

Logistics Report

for a

**DETAILED AIRBORNE
MAGNETIC, RADIOMETRIC AND
DIGITAL ELEVATION SURVEY**

for the

WEST TANAMI SUBSET PROJECT

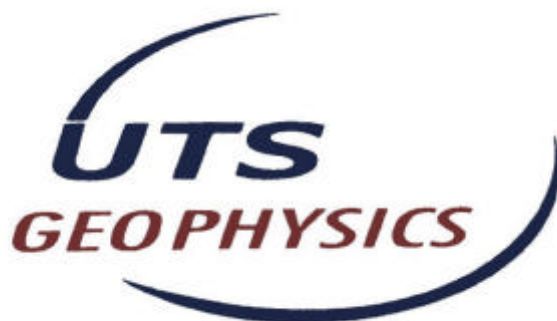
carried out on behalf of

GEOSCIENCE AUSTRALIA

acting for

GSWA

by



(UTS Job #A496)

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TABLE OF CONTENTS

1	GENERAL SURVEY INFORMATION.....	3
2	SURVEY LOCATION	3
3	AIRCRAFT AND SURVEY EQUIPMENT	4
3.1	SURVEY AIRCRAFT	5
3.2	DATA POSITIONING AND FLIGHT NAVIGATION	5
3.3	UTS DATA ACQUISITION SYSTEM AND DIGITAL RECORDING	6
3.4	ALTITUDE READINGS	6
3.5	UTS STINGER MOUNTED MAGNETOMETER SYSTEM	6
3.6	TOTAL FIELD MAGNETOMETER	7
3.7	AIRCRAFT MAGNETIC COMPENSATION	7
3.8	DIURNAL MONITORING MAGNETOMETER.....	8
3.9	BAROMETRIC ALTITUDE	8
3.10	TEMPERATURE AND HUMIDITY.....	9
3.11	RADIOMETRIC DATA ACQUISITION	9
4	PERSONNEL	10
4.1	FIELD OPERATIONS	10
4.2	PROJECT MANAGEMENT	10
5	SURVEY PARAMETERS	11
6	SURVEY LOGISTICS	12
6.1	SURVEY FLIGHT SUMMARY	12
6.2	DIURNAL MAGNETOMETER LOCATIONS	16
6.3	SPECTROMETER CALIBRATION RESULTS.....	16
7	DATA PROCESSING PROCEDURES.....	17
7.1	DATA PRE-PROCESSING	17
7.2	MAGNETIC DATA PROCESSING	18
7.3	RADIOMETRIC DATA PROCESSING	21
7.4	DIGITAL ELEVATION MODEL DATA PROCESSING.....	23
	APPENDIX A - LOCATED DATA FORMATS.....	25
	APPENDIX B - COORDINATE SYSTEM DETAILS.....	28
	APPENDIX C - SURVEY BOUNDARY DETAILS.....	29
	APPENDIX D - PROJECT DATA OVERVIEW	31
	APPENDIX E – RADIOMETRIC CALIBRATION RESULTS	32
	APPENDIX F – ACQUISITION AND PROCESSING PARAMETERS	41
	APPENDIX G – SURVEY KILOMETRE REPORT	44
	APPENDIX H – RADIOMETRIC TEST LINE SUMMARY	57
	APPENDIX I – NASVD COMPONENTS.....	59

1 GENERAL SURVEY INFORMATION

In June through to August 2002, UTS Geophysics conducted a low level airborne geophysical survey approximately 150km southeast of Halls Creek for the Commonwealth of Australia acting through Geoscience Australia on behalf of GSWA.

This report summarises the logistics, survey parameters and processing details of the survey.

The survey commenced on the 11th June 2002 and was completed on the 28th August 2002.

UTS Geophysics provided the described survey for the following company:

Geoscience Australia, acting for GSWA
GPO Box 378
Canberra ACT 2601

2 SURVEY LOCATION

The area surveyed was approximately 150km southeast of Halls Creek in Western Australia. Survey boundary coordinates and a location map are provided in Appendix C of this report.

The survey was flown using the AMG84 coordinate system (a Universal Transverse Mercator projection) derived from the Australian Geodetic Datum and was contained within zone 52 with a central meridian of 129 degrees. Details of the datum and projection system are provided in Appendix B of this report.

3 AIRCRAFT AND SURVEY EQUIPMENT

The UTS navigation flight control computer, data acquisition system and geophysical sensors were installed into a specialised geophysical survey aircraft.

The list of geophysical and navigation equipment used for the survey is as follows:

General Survey Equipment

- FU24-954 fixed wing survey aircraft.
- UTS proprietary flight planning and survey navigation system.
- UTS proprietary high speed digital data acquisition system.
- Novatel 3951R, 12 channel precision navigation GPS.
- UTS proprietary differential GPS base station.
- UTS LCD pilot navigation display and external track guidance display.
- UTS post mission data verification and processing system.
- Bendix King KRA-405 radar altimeter.

Magnetic Data Acquisition Equipment

- UTS tail stinger magnetometer installation.
- Scintrex Cesium Vapour CS-2 total field magnetometer.
- Fluxgate three component vector magnetometer.
- RMS Aeromagnetic Automatic Digital Compensator (AADC II).
- Diurnal monitoring magnetometer (Scintrex Envimag).

Radiometric Data Acquisition Equipment

- Exploranium GR-820 gamma ray spectrometer.
- Exploranium gamma ray detectors.
- Barometric altimeter (height and pressure measurements).
- Temperature and humidity sensor.

3.1 *Survey Aircraft*

The aircraft used were FU24-954 fixed wing survey aircraft owned by UTS Geophysics, registrations VH-HVP and VH-UTR.

Power Plant

- Engine Type Single engine, Lycoming, IO-720
- Brake Horse Power 400 bhp
- Fuel Type AV-GAS

Performance

- Cruise speed 105 Kn
- Survey speed 100 Kn
- Stall speed 45 Kn
- Range 970 Km
- Endurance (no reserves) 5.6 hours
- Fuel tank capacity 490 litres



3.2 *Data Positioning and Flight Navigation*

Survey data positioning and flight line navigation was derived using post processed differential GPS (Global Positioning System). The base station was located at S 18°13'22.6095", E 127°40'14.2745". This position was determined by averaging the GPS positions from the base station over the course of the survey.

Navigation was provided through a UTS designed and built electronic pilot navigation system providing computer controlled digital navigation instrumentation mounted in the cockpit as well as an externally mounted track guidance system.

GPS derived positions were used to provide both aircraft navigation and survey data location information.

The GPS systems used for the survey were:

- Aircraft GPS Model Novatel 3951R
- Base Station GPS Model Novatel 3111R
- Sample rate 2 Seconds (0.5 Hz)
- GPS satellite tracking channels 12 parallel
- Typical differentially corrected accuracy 1-2 metres (horizontal)
3-5 metres (vertical)

3.3 *UTS Data Acquisition System and Digital Recording*

All geophysical sensor data and positional information measured during the survey was recorded using a UTS developed, high speed, precision data acquisition system. Survey data was downloaded onto magnetic tape on completion of each survey flight.

Instrument synchronisation times were measured and removed in real-time by the UTS data acquisition system.

3.4 *Altitude Readings*

Accurate survey heights above the terrain were measured using a King radar altimeter installed in the aircraft. The height of each survey data point was measured by the radar altimeter and stored by the UTS data acquisition system.

- Radar altimeter model King KRA-405, twin antenna altimeter
- Accuracy 0.3 metres
- Resolution 0.1 metres
- Range 0 - 500 metres
- Sample rate 0.1 Seconds (10Hz)

The digital terrain model is calculated by subtracting the terrain clearance (radar altimeter) from the GPS height (interpolated to 0.1 Hz), and as such the accuracy is constrained by the differentially corrected GPS position.

3.5 *UTS Stinger Mounted Magnetometer System*

The installation platform used for the acquisition of magnetic data was a tail mounted stinger. This proprietary stinger system was constructed of carbon fibre and designed for maximum rigidity and stability.

Both the total field magnetometer and three component vector magnetometer were located within the tail stinger.



3.6 *Total Field Magnetometer*

Total field magnetic data readings for the survey were made using a Scintrex Cesium Vapour CS-2 Magnetometer. This precision sensor has the following specifications:



- Model Scintrex Cesium Vapour CS-2 Magnetometer
- Sample Rate 0.1 seconds (10Hz)
- Resolution 0.001nT
- Operating Range 15,000nT to 100,000nT
- Temperature Range -20°C to +50°C

3.7 *Aircraft Magnetic Compensation*

At the start of the survey, the system was calibrated for reduction of magnetic heading error. The heading and manoeuvre effects of the aircraft on the magnetic data was removed using an RMS Automatic Airborne Digital Compensator (AADC II).

Calibration of the aircraft heading effects were measured by flying a series of pitch, roll and yaw manoeuvres at high altitude while monitoring changes in the three axis magnetometer and the effect on total field readings. A 26 term model of the aircraft magnetic noise covering permanent, induced and eddy current fields was determined. These coefficients were then applied to the data collected during the survey in real-time. The coefficients are listed in Appendix F

UTS static compensation techniques were also employed to reduce the initial magnetic effects of the aircraft upon the survey data.

3.8 *Diurnal Monitoring Magnetometer*

A base station magnetometer was located in a low gradient area beyond the region of influence by any man made interference to monitor diurnal variations during the survey.

The specifications for the magnetometer used are as follows:

- Model Scintrex Envimag
- Resolution 0.1 nT
- Sample interval 5 seconds (0.2Hz)
- Operating range 20,000nT to 90,000nT
- Temperature -20°C to +50°C



3.9 *Barometric Altitude*

An Air DB barometric altimeter was installed in the aircraft so as to record and monitor barometric height and pressure. The data was recorded at 0.10 second intervals and is used for the reduction of the radiometric data.

- Model Air DB barometric altimeter
- Accuracy 2 metres
- Height resolution 0.1 metres
- Height range 0 - 3500 metres
- Maximum operating pressure: 1,300 mb
- Pressure resolution: 0.01 mb
- Sample rate 10 Hz

3.10 Temperature and Humidity

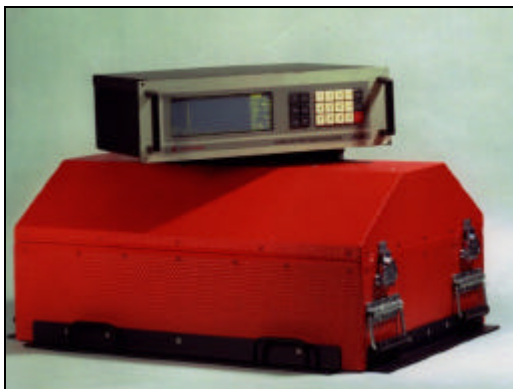
Temperature and humidity measurements were made during the survey at a sample rate of 10Hz. Ambient temperature was measured with a resolution of 0.1 degree Celsius and ambient humidity to a resolution of 0.1 percent.

3.11 Radiometric Data Acquisition

The gamma ray spectrometer used for the survey was capable of recording 256 channels and was self stabilising in order to minimise spectral drift. The detectors used contain thallium activated sodium iodide crystals.

Thorium, cesium and uranium source measurements were made each survey day to monitor system resolution and sensitivity. A calibration line was also flown at the start and end of each survey day to monitor ground moisture levels and system performance. The background and height corrected thorium channel from the test lines are presented in Appendix H, along with a location map for the test lines.

