat: -19.96191985 Lon: 129.721929)
Crew Accommodation	Tanami Mine Camp (Northern Star Resources Ltd)

Traverse line ID range	100010 - 400450
Traverse line fiducial range	1939000 - 6091495
Tie line ID range	190010 - 490100
Tie line fiducial range	1885200 - 6210295

Figure 3. Survey Base Map.

1.2 Survey Aircraft

Survey Aircraft	Cessna 210L (VH-THS)	S/N: 21060031
Engine	Continental IO-550	
Fuel Type	Avgas	
Fuel Burn	65 Litres per hour	
Typical Survey Speed	130 Knots	
Stall Speed	65 Knots	

Figure 4. Survey Aircraft VH-THS.

1.3 Survey Equipment Specifications

Total Field Magnetometer	G823 Optically pumped caesium Vapour
Sensitivity	0.0009 nT @ 20 Hz
Absolute Accuracy	<3 nT throughout entire range
Noise Envelope	0.0009 nT @ 20 Hz
Ambient Range	20,000 nT – 100,000 nT
Sampling Rate	20 Hz
Fiducial Precision	20 Hz

Fluxgate Magnetometer	Billingsley TFM100G2 triaxle fluxgate magnetometer
Sensitivity	100 µV/nT
Absolute Accuracy	± 0.75% of full scale (0.5% typical)
Noise Envelope	20 picoTesla RMS/ Hz @1 Hz

Acquisition System	GeoResults ZDAS
Fiducial Precision	20 Hz

Navigation	Novatel OEM-V1 (Internal of ZDAS)
DGPS	L1 Omnistar VBS
Base GPS	Not required when using L1 Omnistar VBS
Horizontal Position	Typical < 1 meter
Vertical Position	Typical <3 meters
Sampling Rate	2 Hz
Fiducial Precision	0.05 s

Airborne Spectrometer	Radiation Solutions RSX-4 (x2)
Channels	1024
Downward detector volume	33 L in Total
Dead time	Effectively zero @ 1 Hz
Peak Resolution (208TI 2615 keV	4% - 5%
NASVD Compatible	Yes
Sampling rate	1 Hz
Recorded Live/Dead time	0.001 sec

Radar Altimeter	Honeywell KRA405B
Operating Range	0 – 2500 feet
Accuracy	3% <500 feet, 5% >500feet
Laser Altimeter	TruSense S200
Operating Range	0 – 2500 feet
Accuracy	0.01 feet

Barometric Altimeter	Setra 296
Accuracy	0.25% Full Scale

Temperature & Humidity Sensor	Vaisala HMD50Y
Temperature Accuracy	0.2^{o}
Humidity Accuracy	2% Relative Humidity

1.4 Survey equipment Log & Serial Numbers

Total Field Magnetometer	Geometrics G823	S/N: 823247
Magnetometer Counter	Kroum Kmag4	S/N: 114
Fluxgate Magnetometer	Billingsley TFM1000G2	S/N: 904
Acquisition System	GeoResults ZDAS	S/N: Z101
Navigation	Novatel OEM-V1	S/N: 784822
Airborne Spectrometer #1	Radiation Solutions RSX-4	S/N: 5414
Airborne Spectrometer #2	Radiation Solutions RSX-4	S/N: 5431
Radar Altimeter	Honeywell KRA405B	S/N: 07651
Laser Altimeter	TruSense S200	S/N: 107476
Barometric Altimeter	Setra 296	S/N: 632722
Temperature & Humidity Sensor	Vaisala HMD50Y	S/N: C4232055
Base station diurnal monitor	Geometrics G823 GeoResults Diurnal Recorder	S/N: 823240 S/N: G101

- There has been no equipment replaced or repairs carried out since the previous GA project.

1.5 Data Acquisition recording parameters

GPS 3D Position	2 Hz
Fiducial Precision	20 Hz
Magnetometer Sampling rate	20 Hz
Radiometrics Sample rate	1 Hz

1.6 Survey Personnel

Paul Rogerson	Director, Survey Operations Manager
Billy Batjargal	Offsite data processor
Esmaeil Eshaghi	Offsite data processor
John Zampieri	Offsite data processor
Timothy Hetherington	Technical, Offsite crew leader
Lachlan Bell	Field Operator
Michael Brayne	Field Operator
Peter Turkington	Survey Pilot
Hamish Johns	Survey Pilot
Terry Miller	Survey Pilot
Elodie Courtois	Survey Pilot
Anthony Nixon	Survey Pilot
Andrew Langmead	Survey Pilot

1.7 Base station Diurnal Monitoring

Geometrics 823 Total Field Magnetometer	Primary diurnal recorder used for all data processing.
GeoResults Diurnal recorder with GPS sync	
Sampling Rate	1 Hz
Location	Lat: -19.964442 Lon: 129.722683

Geometrics 857 Total Field Magnetometer	Secondary diurnal recorder used for monitoring conditions.
Sampling Rate	0.2 Hz
Location	Lat: -19.965222 Lon: 129.721523

1.8 GPS Base Station Information

- No GPS Base station is required when using L1 Omnistar VBS.

1.9 GPS System Accuracy

Ground calibrations are performed prior to all survey flights. The survey aircraft is parked in the same position and that position is recorded as per Schedule 3 S1.5 (c).

- Individual positions are tabulated in the Ground calibration table later this document.

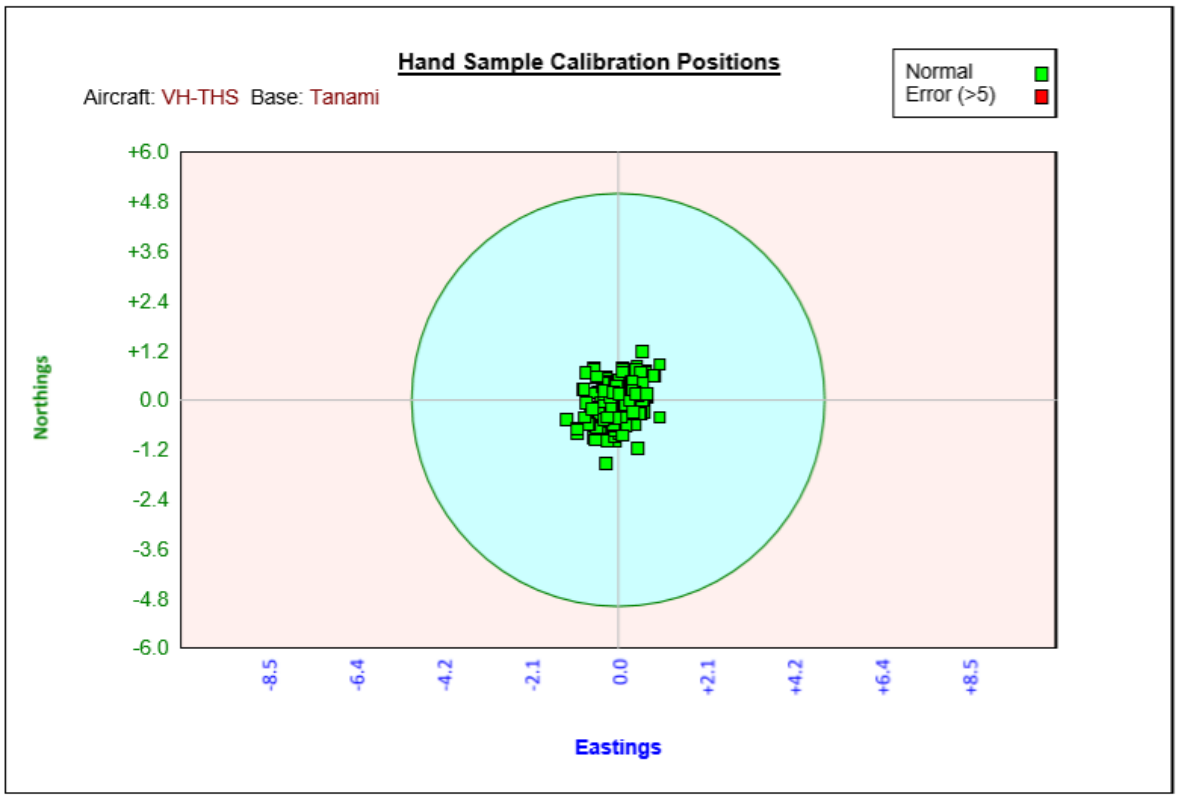


Figure 5. Daily GPS position.

2. Survey Calibrations

2.1 Altimeter linearity test results

Altimeter linearity tests were carried out at Whyalla Airport on 15th February 2017. This involved a series of stacked survey lines beside the Whyalla runway. The results are tabled below as per Schedule 3 S1.6 (b)

- Average height of Whyalla Airstrip at Aircraft GPS antenna: 12.50 (MASL)

GPSHt Antenna (MASL)	GPSHt Antenna (MASL) Corrected to MAGL	Barometric Pressure (hPa)	RadAlt Antenna (MAGL)	RadAlt Antenna corrected to GPSHt Antenna (MAGL)	LasAlt (MAGL)	RadAlt Antenna Calibrated (MAGL)	LasAlt Calibrated (MAGL)
46.62	35.62	999.09	32.09	33.22	38.61	35.64	36.03
74.93	63.93	995.85	59.86	60.99	66.24	62.99	63.53
100.26	89.26	992.59	86.18	87.31	91.99	88.92	89.17
132.98	121.98	990.12	119.61	120.74	125.00	121.84	122.03
210.33	199.33	981.99	198.52	199.65	202.53	199.56	199.21
232.23	221.23	979.08	220.42	221.55	224.13	221.13	220.72
249.55	238.55	977.95	238.92	240.05	242.86	239.36	239.36
271.46	260.46	975.51	260.74	261.87	263.61	260.85	260.02
311.49	300.49	970.34	301.50	302.63	304.41	300.99	300.64
506.11	495.11	949.62	499.95	501.08	-	496.45	-
707.94	696.94	929.51	702.22	703.35	-	695.67	-

Table 2. Altimeter Linearity Test Results

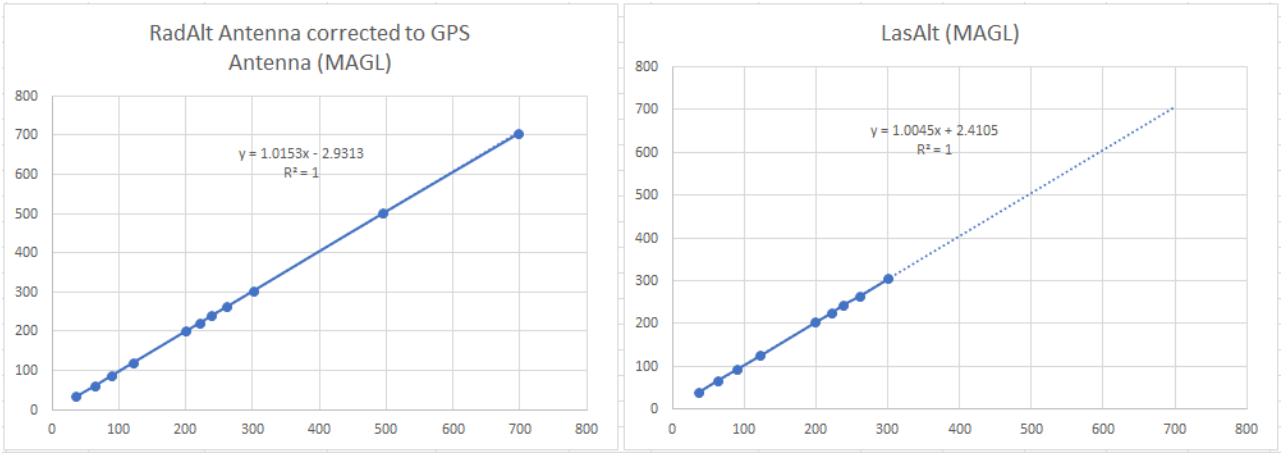


Figure 6. Altimeter linearity Test Results

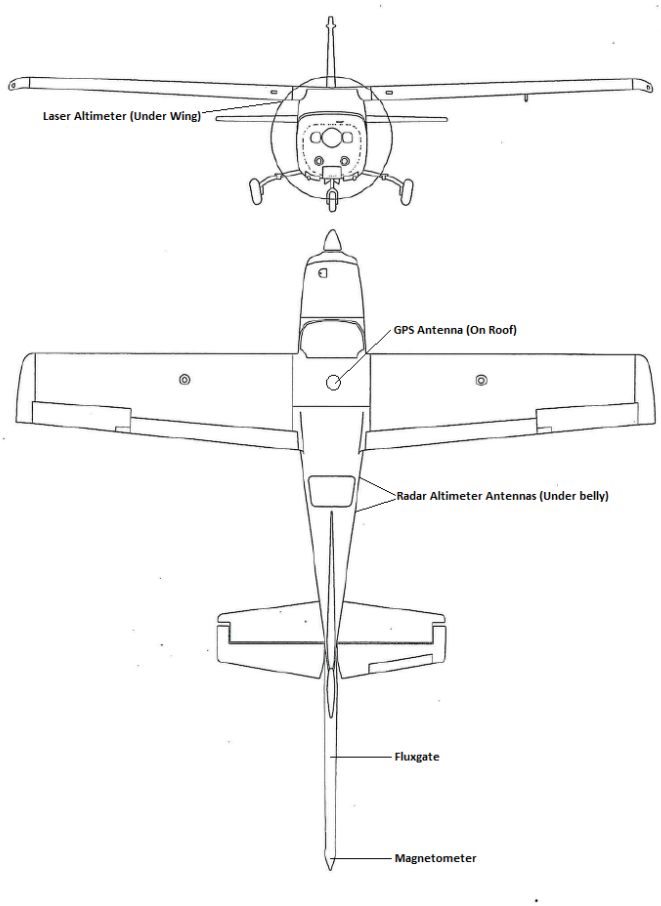
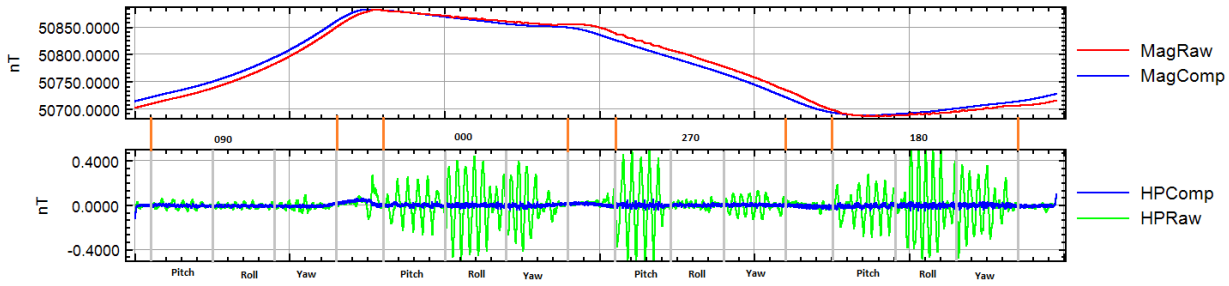


Figure 7. Cessna 210 Sensor location diagram.

Figure 8. Whyalla Airport map.

2.2 Magnetometer Manoeuvre Noise Tests

Magnetometer Manoeuvre Noise Tests were carried out at Tanami Mine Airport on 14th July 2018. This involved flying a series of survey lines at 10,000 feet ASL on true cardinal headings (to coincide with survey direction). The aircraft performed 5° pitch, 10° roll and 5° yaw manoeuvres. The data from the 3-axis fluxgate magnetometer & Caesium magnetometer are recorded to the acquisition system. Computer software is used to calculate a magnetic compensation solution which is used to post-flight compensate the magnetic survey data. The results are tabled and graphed below as per Schedule 3 S1.9 (i)



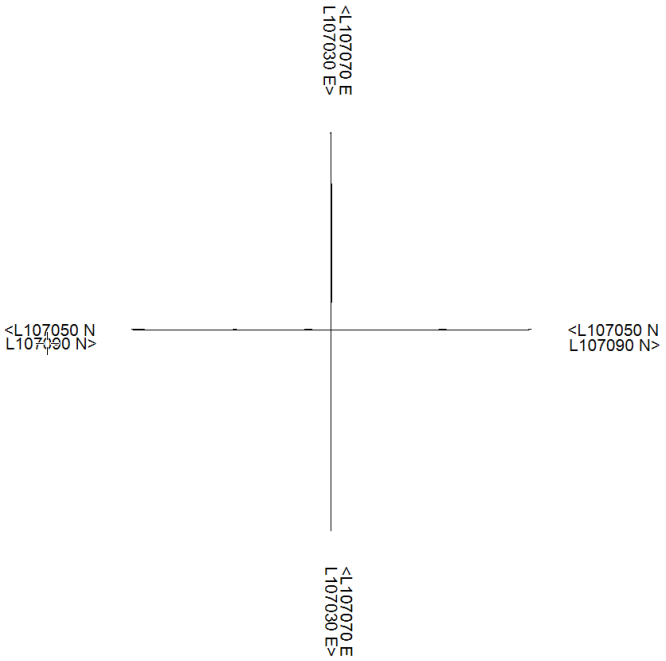
Day 195, Flight 002				
Direction (°T)	Pitch (nT)	Roll (nT)	Yaw (nT)	FOM (nT)
090	0.0692	0.0822	0.0763	*0.2277*
000	0.0877	0.0417	0.0468	*0.1762*
270	0.0581	0.0579	0.0702	*0.1862*
180	0.0407	0.0360	0.0309	*0.1076*
				0.6977

Table 3. Magnetometer Manoeuvre Noise Test results.

- Results of the Magnetometer Manoeuvre Test are considered to be within the acceptable limits.

2.3 Magnetometer Heading Error Test

Magnetometer Heading Error Tests were carried out at Tanami Mine Airport on 14th July 2018. This involved flying a series of bi-directional survey lines at 10,000 feet ASL on true cardinal headings. The difference in the Compensated & Diurnal/IGRF/Parallax corrected Magnetometer value is subtracted from the opposite value at the common point. The results are tabled below as per Schedule 3 S1.9 (j)



Day 195, Flight 001								
Direction (°T)	Line #	Time (spm)	Easting (M)	Northing (M)	GPSHt (MASL)	MagTF (Compensated) (nT)	MagTF (Compensated, Diurnal/IGRF/Parallax Corrected) (nT)	Heading error (nT)
000	007070	41571.10	561175.28	7821992.22	3046.11	50717.4901	50717.7346	
180	007030	40489.35	561174.01	7821992.28	3042.50	50719.5903	50718.1788	**0.4443**
090	007090	42113.25	561177.14	7821993.93	3047.89	50717.6288	50718.5041	
270	007050	41051.30	561175.84	7821994.12	3048.87	50718.4540	50717.5459	**0.1029**

Table 4. Magnetometer Heading Error Test results.

- Results of the Magnetometer Heading Error Test are considered to be within the acceptable limits.

2.4 Gamma-ray Spectrometer Calibrations

Details of Cosmic and Aircraft background calibration consist of the survey aircraft flown over the ocean off the coast of Geraldton, WA on 12th February 2019. Stacked survey lines were flown at various heights between 3000 feet and 10,000 feet above sea level. No less than 600 seconds of data was recorded at each altitude. The results are tabled and graphed below as per Schedule 3 S1.12 (g)

Line	Cosmic	GPS height	TC	K	U	Th
104030	205.975	999.58	296.604	30.78	11.17	11.225
104041	227.72	1249.28	314.211	32.533	11.646	12.608
104050	252.449	1498.92	333.241	33.167	12.657	14.118
104060	278.521	1749.5	358.788	35.055	13.468	15.623
104070	310.859	1998.77	390.36	36.545	15.232	17.517
104080	345.453	2248.99	426.065	38.795	16.704	19.601
104090	386.692	2498.2	474.175	41.137	18.587	22.052
104100	433.152	2748.45	528.185	44.619	21.246	24.918
104110	485.601	2998.52	589.385	47.872	24.266	28.348
Aircraft background			**69.575**	**18.18**	**0.787**	**0.00**
Cosmic background			**1.054**	**0.06**	**0.047**	**0.061**

Table 5. Cosmic and Aircraft Background Flight Data

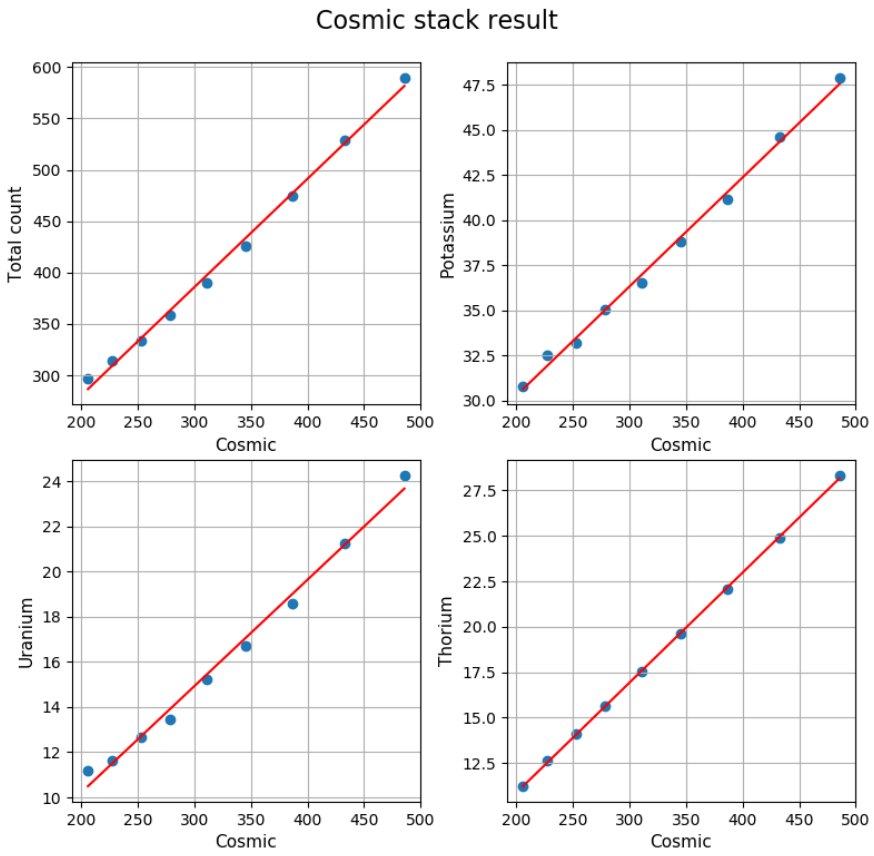


Figure 9. Gamma-ray Spectrometer Cosmic Stack results.

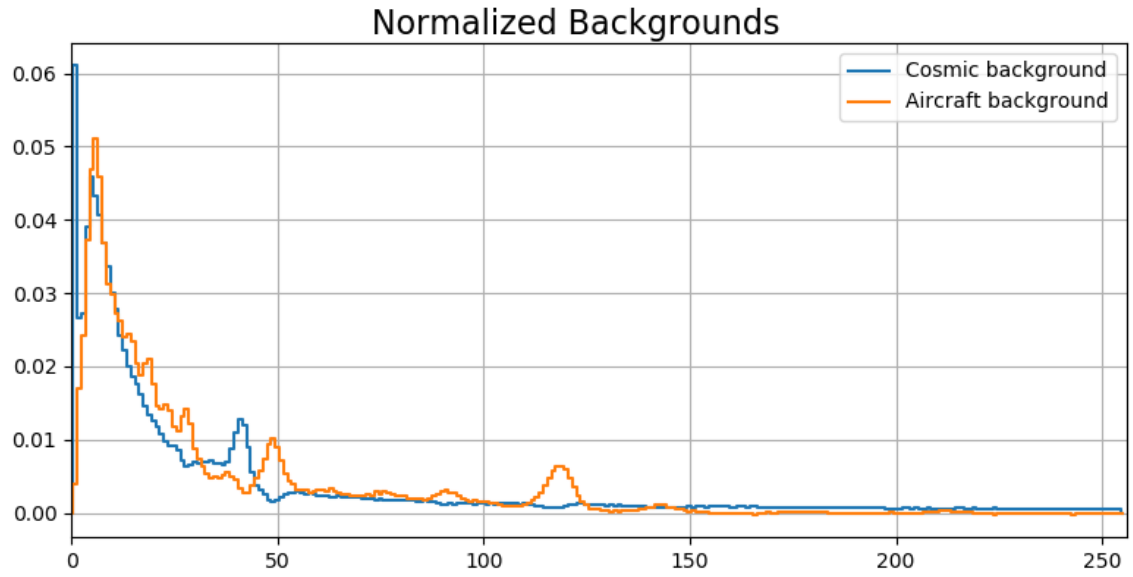


Figure 10. Gamma-ray Spectrometer Cosmic & Aircraft Background spectrum graph.

2.5 Stripping ratios from calibration pads

On 9th February 2019, the survey aircraft was parked in an undisturbed level position at Northam airport, WA. The survey equipment was powered on and left for 120 minutes to temperature stabilise. Radiometric calibration pads were placed centred under each airborne spectrometer installed into the survey aircraft. Data was recorded and the following values were calculated and used as stripping ratios for the processing of the acquired radiometric survey data. The results are tabled below as per Schedule 3 S1.12 (l)

Aircraft	Detector #	Alpha	Beta	Gamma	a
VH-THS	Master 5424	0.300	0.447	0.783	0.039
	Slave 5431	0.302	0.456	0.784	0.041
	Average	0.301	0.451	0.783	0.040

Table 6. Gamma-ray Spectrometer stripping ratio results.

- The reverse stripping ratios were adopted from theoretical physical constants. Note that the reverse stripping ratios 'b' and 'g' are not used in the processing.

2.6 System sensitivities & Height attenuation co-efficient

On 11th February 20119, the survey aircraft flew a series of stacked survey lines over the Carnamah Radiometric test range, WA. An Exploranium GR320 handheld spectrometer was used to collect required samples at each point along the test range on the same day the survey aircraft flew.

- The Aircraft and Cosmic Background values are for the windows only. During processing the equivalent 256 channel aircraft and cosmic backgrounds are removed.