- Spectrometer model Exploranium GR820
- Detector volume 32 litres
- Sample rate 1 Hz



4 PERSONNEL

4.1 *Field Operations*

UTS Geophysics operators and data processors

Sean Plunkett
Matt Zengerer
James Wallis
David Andreazza

UTS Geophysics Survey Pilots

Mike Officer
Graham Simpson
Adam King
Peter Barter
Peter Williams
Justin Walker

4.2 *Project Management*

Geoscience Australia

Ross Franklin

UTS Geophysics Perth Office

Nino Tufilli

5 SURVEY PARAMETERS

The survey data acquisition specifications for each area flown are specified in the following table:

PROJECT NAME	LINE SPACING	LINE DIRECTION	TIE LINE SPACING	TIE LINE DIRECTION	SENSOR HEIGHT	TOTAL LINE KM
West Tanami Subset – Area 1	400m	179.5-359.5	4000m	89.97-270.03	60m	19,391.6
West Tanami Subset – Area 2	400m	179.5-359.5	4000m	89.97-270.03	60m	32,266.3
West Tanami Subset – Area 3	400m	179.5-359.5	4000m	89.97-270.03	60m	11,849.4
West Tanami Subset – Area 4	400m	179.5-359.5	4000m	89.97-270.03	60m	4,349.9
TOTAL						67,857

The total number of line kilometres of survey data collected over the survey areas specified in the above table was 67,857.

The specified sensor height for the magnetic samples is as stated in the above table. This sensor height may be varied where topographic relief or laws pertaining to built up areas do not allow this altitude to be maintained, or where the safety of the aircraft and equipment is endangered.

The coordinate boundaries for the survey areas flown are detailed in Appendix C.

6 SURVEY LOGISTICS

The base location used for operating the aircraft and performing in-field quality control and data processing of the survey data was the Halls Creek Motel, Halls Creek, in Western Australia. The aircraft was operated from the Halls Creek airport.

6.1 Survey Flight Summary

The following table summarises the flight logs for the survey areas flown by VH-HVP:

Flight Date	Area No	Flight No	Area Name / Survey Details	Lines Flown	Line Km Flown
11/06/02	01	01	Traverse Lines: 102650 – 102560	10	562
12/06/02	01	T1	Tie Lines: 190520– 190550	4	641
13/06/02	01	T2	Tie Lines: 190510-190480	4	640
	01	T3	Tie Lines: 190470-190400	6	650
14/06/02	01	02	Traverse Lines: 102550-102420	14	787
	01	03	Traverse Lines: 102410-102380	4	225
15/06/02	01	04	Traverse Lines: 102270-102160	12	675
	01	05	Traverse Lines: 102150-102020	14	787
16/06/02	01	06	Traverse Lines: 102010-101900	12	675
17/06/02	01	07	Traverse Lines: 101890-101780	12	675
	01	08	Traverse Lines: 101770-101660	12	675
18/06/02	02	01	Traverse Lines: 201020-201050	4	889
	02	02	Traverse Lines: 201060-201090	4	889
19/06/02	02	03	Traverse Lines: 201100-201110	2	445
	02	04	Traverse Lines: 201120-201130	2	445
20/06/02	02	05	Traverse Lines: 201140-201170	4	889
	02	06	Traverse Lines: 201180-201210	4	889
21/06/02	02	07	Traverse Lines: 201220-201250	4	889
	02	08	Traverse Lines: 201260-201270	2	445
22/06/02	02	09	Traverse Lines: 201280-201290	2	445
27/06/02	02	10	Traverse Lines: 201010-201980	4	889
	01	09	Traverse Lines: 101650-101620, 101200-101250	10	563
28/06/02	01	10	Traverse Lines: 101270-101260, 101190-101130	9	507
	02	11	Traverse Lines: 200970-200960	2	445
29/06/02	02	12	Traverse Lines: 200950-200940	2	445
	02	13	Traverse Lines: 200930-200920	2	445
	01	11	Traverse Lines: 101590-101480	12	675
30/06/02	01	12	Traverse Lines: 102370-102340, 102320-102280	9	506
	02	14	Traverse Lines: 200910-200880	4	889

01/07/02	02	15	Traverse Lines: 200870-200840	4	889
	02	16	Traverse Lines: 201840-201830	2	445
	02	17	Traverse Lines: 201820-201810	2	445
02/07/02	02	18	Traverse Lines: 201800-201770	4	889
	02	19	Traverse Lines: 201760-201730	4	889
03/07/02	02	20	Traverse Lines: 201720-201690	4	889
	02	21	Traverse Lines: 201680-201650	4	889
04/07/02	02	23	Traverse Lines: 201640-201610	4	889
	02	24	Traverse Lines: 201600-201590	2	445
05/07/02	02	25	Traverse Lines: 201580-201550	4	889
	02	26	Traverse Lines: 201540-201510	4	889
06/07/02	02	27	Traverse Lines: 201500-201470	4	889
	02	28	Traverse Lines: 201460-201430	4	889
07/07/02	02	29	Traverse Lines: 201420-201410	2	445
11/07/02	02	30	Traverse Lines: 201390-201400	2	444
12/07/02	02	31	Traverse Lines: 200500-200510	2	444
	03	01	Traverse Lines: 300010-300080	8	141
	02	32	Traverse Lines: 200520-200530	2	444
	03	02	Traverse Lines: 300100-200200	11	193
13/07/02	02	33	Traverse Lines: 200540-200550	2	444
	03	03	Traverse Lines: 300090, 300210	2	35
	02	34	Traverse Lines: 200560-200570, 200140-200430	32	692
14/07/02	02	35	Traverse Lines: 200580-200590	2	593
	03	04	Traverse Lines: 300220-300300	9	171
	02	36	Traverse Lines: 200600-200610	2	444
15/07/02	02	37	Traverse Lines: 200620-200630	2	444
	03	05	Traverse Lines: 300310-300370	7	164
	02	38	Traverse Lines: 200640	1	222
	03	06	Traverse Lines: 300380-300430	6	186
16/07/02	02	39	Traverse Lines: 200650-200660	2	444
	03	07	Traverse Lines: 300440-300490	6	199
	02	40	Traverse Lines: 200670-200680	2	444
	03	08	Traverse Lines: 300500-300540	5	211
17/07/02	02	41	Traverse Lines: 200690-200700	2	445
	03	09	Traverse Lines: 300550-300590	5	184
	02	42	Traverse Lines: 200710-200720	2	445
	03	10	Traverse Lines: 300600-300640	5	192
18/07/02	02	43	Traverse Lines: 200730-200740	2	445
	03	11	Traverse Lines: 300650-300690	5	201
	02	44	Traverse Lines: 200750	1	222
	03	12	Traverse Lines: 300700-300740	5	205
19/07/02	02	45	Traverse Lines: 200460-200490, 200770-200780	6	670
20/07/02	02	46	Traverse Lines: 200790-200800	2	445
	03	13	Traverse Lines: 300750-300790	5	209

	02	47	Traverse Lines:200810-200820	2	445
	03	14	Traverse Lines: 300800-300840	5	213
21/07/02	02	48	Traverse Lines: 200830	1	222
	03	15	Traverse Lines: 300850	1	43
01/08/02	02	49	Traverse Lines: 201310	1	222
	03	16	Traverse Lines: 301300, 301320	2	145
	02	50	Traverse Lines: 201320	1	222
	03	17	Traverse Lines: 300860-300900	5	218
02/08/02	02	51	Traverse Lines: 201330	1	222
	02	52	Traverse Lines: 201340-201350	2	445
	03	18	Traverse Lines: 300910-300940	4	176
03/08/02	02	53	Traverse Lines: 201360-201370	2	445
	03	19	Traverse Lines: 300950-300980	4	179
	02	54	Traverse Lines: 201380 Refly Lines: 200610	2	445
	03	20	Traverse Lines: 300990-301020	4	182
04/08/02	02	21	Refly Lines: 200590-200600	2	444
	03	55	Refly Lines: 300210-300300	9	172
	02	22	Refly Lines: 200450-200440	2	113
	03	56	Traverse Lines: 302540-3002030	12	244
05/08/02	03	23	Traverse Lines: 302140-302130, 302420-302290	16	362
	03	24	Traverse Lines: 301330, 301310, 301290-301220	10	584
06/08/02	03	25	Traverse Lines: 302090-302120, 302150-302280	18	443
	03	26	Traverse Lines: 301340-301350, 301210-301160	8	479
07/08/02	03	27	Traverse Lines: 301360-301370, 301150-301100	8	473
	03	28	Traverse Lines: 301700-301650	6	570
08/08/02	03	29	Traverse Lines: 301380-301390, 301909-301030	9	514
	03	30	Traverse Lines: 301710-301760	6	550
09/08/02	03	31	Traverse Lines: 301770-301820	6	486
	03	32	Traverse Lines: 301830-301900	8	519
10/08/02	02	57	Refly Lines: 201300	1	222
	03	33	Traverse Lines: 301910-301930, 301950-301970	6	316
	02	58	Refly Lines: 200760	1	222
	03	34	Traverse Lines: 301980-302060	9	382
11/08/02	03	35	Traverse Lines: 302070-302080, 301640-301620 Refly Lines: 301940	6	491
14/08/02	03	36	Traverse Lines: 301610-3001560	6	570
	03	37	Traverse Lines: 301550-300150	6	570
15/08/02	03	38	Traverse Lines: 301490-301440	6	570
	03	39	Traverse Lines: 301430-301400	4	380
	01	13	Traverse Lines: 102330, 101610-101600	3	162
16/08/02	01	14	Traverse Lines: 100110-100010	11	574
	01	15	Traverse Lines: 100120-100230	12	676
17/08/02	01	16	Traverse Lines: 100240-100350	12	676
	01	17	Traverse Lines: 100360-100470	12	676
18/08/02	01	18	Traverse Lines: 100480-100590	12	676

	01	19	Traverse Lines: 100600-100710	12	676
23/08/02	01	20	Traverse Lines: 101470-101390	9	506
24/08/02	01	T4	Tie Lines: 190010-190080	8	475
	01	21	Traverse Lines: 100720-100830	12	675
25/08/02	01	T5	Tie Lines: 190090-190170	9	509
	01	22	Traverse Lines: 100840-100950	12	675
26/08/02	01	T6	Tie Lines: 190180-190270	10	545
	01	T7	Tie Lines: 190390, 190430-190420	3	374
	01	23	Traverse Lines: 101380-101340	5	281
27/08/02	01	T8	Tie Lines: 190280-190380	11	600
	01	24	Traverse Lines: 100960-101070	12	675
28/08/02	01	25	Traverse Lines: 101080-101120, 101280-101330	11	619

The following table summarises the flight logs for the survey areas flown by VH-UTR:

Flight Date	Area No	Flight No	Area Name / Survey Details	Lines Flown	Line Km Flown
20/07/02	04	01	Traverse Lines: 400010-400120	12	337
	04	02	Traverse Lines: 400130-400280	16	397
21/07/02	04	03	Traverse Lines: 400220,400290-400490	22	487
	04	04	Traverse Lines: 400500-400590	10	444
22/07/02	04	05	Traverse Lines: 400600-400710	12	454
	04	06	Traverse Lines: 400720-400830	12	444
23/07/02	04	07	Traverse Lines: 400840-400950	12	444
	04	08	Traverse Lines: 400960-401090	14	517
24/07/02	04	09	Traverse Lines: 401100-401210	12	444
	04	10	Traverse Lines: 401220-401320	11	407
25/07/02	04	T1	Tie Lines :490010-490050	5	381
	04	T2	Tie Lines: 490060-490100	5	360
26/07/02	04	T3	Tie Lines: 490110-490170	7	416
	04	T4	Tie Lines: 490180-490260	9	477

A complete survey kilometre report is contained in Appendix G of this report.

6.2 *Diurnal Magnetometer Locations*

The following table contains the approximate locations where the diurnal base station magnetometer was located for each survey area.

Area Name	Period	Base Station ID	Location
Areas 1, 2, 3, 4	11/06/02-28/08/02	41	300m west of Halls Creek Airport terminal building

6.3 *Spectrometer Calibration Results*

Appendix E of this report contains the results of the daily spectrometer resolution and sensitivity tests performed during the survey.

7 DATA PROCESSING PROCEDURES

7.1 *Data Pre-processing*

The raw survey data was loaded from the field tapes and the recorded data trimmed to the correct survey boundary extents. Any survey lines subsequently reflight were removed from the dataset.

At the commencement of each acquisition flight, all the instrumentation clocks were synchronized to local time, and the error and latency of each instrument in providing its data measurement calculated. The results of these latency measurements were recorded into a synchronisation file, and the results used to assign GPS positions to the magnetic, radiometric and elevation data. As a result of the physical separation of the sensors, a small residual offset still exists between instrument timings.

To compensate for this residual parallax error, an adjustment was made to the instrument clocks. The magnetic and radar altimeter data was adjusted by 0.600 seconds (approximately 30 metres), and the radiometric data was adjusted by 1.375 seconds (approximately 70 metres) for each flight.

The synchronized, parallax corrected data was then exported as located ASCII data.

7.2 *Magnetic Data Processing*

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.

The diurnal data was filtered with a 13 point moving average filter to reduce noise levels, followed by second difference filter was to identify and remove spikes of less than 0.25 nT.

The filtered diurnal measurements were subtracted from the diurnal base field and the residual corrections applied to the survey data by synchronising the diurnal data time and the aircraft survey time. The average diurnal base station value of 50306.25 nT was added to the survey data.

An eighth 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.

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. The IGRF 2000 (updated to 2002.75) correction was calculated at each data point (taking into account the height above sea level).

This regional magnetic gradient was subtracted from the survey data points.

Tie line levelling was applied to the data by least squares minimisation, using a polynomial fit of order 0, of the differences in magnetic values at the crossover points of the survey traverse and tie line data.

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 magnetic data.

To reduce the effects of terrain induced variations the recorded magnetic field at the crossover points, points having a radar altimeter difference of 5 metres or a magnetic gradient of 0.16 nT/metre on the traverse or tie line were excluded from the tying process.

In order to remove any residual long wavelength variations in the tie line levelled data along the traverse lines, polynomial levelling was then applied using the following steps:

- For each traverse line the residual crossover value at each intersecting tie line was calculated.
- An Akima spline was fitted to the crossover values along each traverse line.
- The interpolated crossover values were removed from the traverse line data.

Final micro-levelling techniques were then selectively applied to the tie line levelled data to remove minor residual variations in profile intensity. Selective microlevelling was applied in order to leave unaffected any data having no residual levelling artifacts. Selective microlevelling proceeds using the following steps:

- The areas of interest that required micro-levelling were identified through the use of image processing visualisation.
- Polygons were used to define areas requiring microlevelling.
- “Pseudo-ties” were constructed from the gridded data by extracting traverses from the grid normal to the flight direction.
- Line dependent artifacts were removed from the pseudo lines using a custom filter.
- Crossover values were calculated between traverse lines and pseudo tie lines.
- The traverse lines were adjusted in the pre-defined sections to minimise the crossover values.

This process was repeated in order to remove various wavelength line dependent artifacts from the pseudo-ties. The object of each microlevelling iteration was to produce a smooth control surface to which the traverse lines are levelled. This control surface was provided through the use of “pseudo-ties”.

The most predominant artifact wavelength was one flight line spacing, as adjacent flight lines were flown in opposite directions.

The custom filter design was based on a normalised Blackman filter. The most commonly used Blackman window, optimal for line dependent artifacts with a wavelength of one line spacing, was 13 grid points. (The data was gridded at one fifth of the line spacing) This translated to a filter length of 13 for the “pseudo-ties”. Any remaining line dependent features with longer wavelengths were treated in a similar manner, but with a larger filter width.

(Ref. Sweeney, R.E., Grauch, V.J.S., and Phillips J.D. 2002, Merged Digital Aeromagnetic Data for the Middle Rio Grande and Southern Española Basins, New Mexico: U.S. Geological Survey, MS 964 Federal Center, Denver CO 80225, Open-File Report 02-205)

Located and gridded data were generated from the final processed magnetic data.

7.3 Radiometric Data Processing

Statistical noise reduction of the 256 channel data was performed using the Noise Adjusted Singular Variable Decomposition (NASVD) method described by Hovgaard and Grasty (1997).

A noise-adjusted singular value decomposition is performed, and the number of components to be used is determined by inspection of plots of the spectral components and by a statistical analysis of the contributions of the components. If the spectral shapes show any unusual characteristics, further analysis of the concentrations of the spectral components in the line data is performed in order to identify and eliminate any corrupt spectra. If such spectra were eliminated, the NASVD process is re-performed, in order to obtain spectral components free of any bias from corrupt spectra.

Only the dominant spectral shapes (identified as described above) were used in the spectral reconstruction process. The first 6 NASVD components were used for this process. Plots of the first 10 components are included in Appendix I.

Channels 15-250 only are spectrally smoothed, as these contain the regions of interest and are not dominated by the lower end of the Compton continuum. The energy spectrum between the potassium and thorium peaks was recalibrated from the spectrally smoothed 256 channel measurements.

The radar altimeter data was checked for spikes. Any spikes were manually edited.

The aircraft background spectrum and the scaled unit cosmic spectrum were then subtracted from the 256 channel data.

The 256 channel data was then windowed to the 5 primary channels of total count, potassium, uranium, thorium and low-energy uranium. Dead time corrections were then applied to the data.

Radon background removal was performed using the Minty Spectral Ratio method (1992).

The radar altimeter data was corrected to standard temperature and pressure. Height corrected spectral stripping was then applied to the windowed data.

Height attenuation corrections based on the STP radar altimeter were then performed to remove any altitude variation effects from the data.

The corrected count rate data was then converted to ground concentrations for potassium, uranium and thorium (sensitivity coefficients are supplied in Appendix F).

Final micro-levelling techniques were then selectively applied to the tie line levelled data to remove minor residual variations in profile intensities.

Selective microlevelling was applied in order to leave unaffected any data having no residual levelling artifacts.

Selective microlevelling proceeds using the following steps:

- The radiometric data was low-pass filtered in order to remove the high frequency data.
- The residual high frequency data was obtained by subtracting the low-passed data from the raw data and saved.
- The low-passed data was gridded.
- The areas of interest that required micro-levelling were identified through the use of image processing visualisation.
- Polygons were used to define areas requiring microlevelling.
- “Pseudo-ties” were constructed from the gridded data by extracting traverses from the grid normal to the flight direction.
- Line dependent artifacts were removed from the pseudo lines using a custom filter.
- Crossover values were calculated between traverse lines and pseudo tie lines.
- The traverse lines were adjusted in the pre-defined sections to minimise the crossover values.

This process was repeated in order to remove various wavelength anomalies. The non-linear and low-pass filter settings were adjusted at each pass in order to address the wavelength of the artifact being removed.

When all line dependant artifacts had been removed from the low-passed data, the saved high frequency content was added back.

7.4 *Digital Elevation Model Data Processing*

The raw radar altimeter data was checked for spikes, and any found were manually edited. The GPS altimeter data was checked for spikes and steps, and any found were manually edited.

The radar altimeter data was then subtracted from the GPS altimeter data. The separation distance between the GPS antenna and the radar altimeter of 1.4 metres was subtracted from the digital elevation data.

The digital elevation data thus derived was tie line levelled and gridded. Tie line levelled data was then examined and selectively microlevelled to produce a grid without line dependent artifacts. (See Magnetic Data Processing above.)

The set of geoid-ellipsoid data for the survey area was then applied to the digital elevation data to provide heights above sea level. Spot heights were then taken from topographic maps of the area and compared with the located data. The data was adjusted for any residual differences. A listing of the spot heights used for this final correction are listed in Appendix F.

For further information concerning the survey flown, please contact the following office:

Head Office Address:

UTS Geophysics
Fauntleroy Avenue, Perth Airport
REDCLIFFE WA 6104

Tel: +61 8 9479 4232
Fax: +61 8 9479 7361

Postal Address:

UTS Geophysics
P.O. Box 126
BELMONT WA 6984

Quoting reference number: A496

APPENDIX A - LOCATED DATA FORMATS

MAGNETIC LOCATED DATA

FIELD	FORMAT	DESCRIPTION	UNITS
1	Project Number	I4	N/A
2	Flight Number	I4	N/A
3	Line Number	I8	N/A
4	Fiducial	F10.1	N/A
5	Date	ddmmyyyy	N/A
6	Bearing	F6.1	deg East of North
7	Longitude	F11.6	deg GDA94
8	Latitude	F11.6	deg GDA94
9	Easting	F11.2	m GDA94, MGA52
10	Northing	F11.2	m GDA94, MGA52
11	Altimeter	F6.2	m
12	Pressure	F6.1	mbar
13	Temperature	F5.1	°C
14	Final Magnetics (not microlevelled)	F10.3	nT
15	Final Magnetics (microlevelled)	F10.3	nT

DIGITAL TERRAIN MODEL LOCATED DATA

FIELD	FORMAT	DESCRIPTION	UNITS
1	Project Number	I4	N/A
2	Flight Number	I4	N/A
3	Line Number	I8	N/A
4	Fiducial	F10.1	N/A
5	Date	ddmmyyyy	N/A
6	Bearing	F6.1	deg East of North
7	Longitude	F11.6	deg GDA94
8	Latitude	F11.6	deg GDA94
9	Easting	F11.2	m GDA94, MGA52
10	Northing	F11.2	m GDA94, MGA52
11	Altimeter	F6.2	m
12	Pressure	F6.1	mbar
13	Temperature	F5.1	°C
14	Final Aircraft Elevation	F7.1	m GDA94 ellipsoid
15	Final Ground Elevation	F7.1	m AHD

RADIOMETRIC LOCATED DATA

FIELD	FORMAT	DESCRIPTION	UNITS
1	Project Number	I4	N/A
2	Flight Number	I4	N/A
3	Line Number	I8	N/A
4	Fiducial	F10.1	N/A
5	Date	ddmmyyyy	N/A
6	Bearing	F6.1	deg East of North
7	Longitude	F11.6	deg GDA94
8	Latitude	F11.6	deg GDA94
9	Easting	F11.2	m GDA94, MGA52
10	Northing	F11.2	m GDA94, MGA52
11	Altimeter	F6.2	m
12	Pressure	F6.1	mbar
13	Temperature	F5.1	°C
14	Final Dose Rate	F10.3	nGy/hr
15	Final Potassium Concentration	F7.3	%
16	Final Uranium Concentration	F6.3	ppm
17	Final Thorium Concentration	F6.3	ppm

GRIDDED DATASET FORMATS

Gridding was performed using a bicubic spline algorithm for the total magnetic intensity data, and a minimum curvature algorithm for the radiometric and digital terrain data.

The following grid formats have been provided:

- ER-Mapper format

LINE NUMBER FORMATS

Line numbers are identified with a six digit composite line number and have the following format - ALLLLB, where:

A	Survey area number
LLLL	Survey line number 0001-8999 reserved for traverse lines 9001-9999 reserved for tie lines
B	Line attempt number, 0 is attempt 1, 1 is attempt 2 etc..

UTS FILE NAMING FORMATS

Located and gridded data provided by UTS Geophysics uses the following 8 character file naming convention to be compatible with PC DOS based systems.

File names have the following general format - JJJJAABB.EEE, where:

JJJJ	UTS Job number
AA	Area number if the survey is broken into blocks
BB	M Magnetic data R Radiometric data TC Total count data K Potassium counts U Uranium counts Th Thorium counts KC Potassium concentration UC Uranium concentration ThC Thorium concentration DT Digital terrain data
EEE	File name extension LDT Located digital data file FMT Located data format definition file ERS Ermapper gridded data header file Ermapper data portion has no extension GRD Geosoft gridded data file

APPENDIX B - COORDINATE SYSTEM DETAILS

Locations for the survey data are provided in both geographical latitude and longitude and Universal Transverse Mercator metric projection coordinate systems.