The Height attenuation coefficients were determined from communication with Dr. Jens Hovgaard. These values are based on his testing and IAEA values. These ratios are determined by the natural laws of radiometric attenuation, so one set of ratios was used for the survey. The results are tabled below as per Schedule 3 S1.12 (n)

STP height	TC	K	U	Th
29.1	40.28	188.44	34.75	7.55
49.63	34.24	156.78	29.86	6.40
74.16	28.51	125.02	25.49	5.26
98.81	23.86	101.28	21.60	4.53
125.07	19.67	80.98	18.15	3.75
149.63	16.63	66.82	15.58	3.20
174.35	14.06	55.30	13.52	2.69
201.34	11.63	44.32	11.09	2.21
221.46	10.13	38.88	10.03	1.96
249.07	8.49	30.45	8.88	1.65

Table 7. Carnamah Range Test Data

Window	TC	K %	eU ppm	eTh ppm
Ground concentration Historic dry average	155.34	3.11	4.05	36.76
Ground concentration Measured on the day	159.05	3.10	4.83	36.50

Table 8. Carnamah Range Ground Concentration (Historic dry average concentration)

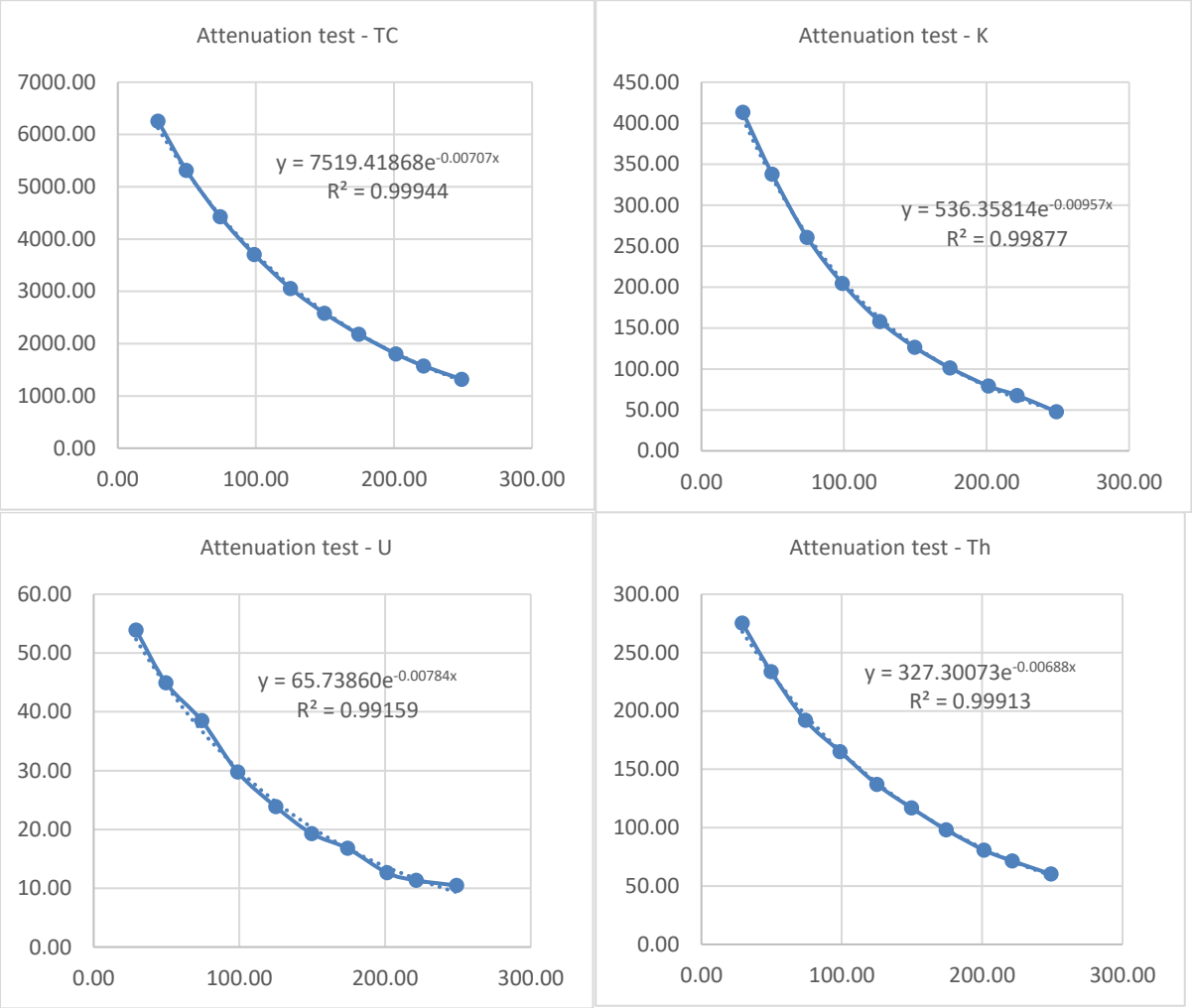


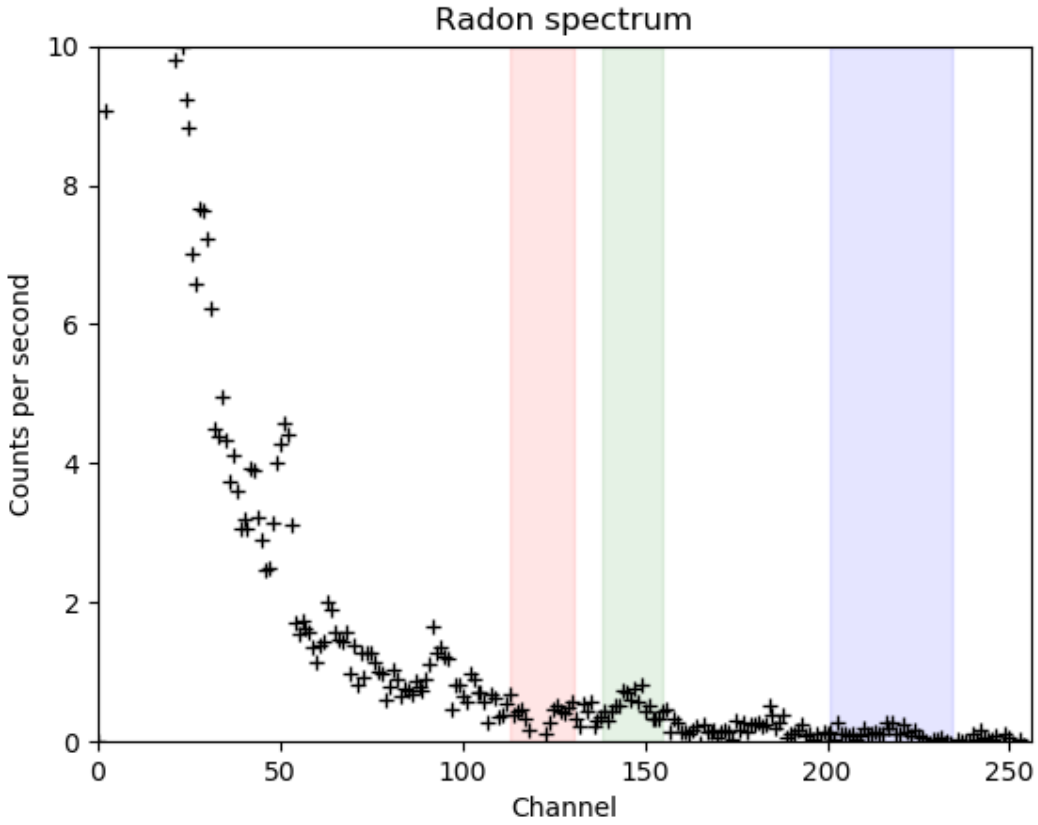
Figure 11: Attenuation Test Plots

Coefficient	Total Count	Potassium	Uranium	Thorium
Height attenuation test result	0.0071	0.0096	0.0078	0.0069
Height attenuation reference values	0.0074	0.0094	0.0084	0.0074
Sensitivity at 60m	32.14	145.12	28.25	6.02

Table 9. Gamma-ray Spectrometer Height Attenuation Coefficients

2.7 Radon background removal

Following Radon spectrum was calculated by subtracting aircraft and cosmic background values from a survey level test line spectrum in the presence of atmospheric Radon. The test flight was performed over Lake Yarra-Yarra in WA.



2.8 Results of Thorium tests before & after Calibrations

- Thorium source tests were carried out before & after each calibration. The results are tabled below as per Schedule 3 S1.12 (p)

	Position			Hand Sample				Background				Normalized				Th Cal Results	
Date	Easting	Northing	GPS Ht	TC	Pot	Ura	Th	TC	Pot	Ura	Th	TC	Pot	Ura	Th	ThPeak	%FWHM
09/06/2017	470668.28	6500570.23	152.23	15048.6	851.6	459.2	760.0	8992.3	671.6	314.0	348.2	6056.3	180.0	145.2	411.80	217.66	4.24
09/06/2017	470668.47	6500569.70	152.78	14870.2	839.8	447.7	761.9	8860.1	663.3	304.4	351.6	6009.9	176.5	143.3	410.3	217.76	4.20

Table 10. Th source test carried out at Northam Airport before & after radiometric pad calibration.

	Position			Hand Sample				Background				Normalized				Th Cal Results	
Date	Easting	Northing	GPS Ht	TC	Pot	Ura	Th	TC	Pot	Ura	Th	TC	Pot	Ura	Th	ThPeak	%FWHM
10/06/2017	470661.30	6500575.80	152.96	13488.2	792.4	396.3	674.0	7089.6	593.4	235.6	255.6	6398.6	199.0	160.7	418.40	217.60	4.23
10/06/2017	470661.45	6500577.30	153.48	12729.2	764.4	347.3	666.7	6564.4	578.6	199.3	249.5	6164.8	185.8	148.0	417.2	217.56	4.21

Table 11. Th source test carried out at Northam Airport before & after Carnamah test range.

- A thorium source test was carried out before conducting the first survey flight at the project base location. The result is tabled below as per Schedule 3 S1.12

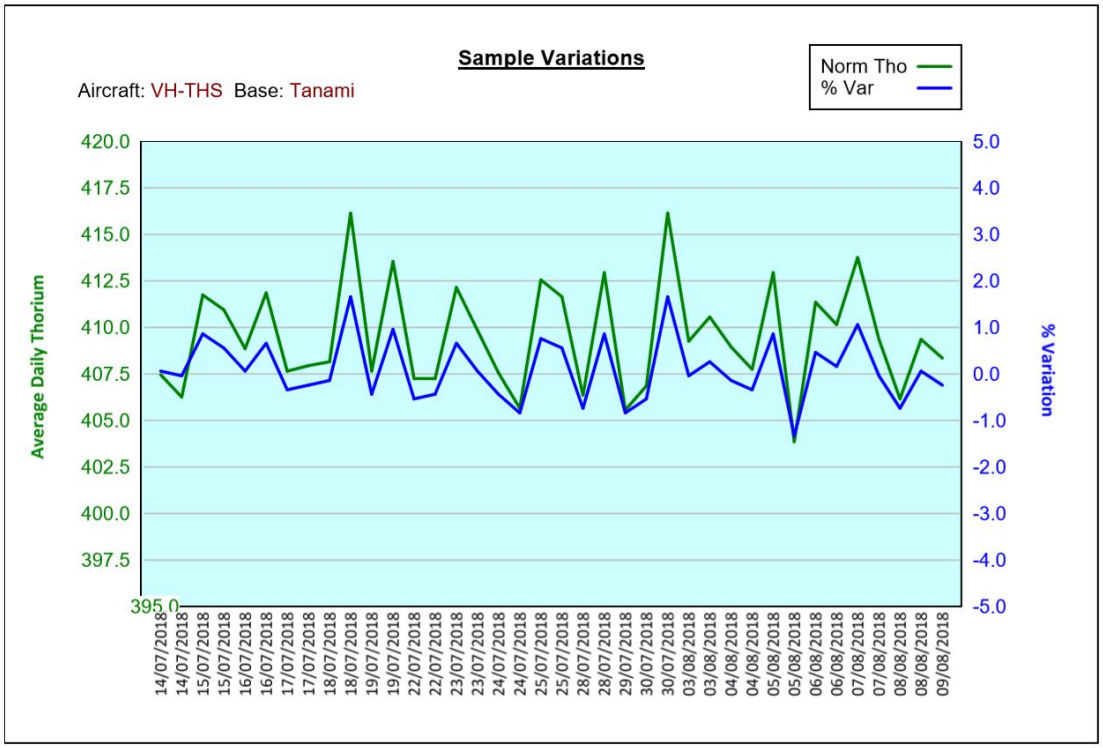
	Position			Hand Sample				Background				Normalized				Th Cal Results	
Date	Easting	Northing	GPS Ht	TC	Pot	Ura	Th	TC	Pot	Ura	Th	TC	Pot	Ura	Th	ThPeak	%FWHM
14/07/2018	575446.66	7792531.86	432.6	11088.7	444.4	314.0	657.1	5063.2	258.4	172.1	249.8	6025.5	186.0	141.9	407.3	217.64	4.20

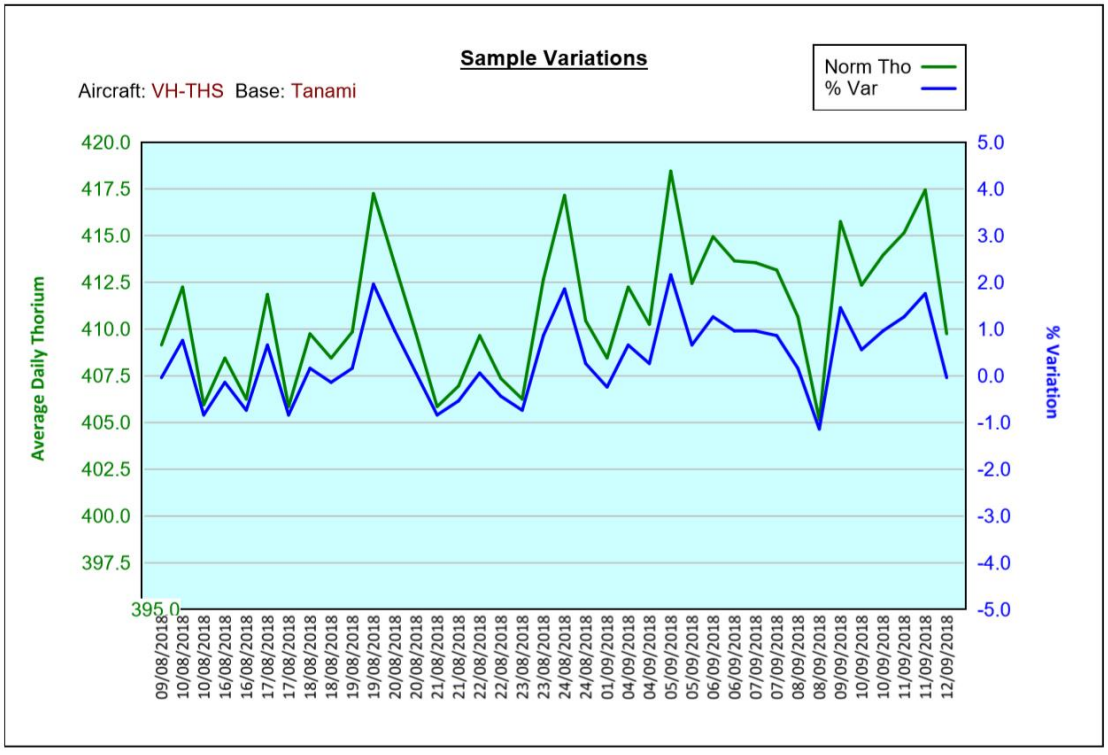
Table 12. Th source test carried out at Tanami Mine Airport prior to Survey commencement.

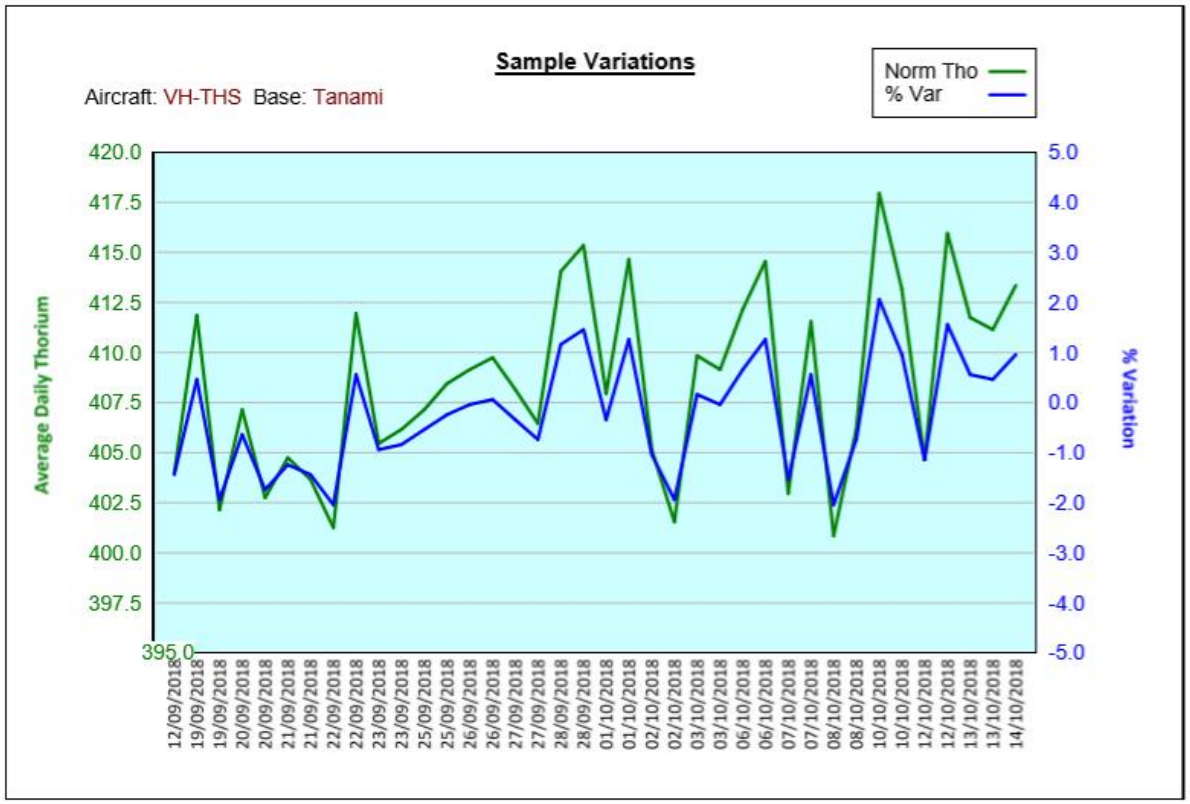
3. In-Field Data Quality Control

3.1 Daily Gamma Ray Spectrometer Tests

Thorium source tests were carried out before the day's first survey flight and after the day's last survey flight. The results are graphed and tabled below as per Schedule 3 S1.12 (r) & Schedule 3 S1.12 (s)






Sample Variations
Aircraft: VH-THS Base: Tanami
Norm Tho
% Var
Average Daily Thorium
% Variation
420.0
417.5
415.0
412.5
410.0
407.5
405.0
402.5
400.0
397.5
395.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
12/09/2018
19/09/2018
19/09/2018
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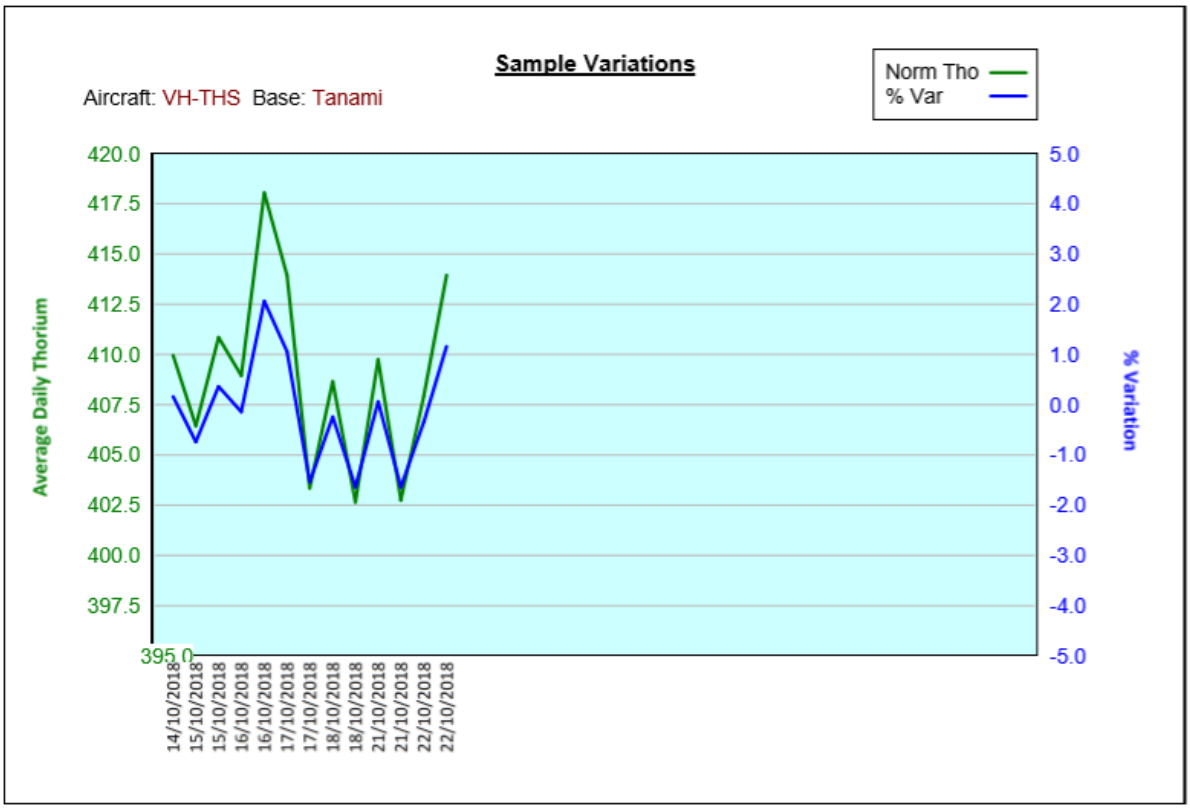

Sample Variations
Aircraft: VH-THS Base: Tanami
Norm Tho
% Var
Average Daily Thorium
% Variation
420.0
417.5
415.0
412.5
410.0
407.5
405.0
402.5
400.0
397.5
395.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
14/10/2018
15/10/2018
15/10/2018
16/10/2018
16/10/2018
17/10/2018
17/10/2018
18/10/2018
18/10/2018
21/10/2018
21/10/2018
22/10/2018
22/10/2018

Av Normalized Th: 409.5 Min TH: 400.7 Max TH: 418.3 Standard Deviation: 4.0

Ground Cals - VH-THS - Tanami

		Position			Hand Sample				Background				Normalized				Th Cal Results		TH Chg	Diff
Date	Flt	East	North	GPS Ht	TC	Pot	Ura	Tho	TC	Pot	Ura	Tho	TC	Pot	Ura	Tho	ThPeak	% FWHM	+/- 3%	5 max
14/07/2018	1	575446.66	7792531.86	432.6	11088.7	444.4	314.0	657.1	5063.2	258.4	172.1	249.8	6025.5	186.0	141.9	407.3	217.64	4.20	0.0	0.0
14/07/2018	2	575446.36	7792531.20	431.9	10833.6	432.1	303.8	653.7	4920.9	256.0	164.1	247.6	5912.7	176.1	139.7	406.1	217.79	4.16	-0.1	0.7
15/07/2018	4	575446.56	7792530.88	432.8	10961.9	437.6	306.1	659.6	4956.3	256.5	166.6	248.0	6005.6	181.1	139.5	411.6	217.85	4.24	0.8	1.0
15/07/2018	4	575446.38	7792530.90	433.5	10916.0	435.3	308.1	654.4	4897.4	257.6	166.1	243.6	6018.6	177.7	142.0	410.8	217.85	4.24	0.5	1.0
16/07/2018	5	575446.46	7792531.87	432.4	10954.5	435.8	303.4	658.2	4904.2	252.4	163.7	249.5	6050.3	183.4	139.7	408.7	217.87	4.12	0.0	0.2
16/07/2018	5	575446.30	7792531.64	431.0	10842.5	434.0	306.7	650.8	4822.7	254.2	164.2	239.1	6019.8	179.8	142.5	411.7	217.87	4.12	0.6	0.4
17/07/2018	6	575446.49	7792531.32	431.5	10860.9	434.8	299.6	650.6	4788.4	251.2	158.7	243.1	6072.5	183.6	140.9	407.5	217.80	4.21	-0.4	0.6
17/07/2018	6	575446.90	7792531.49	432.0	10883.9	435.9	302.5	657.9	4891.2	251.8	162.5	250.1	5992.7	184.1	140.0	407.8	217.80	4.21	-0.3	0.4
18/07/2018	7	575446.71	7792531.70	432.0	11014.6	441.1	310.8	660.3	5011.0	257.3	167.4	252.3	6003.6	183.8	143.4	408.0	217.57	4.28	-0.2	0.2
18/07/2018	8	575446.65	7792531.39	432.5	10978.1	436.3	310.4	659.3	4822.6	253.3	161.6	243.3	6155.5	183.0	148.8	416.0	217.80	4.16	1.6	0.5
19/07/2018	10	575446.49	7792531.32	431.5	10860.9	434.8	299.6	650.6	4788.4	251.2	158.7	243.1	6072.5	183.6	140.9	407.5	217.56	4.20	-0.5	0.6
19/07/2018	11	575446.66	7792531.11	431.8	11004.0	438.2	309.2	661.5	4897.0	256.5	165.2	248.1	6107.0	181.7	144.0	413.4	217.81	4.19	0.9	0.8
22/07/2018	12	575447.24	7792532.33	431.1	10984.9	437.0	306.6	661.3	4932.4	254.6	163.2	254.2	6052.5	182.4	143.4	407.1	217.59	4.18	-0.6	0.7
22/07/2018	14	575446.17	7792532.08	431.7	10978.2	437.3	310.9	657.6	4939.2	256.5	166.7	250.5	6039.0	180.8	144.2	407.1	217.77	4.19	-0.5	0.5
23/07/2018	15	575446.05	7792530.97	431.5	10983.4	435.6	307.6	658.0	4953.9	257.7	166.0	246.0	6029.5	177.9	141.6	412.0	217.54	4.24	0.6	1.1
23/07/2018	16	575447.31	7792532.57	432.0	11031.0	443.3	310.7	659.8	4998.1	259.8	169.7	250.1	6032.9	183.5	141.0	409.7	217.79	4.15	0.0	1.0
24/07/2018	17	575447.33	7792531.97	432.6	10983.7	438.4	305.4	660.6	4983.2	254.6	165.0	253.2	6000.5	183.8	140.4	407.4	217.45	4.13	-0.5	0.7
24/07/2018	18	575447.09	7792532.68	431.1	10950.5	433.2	307.9	656.4	4953.8	258.7	166.4	250.9	5996.7	174.5	141.5	405.5	217.80	4.17	-0.9	0.9
25/07/2018	19	575446.84	7792532.20	431.3	11062.2	439.8	310.0	662.6	5005.9	257.6	167.7	250.2	6056.3	182.2	142.3	412.4	217.81	4.17	0.7	0.4
25/07/2018	19	575446.82	7792531.65	432.7	11129.7	447.1	321.6	660.3	5104.0	270.9	178.0	248.8	6025.7	176.2	143.6	411.5	217.81	4.17	0.5	0.3
28/07/2018	20	575446.81	7792531.97	431.8	10891.1	434.5	303.2	654.2	4906.4	251.0	162.4	248.0	5984.7	183.5	140.8	406.2	217.56	4.13	-0.8	0.2
28/07/2018	22	575447.50	7792532.47	431.8	11028.9	439.5	308.9	663.9	4983.9	256.9	166.3	251.1	6045.0	182.6	142.6	412.8	217.86	4.20	0.8	1.0
29/07/2018	23	575447.64	7792532.74	430.4	10925.9	437.7	304.5	657.2	4988.2	256.1	165.8	251.8	5937.7	181.6	138.7	405.4	217.58	4.20	-0.9	1.3
30/07/2018	24	575446.35	7792532.41	431.6	10948.9	435.4	306.3	657.4	4963.3	256.7	163.8	250.7	5985.6	178.7	142.5	406.7	217.80	4.16	-0.6	0.6
30/07/2018	24	575446.65	7792531.39	432.5	10978.1	436.3	310.4	659.3	4822.6	253.3	161.6	243.3	6155.5	183.0	148.8	416.0	217.80	4.16	1.6	0.5
03/08/2018	25	575447.06	7792532.08	432.4	10907.5	434.7	299.8	658.1	4870.1	250.0	159.1	249.0	6037.4	184.7	140.7	409.1	217.51	4.13	-0.1	0.5
03/08/2018	26	575446.74	7792532.64	432.5	10938.5	435.7	303.5	659.5	4916.4	255.4	160.8	249.1	6022.1	180.3	142.7	410.4	217.75	4.10	0.2	0.8
04/08/2018	27	575447.08	7792532.62	432.6	10944.1	435.1	300.8	660.4	4912.9	254.1	163.6	251.6	6031.2	181.0	137.2	408.8	217.61	4.19	-0.2	0.9
04/08/2018	28	575447.17	7792531.55	432.9	10811.6	431.4	299.2	654.3	4854.8	252.5	162.4	246.7	5956.8	178.9	136.8	407.6	217.76	4.15	-0.4	0.6
05/08/2018	29	575446.80	7792531.94	432.5	10946.7	437.6	305.8	658.5	4895.2	253.8	163.7	245.7	6051.5	183.8	142.1	412.8	217.57	4.19	0.8	0.2
05/08/2018	30	575446.68	7792531.76	432.6	10908.6	432.9	304.6	655.1	4888.4	254.0	161.4	251.4	6020.2	178.9	143.2	403.7	217.75	4.20	-1.4	0.1
06/08/2018	31	575446.65	7792532.38	431.7	10872.9	432.3	301.0	660.5	4909.0	253.0	162.3	249.3	5963.9	179.3	138.7	411.2	217.58	4.23	0.4	0.5
06/08/2018	32	575446.82	7792531.86	431.8	10844.0	433.7	303.6	654.9	4812.4	251.7	158.0	244.9	6031.6	182.0	145.6	410.0	217.75	4.19	0.1	0.2
07/08/2018	33	575446.99	7792531.74	431.4	11104.2	443.4	316.1	663.7	5099.3	267.6	173.1	250.1	6004.9	175.8	143.0	413.6	217.56	4.27	1.0	0.4