WGS84	World Geodetic System 1984
Coordinate Type	Geographical
Semi Major Axis	6378137m
Flattening	1/298.257223563
AMG84	Australian Map Grid 1984
Coordinate Type	Universal Transverse Mercator Projection Grid
Geodetic datum	Australian Geodetic Datum
Semi Major Axis	6378160m
Flattening	1/298.25
MGA94	Map Grid of Australia 1994
Coordinate type	Universal Transverse Mercator Projection Grid
Geodetic datum	Geodetic Datum of Australia
Semi major axis	6378137m
Flattening	1/298.257222101

APPENDIX C - SURVEY BOUNDARY DETAILS



Survey Location Map

Job ID code: A4960101
 Job: West Tanami Subset
 Coordinates AGD84 Zone AMG52Grid Zone: 52
 Include Point: 499986.0 0.00

394866.000	7954399.000
395412.248	7898207.247
500666.412	7898507.235
500666.429	7954829.328
394866.000	7954399.000

Job ID code: A4960201
 Job: West Tanami Subset
 Coordinates AGD84 Zone AMG52Grid Zone: 52
 Include Point: 499986.0 0.00

340711.147	7954171.332
342646.211	7731804.023
416447.284	7732317.036
416447.284	7733317.037
398929.265	7744339.047
398785.263	7768188.073
398566.000	7788557.000
396057.258	7788540.096
395412.248	7898207.247
394866.000	7954399.000
340711.147	7954171.332

Job ID code: A4960301
 Job: West Tanami Subset
 Coordinates AGD84 Zone AMG52Grid Zone: 52
 Include Point: 499986.0 0.00

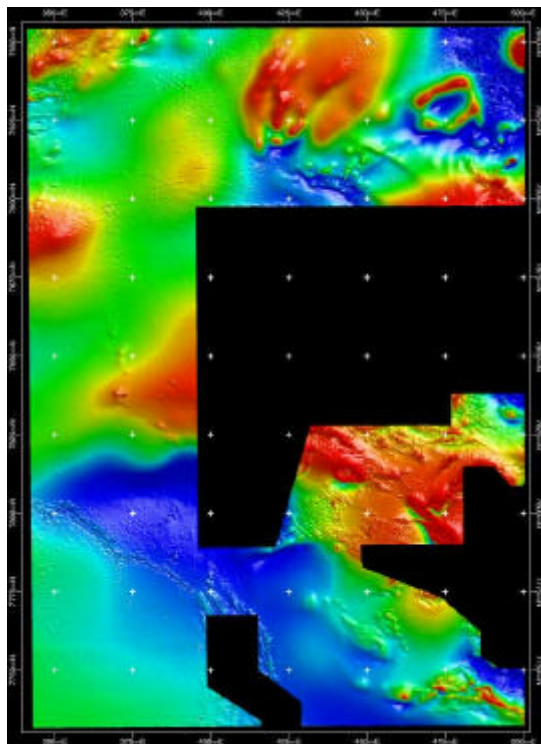
398566.000	7788557.000
398785.263	7768188.073
414741.281	7768282.074
414830.281	7750521.055
428652.296	7740070.044
428682.296	7732376.036
500666.365	7732521.027
500666.370	7750121.044
492560.361	7750119.046
486622.356	7754042.052
486566.358	7761688.060
473739.346	7772787.075
448381.319	7782388.089
448355.320	7790541.098
447866.000	7827500.000
431722.301	7827453.145
420364.287	7788672.097
398566.000	7788557.000

Job ID code: A4960401
 Job: West Tanami Subset
 Coordinates AGD84 Zone AMG52Grid Zone: 52
 Include Point: 499986.0 0.00

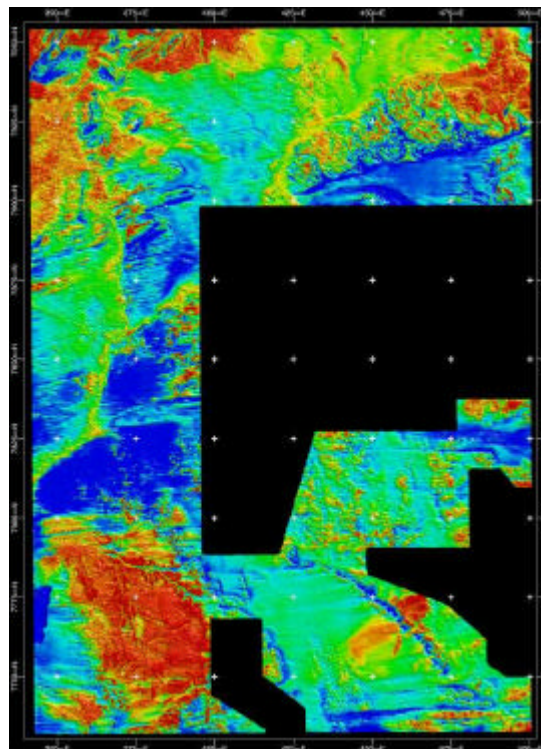
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448355.320	7790541.098
480808.358	7790608.093
480760.363	7815506.124
490437.375	7815515.122
495677.380	7809431.113
500666.386	7809431.111
500666.394	7837542.147
476514.362	7837528.153
476527.360	7827569.140
447866.000	7827500.000

APPENDIX D - PROJECT DATA OVERVIEW

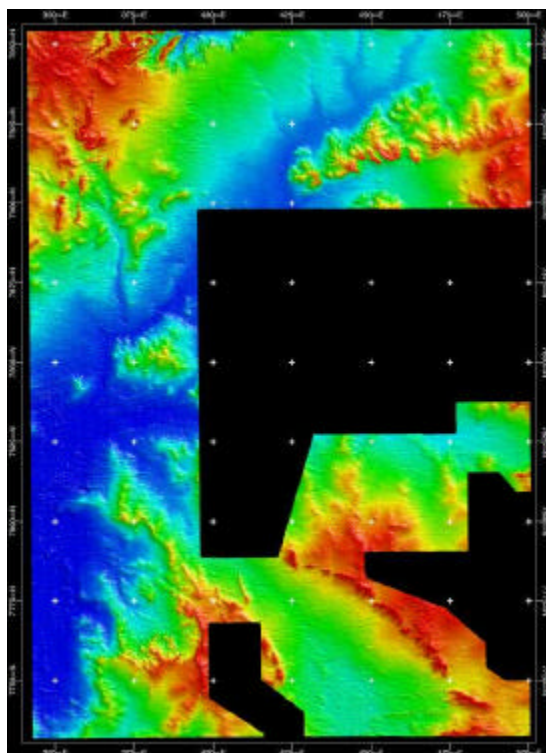
West Tanami Project



Total Magnetic Intensity

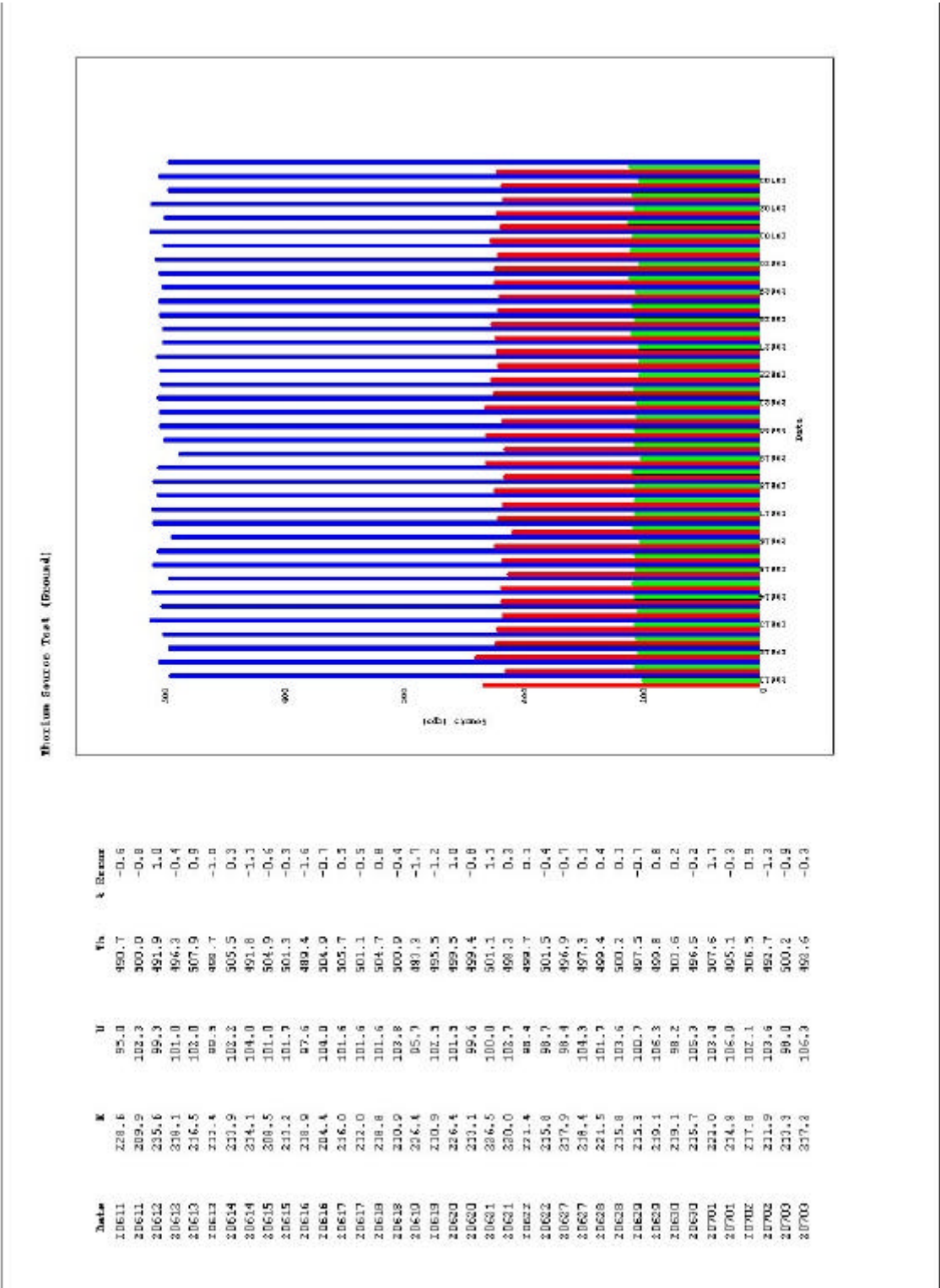


Radiometric Total Count

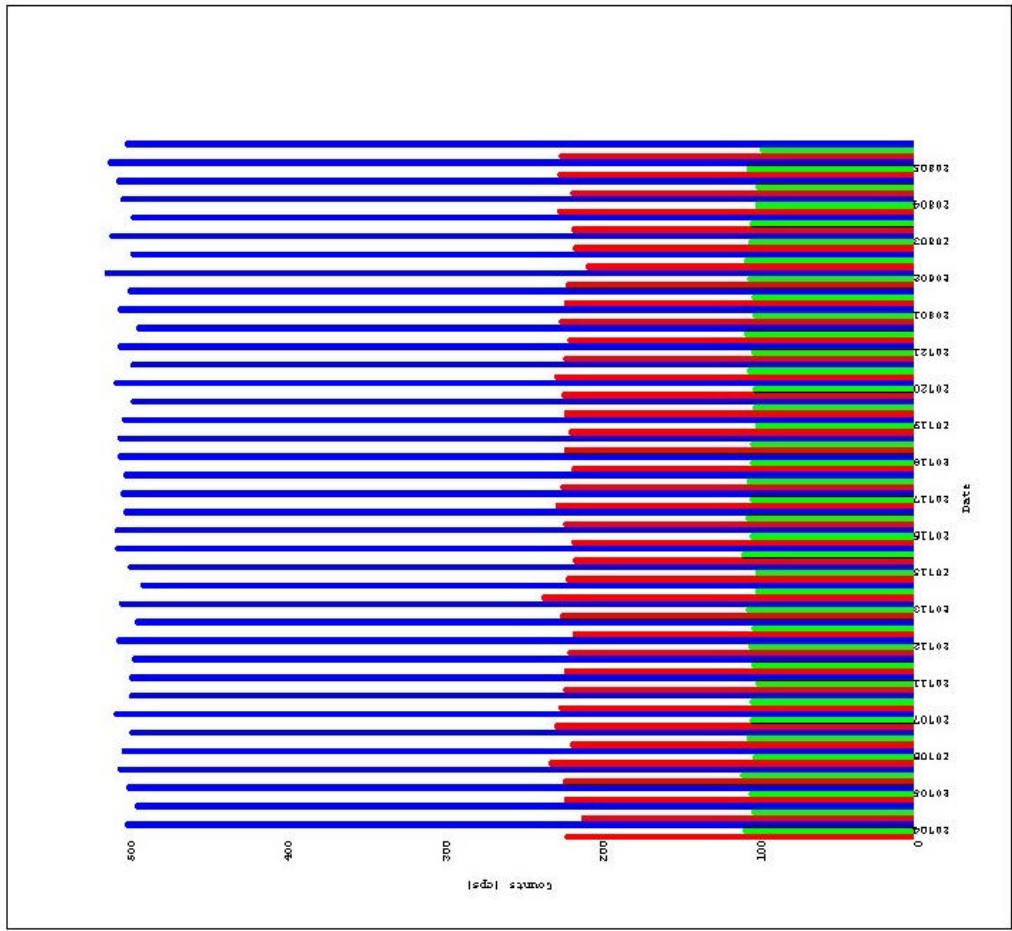


Digital Terrain Model

APPENDIX E – RADIOMETRIC CALIBRATION RESULTS

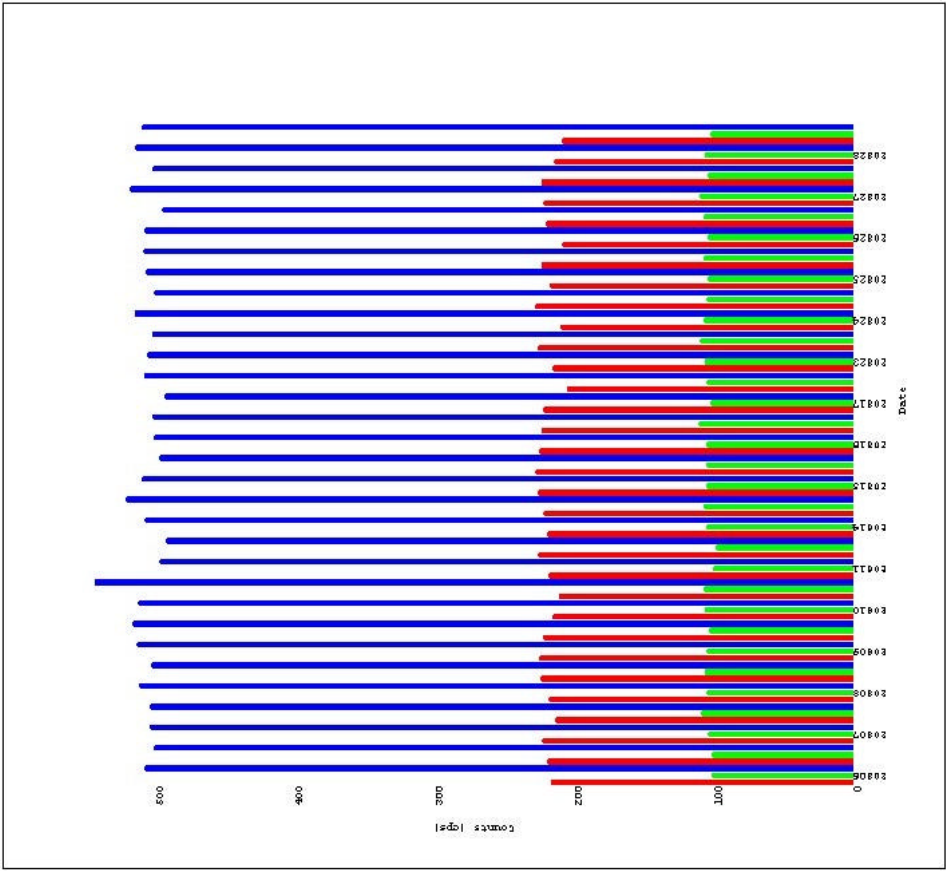


Thorium Source Test (Ground)



Date	K	U	Th	% Error
20704	217.8	105.0	497.6	0.2
20704	207.7	99.5	491.5	-2.5
20705	218.7	101.6	496.8	-0.2
20705	219.6	106.4	502.0	1.1
20706	228.2	99.3	500.1	1.0
20706	215.2	103.0	495.4	-0.7
20707	225.1	100.3	504.6	1.4
20707	222.2	100.4	495.3	-0.1
20711	219.4	96.7	495.5	-0.9
20711	219.2	99.5	493.0	-0.9
20712	216.6	101.5	503.4	0.3
20712	213.2	99.8	491.4	-1.8
20713	221.4	103.3	501.8	0.9
20713	232.6	97.2	487.5	-0.2
20715	217.6	97.6	496.2	-0.9
20715	212.5	106.1	503.6	0.4
20716	214.0	100.7	504.2	0.0
20716	220.0	103.4	498.4	0.4
20717	224.6	100.6	500.8	0.9
20717	221.2	103.1	498.8	0.5
20718	214.5	100.7	502.2	-0.2
20718	218.8	100.4	502.2	0.3
20719	215.5	97.1	498.9	-0.9
20719	219.1	99.3	493.9	-0.8
20720	220.1	98.7	504.7	0.6
20720	224.8	102.4	493.5	0.2
20721	219.6	99.8	502.6	0.4
20721	216.6	104.7	490.5	-0.9
20801	222.0	99.0	507.3	0.5
20801	219.1	100.0	496.6	-0.4
20802	217.3	101.8	511.0	1.4
20802	204.6	104.1	494.2	-2.0
20803	213.9	101.4	508.0	0.4
20803	214.2	100.3	493.7	-1.3
20804	223.0	97.1	501.1	0.3
20804	215.3	96.3	503.1	-0.5
20805	222.8	102.5	508.7	1.8
20805	222.0	94.6	497.7	-0.6

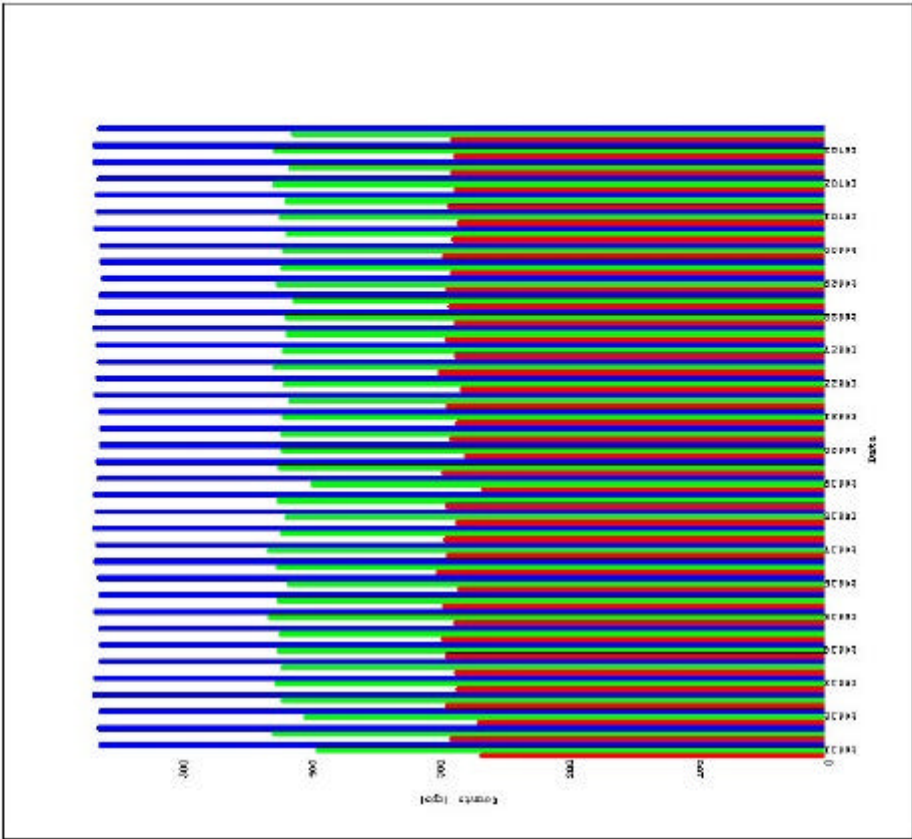
Thorium Source Test (Ground)



Date	K	U	Th	% Error
2006	213.1	98.2	503.6	-0.5
2006	215.3	98.3	497.6	-0.9
2007	218.6	100.3	500.8	0.1
2007	209.9	105.3	500.4	-0.4
2008	215.2	101.2	508.2	0.7
2008	220.8	103.1	499.9	0.6
2009	221.7	101.3	510.0	1.7
2009	218.4	99.7	512.8	1.5
2010	211.7	103.0	508.9	0.6
2010	207.8	103.8	540.1	4.0
2011	215.0	96.7	493.9	-1.6
2011	222.7	94.7	489.1	-1.5
2014	216.1	101.0	504.0	0.3
2014	218.4	103.9	518.0	2.6
2015	222.6	101.6	506.2	1.4
2015	234.2	101.5	494.1	0.1
2016	221.3	101.2	497.6	0.1
2016	219.9	106.6	498.3	0.7
2017	217.9	98.9	490.1	-1.5
2017	201.5	101.5	504.3	-1.4
2023	211.8	102.6	502.3	-0.3
2023	221.9	106.1	499.0	1.0
2024	205.9	104.1	510.9	0.2
2024	223.6	101.0	497.4	0.4
2025	213.7	100.4	502.9	-0.2
2025	220.2	103.7	505.8	1.3
2026	205.3	100.7	504.1	-1.1
2026	216.5	103.5	491.6	-0.9
2027	218.3	105.9	514.5	2.4
2027	219.7	100.2	498.5	-0.1
2028	210.5	103.1	510.8	0.7
2028	204.7	99.2	506.2	-1.1