Av Normalized Th: 409.5 Min TH: 400.7 Max TH: 418.3 Standard Deviation: 4.0

Ground Cals - VH-THS - Tanami

		Position			Hand Sample				Background				Normalized				Th Cal Results		TH Chg	Diff
Date	Flt	East	North	GPS Ht	TC	Pot	Ura	Tho	TC	Pot	Ura	Tho	TC	Pot	Ura	Tho	ThPeak	% FWHM	+/- 3%	5 max
07/08/2018	34	575447.23	7792533.06	431.9	11043.0	441.7	313.1	660.8	5047.8	261.1	171.4	251.6	5995.2	180.6	141.7	409.2	217.76	4.17	-0.1	1.3
08/08/2018	35	575447.18	7792532.56	432.5	11059.6	440.3	309.0	660.4	5060.3	262.0	171.1	254.4	5999.3	178.3	137.9	406.0	217.53	4.23	-0.8	0.9
08/08/2018	36	575446.54	7792531.85	431.8	11015.7	438.7	310.7	657.6	4978.4	259.8	169.0	248.4	6037.3	178.9	141.7	409.2	217.68	4.16	0.0	0.1
09/08/2018	37	575446.24	7792531.21	432.1	10925.6	432.7	304.3	655.4	4955.2	255.8	167.6	247.2	5970.4	176.9	136.7	408.2	217.57	4.16	-0.3	0.8
09/08/2018	38	575446.69	7792531.64	432.7	10988.0	439.5	311.7	654.7	4969.5	260.3	170.8	245.7	6018.5	179.2	140.9	409.0	217.71	4.21	-0.1	0.2
10/08/2018	39	575446.48	7792532.21	431.7	10926.5	433.8	303.2	659.8	4892.2	255.6	164.0	247.7	6034.3	178.2	139.2	412.1	217.56	4.14	0.7	0.4
10/08/2018	40	575446.55	7792530.99	432.9	10987.9	440.3	311.9	656.7	5026.6	262.2	170.6	250.9	5961.3	178.1	141.3	405.8	217.72	4.17	-0.9	0.9
16/08/2018	41	575446.51	7792531.41	429.9	10916.8	438.0	302.4	658.2	4924.4	253.9	163.0	249.9	5992.4	184.1	139.4	408.3	217.75	4.21	-0.2	0.5
16/08/2018	41	575446.02	7792531.69	432.6	10841.0	432.4	307.4	652.4	4901.6	253.1	164.9	246.3	5939.4	179.3	142.5	406.1	217.75	4.21	-0.8	0.7
17/08/2018	42	575446.60	7792531.31	431.3	11064.1	443.8	315.9	656.3	5000.1	259.1	172.3	244.6	6064.0	184.7	143.6	411.7	217.54	4.29	0.6	0.6
17/08/2018	43	575447.11	7792530.70	432.2	10889.4	437.1	305.9	653.6	4923.4	254.3	165.9	247.9	5966.0	182.8	140.0	405.7	217.67	4.19	-0.9	1.2
18/08/2018	44	575447.26	7792531.80	432.6	10928.3	434.7	306.0	654.2	4863.7	249.9	162.3	244.6	6064.6	184.8	143.7	409.6	217.60	4.20	0.1	0.6
18/08/2018	45	575446.75	7792532.56	431.2	10960.1	435.9	309.8	650.6	4913.7	256.4	169.6	242.3	6046.4	179.5	140.2	408.3	217.72	4.25	-0.2	0.7
19/08/2018	46	575447.18	7792531.84	432.5	11051.0	443.1	314.0	658.6	5063.4	262.0	174.4	248.9	5987.6	181.1	139.6	409.7	217.59	4.20	0.1	0.5
19/08/2018	47	575447.21	7792531.74	432.6	10987.6	438.6	311.8	662.4	4880.2	254.3	164.8	245.3	6107.4	184.3	147.0	417.1	217.74	4.12	1.9	0.6
20/08/2018	48	575446.74	7792531.61	431.4	10881.2	434.5	300.8	660.6	4835.4	251.7	160.1	247.3	6045.8	182.8	140.7	413.3	217.60	4.21	0.9	0.3
20/08/2018	49	575446.07	7792532.05	433.5	10884.1	430.9	303.1	657.6	4853.2	252.4	157.7	248.0	6030.9	178.5	145.4	409.6	217.76	4.26	0.0	0.6
21/08/2018	50	575447.07	7792531.84	430.4	11028.9	441.9	310.9	656.5	4993.8	259.5	169.7	250.8	6035.1	182.4	141.2	405.7	217.50	4.25	-0.9	0.4
21/08/2018	51	575446.33	7792532.35	432.7	10877.2	433.3	303.2	653.9	4875.1	256.4	161.3	247.1	6002.1	176.9	141.9	406.8	217.75	4.13	-0.6	0.6
22/08/2018	52	575446.39	7792532.22	432.5	11016.6	439.2	308.7	659.6	4980.8	256.6	166.2	250.1	6035.8	182.6	142.5	409.5	217.57	4.23	0.0	0.4
22/08/2018	53	575447.05	7792531.28	431.3	10926.5	435.0	309.8	655.3	4883.4	253.8	165.3	248.1	6043.1	181.2	144.5	407.2	217.70	4.18	-0.5	0.7
23/08/2018	54	575446.42	7792531.36	431.9	10976.5	438.3	310.5	655.3	5017.5	260.8	169.8	249.2	5959.0	177.5	140.7	406.1	217.53	4.19	-0.8	0.6
23/08/2018	55	575446.48	7792531.46	432.9	10973.7	436.6	308.0	658.8	4856.3	254.2	162.4	246.3	6117.4	182.4	145.6	412.5	217.84	4.19	0.8	0.4
24/08/2018	56	575446.76	7792532.07	429.1	11028.5	438.3	308.7	666.2	4952.7	256.8	166.7	249.2	6075.8	181.5	142.0	417.0	217.75	4.17	1.8	0.2
24/08/2018	56	575446.53	7792531.36	432.2	11083.9	445.7	319.2	657.4	5047.8	263.0	176.0	247.1	6036.1	182.7	143.2	410.3	217.75	4.17	0.2	0.5
01/09/2018	57	575446.34	7792532.42	432.6	11080.5	446.5	315.0	659.5	5055.2	258.1	171.4	251.2	6025.3	188.4	143.6	408.3	217.54	4.20	-0.3	0.6
04/09/2018	58	575446.52	7792531.79	432.8	10993.7	439.1	309.0	659.3	4908.9	253.9	162.5	247.2	6084.8	185.2	146.5	412.1	217.79	4.21	0.6	0.2
04/09/2018	58	575446.34	7792530.34	433.6	11006.0	438.9	314.3	650.8	4966.9	262.2	174.5	240.7	6039.1	176.7	139.8	410.1	217.79	4.21	0.2	1.6
05/09/2018	59	575446.36	7792531.42	432.8	10986.7	439.4	308.1	660.9	4884.2	254.3	165.4	242.6	6102.5	185.1	142.7	418.3	217.54	4.17	2.1	0.5
05/09/2018	60	575446.77	7792531.83	432.8	10881.3	433.8	305.5	654.4	4800.0	250.8	160.3	242.1	6081.3	183.0	145.2	412.3	217.76	4.25	0.6	0.1
06/09/2018	61	575446.93	7792531.79	430.7	10975.3	436.6	306.5	661.6	4916.9	253.9	162.5	246.8	6058.4	182.7	144.0	414.8	217.58	4.20	1.2	0.3
06/09/2018	62	575447.06	7792531.56	433.2	10940.4	430.3	301.3	662.6	4861.1	251.3	161.0	249.1	6079.3	179.0	140.3	413.5	217.75	4.24	0.9	0.5
07/09/2018	63	575446.67	7792531.08	431.4	10960.7	435.4	304.8	660.1	4895.1	252.4	162.3	246.7	6065.6	183.0	142.5	413.4	217.48	4.22	0.9	0.8
07/09/2018	64	575446.56	7792531.13	433.1	10879.0	431.6	302.6	655.1	4815.2	253.1	161.8	242.1	6063.8	178.5	140.8	413.0	217.81	4.21	0.8	0.7
08/09/2018	65	575447.00	7792531.70	431.5	11011.3	441.7	308.1	656.1	4931.9	256.0	165.6	245.6	6079.4	185.7	142.5	410.5	217.57	4.13	0.1	0.4

Av Normalized Th: 409.5 Min TH: 400.7 Max TH: 418.3 Standard Deviation: 4.0

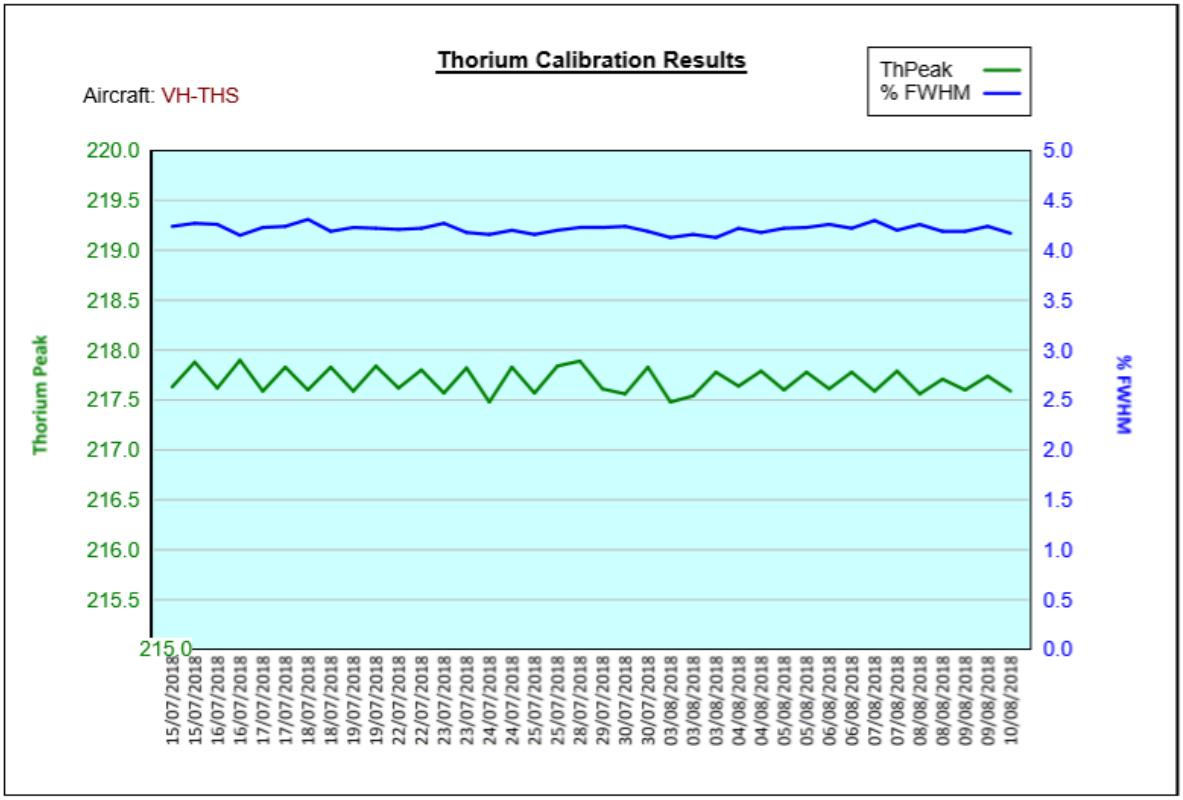
Ground Cals - VH-THS - Tanami

		Position			Hand Sample				Background				Normalized				Th Cal Results		TH Chg	Diff
Date	Flt	East	North	GPS Ht	TC	Pot	Ura	Tho	TC	Pot	Ura	Tho	TC	Pot	Ura	Tho	ThPeak	% FWHM	+/- 3%	5 max
08/09/2018	66	575447.23	7792531.81	432.8	10848.7	434.0	303.7	651.7	4861.5	251.3	163.3	246.7	5987.2	182.7	140.4	405.0	217.73	4.16	-1.2	0.6
09/09/2018	67	575447.26	7792531.59	432.7	11061.3	441.6	312.5	661.2	4988.3	259.1	169.3	245.6	6073.0	182.5	143.2	415.6	217.54	4.20	1.4	0.7
10/09/2018	68	575446.66	7792531.26	432.0	10858.9	429.7	298.8	656.6	4792.2	247.3	160.1	244.4	6066.7	182.4	138.7	412.2	217.54	4.20	0.5	0.6
10/09/2018	69	575446.83	7792531.25	432.6	10955.0	433.6	306.3	661.1	4910.3	252.2	167.3	247.3	6044.7	181.4	139.0	413.8	217.76	4.20	0.9	0.6
11/09/2018	70	575446.46	7792531.24	431.9	11009.2	438.0	307.9	660.6	4913.5	254.5	165.3	245.6	6095.7	183.5	142.6	415.0	217.78	4.19	1.2	0.7
11/09/2018	70	575446.47	7792532.07	432.3	10920.3	436.4	306.8	658.0	4833.6	251.5	159.6	240.7	6086.7	184.9	147.2	417.3	217.78	4.19	1.7	0.3
12/09/2018	71	575446.12	7792531.21	431.0	10937.3	435.4	302.5	660.2	4877.6	249.3	161.5	250.6	6059.7	186.1	141.0	409.6	217.59	4.23	-0.1	0.8
12/09/2018	72	575445.97	7792531.49	433.8	10844.6	431.4	301.5	651.6	4888.5	253.1	162.3	247.8	5956.1	178.3	139.2	403.8	217.44	4.13	-1.5	0.8
19/09/2018	73	575446.17	7792531.55	431.9	11047.4	439.0	307.9	661.5	4938.0	254.4	164.1	249.8	6109.4	184.6	143.8	411.7	217.57	4.14	0.4	0.6
19/09/2018	74	575446.65	7792531.94	432.3	10903.6	434.1	303.5	655.2	4958.6	257.9	164.3	253.2	5945.0	176.2	139.2	402.0	217.69	4.20	-2.0	0.1
20/09/2018	75	575446.03	7792532.64	432.6	10963.9	435.9	304.9	657.0	4949.2	257.6	166.1	250.0	6014.7	178.3	138.8	407.0	217.52	4.14	-0.7	1.0
20/09/2018	76	575446.57	7792531.71	432.1	10867.3	439.4	307.2	648.3	4895.1	251.9	164.1	245.7	5972.2	187.5	143.1	402.6	217.82	4.17	-1.8	0.2
21/09/2018	77	575445.92	7792531.29	432.2	11077.1	447.5	317.9	655.7	5113.9	263.8	176.5	251.1	5963.2	183.7	141.4	404.6	217.55	4.20	-1.3	0.9
21/09/2018	78	575446.74	7792531.76	431.1	10893.3	435.8	308.8	652.5	4979.0	260.1	170.9	249.0	5914.3	175.7	137.9	403.5	217.72	4.19	-1.5	0.1
22/09/2018	79	575446.08	7792530.91	432.5	10987.8	439.2	311.5	650.7	5029.0	260.3	173.2	249.6	5958.8	178.9	138.3	401.1	217.53	4.22	-2.1	1.1
22/09/2018	80	575446.76	7792531.79	431.5	10926.2	435.2	303.6	657.7	4874.3	253.0	164.6	245.9	6051.9	182.2	139.0	411.8	217.76	4.23	0.5	0.1
23/09/2018	81	575446.49	7792531.77	432.1	11103.0	443.3	316.1	651.9	5138.0	265.8	177.8	246.6	5965.0	177.5	138.3	405.3	217.55	4.22	-1.0	0.2
23/09/2018	82	575445.38	7792531.40	432.6	10798.8	432.2	301.0	648.1	4767.0	247.7	158.9	242.1	6031.8	184.5	142.1	406.0	217.63	4.18	-0.9	1.4
25/09/2018	83	575446.24	7792532.22	433.4	10993.9	440.3	309.9	655.3	5075.2	262.1	174.0	248.3	5918.7	178.2	135.9	407.0	217.52	4.11	-0.6	0.6
25/09/2018	84	575446.59	7792532.22	431.6	10871.3	432.8	303.8	652.7	4822.8	252.1	160.1	244.4	6048.5	180.7	143.7	408.3	217.67	4.20	-0.3	0.4
26/09/2018	85	575446.53	7792531.30	431.0	11049.0	441.8	312.0	656.1	5091.2	265.7	175.8	247.1	5957.8	176.1	136.2	409.0	217.53	4.17	-0.1	0.6
26/09/2018	86	575446.29	7792531.88	432.1	10879.0	431.7	304.8	658.0	4883.9	253.5	163.5	248.4	5995.1	178.2	141.3	409.6	217.79	4.18	0.0	0.4
27/09/2018	87	575446.73	7792531.48	431.8	10871.0	428.4	301.6	657.8	4882.8	252.5	162.3	249.8	5988.2	175.9	139.3	408.0	217.46	4.18	-0.4	0.4
27/09/2018	88	575446.23	7792531.82	432.2	10905.2	434.5	306.4	658.1	4958.3	257.9	167.7	251.8	5946.9	176.6	138.7	406.3	217.72	4.14	-0.8	0.4
28/09/2018	89	575446.48	7792531.90	432.9	10901.4	432.5	300.9	656.5	4757.7	250.4	154.3	242.6	6143.7	182.1	146.6	413.9	217.75	4.25	1.1	0.2
28/09/2018	89	575446.80	7792531.73	432.0	10898.3	430.8	304.2	658.2	4824.0	252.1	160.1	243.0	6074.3	178.7	144.1	415.2	217.75	4.25	1.4	0.2
01/10/2018	90	575445.84	7792532.54	430.7	10835.0	431.2	296.8	653.1	4819.4	248.6	159.3	245.3	6015.6	182.6	137.5	407.8	217.73	4.08	-0.4	1.1
01/10/2018	90	575446.29	7792532.01	430.3	10881.9	432.1	300.4	656.2	4810.6	247.9	159.6	241.7	6071.3	184.2	140.8	414.5	217.73	4.08	1.2	0.4
02/10/2018	91	575445.82	7792531.46	433.3	10972.6	440.5	309.8	653.1	5038.5	259.8	172.6	248.1	5934.1	180.7	137.2	405.0	217.53	4.16	-1.1	0.9
02/10/2018	92	575446.82	7792531.83	429.9	10880.9	430.6	301.3	653.4	4895.4	251.6	163.4	252.0	5985.5	179.0	137.9	401.4	217.71	4.18	-2.0	0.2
03/10/2018	93	575446.29	7792532.31	432.6	10913.4	433.8	302.7	657.8	4865.9	252.7	158.3	248.1	6047.5	181.1	144.4	409.7	217.75	4.24	0.1	0.6
03/10/2018	93	575447.17	7792531.54	433.2	10913.0	435.6	304.2	660.2	4902.8	251.1	159.6	251.2	6010.2	184.5	144.6	409.0	217.75	4.24	-0.1	0.6
06/10/2018	94	575447.64	7792531.46	433.4	11021.5	444.8	310.3	658.4	4977.2	259.7	167.2	246.4	6044.3	185.1	143.1	412.0	217.69	4.16	0.6	1.1
06/10/2018	94	575446.98	7792532.33	431.1	10911.7	434.6	306.1	660.2	4867.5	252.5	160.9	245.8	6044.2	182.1	145.2	414.4	217.69	4.16	1.2	0.6
07/10/2018	95	575446.47	7792531.46	432.7	10966.0	433.6	309.3	654.1	5013.6	258.3	168.7	251.3	5952.4	175.3	140.6	402.8	217.48	4.23	-1.6	0.4

Av Normalized Th: 409.5 Min TH: 400.7 Max TH: 418.3 Standard Deviation: 4.0

Ground Cals - VH-THS - Tanami

		Position			Hand Sample				Background				Normalized				Th Cal Results		TH Chg	Diff
Date	Flt	East	North	GPS Ht	TC	Pot	Ura	Tho	TC	Pot	Ura	Tho	TC	Pot	Ura	Tho	ThPeak	% FWHM	+/- 3%	5 max
07/10/2018	96	575446.46	7792531.71	432.0	10927.6	439.9	306.7	660.8	4922.4	254.6	165.2	249.4	6005.2	185.3	141.5	411.4	217.71	4.26	0.5	0.3
08/10/2018	97	575446.74	7792531.02	432.1	10857.4	435.2	301.5	653.6	4927.6	253.7	163.4	252.9	5929.8	181.5	138.1	400.7	217.76	4.17	-2.1	0.8
08/10/2018	97	575446.81	7792531.75	431.5	10893.7	433.8	306.7	652.2	4951.2	258.0	165.9	246.2	5942.5	175.8	140.8	406.0	217.76	4.17	-0.8	0.2
10/10/2018	98	575446.57	7792531.45	432.8	10943.6	437.6	305.0	660.5	4853.5	251.6	161.8	242.7	6090.1	186.0	143.2	417.8	217.50	4.27	2.0	0.4
10/10/2018	99	575446.98	7792532.11	432.6	10975.8	437.4	306.1	662.4	4884.3	252.1	161.0	249.4	6091.5	185.3	145.1	413.0	217.76	4.21	0.9	0.4
12/10/2018	100	575446.11	7792532.45	431.7	10764.7	428.9	300.8	645.1	4761.4	244.5	160.3	240.6	6003.3	184.4	140.5	404.5	217.56	4.17	-1.2	0.8
12/10/2018	101	575446.02	7792531.71	432.3	10766.3	423.9	297.1	652.7	4679.3	245.9	153.3	236.9	6087.0	178.0	143.8	415.8	217.73	4.13	1.5	0.7
13/10/2018	102	575445.86	7792531.80	431.8	10881.4	430.1	303.7	652.5	4832.1	248.6	163.3	240.9	6049.3	181.5	140.4	411.6	217.63	4.22	0.5	0.8
13/10/2018	103	575447.00	7792531.59	432.5	10690.7	423.7	292.6	650.7	4714.1	242.3	157.2	239.7	5976.6	181.4	135.4	411.0	217.63	4.19	0.4	0.4
14/10/2018	104	575446.45	7792531.95	431.4	10801.9	431.9	304.4	647.9	4734.4	246.5	158.3	234.7	6067.5	185.4	146.1	413.2	217.57	4.17	0.9	0.2
14/10/2018	105	575446.30	7792532.10	432.4	10726.4	422.9	296.6	650.2	4715.4	246.7	154.4	240.4	6011.0	176.2	142.2	409.8	217.71	4.19	0.1	0.4
15/10/2018	106	575445.65	7792531.07	432.1	10802.6	425.2	297.9	647.7	4773.8	246.6	157.9	241.4	6028.8	178.6	140.0	406.3	217.61	4.24	-0.8	1.3
15/10/2018	107	575446.53	7792532.08	431.9	10737.0	423.1	292.6	654.5	4700.2	240.2	153.1	243.8	6036.8	182.9	139.5	410.7	217.69	4.15	0.3	0.3
16/10/2018	108	575446.00	7792531.67	432.7	10815.5	429.9	301.8	649.5	4795.8	248.5	158.7	240.7	6019.7	181.4	143.1	408.8	217.58	4.23	-0.2	0.7
16/10/2018	109	575447.10	7792531.99	431.7	10766.9	424.3	297.5	657.5	4725.7	245.3	155.0	239.6	6041.2	179.0	142.5	417.9	217.73	4.27	2.0	0.5
17/10/2018	110	575446.28	7792531.41	433.0	10973.7	434.0	308.9	657.2	4885.0	253.6	162.2	243.4	6088.7	180.4	146.7	413.8	217.52	4.15	1.0	0.6
17/10/2018	111	575446.38	7792531.46	431.9	10742.8	425.2	298.2	645.8	4754.8	245.5	156.9	242.6	5988.0	179.7	141.3	403.2	217.74	4.23	-1.6	0.5
18/10/2018	112	575445.80	7792532.15	430.8	10688.1	425.1	294.0	647.8	4655.4	240.6	150.7	239.3	6032.7	184.5	143.3	408.5	217.71	4.19	-0.3	0.9
18/10/2018	112	575446.64	7792532.03	431.6	10689.8	422.2	293.7	647.1	4749.9	243.4	157.3	244.6	5939.9	178.8	136.4	402.5	217.71	4.19	-1.7	0.2
21/10/2018	114	575445.65	7792531.17	429.8	10837.9	431.4	301.1	652.9	4806.3	249.1	158.8	243.3	6031.6	182.3	142.3	409.6	217.58	4.22	0.0	1.2
21/10/2018	115	575446.91	7792531.87	432.8	10798.7	430.3	304.0	648.8	4839.8	251.3	160.7	246.2	5958.9	179.0	143.3	402.6	217.71	4.21	-1.7	0.3
22/10/2018	116	575447.06	7792532.04	431.5	10861.0	429.4	301.3	656.7	4810.1	249.7	157.0	248.9	6050.9	179.7	144.3	407.8	217.69	4.19	-0.4	0.4
22/10/2018	116	575447.34	7792532.04	431.7	10806.5	427.6	302.4	655.4	4761.2	248.9	155.4	241.6	6045.3	178.7	147.0	413.8	217.69	4.19	1.1	0.7


Thorium Calibration Results
Aircraft: VH-THS
ThPeak
% FWHM
Thorium Peak
% FWHM
220.0
219.5
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218.0
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15/07/2018
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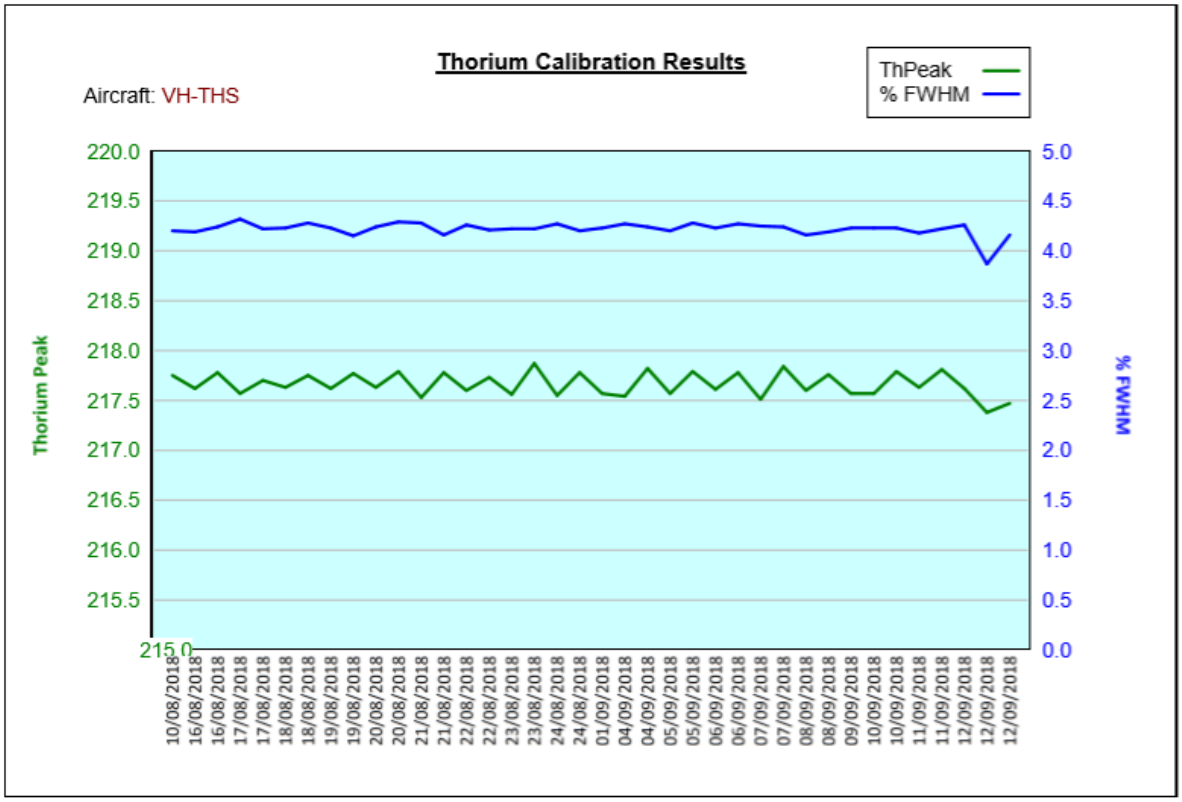
Thorium Calibration Results
Aircraft: VH-THS
ThPeak
% FWHM
Thorium Peak
% FWHM
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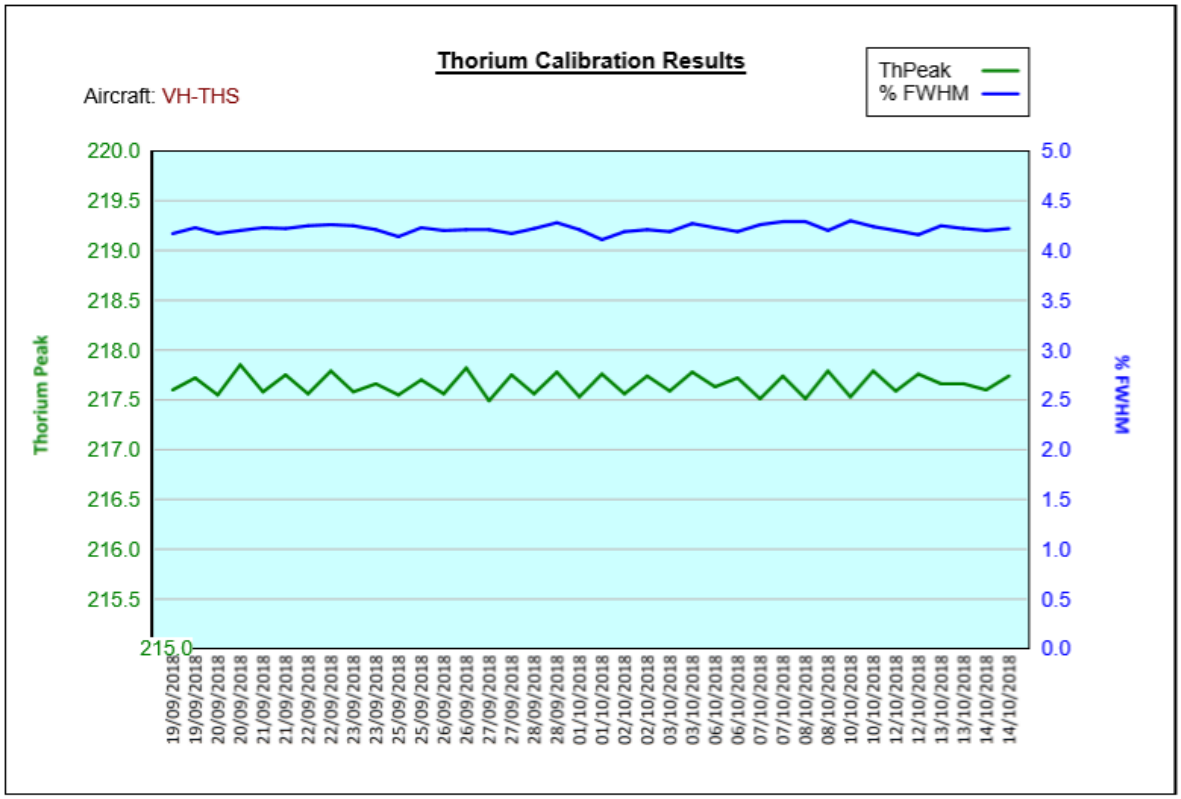
Thorium Calibration Results
Aircraft: VH-THS
ThPeak
% FWHM
Thorium Peak
% FWHM
220.0
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217.5
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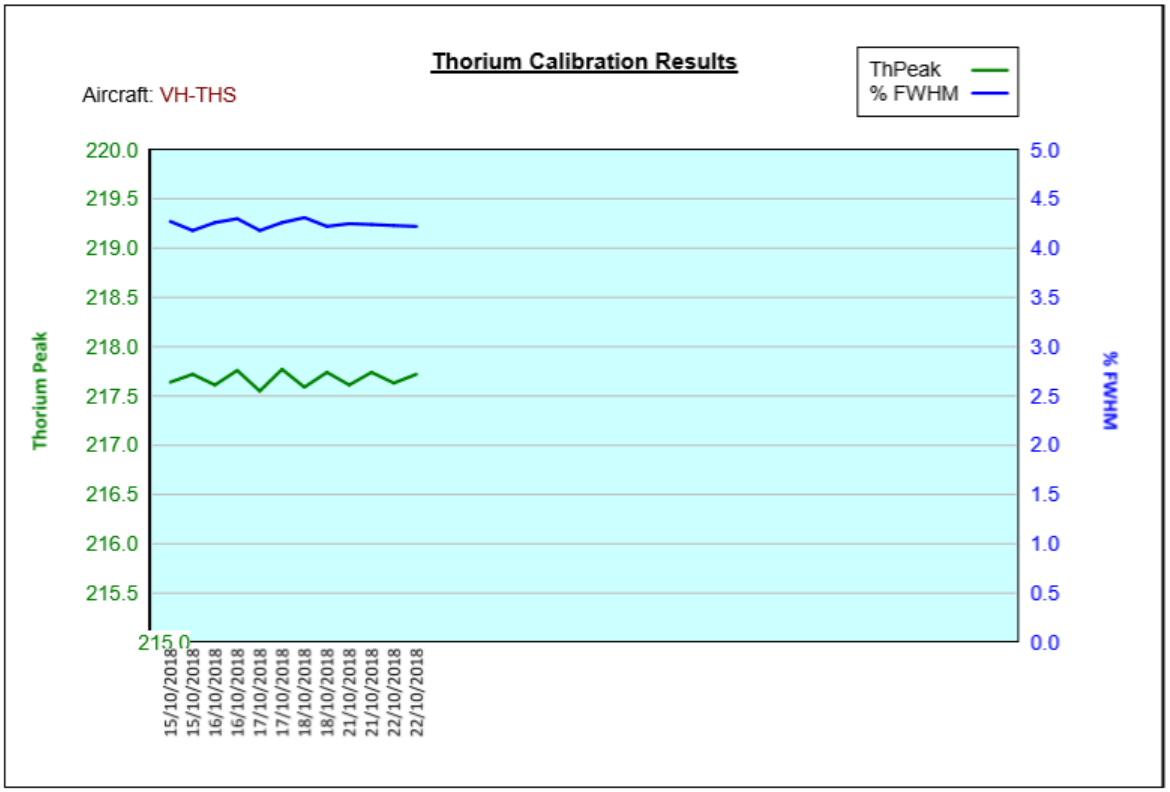
14/10/2018


Thorium Calibration Results
Aircraft: VH-THS
ThPeak
% FWHM
Thorium Peak
% FWHM
220.0
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15/10/2018
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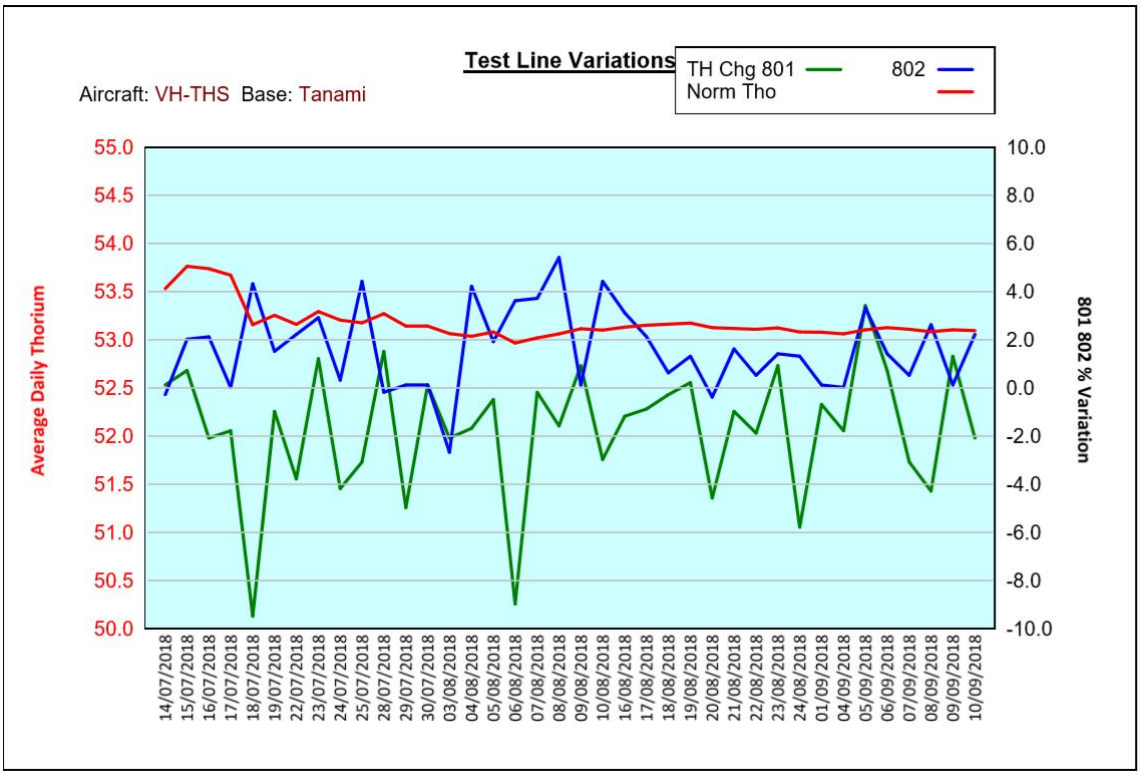
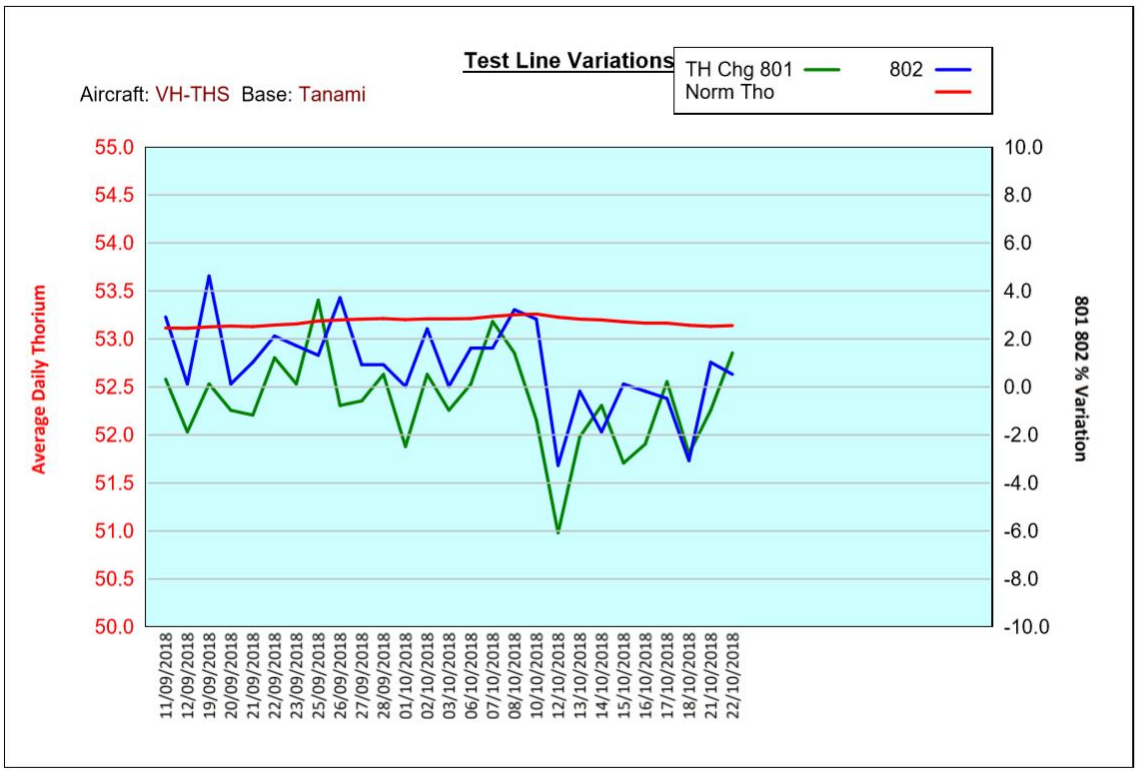
18/10/2018
21/10/2018
21/10/2018
22/10/2018
22/10/2018

3.2 Daily Radiometric Test Line Checks

A survey test line was defined and flown before the day's first survey flight and after the day's last survey flight. The results are graphed and tabled below as per Schedule 3 S1.12 (u) & Schedule 3 S1.12 (x)





Av Normalized Th: 53.1 Min TH: 47.9 Max TH: 55.9 Standard Deviation: 1.4

Test Lines - VH-THS - Tanami												
		801				TH Chg		802				TH Chg
Date	Flt	TC	Pot	Ura	Tho	+/- 10%	Flt	TC	Pot	Ura	Tho	+/- 10%
14/07/2018	2	1397.2	99.7	50.2	53.6	0.0	2	1380.6	99.8	49.0	53.2	-0.4
15/07/2018	4	1398.2	97.8	50.5	53.9	0.6	4	1423.7	99.9	53.2	54.9	1.9
16/07/2018	5	1335.4	95.6	47.5	52.4	-2.2	5	1451.9	102.6	55.6	54.9	2.0
17/07/2018	6	1307.3	95.1	45.1	52.6	-1.9	6	1357.9	95.8	49.1	53.6	-0.1
18/07/2018	7	1280.4	90.7	47.0	47.9	-9.6	8	1411.8	101.4	51.7	55.5	4.2
19/07/2018	10	1307.3	95.1	45.1	52.6	-1.1	11	1390.0	99.8	50.6	54.0	1.4
22/07/2018	12	1269.6	92.0	42.9	51.0	-3.9	14	1398.3	99.7	52.1	54.3	2.1
23/07/2018	15	1460.0	102.6	55.4	53.8	1.1	16	1450.4	102.5	54.5	54.8	2.8
24/07/2018	17	1337.9	94.3	48.6	50.9	-4.3	18	1410.2	100.0	51.7	53.3	0.2
25/07/2018	19	1376.1	97.3	49.7	51.4	-3.2	19	1681.9	115.6	72.3	55.5	4.3
28/07/2018	20	1430.7	98.9	54.8	54.0	1.4	22	1362.5	97.3	50.5	53.1	-0.3
29/07/2018	23	1352.4	94.4	50.3	50.4	-5.1						
30/07/2018	24	1345.6	95.0	50.0	53.1	0.0						
03/08/2018	25	1288.6	92.6	46.2	51.9	-2.2	26	1275.4	92.1	46.4	51.5	-2.8
04/08/2018	27	1284.4	91.6	45.9	52.0	-1.8	28	1322.2	95.4	45.6	55.2	4.1
05/08/2018	29	1420.8	99.3	53.7	52.7	-0.6	30	1354.3	97.3	50.2	54.0	1.8
06/08/2018	31	1201.7	86.2	42.6	48.1	-9.1	32	1307.6	94.9	46.4	54.8	3.5
07/08/2018	33	1599.9	108.0	67.5	52.8	-0.3	34	1475.9	103.3	58.7	54.9	3.6
08/08/2018	35	1391.1	98.4	52.1	52.1	-1.7	36	1491.0	104.9	57.9	55.9	5.3
09/08/2018	37	1459.5	101.2	57.0	53.5	0.8	38	1362.5	97.3	50.5	53.1	0.0
10/08/2018	39	1382.0	99.6	51.9	51.4	-3.1	40	1482.0	104.6	57.3	55.4	4.3
16/08/2018	41	1311.7	94.0	46.1	52.4	-1.3	41	1410.6	99.9	53.6	54.7	3.0
17/08/2018	42	1411.1	97.8	54.1	52.6	-1.0	43	1443.0	100.9	55.7	54.2	2.0
18/08/2018	44	1377.7	97.3	51.2	52.9	-0.4	45	1501.7	105.2	58.6	53.4	0.5
19/08/2018	46	1570.8	107.5	64.0	53.2	0.1	47	1390.4	98.6	53.3	53.8	1.2
20/08/2018	48	1258.9	89.7	44.5	50.6	-4.7	49	1275.3	91.0	43.5	52.8	-0.5
21/08/2018	50	1438.7	99.9	56.4	52.5	-1.1	51	1357.7	97.1	49.0	53.9	1.5
22/08/2018	52	1427.6	99.8	55.5	52.0	-2.0	53	1361.3	97.3	50.7	53.3	0.4
23/08/2018	54	1545.1	105.4	63.1	53.5	0.8	55	1317.8	94.9	47.8	53.8	1.3
24/08/2018	56	1375.3	96.9	53.6	49.9	-5.9	56	1595.2	111.4	69.7	53.7	1.2
01/09/2018	57	1422.5	99.7	55.8	52.6	-0.8						
04/09/2018	58	1415.9	100.8	53.5	52.0	-1.9	58	1529.2	105.4	62.8	53.0	-0.1
05/09/2018	59	1478.7	103.1	56.1	54.8	3.3	60	1351.6	95.3	48.0	54.8	3.2
06/09/2018	61	1459.1	101.4	56.4	53.4	0.6	62	1337.7	95.3	47.3	53.8	1.3

Av Normalized Th: 53.1 Min TH: 47.9 Max TH: 55.9 Standard Deviation: 1.4

Test Lines - VH-THS - Tanami												
		801				TH Chg		802				TH Chg
Date	Flt	TC	Pot	Ura	Tho	+/- 10%	Flt	TC	Pot	Ura	Tho	+/- 10%
07/09/2018	63	1317.8	94.0	47.2	51.4	-3.2	64	1325.2	95.8	46.6	53.3	0.4
08/09/2018	65	1393.1	100.1	53.4	50.7	-4.4	66	1369.9	97.3	49.9	54.4	2.5
09/09/2018	67	1607.9	109.2	66.6	53.7	1.2						
10/09/2018	68	1277.2	90.6	45.4	51.9	-2.2	69	1390.3	100.1	51.4	54.2	2.1
11/09/2018	70	1311.4	93.1	45.3	53.2	0.2	70	1347.1	95.8	49.2	54.6	2.8
12/09/2018	71	1442.2	101.3	54.4	52.0	-2.0						
19/09/2018	73	1386.2	95.7	51.4	53.1	0.0	74	1368.9	96.9	49.9	55.5	4.5
20/09/2018	75	1364.6	96.4	50.0	52.5	-1.1	75	1388.4	99.7	52.1	53.1	0.0
21/09/2018	77	1461.9	101.1	56.1	52.4	-1.3	78	1433.4	100.3	55.7	53.6	0.9
22/09/2018	79	1496.8	104.3	59.5	53.7	1.1	80	1373.6	98.1	50.4	54.2	2.0
23/09/2018	81	1594.3	108.9	65.1	53.1	0.0	82	1284.3	92.4	44.3	54.0	1.6
25/09/2018	83	1489.7	103.9	57.9	55.0	3.5	84	1336.4	95.6	48.6	53.8	1.2
26/09/2018	85	1498.5	104.7	59.2	52.7	-0.9	86	1359.6	95.0	48.6	55.1	3.6
27/09/2018	87	1297.4	92.6	45.8	52.8	-0.7	88	1385.9	97.6	50.4	53.6	0.8
28/09/2018	89	1281.1	93.4	43.1	53.4	0.4	89	1362.6	97.3	48.5	53.6	0.8
01/10/2018	90	1249.0	89.1	42.7	51.8	-2.6	90	1307.7	95.3	44.9	53.1	-0.1
02/10/2018	91	1488.9	102.6	57.4	53.4	0.4	92	1320.5	94.8	45.9	54.4	2.3
03/10/2018	93	1280.0	92.4	44.4	52.6	-1.1	93	1342.7	96.7	46.5	53.1	-0.1
06/10/2018	94	1439.2	101.8	54.3	53.2	0.0	94	1407.8	99.9	52.3	54.0	1.5
07/10/2018	95	1440.2	100.8	53.6	54.6	2.6	96	1388.3	99.3	50.7	54.0	1.5
08/10/2018	97	1327.3	95.8	46.6	53.9	1.3	97	1405.6	98.1	51.6	54.9	3.1
10/10/2018	98	1339.2	95.6	47.8	52.4	-1.5	99	1334.4	95.2	46.3	54.7	2.7
12/10/2018	100	1262.4	91.4	45.1	49.9	-6.2	101	1281.0	93.2	45.1	51.4	-3.4
13/10/2018	102	1377.1	96.8	52.0	52.0	-2.2	103	1247.6	89.3	42.2	53.0	-0.3
14/10/2018	104	1425.7	100.8	54.6	52.7	-0.9	105	1236.7	90.8	42.5	52.1	-2.0
15/10/2018	106	1247.2	89.5	43.3	51.4	-3.3						
16/10/2018	108	1292.6	92.6	46.0	51.8	-2.5	109	1292.2	92.9	45.0	53.0	-0.3
17/10/2018	110	1414.1	99.8	53.6	53.2	0.1	111	1351.6	98.0	48.0	52.8	-0.6
18/10/2018	112	1273.4	91.7	44.4	51.6	-2.9	112	1272.4	91.1	44.5	51.4	-3.2
21/10/2018	114	1298.7	93.5	45.0	52.5	-1.1	115	1364.8	96.6	50.3	53.6	0.9
22/10/2018	116	1351.3	97.1	48.3	53.8	1.3	116	1357.3	96.5	49.1	53.3	0.4

4. Data processing

4.1 Equipment and software

Geosoft Oasis Montaj and Intrepid Geophysics software along with internally developed software and scripts were used in the data processing.

4.2 Elevation

- The processing steps for digital elevation data were as follows:

2. GPS elevation data were collected using egm96 geoid model and was converted to ellipsoid by adding difference values between geoid to ellipsoid to each measurement. The vertical difference between WGS84 and GRS80 (GDA94) ellipsoid are within the error margin of the survey.
3. The primary coordinate datum was in WGS84 which was converted to GDA94.
4. Linearity test calibration results stated in section 2.1 were applied on preliminary recorded raw radar and laser altimeter data to calculate the correct height above ground.
5. Parallax check. No parallax correction was required for the GPS data due to the relative location of the altimeter and GPS antennas on the aircraft.
6. De-spiking of laser and radar altimeter data using non-linear filter and 4^{th} difference filter using Geosoft Oasis Montaj. Further manual editing was also performed where required. For example, out of range data (e.g. heights >750 m recorded by laser altimeter) were removed as well as laser altimeter readings over lakes with a significant offset with adjacent lines due to effect of water and consequently interpolated to provide a reliable and consistent database. Therefore, radar altimeter and laser altimeter data are derived for further processing.
7. Check and edit the GPS height data for spikes and edit where required.
8. Calculation of raw laser and radar digital elevation data by subtracting the laser and radar altimeter from the GPS altitude, respectively. Height difference between GPS antenna and radar altimeter (1.13m) were also included.
9. Tie line levelling: tie line levelling was applied to the data by minimising the error between the tie lines and the traverse lines using the least-squares method with polynomial order of 0 and 1 if required. Further levelling steps were applied to individual lines with shorter smoothing lengths where required.
10. Micro-levelling was applied to the Polynomial levelled data to remove any residual levelling artefacts using Intrepid Data Processing software. The software uses a two-step process involving decorrugation and micro-levelling. Decorrugation is first applied to the Polynomial levelled gridded data, which detects residual features parallel to the acquisition line direction and produces a grid of the corrections required to remove the levelling artefacts. Micro-levelling is then applied, which extrapolates the correction values from the de-corrugation grid to an appropriate value for each point in the traverse lines. It then applies the corrections to the point data to remove the residual levelling artefacts. This micro-levelling process is based on a paper by Minty, 1991. At each step of the processing, care was taken to keep features that deemed real were remained intact. If it was not possible to determine whether a feature is real or is a residual error, it was preferred to leave it intact in the data. Tie line levelling and micro-levelling were performed using Intrepid Geophysics and Geosoft Oasis Montaj softwares.
11. N values that were used for adjusting the final DEM value was obtained from AusGeoid09 v1.01 supplied by Geoscience Australia. Adjustment to AHD for DEM of radar and laser altimeters was performed using the following formula:

DEM (AHD) = DEM (Ellipsoid) – N value

12. Sensor_height channel in the final database is the ellipsoidal elevation of laser altimeter using initial AHD elevation. In the following formula for calculation of sensor_height, Geoid_Ellipsoid conversion is the difference value (m) to convert geoid height to ellipsoid.:

sensor_height (ellipsoid)= Laser DEM (AHD) + laser altimeter + Geoid _Ellipsoid conversion (m)

4.3 Magnetics

1. The diurnal base station data was checked for spikes and steps, and suitably filtered prior to the removal of diurnal variations from the aircraft magnetic data.
2. The diurnal data was filtered with a 3 point wide Naudy filter to identify and remove noise above 0.05 nT.

   Two base stations were used during the survey which the data measured by the primary magnetometer was used for diurnal correction and the secondary base station did QC of data for in-house considerations. During the survey, both base mag stations was forced to move to a temporary location due to safety concerns and then returned to the primary location after a few days. This resulted in three histogram distributions of magnetic diurnal data with a minor DC shift which was compensated during initial steps of the tie line levelling.
3. The filtered diurnal is then applied to the survey data by synchronising the diurnal data date and time with the aircraft survey time. The total average diurnal base station value was added to the survey data.
4. The aircraft data was subject to field QC during the acquisition phase, and then additional QC during the final processing.
5. Parallax correction of 0.135 seconds (4.7 fiducial) was applied to the coordinates to match with the magnetic sensor location.
6. A fourth difference filter was run on the raw magnetic survey data in order to identify any remaining spikes in the data, which were manually edited from the data.
7. The X and Y positioning of the data was then checked for spikes before applying the IGRF correction. Any spikes in the positions were manually edited.
8. The 12th generation of IGRF for epoch 2015-2020 (Thébault et al., 2015) was calculated at each data point using Geosoft Oasis Montaj, considering the height above sea level using the GPS altitude. Individual flight date was used for this calculation. This regional magnetic gradient was subtracted from the survey data points.
9. The data was compensated post flight using a 16-terms model based on the work done by C.D. Hardwick (1986).
10. Magnetic compensation sequences were flown before acquisition commenced and after routine maintenance was performed. The resulting coefficients were used for post flight magnetic compensation using Geometrics MagComp software until the next routine maintenance.

    The final magnetic database was calculated by taking into account the diurnal magnetic variations and IGRF effects on compensated magnetic data as stated in the following formula. Tie line levelling and micro levelling process was then applied to this calculate magnetic database.

Final magnetic data = magnetic data (compensate and edited) – magnetic diurnal + average magnetic diurnal - IGRF value

11. Tie line levelling was applied to the data by least squares minimisation, using a polynomial fit of order 0, 1 and 2 if required, of the differences in magnetic values at the crossover points of the survey traverse and tie line data. Further levelling steps were applied to individual lines with shorter smoothing lengths and the polynomial fit of order 0 where required.

The least squares tie line levelling process employs a two pass Gauss-Seidel iterative scheme. The essential steps in this process are:

- In the first pass the tie lines were first adjusted to minimise, in the least squares sense, the crossover values with the traverse line values being held constant.
- The second pass held the levelled tied line values constant, and minimised in the least squares sense, the crossover values with traverses.
- The DC correction values to be applied to the traverse lines and tie lines were then applied to the data.

12. Micro-levelling is then applied to the Polynomial levelled data to remove any residual levelling artefacts using Intrepid Data Processing software similar to micro-levelling of elevation data. Micro-levelling extrapolates the correction values from the de-corrugation grid to an appropriate value for each point in the traverse lines. It then applies the corrections to the point data to remove the residual levelling artefacts.