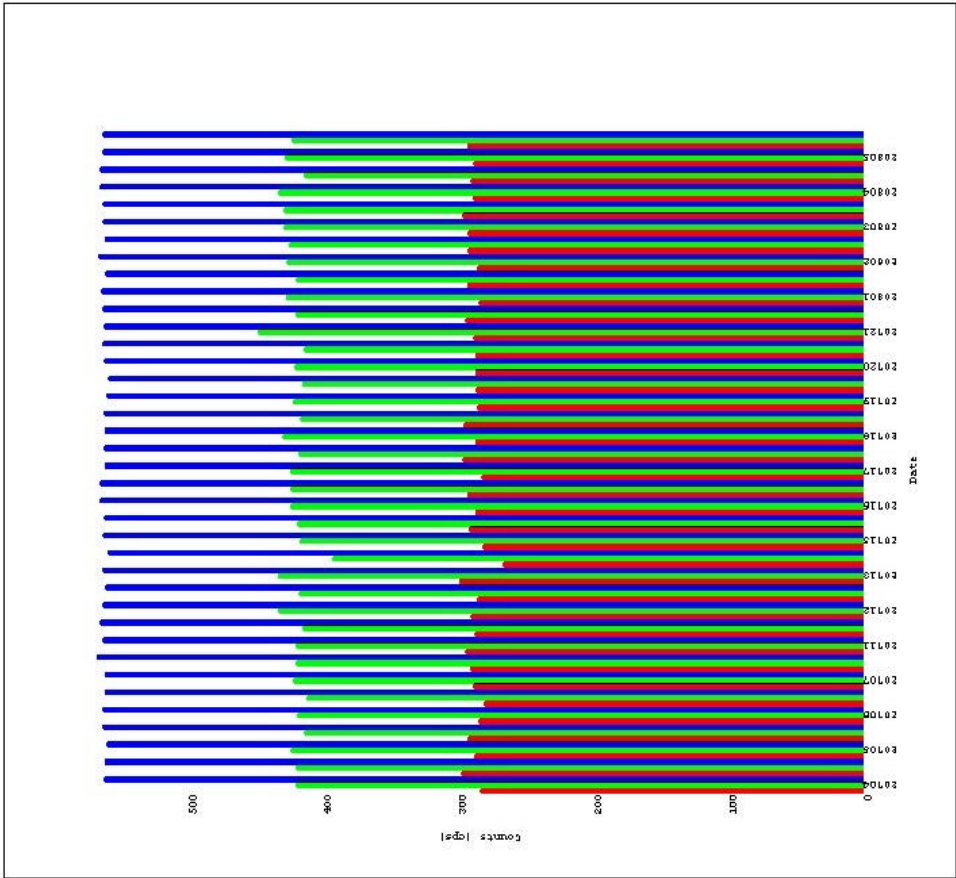
Avg 217.3 101.2 500.4 0.0

Median Source Test (Baseline)



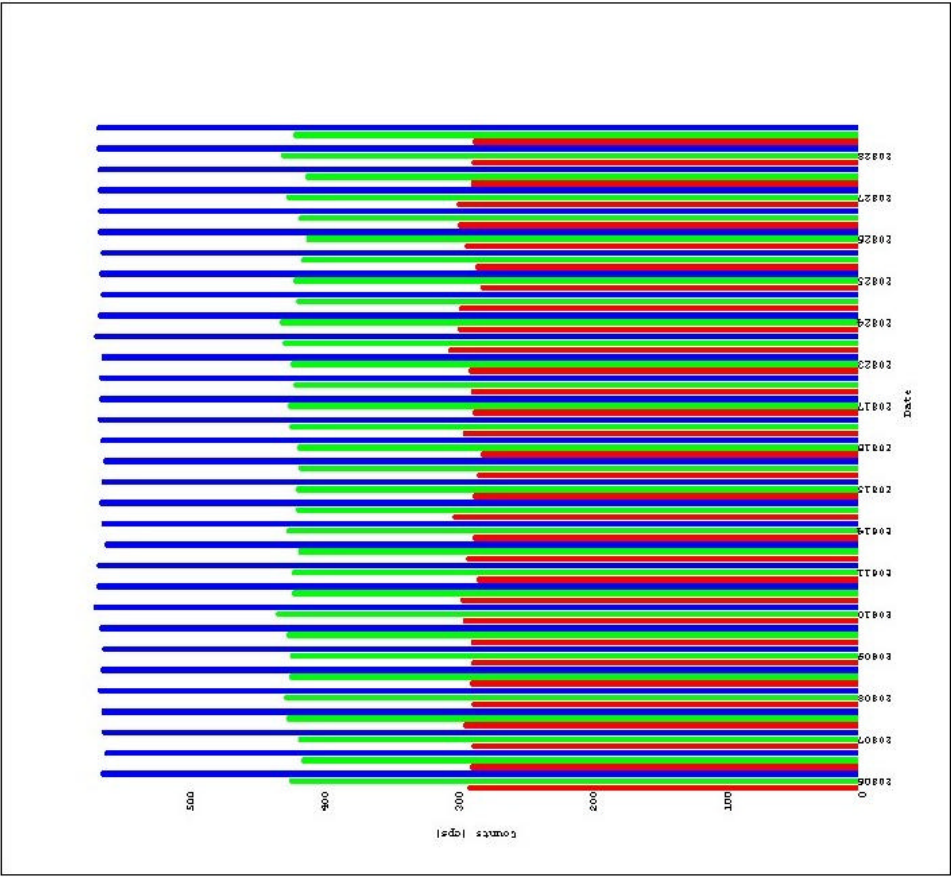
Date	R	U	TA	% Error
20011	203.6	590.1	559.2	-4.3
20012	207.2	484.9	559.0	0.6
20013	204.6	400.3	559.1	-3.2
20014	200.9	415.8	564.2	0.6
20015	202.2	422.6	552.6	0.3
20016	203.2	415.0	552.8	-0.4
20017	200.6	420.6	558.6	0.3
20018	203.1	410.1	559.0	0.6
20019	204.3	407.3	562.6	0.8
20020	202.3	420.6	559.0	0.6
20021	201.6	412.8	559.5	-0.8
20022	207.5	421.5	562.2	1.4
20023	209.3	426.7	561.1	1.2
20024	201.7	417.6	564.2	0.7
20025	202.3	414.3	561.2	-0.5
20026	200.4	420.2	562.7	0.8
20027	202.6	405.2	559.6	-3.7
20028	203.6	420.0	560.4	0.8
20029	215.0	416.0	558.3	-1.3
20030	207.1	417.6	557.2	-0.2
20031	202.3	416.3	559.7	-0.5
20032	200.1	411.9	562.8	0.3
20033	218.4	415.6	560.8	-0.7
20034	205.8	422.9	560.2	1.2
20035	203.0	416.7	561.0	-0.3
20036	200.4	415.3	564.1	0.3
20037	203.0	414.8	561.0	-0.3
20038	207.0	408.8	558.7	-0.7
20039	200.0	421.2	556.7	0.4
20040	206.3	417.7	557.5	-0.2
20041	202.3	416.4	558.0	0.2
20042	205.7	413.6	562.3	-0.2
20043	201.5	418.6	560.8	-0.2
20044	207.7	414.8	561.8	0.0
20045	203.5	424.0	560.2	0.3
20046	206.1	432.1	563.7	-0.2
20047	204.9	403.6	563.0	0.6
20048	206.5	409.6	560.1	-0.6

Uranium Source Test (Background)



Date	K	U	Th	% Error
20704	280.6	416.5	559.5	-0.6
20704	294.1	416.6	558.6	0.4
20705	284.9	420.7	557.3	-0.1
20705	289.4	410.9	560.3	-0.3
20706	281.3	415.7	560.3	-0.5
20706	277.5	409.0	559.0	-1.5
20707	285.4	419.3	558.8	-0.0
20707	287.1	416.8	564.7	0.4
20711	291.7	416.3	560.3	0.3
20711	284.8	411.6	561.9	-0.5
20712	287.4	429.8	560.6	1.1
20712	281.7	415.0	557.6	-0.7
20713	296.3	430.3	560.8	1.8
20713	263.2	390.0	555.9	-4.4
20715	279.1	414.3	560.0	-0.8
20715	288.3	416.0	559.7	-0.0
20716	283.9	420.6	561.9	0.2
20716	290.1	421.0	561.8	0.7
20717	280.1	420.6	558.7	-0.4
20717	293.4	414.8	559.7	0.3
20718	283.8	426.7	558.5	0.4
20718	292.4	413.6	559.3	0.1
20719	281.5	419.6	557.1	-0.4
20719	283.6	412.6	556.0	-0.9
20720	284.3	417.6	559.7	-0.2
20720	284.3	410.5	560.2	-0.7
20721	285.6	445.4	559.9	2.1
20721	292.1	416.7	560.8	0.4
20801	281.7	424.8	560.9	0.3
20801	290.4	416.5	557.7	0.1
20802	282.1	423.6	562.8	0.3
20802	289.3	422.2	559.0	0.5
20803	289.3	425.7	560.2	0.9
20803	293.6	425.8	560.3	1.2
20804	286.1	429.3	562.3	1.1
20804	287.5	410.5	562.1	-0.3
20805	285.4	425.3	560.8	0.6
20805	290.3	419.7	560.5	0.5

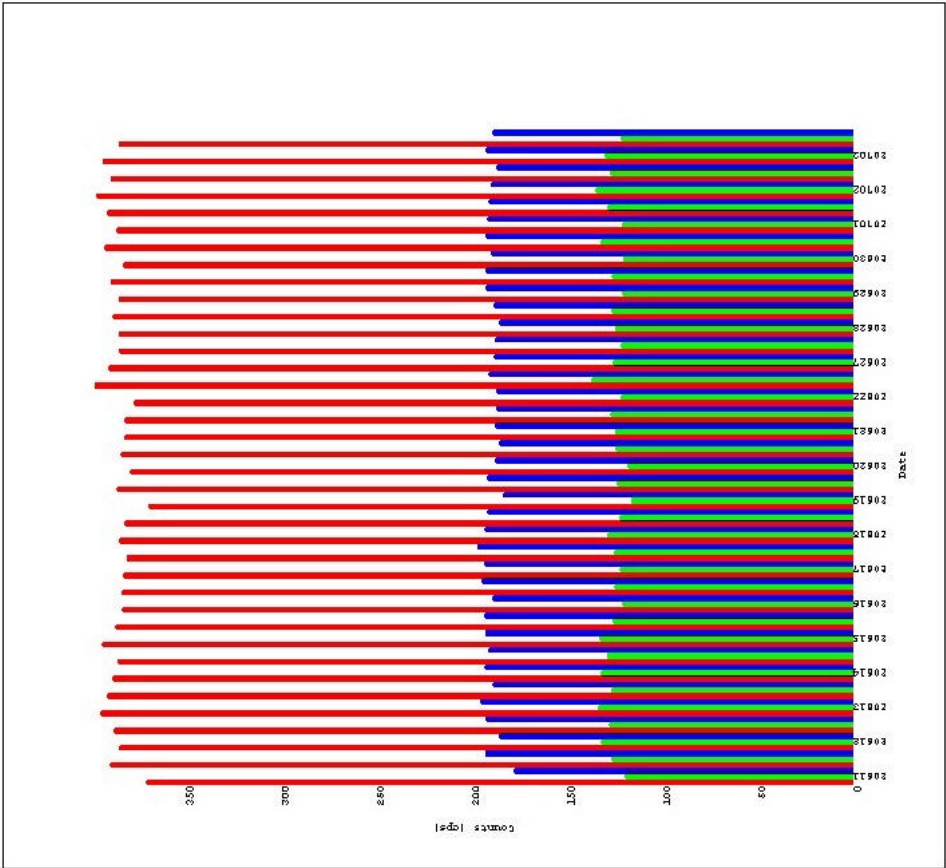
Uranium Source Test (Ground)



Date	K	U	Vh	% Error
20806	287.4	420.3	560.8	0.3
20806	285.5	410.8	556.9	-0.9
20807	284.1	413.1	559.3	-0.6
20807	289.4	421.9	559.6	0.5
20808	284.2	423.5	562.3	0.5
20808	285.4	420.0	560.3	0.1
20809	283.6	419.1	559.2	-0.2
20809	284.9	421.6	561.5	0.3
20810	291.0	429.8	565.9	1.8
20810	292.9	417.9	562.9	0.8
20811	280.0	417.4	563.2	-0.3
20811	287.7	412.8	557.5	-0.5
20814	282.5	421.7	559.7	-0.0
20814	298.2	415.3	561.2	0.8
20815	282.7	415.0	559.6	-0.5
20815	280.5	412.0	557.8	-1.1
20816	276.7	414.1	560.4	-1.0
20816	290.6	420.4	562.3	0.7
20817	283.2	420.8	561.7	0.1
20817	284.6	416.5	561.3	-0.1
20823	286.3	418.4	559.7	0.0
20823	301.2	424.7	564.6	2.1
20824	293.9	426.9	562.2	1.5
20824	293.5	415.3	560.7	0.4
20825	277.1	416.7	562.0	-0.7
20825	281.3	410.4	561.0	-0.9
20826	289.0	407.4	562.2	-0.4
20826	294.0	412.1	562.7	0.4
20827	295.4	422.0	562.8	1.3
20827	284.3	407.6	562.7	-0.7
20828	283.9	425.8	563.1	0.7
20828	282.9	416.2	563.1	-0.1