- Following are the micro-levelling parameters for the main block of magnetics data:

  Across line high-pass cut-off: 600 m

  Along line low-pass cut-off: 5000 m

  Maximum amplitude of correction: 1 nT

  Across line high-pass cut-off: 600 m

  Along line low-pass cut-off: 3000 m

  Maximum amplitude of correction: 0.8 nT

  Across line high-pass cut-off: 600 m

  Along line low-pass cut-off: 1000 m

  Maximum amplitude of correction: 0.2 nT

- In addition to the micro-levelling described by above parameters, careful local micro-levelling was applied where required with appropriate parameters.
- For infilled blocks different parameters might have been used according to data and survey specifications.

During Tie line levelling and micro levelling of magnetic data, the second vertical derivative images of magnetic data were used to highlight flight noises and remove them. Micro levelling process applies a 1-dimensional filter along the traverse lines, and it might reduce the amplitude of some of the signals parallel to flight line direction. While some of these anomalies might inevitably have a reduction in their amplitude, the effort was made to minimise this decorrugation filtering effect on data and prevent disappearing any feature during micro levelling. This micro-levelling process is based on a paper by Minty, 1991.

4.4 Radiometrics

The processing steps for radiometric data were as follows:

1. A parallax correction of 0.5 sec was applied to the coordinates to match with the geophysical sensor location on the aircraft.
2. Checked radar and laser altimeter, pressure and temperature data for spikes. De-spiking and manual edits were performed where required.
3. NASVD spectral smoothing

a. Examine the output to determine the number of components required.
b. Select 8 components for spectral reconstruction.

4. Standard 256 channel radiometric corrections done:

a. Dead-time correction performed on 256 channel data.
b. Check if energy recalibration required
c. Remove 256 channel aircraft and cosmic backgrounds from the data
d. Remove background radon from window data using spectral ratio method.
e. Perform STP height corrected spectral stripping
f. Perform STP height correction of window data to specified survey height (60m).
g. Micro-levelling
h. Conversion to ground concentration using coefficients derived from Carnamah radiometric calibration range.

After consulting with Dr. Brian Minty and Geoscience Australia, NASVD spectral processing was done using the first 8 components. This step was done per flight basis with permission from Geoscience Australia.

Micro-levelling was applied where required with the following general parameters:

Across line high-pass cut-off: 500 m

Along line low-pass cut-off: 10000 m

Maximum amplitude of correction: appropriate amplitude per TC, K, U and Th windows

In addition to the micro-levelling described by above parameters, careful local micro-levelling was applied where required with appropriate parameters.

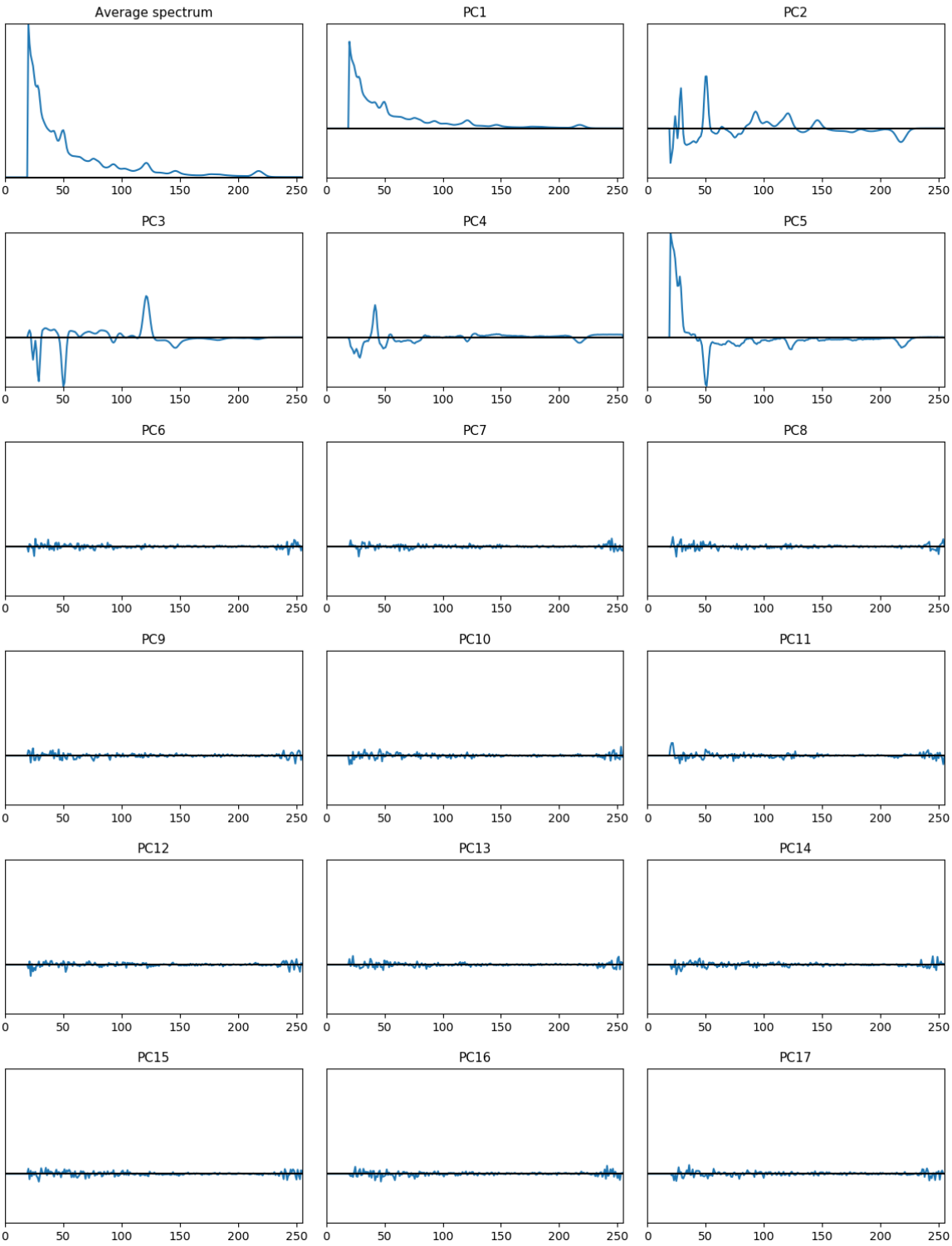


Figure 12. NASVD Principal Component Plots

5. Deliverable items

The deliverable items included all digital data. The located data conformed to ASEG-GDF II format and the gridded data was supplied in ERMapper format. The main survey block (with a line spacing of 200m) and two infilled blocks of 5ZA and 5N (with a line spacing of 100 m) were delivered to GA. For infilled blocks, flight numbers differ from what stated in the main block and were delivered. The description of the delivered data is below:

File name	Definition
P1312_ FLT003_FLT116_RawEdited_Mag	Raw magnetic data
P1312_ FLT003_FLT116_RawEdited_Elev	Raw elevation data
P1312_ FLT003_FLT116_RawEdited_Rad	Raw 256 channel and window radiometric data
P1312_ FLT003_FLT116_Final_Mag	Final magnetic data
P1312_ FLT003_FLT116_Final_Elev	Final elevation data
P1312_ FLT003_FLT116_Final_Rad	Final radiometric data

File name	Definition	Units
P1312_TMI.ers	Magnetics	nT
P1312_RTP.ers	Magnetics reduced to the pole	nT
P1312_RTP_fft1VD.ers	First vertical derivative of magnetics reduced to the pole	nT/m
P1312_DEMradar.ers	Final elevation (AHD) gridded data. Radar	m (AHD)
P1312_DEMlaser.ers	Final elevation (AHD) gridded data. Laser	m (AHD)
P1312_DoseRate_nasvd.ers	Dose Rate (no spectral smoothing)	nGy/hr
P1312_K_nasvd.ers	Potassium Concentration (no spectral smoothing)	percent
P1312_U_nasvd.ers	Uranium Concentration (no spectral smoothing)	ppm
P1312_Th_nasvd.ers	Thorium Concentration (no spectral smoothing)	ppm
P1312_DoseRate_no_nasvd.ers	Dose Rate (spectral smoothing)	nGy/hr
P1312_K_no_nasvd.ers	Potassium Concentration (spectral smoothing)	percent
P1312_U_no_nasvd.ers	Uranium Concentration (spectral smoothing)	ppm
P1312_Th_no_nasvd.ers	Thorium Concentration (spectral smoothing)	ppm

6. Format of final located ASCII files

6.1 Final Elevation Dataset:

Column	Format	Dummy	Unit	Description
RT	A4	-	-	
survey	I5	-999	-	Project number
flight	I4	-99	-	Flight number
LINE	I9	-9999999	-	Line number
FID	I9	-9999999	-	Fiducial number
dateCode	I9	-9999999	YYYYMMDD	Date
bearing	I4	-99	deg	Bearing
longitude_gda94	F12.7	-99.9999999	deg	GDA94 longitude
latitude_gda94	F12.7	-99.9999999	deg	GDA94 Latitude
easting_gda94	F11.2	-999999.99	m	GDA94 MGA52 Easting
northing_gda94	F11.2	-999999.99	m	GDA94 MGA52 Northing
gps_height	F8.2	-999.99	m	GDA94 (ellipsoidal) GPS Height (edited and interpolated)
Zone	I3	-9	-	MGA Zone Number
radar_alt	F8.2	-999.99	m	Radar Altimeter (edited & interpolated if required and calibrated)
laser_alt	F8.2	-999.99	m	Laser Altimeter (edited & interpolated if required and calibrated)
sensor_height	F8.2	-999.99	m	Elevation (ellipsoidal) of laser altimeter
dem_laser	F8.2	-999.99	m	Micro levelled digital elevation model of laser altimeter (AHD)
dem_radar	F8.2	-999.99	m	Micro levelled digital elevation model of radar altimeter (AHD

6.2 Final Magnetics Dataset:

Column	Format	Dummy	Unit	Description
RT	A4	-	-	
survey	I5	-99	-	Project number
flight	I4	-9	-	Flight number
LINE	I9	-999999	-	Line number
FID	I9	-999999	-	Fiducial number
dateCode	I9	-999999	YYYYMMDD	Date
gps_time	F8.2	-999.99	s	Time seconds past midnight UTC
local_time	F8.2	-999.99	s	Time seconds past midnight Northern Territory Standard Time (UTC +9:30)
bearing	I4	-9	deg	Bearing
longitude_gda94	F12.7	-99.9999999	deg	GDA94 longitude (parallax corrected to location of Mag sensor)
latitude_gda94	F12.7	-99.9999999	deg	GDA94 Latitude (parallax corrected to location of Mag sensor)
easting_gda94	F11.2	-999999.99	m	GDA94 MGA52 Easting (parallax corrected to location of Mag sensor)
northing_gda94	F11.2	-999999.99	m	GDA94 MGA52 Northing (parallax corrected to location of Mag sensor)
gps_height	F8.2	-999.99	m	GDA94 (ellipsoidal) GPS Height (parallax corrected to location of Mag sensor)
zone	I3	-9	-	MGA Zone Number
radar_alt	F8.2	-999.99	m	Radar Altimeter (edited & interpolated if required, calibrated & parallax corrected to location of mag sensor)
laser_alt	F8.2	-999.99	m	Laser Altimeter (edited & interpolated if required, calibrated & parallax corrected to location of mag sensor)
dem_laser	F8.2	-999.99	m	Micro levelled digital elevation model of laser altimeter (AHD)

dem_radar	F8.2	-999.99	m	Micro levelled digital elevation model of radar altimeter (AHD)
magnetics_final_tielevelled	F10.3	-9999.999	nT	Final tie line levelled magnetics
magnetics_final_microlevelled	F10.3	-9999.999	nT	Final micro levelled magnetics
magnetics_final_microlevelled_1vd	F10.3	-9999.999	nT	First vertical derivative (fft line filter) of final micro levelled magnetics
magnetic_diurnal	F10.3	-9999.999	nT	Magnetic diurnal (interpolated)
magnetic_igrf	F10.3	-9999.999	nT	Calculated IGRF

6.3 Radiometrics Dataset:

Column	Format	Dummy	Unit	Description
RT	A4	-	-	
Survey	I5	-99	-	Project number
Flight	I4	-9	-	Flight number
Line	I9	-999999	-	Line number
Fid	I9	-999999	-	Fiducial number
Date Code	I9	-999999	YYYYMMDD	Date
Bearing	I4	-9	degrees	Bearing
Longitude GDA94	F12.7	-99.9999999	degrees	GDA94 Longitude
Latitude GDA94	F12.7	-99.9999999	degrees	GDA94 Latitude
Easting GDA94	F11.2	-999999.99	metres	GDA94 MGA52 Easting
Northing GDA94	F11.2	-999999.99	metres	GDA94 MGA52 Northing
GPS Height	F8:2	-999.99	metres	GPS height
Zone	I3	-9	-	MGA zone
Radar Alt	F8.2	-999.99	metres	Raw Parallax corrected & calibrated radar altimeter
Laser Alt	F8.2	-999.99	metres	Raw Parallax corrected & calibrated laser altimeter
DEM Laser	F8.2	-999.99	metres	Laser elevation
DEM Radar	F8.2	-999.99	metres	Radar elevation
Pressure	F8.2	-999.99	mbar	Barometric pressure
Temperature	F6.2	-9.99	degC	C Temperature
Dose no NASVD	F10.3	-9999.999	nGy/hr	Final Dose Rate (no spectral smoothing)
K percent no NASVD	F9.3	-999.999	%	Final Potassium Concentration (no spectral smoothing)
U ppm no NASVD	F9.3	-999.999	ppm	Final Uranium Concentration (no spectral smoothing
Th ppm no NASVD	F9.3	-999.999	ppm	Final Thorium Concentration (no spectral smoothing)
Dose NASVD	F10.3	-9999.999	nGy/hr	Final Dose Rate (no spectral smoothing)
K percent NASVD	F9.3	-999.999	%	Final Potassium Concentration (spectral smoothing)
U ppm NASVD	F9.3	-999.999	ppm	Final Uranium Concentration (no spectral smoothing)
Th ppm NASVD	F9.3	-999.999	ppm	Final Thorium Concentration (no spectral smoothing)

7. References

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8. Flight Logs

Daily Log								
Date	Flt Num	Block(s)	Operator(s)	Aircraft	SBY	MNT	SUS	Comments
13/07/2018		Tanami East West Area		VH-THS				
14/07/2018	1	Tanami East West Area	L Bell	VH-THS				Flew Cloverleaf.
14/07/2018	2	Tanami East West Area	L Bell	VH-THS				Flew two Comp Boxes.
14/07/2018	3	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 101420-101430. All lines accepted.
15/07/2018	4	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 100010-100040, and flew Tie Lines 190010-190020 and 191150-191180. All lines accepted.
16/07/2018	5	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 100050-100080 and Tie Lines 191040-191140. All lines accepted.
17/07/2018		Tanami East West Area		VH-THS				
17/07/2018		Tanami East West Area		VH-THS				
17/07/2018	6	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 100170-100180. All lines accepted.
18/07/2018	7	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 100130-100160 and Tie Lines 190030-190100. All lines accepted.
18/07/2018	8	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 100090 and 100120. All lines accepted.
19/07/2018	9	Tanami East West Area	L Bell	VH-THS				Flight abandoned.
19/07/2018	10	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 100100 and 100110. All lines accepted.
19/07/2018	11	Tanami East West Area	L Bell	VH-THS				Flew Trav Line 100190-100220. All lines accepted. Heights busts in Trav Lines 100210 and 100220 due to occupied buildings.
20/07/2018		Tanami East West Area			1.0			Full day standby due to unsuitable survey weather.
21/07/2018		Tanami East West Area			1.0			Full day standby due to unsuitable survey weather.
22/07/2018	12	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 100230-100240. All lines accepted.
22/07/2018	13	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 100250-100260. All lines accepted.
22/07/2018	14	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 100730-100760. All lines accepted.
23/07/2018	15	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 100690-100720 and Tie Lines 190110-1901140. All lined accepted.
23/07/2018	16	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 100270-100300 and Tie Lines 190950-191030. All lines accepted.
24/07/2018	17	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 100310-100350. All lines accepted.
24/07/2018	18	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 100650-100680. All lines accepted except for Trav Line 100670, due to out of spec diurnal.
25/07/2018	19	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 100360-100370. All lines accepted.
25/07/2018		Tanami East West Area				0.5		Half day standby due to scheduled maintenance.

Daily Log								
Date	Flt Num	Block(s)	Operator(s)	Aircraft	SBY	MNT	SUS	Comments
25/07/2018		Tanami East West Area		VH-THS				Aircraft ferried from Tanami to Batchelor for maintenance.
26/07/2018		Tanami East West Area				1.0		Full day standby due to scheduled maintenance.
27/07/2018		Tanami East West Area		VH-THS				Aircraft return to Tanami after maintenance completed in Batchelor.
27/07/2018		Tanami East West Area				1.0		Full day standby due to maintenance
28/07/2018	20	Tanami East West Area	R Butterfield	VH-THS				First flight after maintenance inspection. Compbox completed successfully.
28/07/2018	21	Tanami East West Area	R Butterfield	VH-THS				Flew Trav Lines 100620-100640 and 100671. Reflight Line 100670 completed after original line rejected due to diurnal. All data accepted.
28/07/2018	22	Tanami East West Area	R Butterfield L Bell	VH-THS				Flew Trav Lines 100380-100410 and Tie Lines 190930-190940. All data accepted.
29/07/2018	23	Tanami East West Area	R Butterfield	VH-THS				Survey flight attempted however aborted due to power failure to the magnetometer. Remainder of the day spent fault finding and trouble shooting finally resolving the issue by replacing the mag and routing through a different terminal of the KMAG decoupler.
29/07/2018		Tanami East West Area				1.0		No flying possible due to an issue with the survey system. Strong winds were also affecting the area and would have likely made conditions very difflcult for survey in any case.
30/07/2018	24	Tanami East West Area	R Butterfield	VH-THS				Trav lines 100580 - 100610 completed. Windy conditions noted by pilot making flying conditions difficult. A compbox was also completed at the end of the survey flight dueto changes to the mag sensor yesterday.
30/07/2018		Tanami East West Area		VH-THS				While prepping for the afternoon flight a fault was discovered with the instrumentation of the aircraft and after discussions with engineering the decision was made to send the aircraft to Batchelor for rectification. The aircraft departed early afternoon and should hopefuly return to site by midday tomorrow for production to continue in the afternoon.
30/07/2018		Tanami East West Area				0.5		Unscheduled maintenance
31/07/2018		Tanami East West Area		VH-THS				Aircraft ferried from Batchelor to Tanami, returning to service after magneto repair.

Daily Log								
Date	Flt Num	Block(s)	Operator(s)	Aircraft	SBY	MNT	SUS	Comments
31/07/2018		Tanami East West Area				1.0		Survey flight 25 attempted however start up was aborted after aircraft instrumentation indicated a problem with electircal power. On further investigation and consultation with engineering it appeared that the starter generator had encountered a failure possibly due to an electrical fault. Aircraft will need further repair by licensed engineer.
01/08/2018		Tanami East West Area				1.0		No survey flying possible while waiting for new parts and engineer to repair starter motor.
02/08/2018		Tanami East West Area				0.5		Engineer arrived and the started motor of the aircraft was successfully replaced.
02/08/2018		Tanami East West Area			0.5			Due to strong winds associated with the cold front moving across the country conditions in the afternoon were not conducive for survey operations and aircraft were grounded.
03/08/2018	25	Tanami East West Area	R Butterfield	VH-THS				Trav lines 100570 - 100540 completed. Compbox 701 and 702 completed at the end of the flight after starter motor change yesterday.
03/08/2018	26	Tanami East West Area	R Butterfield	VH-THS				Trav lines 100420 to 100450 completed in full. Lines 10460 to 100480 split in half.
04/08/2018	27	Tanami East West Area	R Butterfield	VH-THS				L100461 to L100481 patches of lines split yesterday.
04/08/2018	28	Tanami East West Area	R Butterfield	VH-THS				trav lines 100520, 100770, 100780, 100790 completed. Tie lines 190150 and 190160 completed. Compbox completed at the end of the flight after yesterday's compbox was unsuccessful due to conditions.
05/08/2018	29	Tanami East West Area	R Butterfield	VH-THS				L100530, L100800 to L100840. Lines 83 and 84 split and will need to be patched in the next flight.
05/08/2018	30	Tanami East West Area	R Butterfield	VH-THS				L100830 and L100840 split on previous flight and completed via a patch during this flight. Flight aborted early due to winds causing turbulent condtions
06/08/2018	31	5 ZA Area	R Butterfield	VH-THS				Infill area 5ZA flown in completion.
06/08/2018	32	Tanami East West Area	R Butterfield	VH-THS				Trav lines 101460 to 101510 and tie lines 190170 to 190320 completed.
07/08/2018	33	Tanami East West Area	R Butterfield	VH-THS				Trav L101370 - L101450 and L101520 completed. All data accepted
07/08/2018	34	Tanami East West Area	R Butterfield	VH-THS				Trav lines L100870 to L100900 completed in full and L100910 and L100920 partially completed to be patched tomorrow.

Daily Log								
Date	Flt Num	Block(s)	Operator(s)	Aircraft	SBY	MNT	SUS	Comments
08/08/2018	35	Tanami East West Area	R Butterfield	VH-THS				Trav lines 100911 and 100921 patched from previous flight. L100930 to L100960 completed in full.
08/08/2018	36	Tanami East West Area	R Butterfield	VH-THS				L101530-L101550 and L101360-L101320 flown and accepted.
09/08/2018	37	Tanami East West Area	R Butterfield	VH-THS				L101260-L101310 completed, L101260 only a part line to be patched on the next flight.
09/08/2018	38	Tanami East West Area	R Butterfield	VH-THS				L100970-L101010 flown and all data accepted.
10/08/2018	39	Tanami East West Area	R Butterfield	VH-THS				L101020-L101050 completed. All data accepted.
10/08/2018	40	Tanami East West Area	R Butterfield	VH-THS				L101261 completed after part flight yesterday. L101240 and L101250 flown. Reflight patches of L100520 and L100660 completed.
11/08/2018		Tanami East West Area				1.0		Aircraft scheduled maintenance
12/08/2018		Tanami East West Area		VH-THS				Scheduled aircraft maintenance.
13/08/2018		Tanami East West Area				1.0		Scheduled aircraft maintenance
14/08/2018		Tanami East West Area				1.0		Scheduled Aircraft maintenance
15/08/2018		Tanami East West Area				1.0		Scheduled aircraft maintenance
16/08/2018		Tanami East West Area				0.5		Scheduled aircraft maintnenance complete.
16/08/2018		Tanami East West Area		VH-THS				Aircraft returned to site after completion of scheduled maintenance.
16/08/2018	41	Tanami East West Area	R Butterfield	VH-THS				2 compboxes post maintenance completed followed by trav lines 101060 and 101070. All data accepted.
17/08/2018	42	Tanami East West Area	R Butterfield	VH-THS				trav lines 101080-101120 completed. Partial reflight line 100880 also flown, previously rejected due to diurnal. All data accepted.
17/08/2018	43	Tanami East West Area	R Butterfield	VH-THS				Trav lines 101210-101180 completed, all data accepted. Dunnings fuel truck arrived and replenished fuel supply onsite.
18/08/2018	44	Tanami East West Area	R Butterfield	VH-THS				Trav lines 101560-101650 completed. Pilot reported winds and turbulent condtions on the survey area.
18/08/2018	45	Tanami East West Area	R Butterfield	VH-THS				Reflight lines; 100020, 100060, (patched from western boundary) 100080 and 190160 (reflown in full) completed along with tie lines 190330, 190910 and 190920. Turbulent conditions reported from pilot. All data accepted.
19/08/2018	46	Tanami East West Area	R Butterfield	VH-THS				First flight attempt aborted due to strong winds. Survey plan reassessed and 2nd attempt successful. Tie lines 190450-T190520 completed. All data accepted.

Daily Log								
Date	Flt Num	Block(s)	Operator(s)	Aircraft	SBY	MNT	SUS	Comments
19/08/2018	47	Tanami East West Area	R Butterfield	VH-THS				Ti e lines 190340-190440 completed. Unable to fly trav lines due to strongg easterly winds.
20/08/2018	48	Tanami East West Area	R Butterfield	VH-THS				Strong easterly winds limited operations to tie lines.
20/08/2018	49	Tanami East West Area	R Butterfield	VH-THS				trav and tie lines completed. trav 101220 only partially completed.
21/08/2018	50	Tanami East West Area	R Butterfield	VH-THS				Trav lines 101130-101170 completed. Line 101220 patched after partial completion yesterday.
21/08/2018	51	Tanami East West Area	R Butterfield	VH-THS				trav lines 101670-10174 completed. Reflight patch of L101650 also completed. All data accepted.
22/08/2018	52	5 North Area	R Butterfield	VH-THS				Infill area 5North commenced. All tie lines completed and L300010 to L300110 completed. All data accepted.
22/08/2018	53	5 North Area	R Butterfield	VH-THS				Trav lines continued on the 5 North Infill area with L300120-L300380 completed. All data accepted.
23/08/2018	54	5 North Area	R Butterfield	VH-THS				trav lines 300390-300700 completed. All data accepted.
23/08/2018	55	5 North Area	R Butterfield	VH-THS				trav lines 300740-301020 completed. All data accepted.
24/08/2018	56	5 North Area	R Butterfield	VH-THS				trav lines completed on the 5 North infill area. All data accepted.
24/08/2018		Tanami East West Area		VH-THS				Aircraft ferried to Batchelor for scheduled maintenance.
24/08/2018		Tanami East West Area				0.5		Scheduled maintenance.
25/08/2018		Tanami East West Area				1.0		Scheduled maintenance.
26/08/2018		Tanami East West Area				1.0		Scheduled maintenance.
27/08/2018		Tanami East West Area				1.0		Scheduled maintenance.
28/08/2018		Tanami East West Area				1.0		Scheduled maintenance.
29/08/2018		Tanami East West Area				1.0		Scheduled maintenance.
30/08/2018		Tanami East West Area				1.0		Scheduled maintenance.
31/08/2018		Tanami East West Area				1.0		Scheduled maintenance.
31/08/2018		Tanami East West Area		VH-THS				Ferry flight from Batchelor to the Tanami after scheduled maintenance.
01/09/2018	57	5 North Area	L Bell	VH-THS				Flew Trav Line 301160-301590. All lines accepted, except for Trav Line 301160, which will be reflown in full, and a section of Trav Line 301170, which will be patched.
02/09/2018		Tanami East West Area			1.0			Full day standby due to unsuitable survey weather.
03/09/2018		Tanami East West Area			1.0			Full day standby due to unsuitable survey weather.

Daily Log								
Date	Flt Num	Block(s)	Operator(s)	Aircraft	SBY	MNT	SUS	Comments
04/09/2018	58	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 101750-101760. Trav Line 101750 accepted. Trav Line 101760 not accepted due to speed busts.
04/09/2018		Tanami East West Area			1.0			Full day standby due to unsuitable survey weather.
05/09/2018	59	Tanami East West Area 5 North Area	L Bell	VH-THS				Flew Trav Lines 101760-101840, 300720 and 301140-301160. All lines accepted. Trav Line 101830 split as pilot was blown off line and reintercepted the line 10km back so as to have acceptable overlap.
05/09/2018	60	Tanami East West Area	L Bell	VH-THS				Flew Trav Line 101850-101940. All lines accepted, except for a section of Trav Lines 101890 and 101930, both due to speed busts.
06/09/2018	61	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 101950-102040. All lines accepted.
06/09/2018	62	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 102070-102160. All lines accepted.
07/09/2018	63	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 102050-102060 and 102170102240. All lines accepted.
07/09/2018	64	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 102250-102340. All lines accepted.
08/09/2018	65	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 102350-102440. All lines accepted. Trav Line 102360 will be completed at a later date.
08/09/2018	66	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 102450-102540. All lines accepted.
09/09/2018	67	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 102550-102580. All lines accepted, except for Trav Line 102580 which was abandoned due to unsuitable survey weather, and will be reflown in full.
09/09/2018		Tanami East West Area			1.0			Full day standby due to unsuitable survey weather.
10/09/2018	68	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 102580-102670. All lines accepted, except for sections of Trav Line 102590 and 102610, both due to speed busts.
10/09/2018	69	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 102680-102770. All lines accepted.
11/09/2018	70	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 102780-102870. All lines accepted. Height bust in Trav Lines 102780-102790 due to radio tower. No morning flight due to unsuitable survey weather.
12/09/2018	71	Tanami East West Area	L Bell	VH-THS				Flew Trav Lines 102880-102970. All lines accepted.
12/09/2018	72	Tanami East West Area 5 North Area	L Bell	VH-THS				Flew Trav Lines 101891, 101931, 102131, 102361, 102591, 102611, 10298-102990 and 301171. All lines accepted, except for a section of Trav Line 102990, which will be reflown and completed at a later date. Flight abandoned early due to mechanical issues.

Daily Log								
Date	**Flt Num**	**Block(s)**	**Operator(s)**	**Aircraft**	**SBY**	**MNT**	**SUS**	**Comments**
13/09/2018		Tanami East West Area		VH-THS				Aircraft ferried to Batchelor for routine inspection.
14/09/2018		Tanami East West Area				1.0		Scheduled maintenance
14/09/2018		Tanami East West Area		VH-THS				Test flight completed as part of the inspection.
15/09/2018		Tanami East West Area				1.0		Scheduled maintenance
16/09/2018		Tanami East West Area				1.0		Scheduled maintenance
17/09/2018		Tanami East West Area				1.0		Scheduled maintenance
18/09/2018		Tanami East West Area		VH-THS				Aircraft ferried from Batchelor to Tanami post inspection.
18/09/2018		Tanami East West Area			0.5			No flying possible due to strong winds and smoke from bushfires in the direct vacinity of the base of operations.
19/09/2018	73	Tanami East West Area	R Butterfield	VH-THS				L103000 to L103050 flown and accepted. 2 compboxes flown and accepted
19/09/2018	74	Tanami East West Area	R Butterfield	VH-THS				L104200 to L104110 flown and accepted
20/09/2018	75	Tanami East West Area	R Butterfield	VH-THS				L104100 and L104090 attempted with only L104100 accepted. Strong winds making speed difficult to control causing L104090 to be rejected. Flight aborted due to strong wind.
20/09/2018	76	Tanami East West Area	R Butterfield	VH-THS				Take off delayed due to strong winds through the morning. L103070 to L103120 flown and accepted. L102990 patched from earlier flight as the end of line was affected when alternator failed during flight.
21/09/2018	77	Tanami East West Area	R Butterfield	VH-THS				L103060 then L103130 to L103210 flown and accepted.
21/09/2018	78	Tanami East West Area	R Butterfield	VH-THS				L104000 to L1040902 flown and accepted. L1040902 a reflight after speed busts through the line yesterday.
22/09/2018	79	Tanami East West Area	R Butterfield	VH-THS				L103990 to L103900 flown. Some lines with speed busts due to wind and terrain under review.
22/09/2018	80	Tanami East West Area	R Butterfield	VH-THS				L103220 to L103310 flown and all data accepted.
23/09/2018	81	Tanami East West Area	R Butterfield	VH-THS				L103320-L103350 completed and accepted. Flight aborted early due to strong winds and excessive turbulence.
23/09/2018	82	Tanami East West Area	R Butterfield	VH-THS				L103820 to L103890 flown and all data accepted.
24/09/2018		Tanami East West Area				1.0		Aircraft forced to return to Batchelor for engineering support for a braking issue.
24/09/2018		Tanami East West Area		VH-THS				Aircraft ferried to Batchelor for unscheduled maintenance
24/09/2018		Tanami East West Area		VH-THS				Aircraft ferried back to Tanami after repair.

Daily Log								
Date	Flt Num	Block(s)	Operator(s)	Aircraft	SBY	MNT	SUS	Comments
25/09/2018	83	Tanami East West Area	R Butterfield	VH-THS				L103360-L103450 flown. All accepted bar speed bust on L103410 that will be patched.
25/09/2018	84	Tanami East West Area	R Butterfield	VH-THS				L103740-L103810 completed and all data accepted. L103921, L103941 and L103962 were patched after speed busts during flight 79 caused relfight.
26/09/2018	85	Tanami East West Area	R Butterfield	VH-THS				L103640 - L103730 completed and all data accepted.
26/09/2018	86	Tanami East West Area	R Butterfield	VH-THS				L103460-L103550 flown and all data accepted.
27/09/2018	87	Tanami East West Area	R Butterfield	VH-THS				L103560-L103630 then L104210-L104220 plus L103410 reflight patch flown and all data accepted.
27/09/2018	88	Tanami East West Area	R Butterfield	VH-THS				L104230-L10432 flown and all data accepted
28/09/2018	89	Tanami East West Area	R Butterfield	VH-THS				L104330 to L104400 completed. Start of L104370 rejected due missed entry.
29/09/2018		Tanami East West Area			1.0			No survey operations possible due to strong winds in the area.
30/09/2018		Tanami East West Area				1.0		Aircraft unable to fly due to failed master solenoid. Engineer expected onsite tomorrow morning for repair.
01/10/2018	90	Tanami East West Area	R Butterfield	VH-THS				L104410-L104480 flown and accepted. L104371 a patch at the start of line due to poor line entry during flight 89, data accepted.
01/10/2018		Tanami East West Area				0.5		Engineer arrived late morning and repaired failed solenoid. Aircraft signed out to return to service just after mid day.
02/10/2018	91	Tanami East West Area	R Butterfield	VH-THS				L104490-L104580 completed and all data accepted.
02/10/2018	92	Tanami East West Area	R Butterfield	VH-THS				L106820-L106910 and T190750-T190770 completed and all data accepted.
03/10/2018	93	Tanami East West Area	R Butterfield	VH-THS				L106720-L106810 flown and accepted. T190810 and T190740 flown and accepted.
03/10/2018		Tanami East West Area		VH-THS				Aircraft ferried to Batchelor for scheduled maintenance.
03/10/2018		Tanami East West Area				0.5		Scheduled maintenance.
04/10/2018		Tanami East West Area				1.0		Scheduled maintenance.
05/10/2018		Tanami East West Area				1.0		Scheduled maintenance
06/10/2018		Tanami East West Area				0.5		completion of scheduled maintenance
06/10/2018		Tanami East West Area		VH-THS				Aircraft ferried to Tanami post maintenance inspection. A. Langmead replaces E. Courtois.
06/10/2018	94	Tanami East West Area	R Butterfield	VH-THS				T190720 & T190730 plus L106600-L106710 all flown and all data accepted.

Daily Log								
Date	Flt Num	Block(s)	Operator(s)	Aircraft	SBY	MNT	SUS	Comments
07/10/2018	95	Tanami East West Area	R Butterfield	VH-THS				L106480-L106590 and T190710 flown and all data accepted. Compboxes also flown at the start of the flight due to recently completed maintenance.
07/10/2018	96	Tanami East West Area	R Butterfield	VH-THS				L104590-L104680 flown and all data accepted.
08/10/2018		Tanami East West Area			0.5			Operations delayed at the start of the day due to potential diurnal activity. Base data collected and assessed prior to the commencement of survey ops.
08/10/2018	97	Tanami East West Area	R Butterfield	VH-THS				T190690 and T190700 flown and accepted. L106350 - L106470 flown and accepted. Turbulent conditions experienced at the end of the day due to enchroaching weather.
09/10/2018		Tanami East West Area		VH-THS				Survey flight aborted due to storms in the area.
09/10/2018		Tanami East West Area			1.0			No survey flying possible due to storms in the area.
10/10/2018	98	Tanami East West Area	R Butterfield	VH-THS				L104690-L104780 flown and accepted.
10/10/2018	99	Tanami East West Area	R Butterfield	VH-THS				T190670 & T190680 flown and accepted. L106320-L106340 and L106370 all flown and accepted.
11/10/2018		Tanami East West Area			1.0			No survey operations possible due clearing storm activity.
12/10/2018	100	Tanami East West Area	R Butterfield	VH-THS				L106210-L106310, T190530 & T190660 flown and all data accepted.
12/10/2018	101	Tanami East West Area	R Butterfield	VH-THS				L104780-L104840 and L105320-L105350 flown and accepted. Pilot was forced to move north of planned lines to avoid weather in the area.
13/10/2018	102	Tanami East West Area	R Butterfield	VH-THS				L104850-L104940 flown and all data accepted.
13/10/2018	103	Tanami East West Area	R Butterfield	VH-THS				L106110-L106200 and T190650 & T190800 completed and all data accepted.
14/10/2018	104	Tanami East West Area	R Butterfield	VH-THS				L106000-L106090 plus T190540 and T190640 flown and all data accepted.
14/10/2018	105	Tanami East West Area	R Butterfield	VH-THS				L104950-L105020 completed and all data accepted
15/10/2018	106	Tanami East West Area	R Butterfield	VH-THS				L105030-L105120 completed and all data accepted.
15/10/2018	107	Tanami East West Area	R Butterfield	VH-THS				L105880-L105990 flown and accepted. L190780 was aborted approximately 5km from end due to low visibility caused by smoke from a near bush fire.
16/10/2018	108	Tanami East West Area	R Butterfield	VH-THS				L105780-L105870 flown and completed. T190550 and T190560 flown and accepted. T190780 patched at the southern end after yesterday was aborted.

Daily Log								
Date	Flt Num	Block(s)	Operator(s)	Aircraft	SBY	MNT	SUS	Comments
16/10/2018	109	Tanami East West Area	R Butterfield	VH-THS				L105130-L105240 completed and all data accepted.
17/10/2018	110	Tanami East West Area	R Butterfield	VH-THS				L505250-L505130 then L505360-L505380 flown and all data accepted.
17/10/2018	111	Tanami East West Area	R Butterfield	VH-THS				L105730-L105770 plus T190630 flown and accepted. Survey flight aborted due to storm build up in the survey area.
18/10/2018	112	Tanami East West Area	R Butterfield	VH-THS				T190620-T190570 flown and all data accepetd.
18/10/2018		Tanami East West Area		VH-THS				Aircraft ferried from Tanami to Batchelor for rotine inspection.
18/10/2018		Tanami East West Area				0.5		Routine inspection
19/10/2018		Tanami East West Area				1.0		Routine inspection
20/10/2018		Tanami East West Area		VH-THS				Aircraft ferried from Batchelor to Tanami
20/10/2018	113	Tanami East West Area	R Butterfield	VH-THS				Compbox calibration completed
20/10/2018		Tanami East West Area			1.0			No survey operations possible due to poor waether in the area.
21/10/2018	114	Tanami East West Area	R Butterfield	VH-THS				L105610-L105720 flown and all data accepted.
21/10/2018	115	Tanami East West Area	R Butterfield	VH-THS				L105390-L105480 flown and all data accepted.
22/10/2018	116	Tanami East West Area	R Butterfield	VH-THS				L105490-L105600 flown and all data accepted. L105420 patched at the western end due spectrometer spike during yesterday's flight 115.

9. Processed Grids

Final flight paths and grids for the main block and two infilled blocks of 5ZA and 5N are supplied in this section.

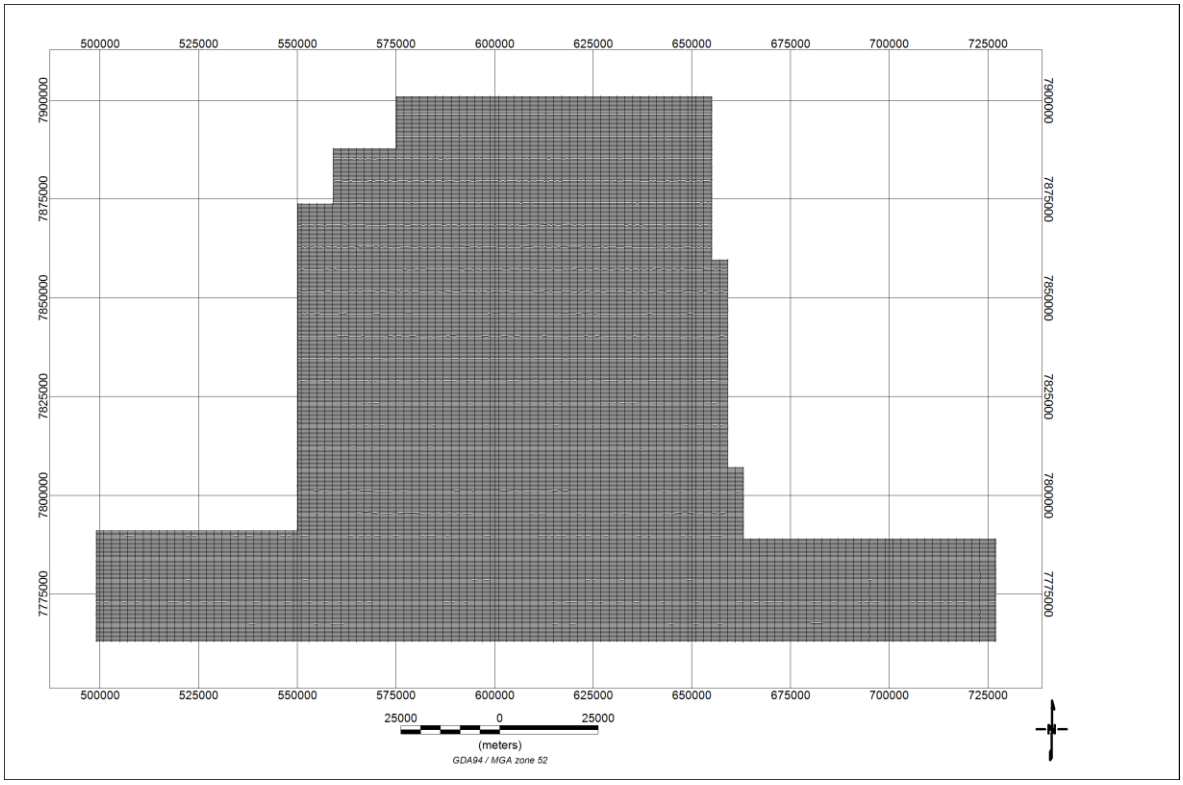

Figure 13. Flight path map of the main EW block (line spacing of 200 m).

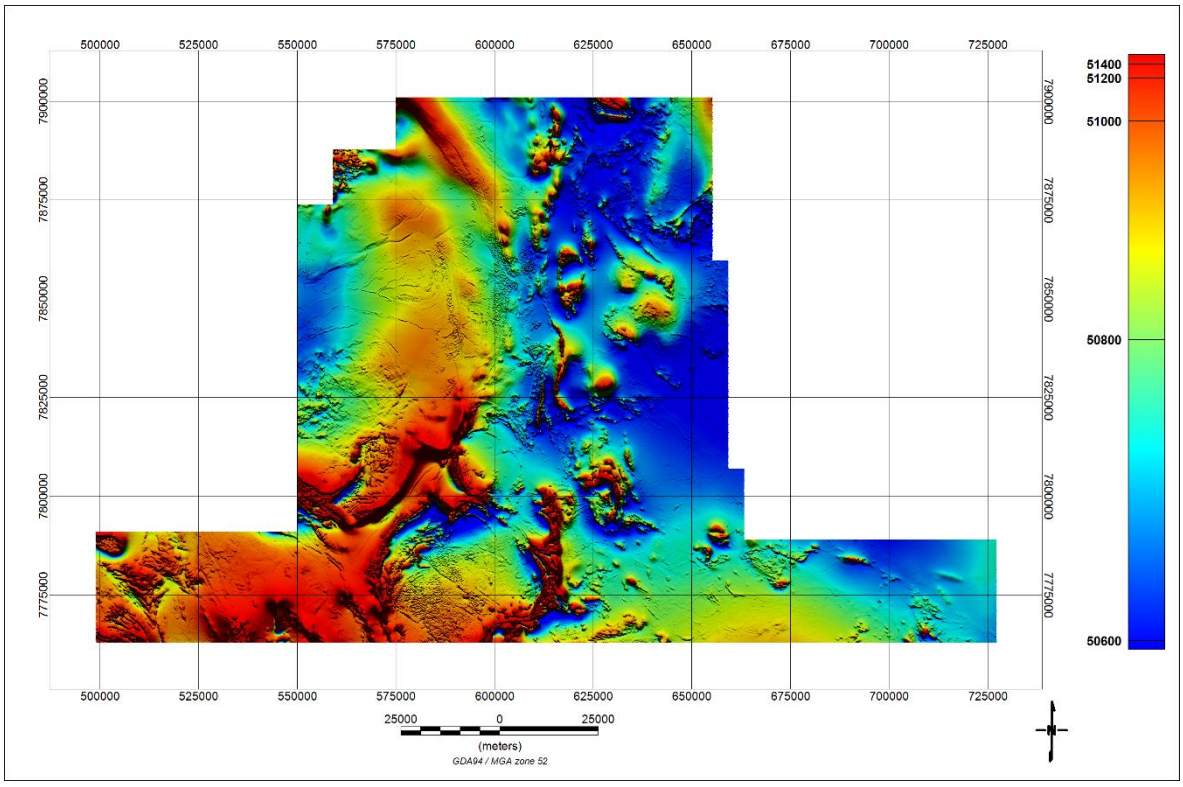

Figure 14. Total Magnetic Intensity (TMI) map of the main EW block.

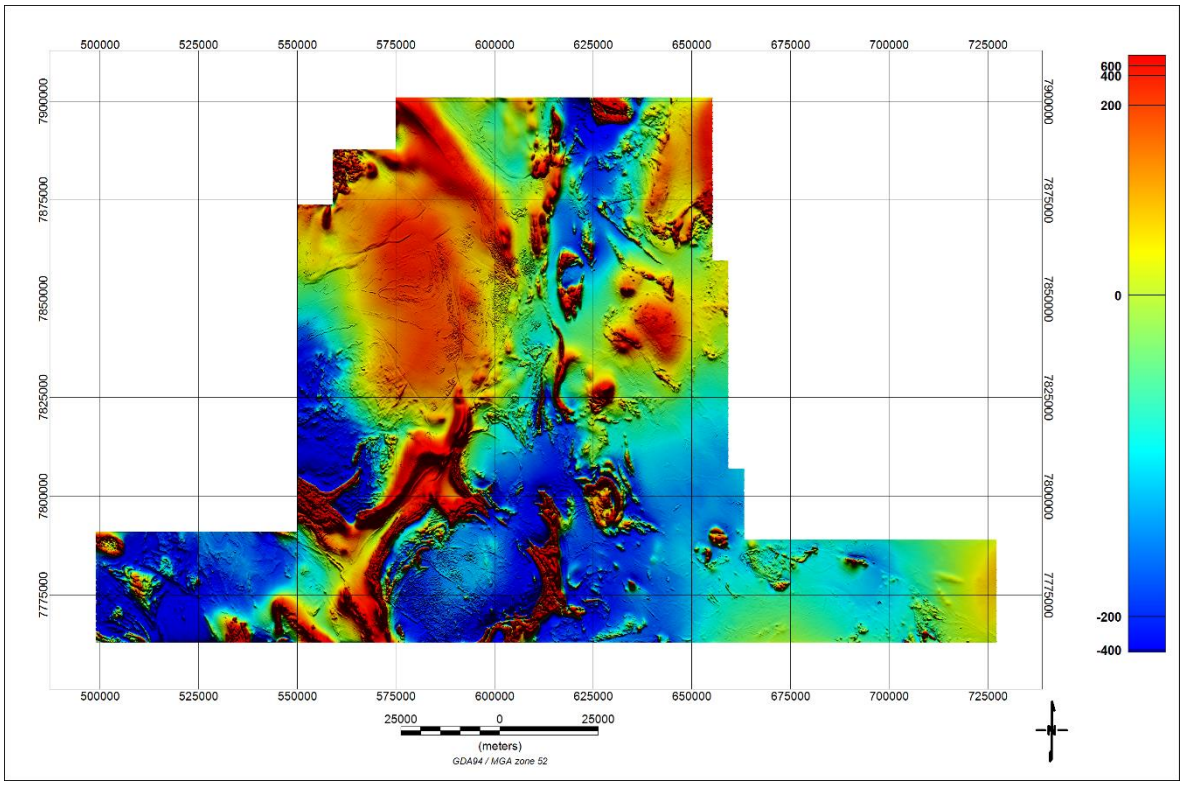

Figure 15. Reduced to Pole (RTP) Total Magnetic Intensity map of the main EW block.

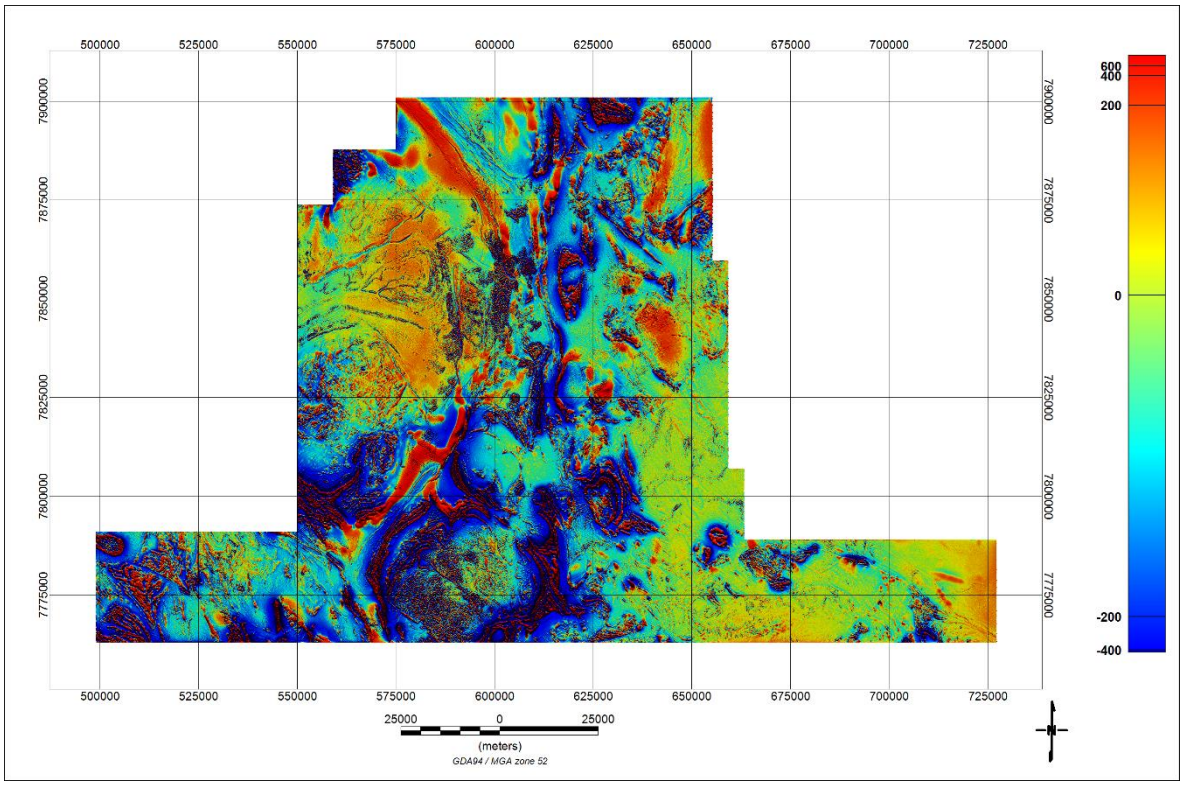

Figure 16. Reduced to Pole TMI First Vertical Derivative map of the main EW block.

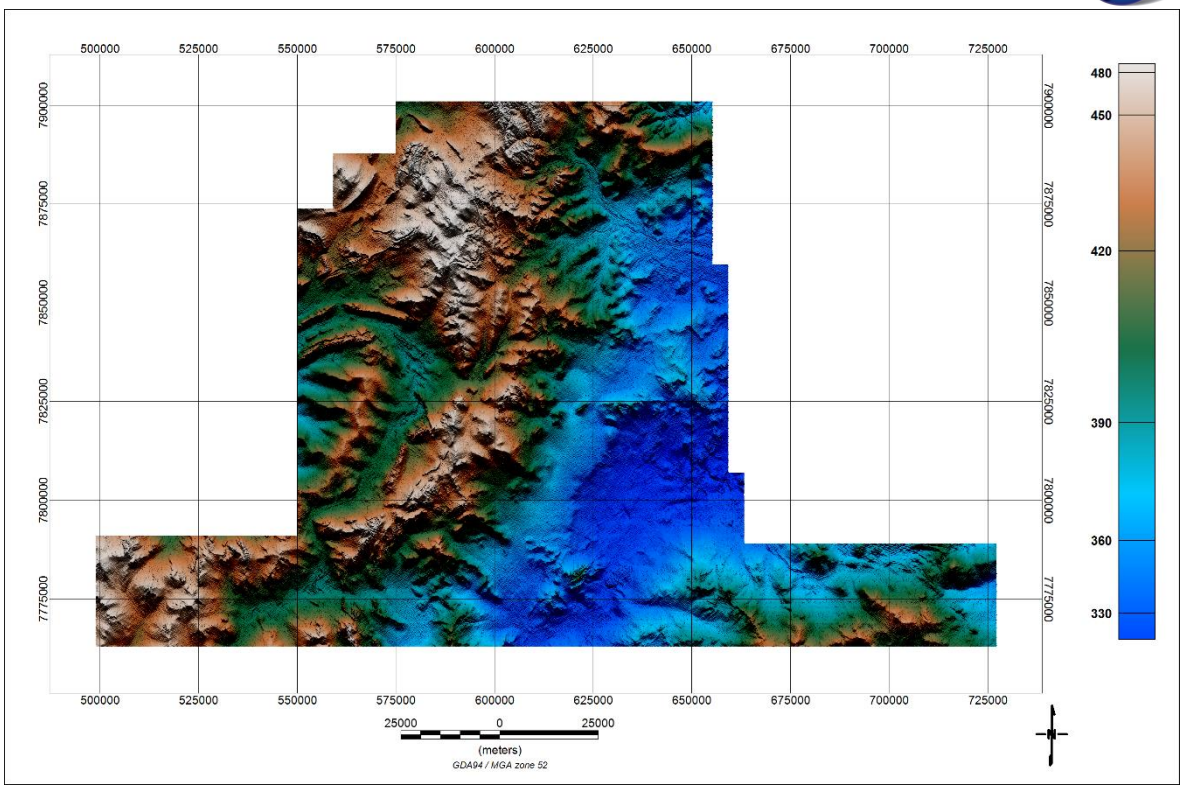

Figure 17. Laser altimeter Digital Elevation Model (DEM) map of the main EW block.

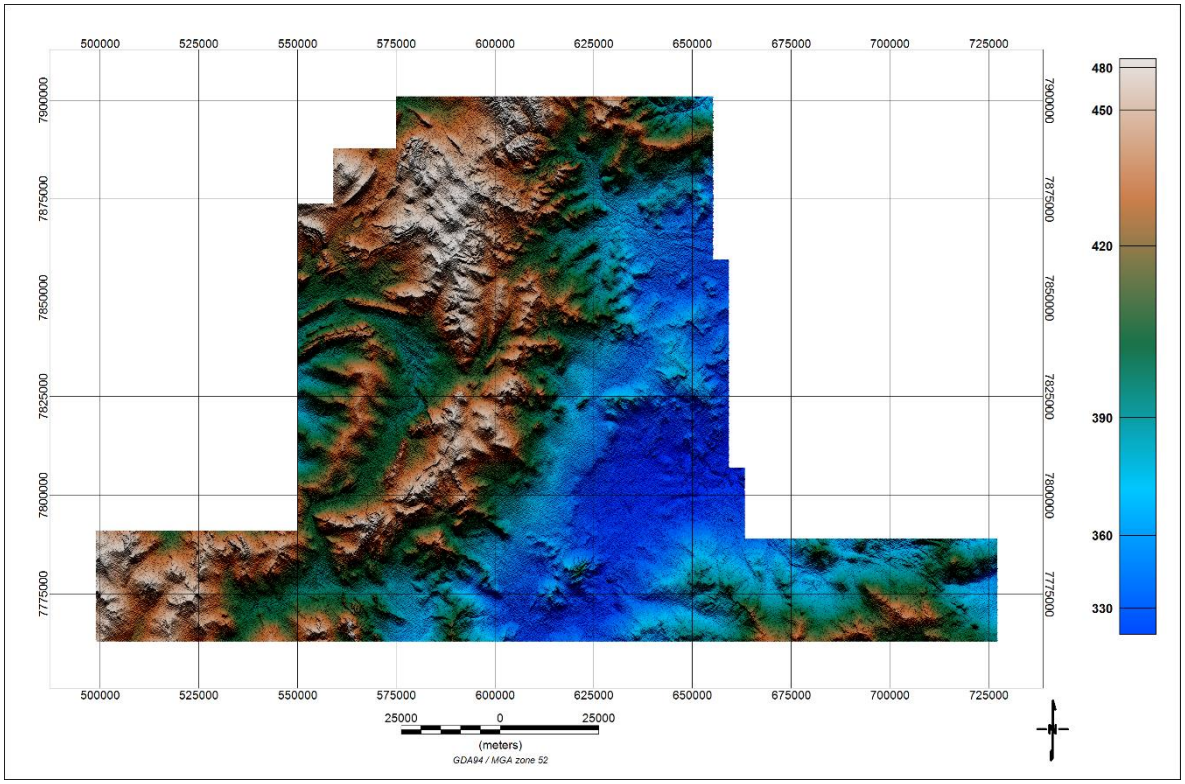

Figure 18. Radar altimeter Digital Elevation Model (DEM) map of the main EW block.