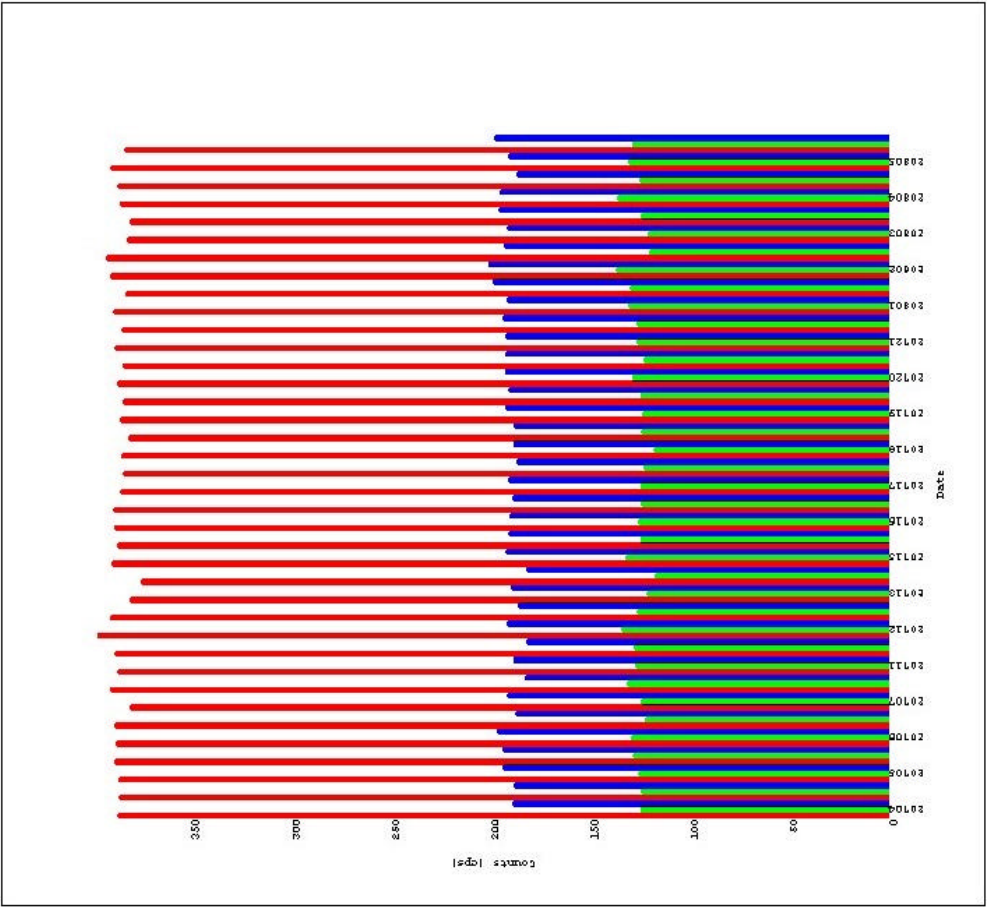
Avg: 286.0 417.5 560.5 0.0

Background Source Test (6xround)



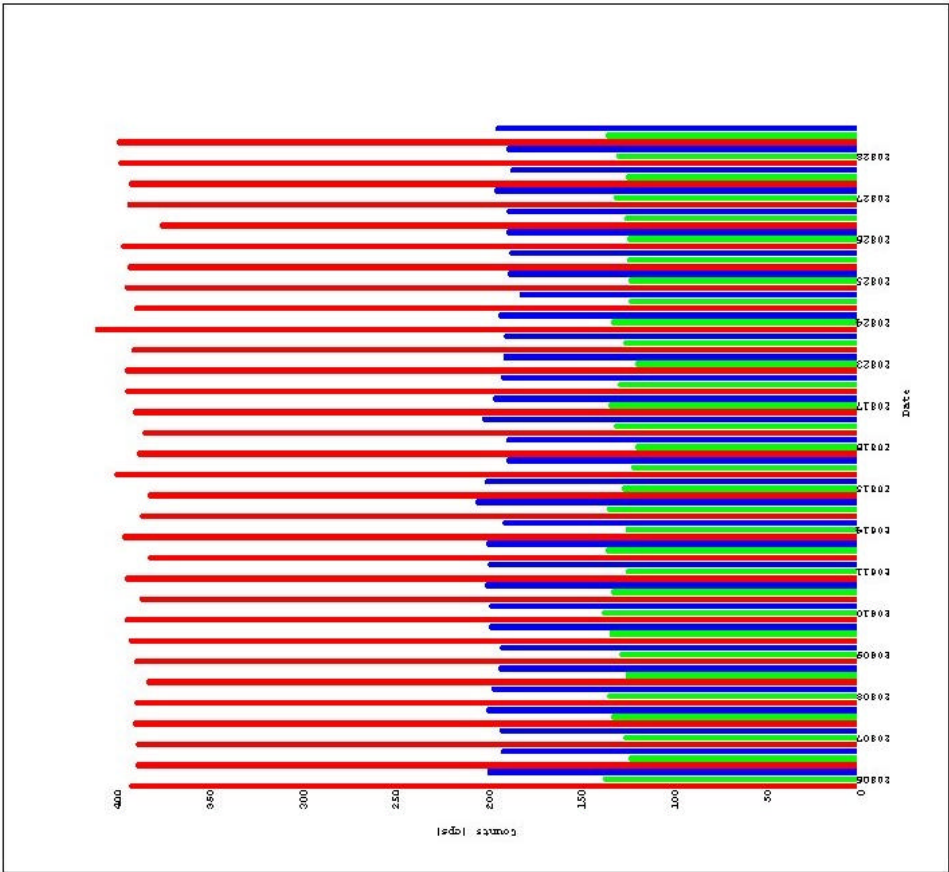
Date	K	U	Vh	% Error
20611	368.2	116.9	175.0	-5.4
20611	387.1	124.1	190.2	0.5
20612	381.9	129.6	182.9	-0.5
20612	385.0	125.2	189.9	0.4
20613	392.2	131.3	192.4	2.6
20613	388.1	124.3	186.5	0.2
20614	385.1	129.3	190.7	1.1
20614	382.9	126.6	188.4	0.0
20615	391.5	130.3	190.1	2.0
20615	384.1	123.5	190.8	0.1
20616	380.8	118.3	186.8	-1.7
20616	380.3	122.9	192.1	-0.3
20617	380.1	119.8	190.8	-1.0
20617	378.0	123.1	194.4	-0.3
20618	381.5	125.7	191.0	0.1
20618	379.3	120.1	189.0	-1.3
20619	366.9	113.7	180.4	-5.2
20619	383.6	120.8	188.9	-0.6
20620	376.1	115.4	184.8	-3.0
20620	381.0	121.4	183.0	-1.7
20621	379.1	122.0	185.1	-1.6
20621	379.1	124.5	184.1	-1.4
20622	374.5	119.5	184.3	-2.8
20622	395.0	134.4	188.6	2.9
20627	387.7	123.7	185.4	-0.1
20627	381.7	119.5	184.7	-1.7
20628	382.3	122.0	183.1	-1.5
20628	385.1	123.8	185.7	-0.4
20629	381.5	118.9	189.9	-0.9
20629	386.6	124.0	189.5	0.4
20630	379.8	117.8	187.1	-1.8
20630	389.5	129.3	189.8	1.6
20701	383.6	118.8	188.8	-0.9
20701	388.3	126.0	188.3	0.7
20702	393.6	132.6	187.5	2.3
20702	386.4	124.4	184.1	-0.4
20703	390.8	127.6	189.9	1.5
20703	382.4	119.2	186.7	-1.3

Background Source Test (ground)



Date	K	U	Ph	% Error
20704	384.6	122.1	186.4	-0.6
20704	384.1	121.4	185.3	-1.0
20705	384.1	123.6	191.5	0.2
20705	385.5	125.6	191.5	0.7
20706	385.4	127.3	193.7	1.3
20706	385.9	119.8	184.9	-1.0
20707	378.8	121.7	189.1	-1.1
20707	388.3	129.0	180.2	-0.0
20711	384.5	124.4	185.9	-0.4
20711	386.0	125.1	179.5	-1.0
20712	394.8	131.6	188.7	2.5
20712	388.4	123.8	183.7	-0.2
20713	378.6	119.0	187.4	-1.8
20713	372.3	115.0	179.2	-4.5
20715	387.7	129.5	189.7	1.3
20715	384.4	122.2	188.2	-0.4
20716	385.9	123.3	188.0	-0.0
20716	386.7	121.8	186.7	-0.3
20717	383.2	121.9	188.2	-0.6
20717	381.7	120.9	184.4	-1.6
20718	382.8	115.7	185.9	-1.9
20718	378.9	121.3	185.6	-1.7
20719	383.1	120.7	189.5	-0.6
20719	381.7	122.1	188.3	-0.8
20720	384.4	126.2	190.4	0.5
20720	381.7	120.6	189.4	-0.8
20721	385.7	124.1	189.6	0.3
20721	382.8	124.0	191.3	0.1
20801	386.9	128.1	189.1	0.9
20801	380.2	127.3	196.3	0.9
20802	388.3	134.3	198.7	3.4
20802	390.1	117.1	190.6	0.0
20803	379.8	118.4	189.2	-1.5
20803	378.3	121.3	193.2	-0.7
20804	383.3	133.4	197.5	1.7
20804	384.4	122.7	184.3	-0.9
20805	388.4	128.3	188.6	1.1
20805	381.0	126.6	195.7	0.8

Background Source Test (82000)



Date	K	U	Th	% Error
20806	388.4	133.5	196.4	3.0
20806	384.6	120.1	188.6	-0.6
20807	384.8	122.8	189.4	-0.1
20807	387.0	129.3	196.5	2.2
20808	386.1	131.3	193.4	1.9
20808	379.1	121.4	189.9	-1.0
20809	386.4	124.8	189.6	0.3
20809	388.8	130.1	195.2	2.4
20810	391.3	134.0	194.7	3.2
20810	382.8	128.9	197.3	1.6
20811	391.0	120.8	195.4	1.4
20811	378.9	132.4	196.7	1.5
20814	392.3	121.5	188.1	0.6
20814	383.1	131.8	202.4	2.8
20815	370.4	123.6	197.1	0.2
20815	396.8	118.4	185.7	0.5
20816	384.1	116.2	185.8	-1.6
20816	381.5	128.0	198.5	1.5
20817	387.0	131.0	193.0	1.9
20817	391.0	125.5	188.5	1.1
20823	390.9	116.0	187.4	-0.5
20823	387.4	122.8	187.1	-0.0
20824	407.2	129.2	189.8	4.1
20824	385.9	119.5	178.6	-1.9
20825	391.3	119.7	185.0	-0.2
20825	389.3	120.5	184.6	-0.4
20826	392.7	120.7	185.4	0.2
20826	372.4	122.4	185.4	-2.5
20827	389.6	127.7	192.2	1.7
20827	388.4	121.0	184.0	-0.6
20828	394.8	126.6	185.7	1.4
20828	395.5	132.0	191.1	3.0

Avg 384.8 124.0 188.7 0.0

APPENDIX F – ACQUISITION AND PROCESSING PARAMETERS

Magnetic Data

RMS AADC Coefficients

VH-HVP

Solution Date: 10/06/2002

Solution Altitude: 6500 ft AGL

Standard Deviation Total Field Uncompensated	2.969×10^{-1}
Standard Deviation Total Field Compensated	2.524×10^{-2}
Improvement Ratio	11.8
Norm	17.9

VH-UTR

Solution Date: 19/07/2002

Solution Altitude: 6500 ft AGL

Standard Deviation Total Field Uncompensated	2.277×10^{-1}
Standard Deviation Total Field Compensated	1.768×10^{-2}
Improvement Ratio	12.9
Norm	13.5

Magnetic Processing Parameters

Model	: IGRF 2000
Declination	: 3.56 degrees
Inclination	: -50.79 degrees
Field strength	: 51142.21 nT
Average diurnal	: 50306.25 nT

Radiometric Data

Both aircraft flew the calibration range at Carnamah, WA and then height stacks over water on the 26th April, 2002. The results of these calibrations are summarised below.