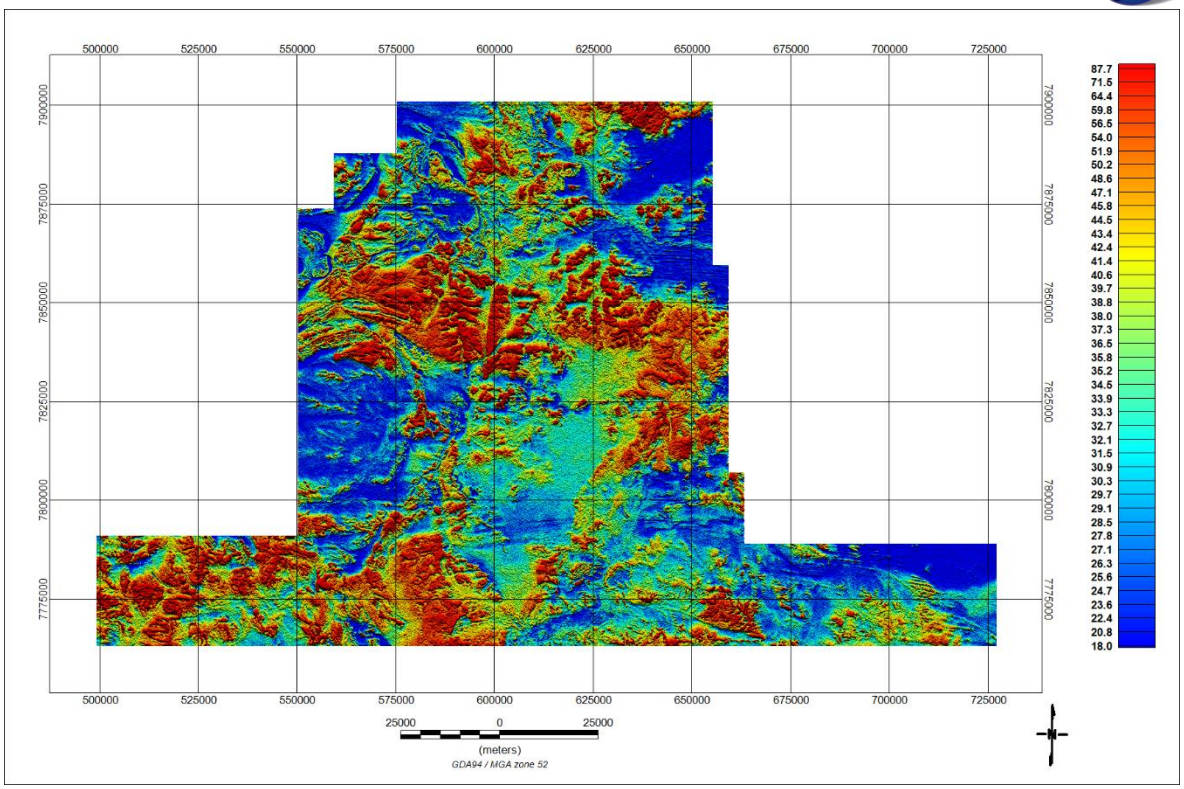

Figure 19. Dose Rate map of the main EW block.

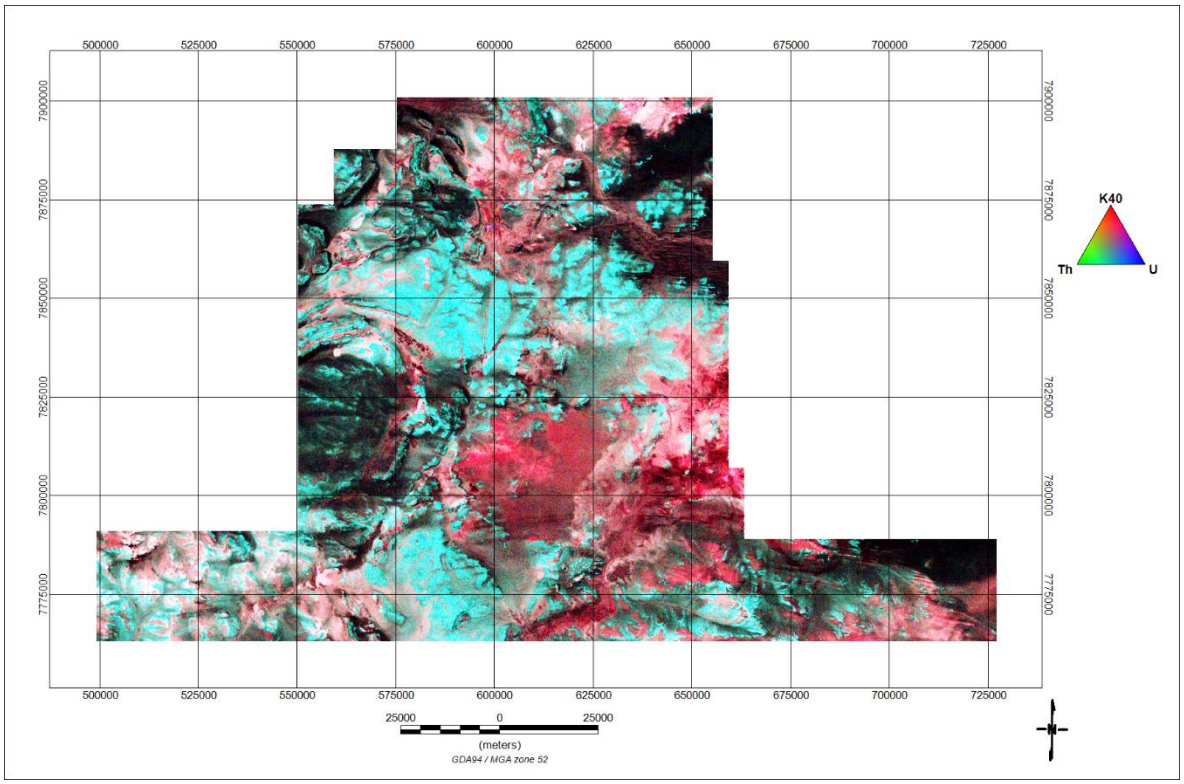

Figure 20. Ternary map of the main EW block.

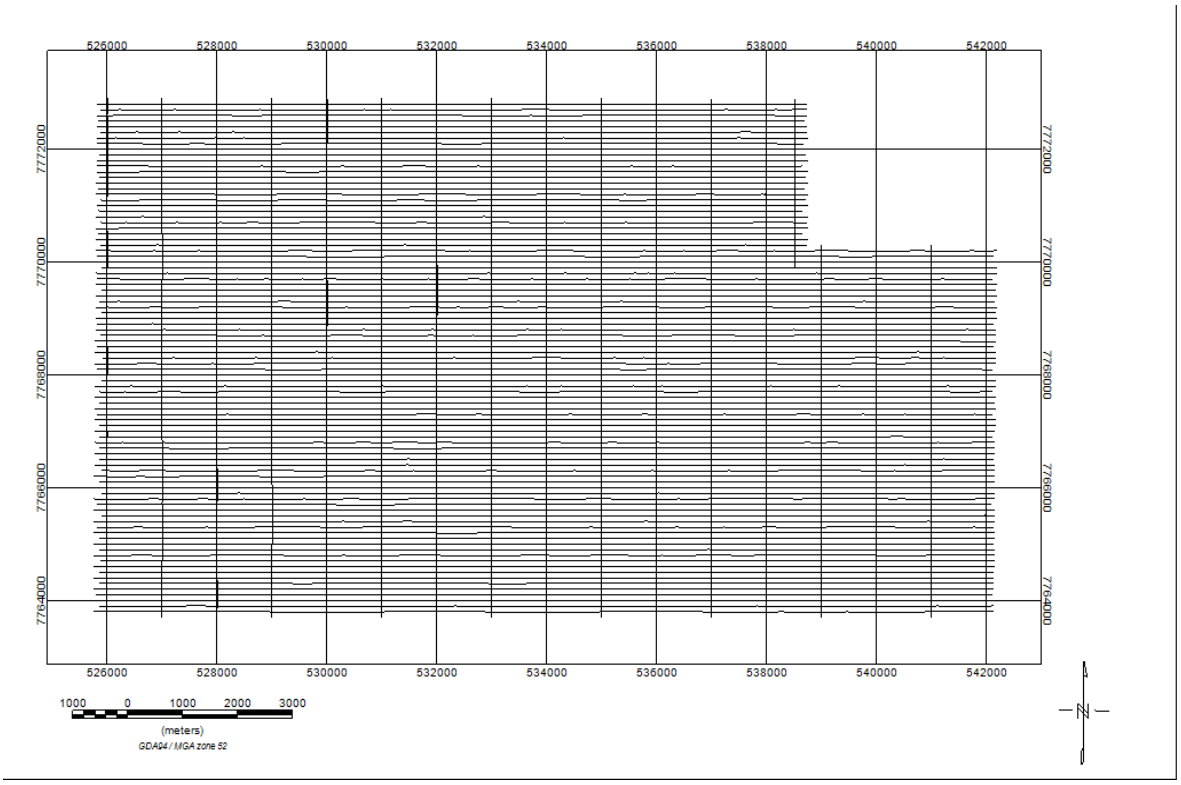

Figure 21. Flight path map of infilled block of 5ZA (line spacing of 100 m)

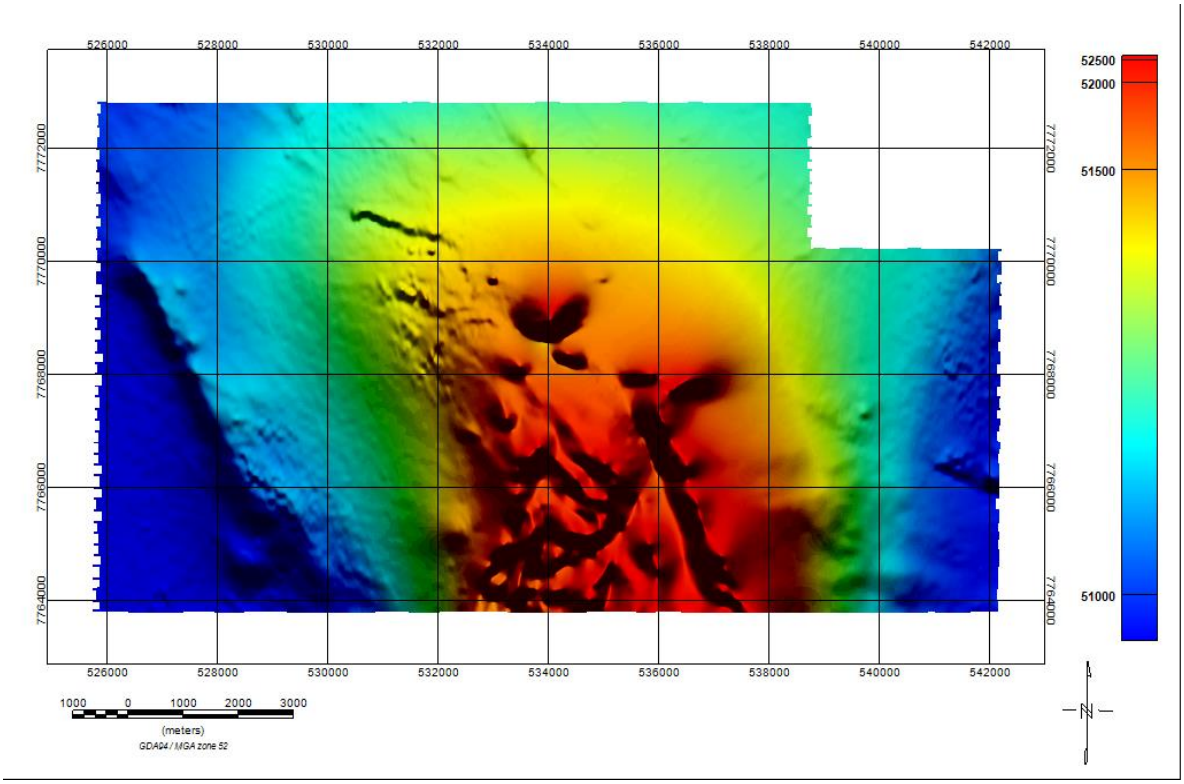

Figure 22. Total Magnetic Intensity (TMI) map of infilled block of 5ZA.

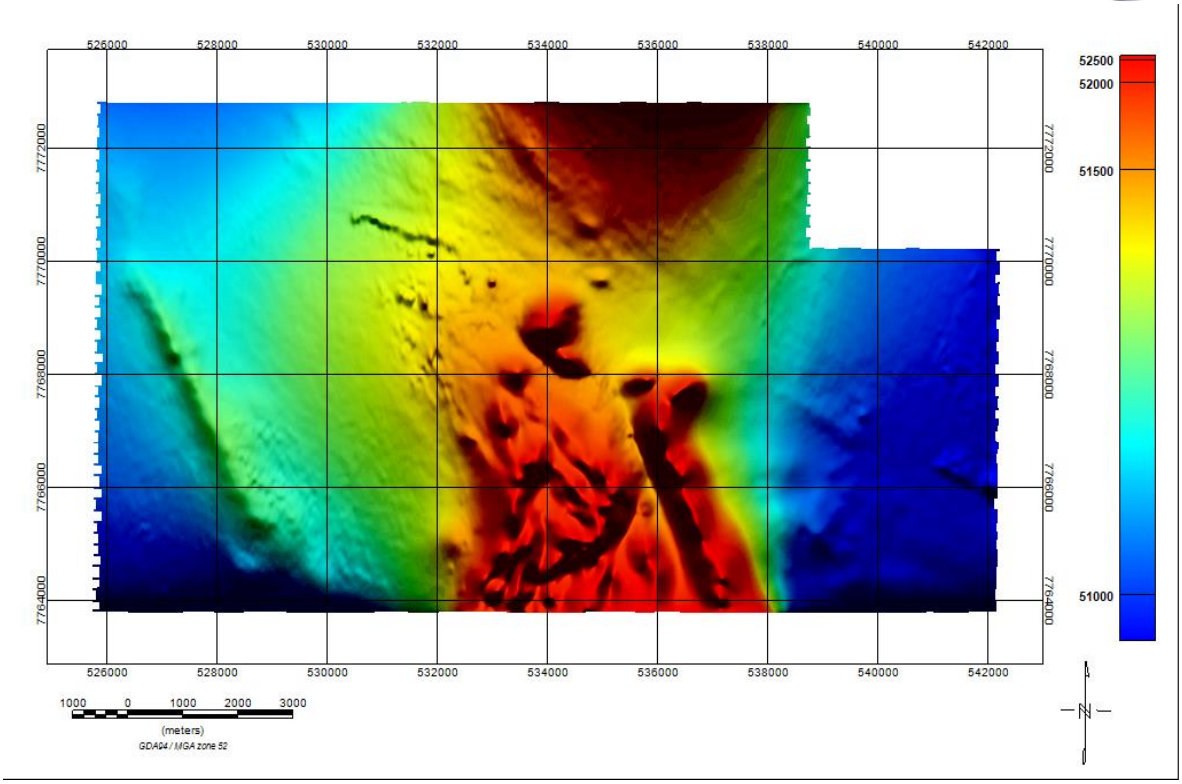

Figure 23. Reduced to Pole (RTP) Total Magnetic Intensity map of infilled block of 5ZA.

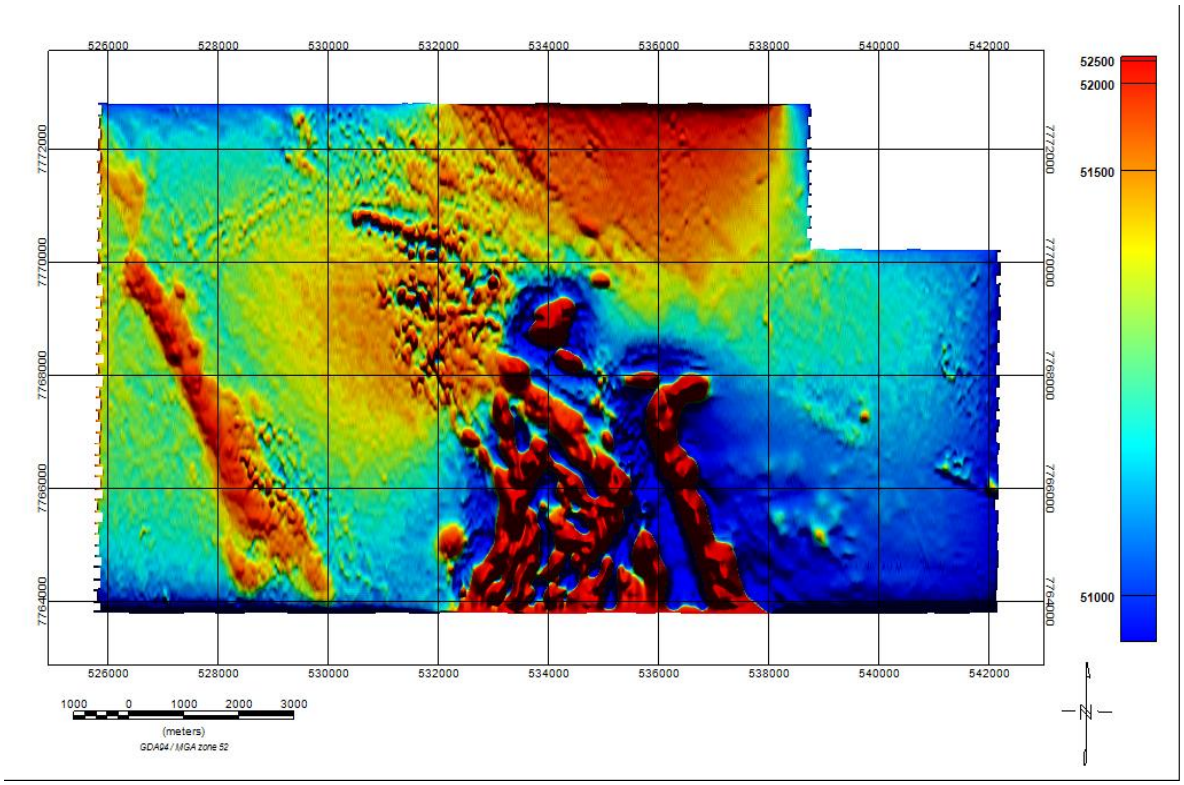

Figure 24. Reduced to Pole TMI First Vertical Derivative map of infilled block of 5ZA.

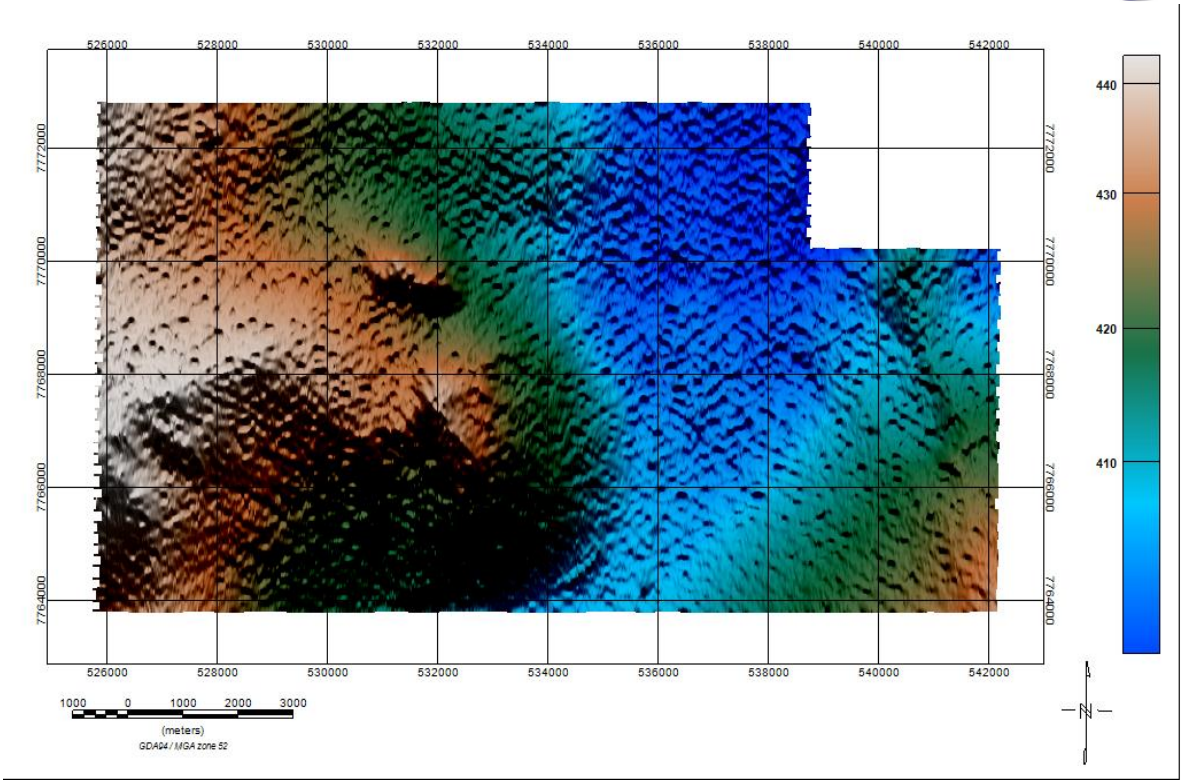

Figure 25. Laser altimeter Digital Elevation Model (DEM) map of infilled block of 5ZA.

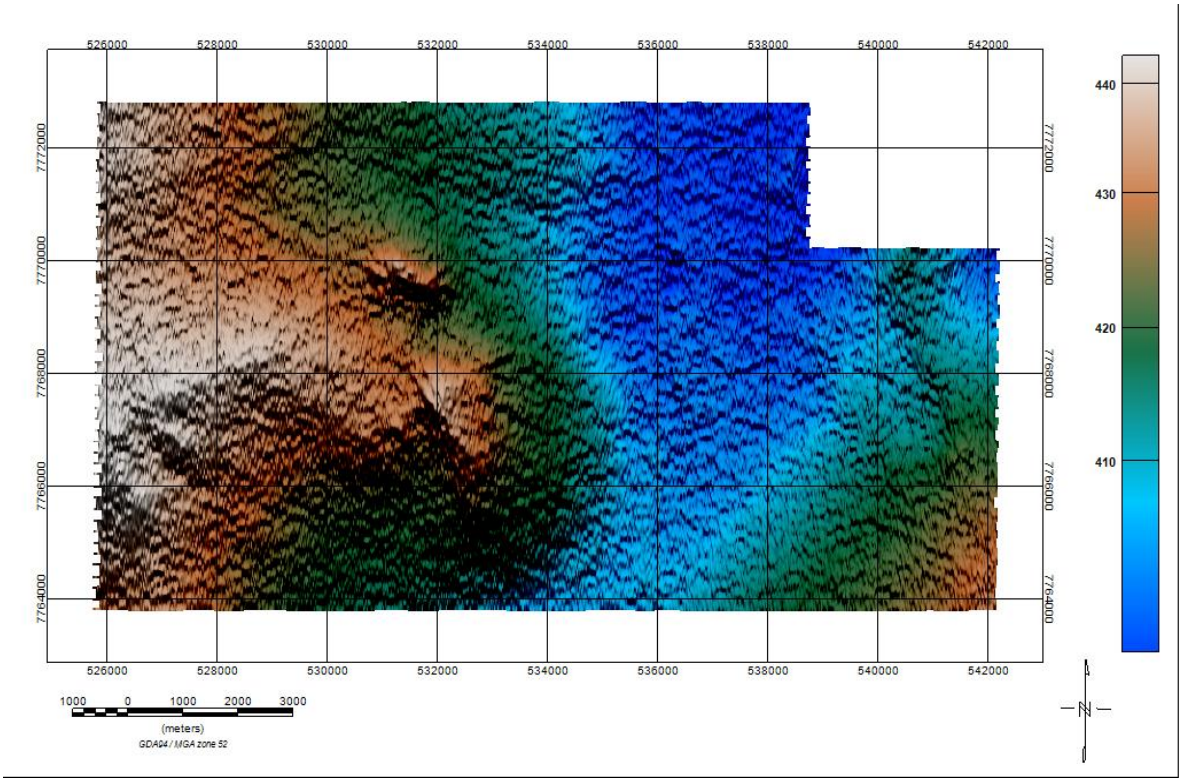

Figure 26. Radar altimeter Digital Elevation Model (DEM) map of infilled block of 5ZA.

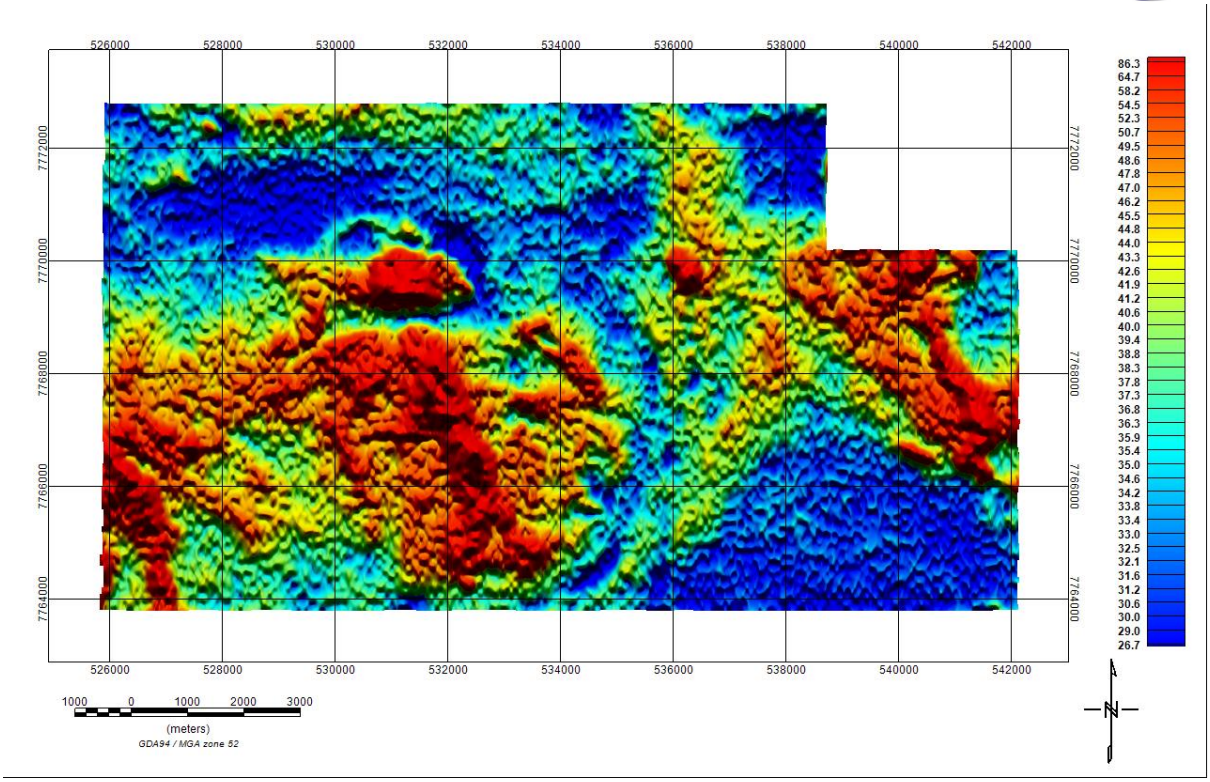

Figure 27. Dose Rate map of the main 5ZA block.

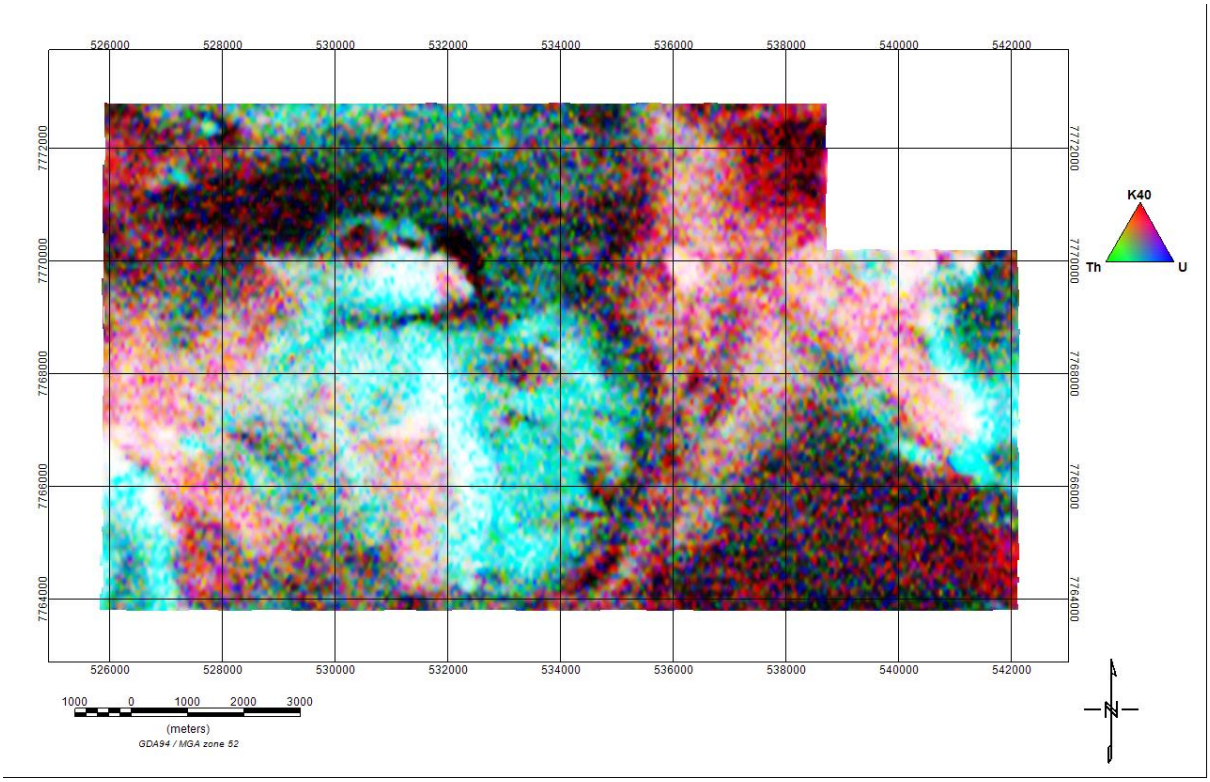

Figure 28. Ternary map of the main 5ZA block.

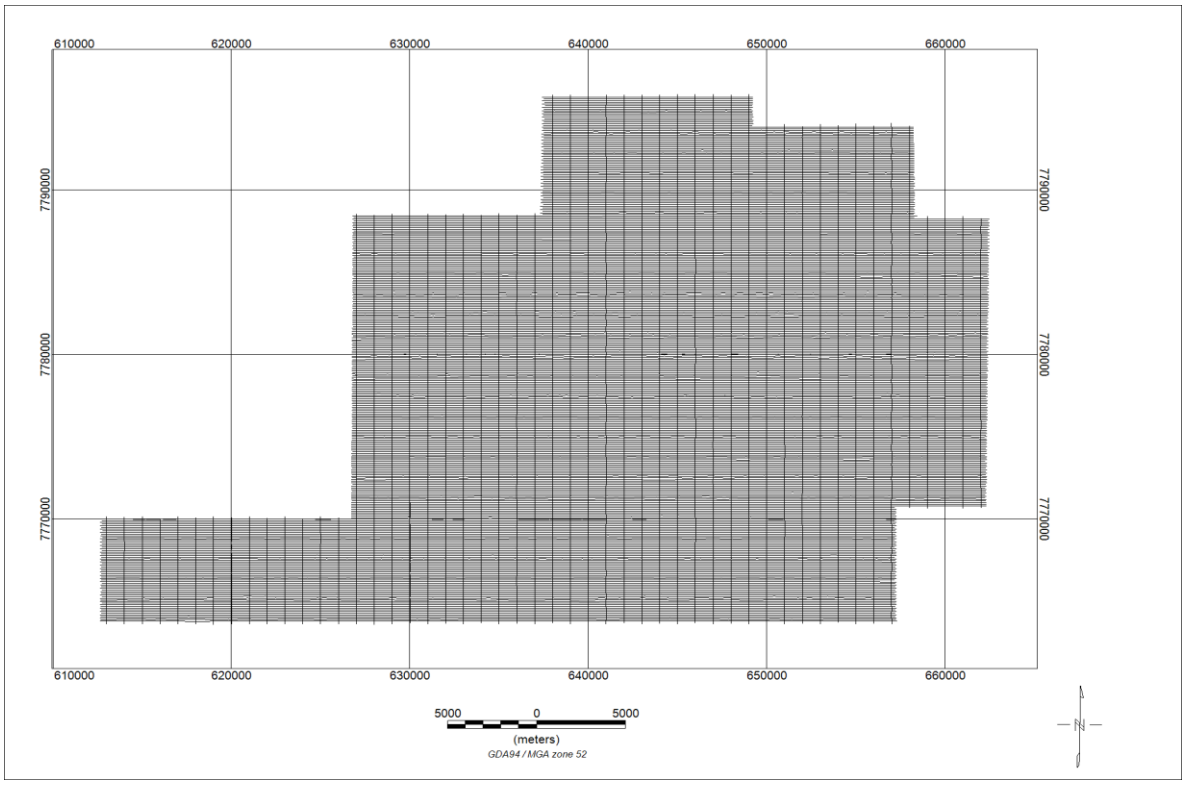

Figure 29. Flight path map of infilled block of 5N (line spacing of 100 m).

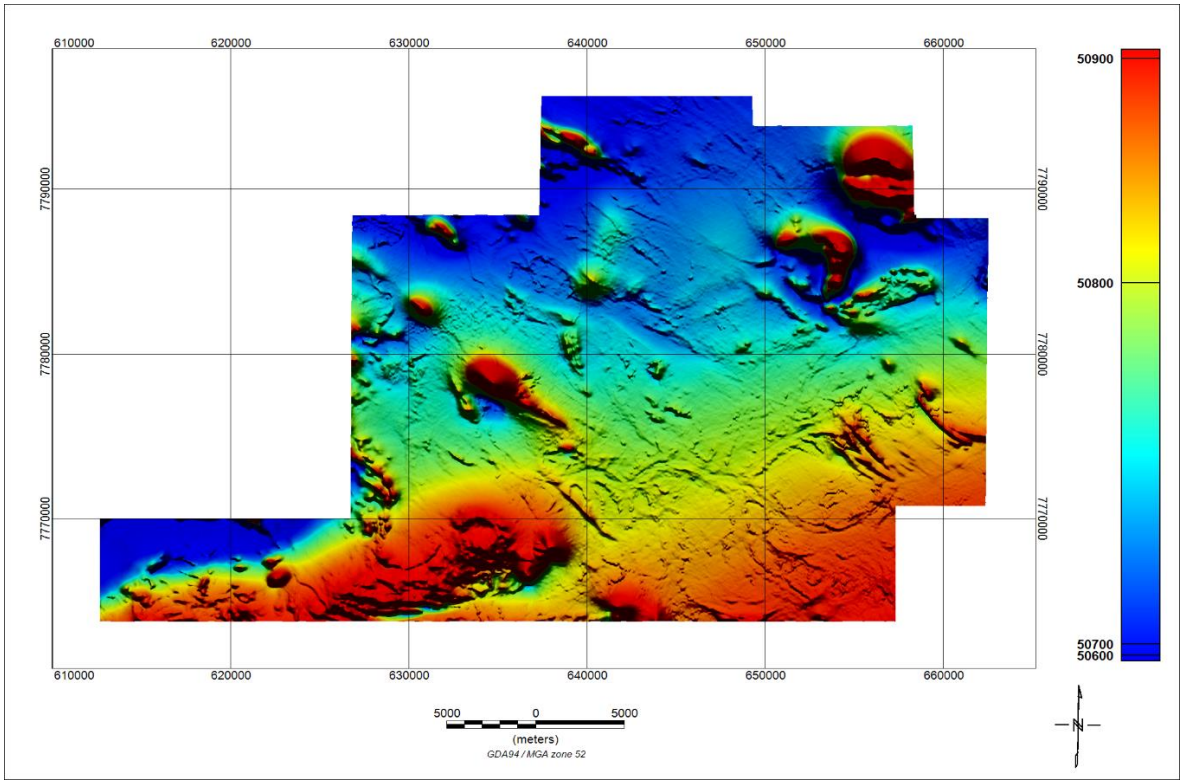

Figure 30. Total Magnetic Intensity (TMI) map of infilled block of 5N.

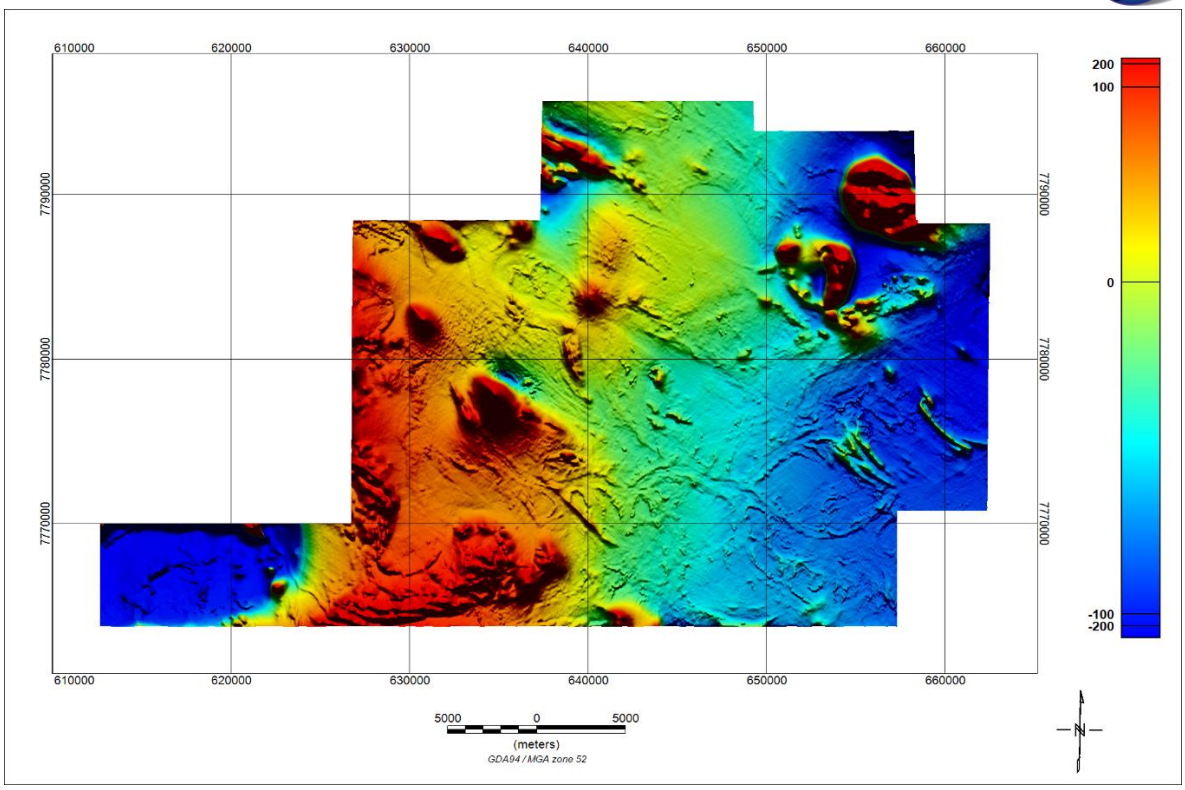

Figure 31. Reduced to Pole (RTP) Total Magnetic Intensity map of infilled block of 5N.

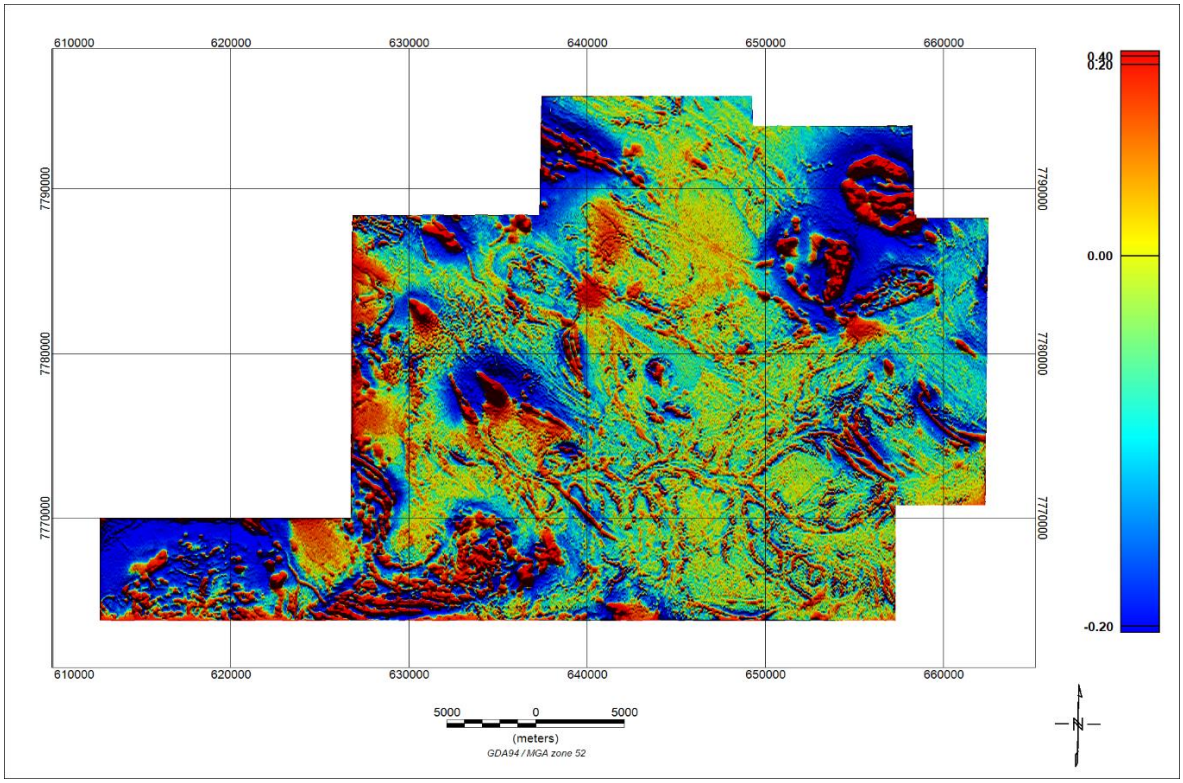

Figure 32. Reduced to Pole TMI First Vertical Derivative map of infilled block of 5N.

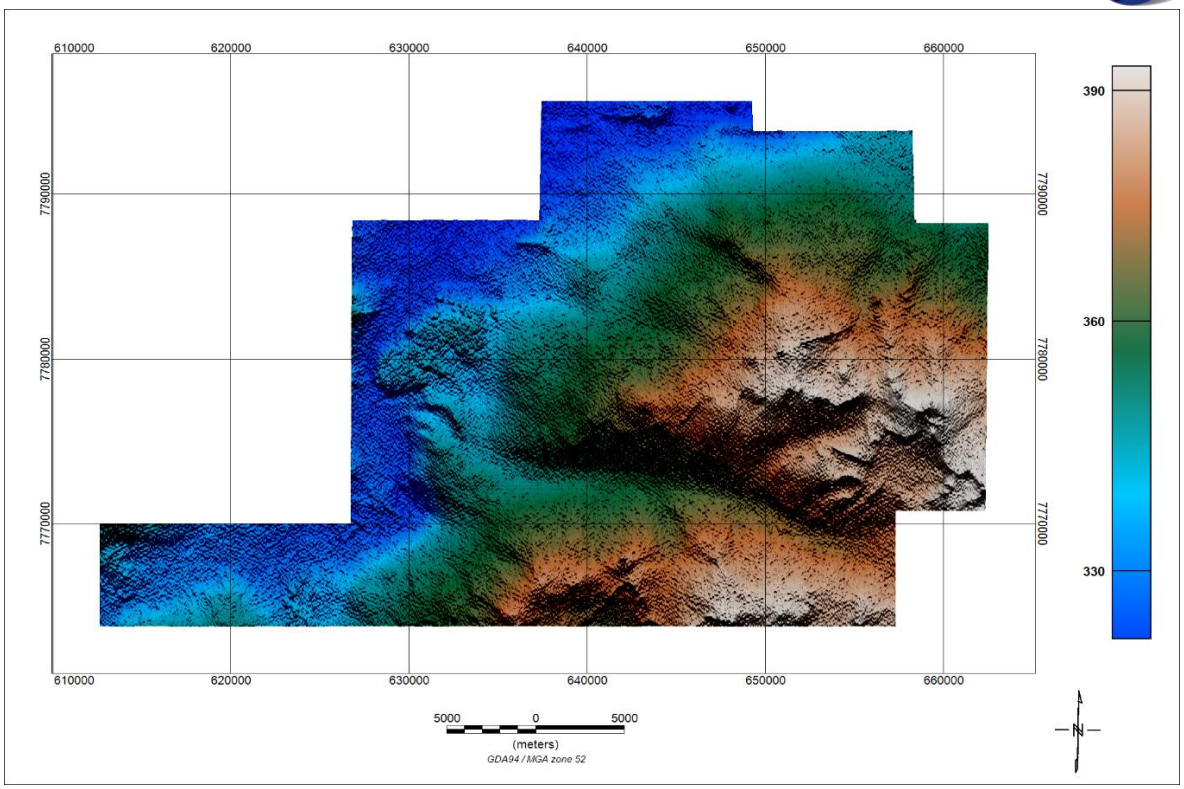

Figure 33. Laser altimeter Digital Elevation Model (DEM) map of infilled block of 5N.

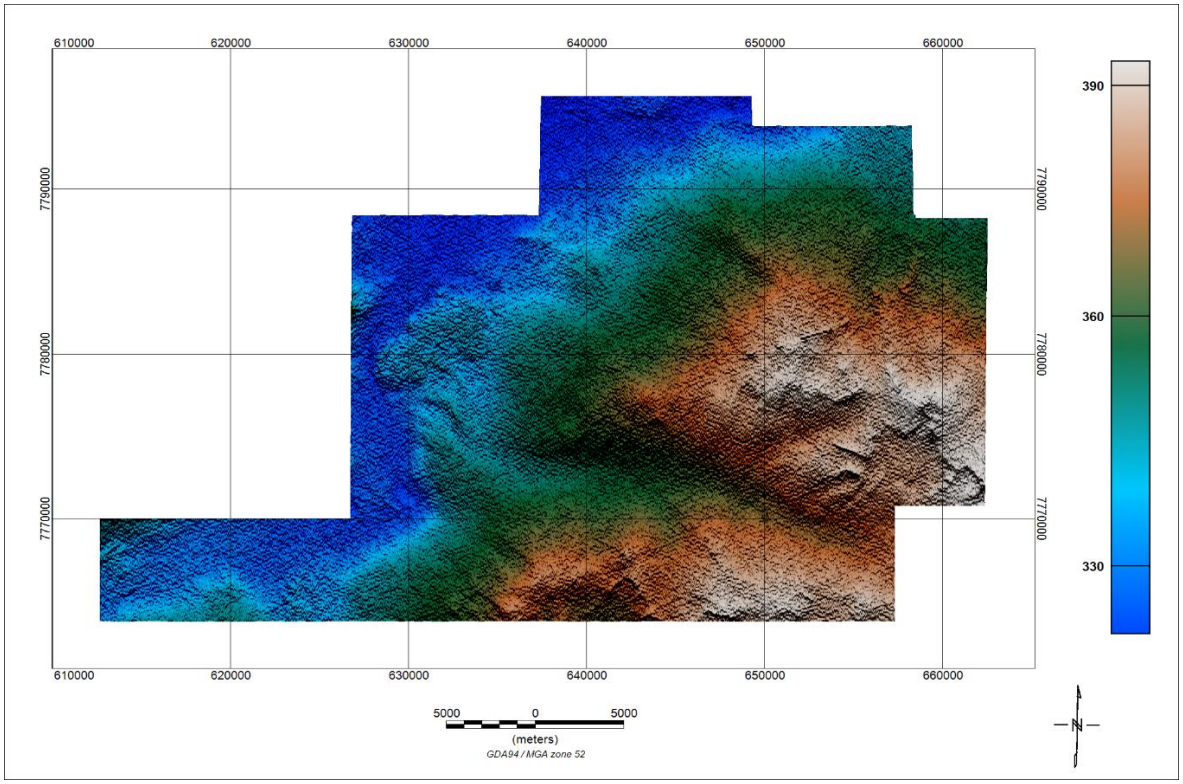

Figure 34. Radar altimeter Digital Elevation Model (DEM) map of infilled block of 5N.

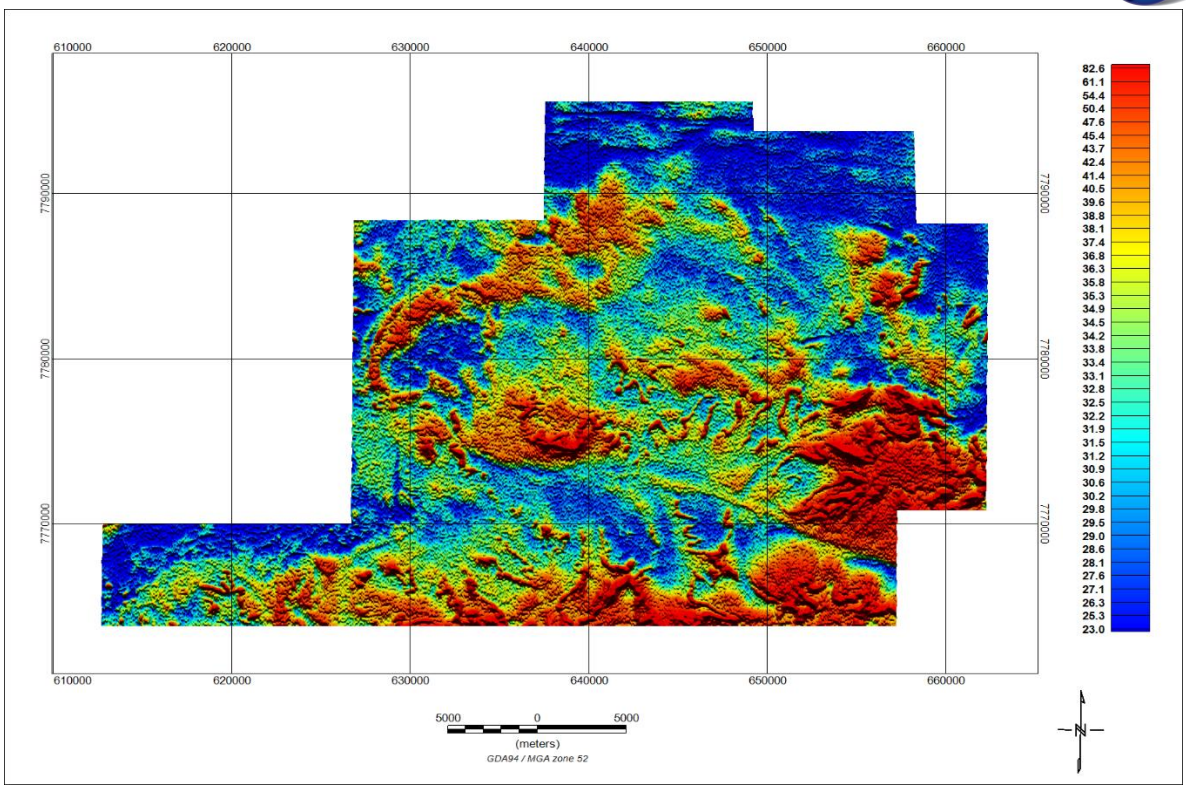

Figure 35. Dose Rate map of the main 5N block.

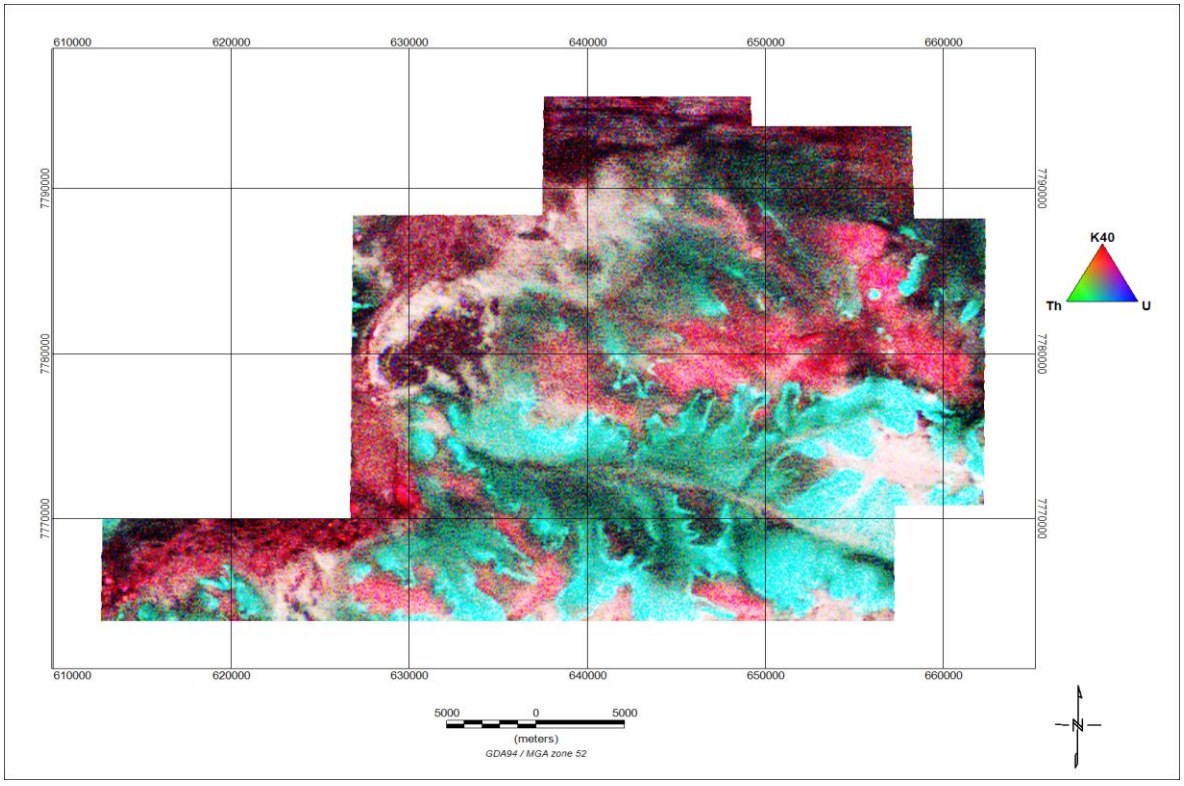

Figure 36. Ternary map of the main 5N block.