VH-HVP

Striping Coefficients

Alpha	0.231
Beta	0.400
Gamma	0.748
a	0.028
b	0.004
c	0.000

Height Attenuation Coefficients

Total Count:	-0.006399
Potassium:	-0.007724
Uranium:	-0.007527
Thorium:	-0.006477

Cosmic Correction Coefficients

Total Count:	1.050639
Potassium:	0.04744
Uranium:	0.046287
Thorium:	0.055201

Aircraft Background Coefficients

Total Count:	62.958805
Potassium:	8.339367
Uranium:	2.567141
Thorium:	1.110206

Sensitivity Coefficients

Total Count:	35.7437 cps/dose rate
Potassium:	138.1288 cps/%k
Uranium:	14.85442 cps/ppm
Thorium:	7.12099 cps/ppm

VH-UTR

Striping Coefficients

Alpha	0.243
Beta	0.402
Gamma	0.708
a	0.050
b	0.000
c	0.004

Height Attenuation Coefficients

Total Count:	-0.0061869
Potassium:	-0.0074044
Uranium:	-0.0069523
Thorium:	-0.0061239

Cosmic Correction Coefficients

Total Count:	0.867197
Potassium:	0.054684
Uranium:	0.038899
Thorium:	0.044744

Aircraft Background Coefficients

Total Count:	61.09603
Potassium:	10.2356
Uranium:	1.44404
Thorium:	1.52850

Sensitivity Coefficients

Total Count:	37.3826 cps/dose rate
Potassium:	151.9808 cps/%k
Uranium:	13.79394 cps/ppm
Thorium:	7.44580 cps/ppm

Final Reduction - All data reduced to STP height datum 60m

Digital Elevation Data

The following AHD measurements were taken from the AUSLIG digital map data. The average difference between the AHD (calculated as per the contractual specifications) and the AUSLIG map data was calculated. The elevation model was found to be, on average, 22 metres lower than the measured AHD. Subsequently a correction of +22 metres was applied to the digital elevation data.

Spot Height Location Name	Easting	Northing	AUSLIG Elevation (metres AHD)	Calculated DTM (metres AHD)	Dz
Mt Mueller	371000	7801000	415	392	-23
Lake Gregory	344400	7763200	270	261	-9
Killi Killi Hills	497700	7814200	479	454	-25
Mt Wittenoom	486500	7945500	428	396	-32
Falconer Hills	357500	7843300	359	338	-21
				Average Dz	-22 metres

APPENDIX G – SURVEY KILOMETRE REPORT

LINE KM REPORT FOR a496m.ltd

PRJ	FLT	LINE	START COORDINATE		END COORDINATE		LINE KM
862	114	100020	500591	7954905	500663	7943410	11.5
862	114	100030	500168	7954905	500660	7898424	56.5
862	114	100040	500260	7898426	499768	7954910	56.5
862	114	100050	499363	7954920	499860	7898429	56.5
862	114	100060	499466	7898406	498967	7954899	56.5
862	114	100070	498563	7954913	499062	7898420	56.5
862	114	100080	498659	7898413	498167	7954902	56.5
862	114	100090	497762	7954904	498257	7898419	56.5
862	114	100100	497856	7898415	497369	7954892	56.5
862	114	100110	496967	7954905	497461	7898422	56.5
862	115	100120	497057	7898422	496570	7954894	56.5
862	115	100130	496230	7954905	496664	7898406	56.5
862	115	100140	496269	7898395	495778	7954903	56.5
862	115	100150	495371	7954901	495859	7898422	56.5
862	115	100160	495452	7898410	494959	7954875	56.5
862	115	100170	494579	7954894	495061	7898424	56.5
862	115	100180	494695	7898400	494176	7954887	56.5
862	115	100190	493770	7954882	494258	7898413	56.5
862	115	100200	493871	7898411	493372	7954866	56.5
862	115	100210	492980	7954874	493458	7898403	56.5
862	115	100220	493103	7898395	492567	7954872	56.5
862	115	100230	492169	7954889	492667	7898417	56.5
862	116	100240	492252	7898385	491767	7954863	56.5
862	116	100250	491368	7954884	491864	7898400	56.5
862	116	100260	491484	7898395	490954	7954868	56.5
862	116	100270	490588	7954870	491063	7898389	56.5
862	116	100280	490665	7898402	490167	7954858	56.5
862	116	100290	489683	7954866	490249	7898388	56.5
862	116	100300	489864	7898388	489367	7954867	56.5
862	116	100310	488965	7954880	489462	7898412	56.5
862	116	100320	489019	7898386	488561	7954854	56.5
862	116	100330	488167	7954867	488660	7898384	56.5
862	116	100340	488267	7898386	487764	7954871	56.5
862	116	100350	487372	7954862	487862	7898404	56.5
862	117	100360	487469	7898377	486973	7954868	56.5
862	117	100370	486568	7954858	487058	7898382	56.5
862	117	100380	486673	7898387	486167	7954858	56.5
862	117	100390	485827	7954847	486261	7898383	56.5
862	117	100400	485859	7898370	485367	7954843	56.5
862	117	100410	484963	7954864	485459	7898370	56.5
862	117	100420	485066	7898384	484566	7954835	56.5
862	117	100430	484171	7954860	484659	7898392	56.5
862	117	100440	484280	7898373	483767	7954847	56.5
862	117	100450	483368	7954850	483862	7898389	56.5
862	117	100460	483463	7898381	482963	7954850	56.5
862	117	100470	482565	7954834	483062	7898381	56.5
862	118	100480	482668	7898366	482170	7954834	56.5
862	118	100490	481767	7954843	482262	7898367	56.5
862	118	100500	481864	7898377	481366	7954832	56.5
862	118	100510	480969	7954832	481463	7898375	56.5
862	118	100520	481074	7898355	480565	7954832	56.5
862	118	100530	480159	7954828	480659	7898363	56.5
862	118	100540	480261	7898369	479768	7954817	56.5
862	118	100550	479371	7954826	479856	7898367	56.5
862	118	100560	479451	7898356	478968	7954818	56.5
862	118	100570	478568	7954819	479062	7898374	56.5
862	118	100580	478648	7898347	478170	7954822	56.5
862	118	100590	477816	7954826	478259	7898362	56.5
862	119	100600	477852	7898350	477364	7954812	56.5
862	119	100610	476967	7954827	477461	7898358	56.5
862	119	100620	477068	7898352	476563	7954801	56.5
862	119	100630	476167	7954829	476658	7898352	56.5
862	119	100640	476270	7898351	475769	7954803	56.5
862	119	100650	475374	7954817	475861	7898357	56.5
862	119	100660	475484	7898344	474971	7954808	56.5
862	119	100670	474518	7954819	475062	7898367	56.5
862	119	100680	474661	7898342	474175	7954806	56.5
862	119	100690	473769	7954797	474253	7898364	56.4
862	119	100700	473868	7898340	473373	7954784	56.5
862	119	100710	472970	7954808	473463	7898344	56.5
862	121	100720	473075	7898342	472564	7954803	56.5

862	121	100730	472170	7954792	472660	7898356	56.4
862	121	100740	472238	7898344	471744	7954788	56.5
862	121	100750	471335	7954801	471862	7898340	56.5
862	121	100760	471470	7898331	470966	7954795	56.5
862	121	100770	470578	7954800	471060	7898345	56.5
862	121	100780	470675	7898326	470170	7954774	56.5
862	121	100790	469754	7954783	470263	7898341	56.4
862	121	100800	469860	7898334	469370	7954774	56.4
862	121	100810	468959	7954777	469461	7898350	56.4
862	121	100820	469062	7898333	468569	7954779	56.5
862	121	100830	468129	7954796	468663	7898327	56.5
862	122	100840	468285	7898318	467764	7954767	56.5
862	122	100850	467368	7954788	467862	7898325	56.5
862	122	100860	467459	7898314	466969	7954764	56.5
862	122	100870	466543	7954765	467064	7898341	56.4
862	122	100880	466654	7898331	466162	7954761	56.4
862	122	100890	465788	7954772	466264	7898324	56.5
862	122	100900	465847	7898316	465364	7954764	56.5
862	122	100910	464962	7954767	465458	7898322	56.5
862	122	100920	465041	7898308	464568	7954765	56.5
862	122	100930	464182	7954772	464663	7898316	56.5
862	122	100940	464250	7898321	463770	7954761	56.4
862	122	100950	463384	7954770	463859	7898320	56.5
862	124	100960	463471	7898325	462967	7954756	56.4
862	124	100970	462600	7954770	463060	7898314	56.5
862	124	100980	462663	7898308	462169	7954741	56.4
862	124	100990	461781	7954756	462265	7898304	56.5
862	124	101000	461879	7898311	461360	7954748	56.4
862	124	101010	460954	7954747	461461	7898314	56.4
862	124	101020	461077	7898318	460568	7954759	56.4
862	124	101030	460172	7954740	460659	7898314	56.4
862	124	101040	460301	7898312	459767	7954744	56.4
862	124	101050	459334	7954759	459857	7898298	56.5
862	124	101060	459462	7898314	458967	7954741	56.5
862	124	101070	458548	7954747	459062	7898302	56.5
862	125	101080	458697	7898303	458167	7954740	56.4
862	125	101090	458263	7898301	457740	7954933	56.6
862	125	101100	457857	7898291	457367	7954745	56.5
862	125	101110	456967	7954727	457460	7898308	56.4
862	125	101120	457066	7898285	456568	7954745	56.5
862	110	101130	456167	7954727	456667	7898302	56.4
862	110	101140	456252	7898307	455750	7954726	56.4
862	110	101150	455366	7954716	455858	7898282	56.4
862	110	101160	455457	7898308	454965	7954735	56.4
862	110	101170	454567	7954731	455065	7898301	56.4
862	110	101180	454659	7898287	454169	7954719	56.4
862	110	101190	453761	7954731	454259	7898286	56.5
862	109	101200	453871	7898301	453352	7954726	56.4
862	109	101210	452961	7954726	453462	7898278	56.5
862	109	101220	453060	7898292	452573	7954719	56.4
862	109	101230	452168	7954712	452657	7898278	56.4
862	109	101240	452255	7898275	451771	7954706	56.4
862	109	101250	451364	7954705	451859	7898294	56.4
862	110	101260	451458	7898293	450962	7954712	56.4
862	110	101270	451058	7898290	450568	7954723	56.4
862	125	101280	450165	7954713	450656	7898283	56.4
862	125	101290	449762	7954707	450258	7898296	56.4
862	125	101300	449860	7898272	449369	7954702	56.4
862	125	101310	448931	7954700	449462	7898283	56.4
862	125	101320	449063	7898268	448571	7954687	56.4
862	125	101330	448659	7898271	448166	7954700	56.4
862	123	101340	447766	7954714	448261	7898290	56.4
862	123	101350	447871	7898270	447368	7954683	56.4
862	123	101360	446963	7954707	447460	7898281	56.4
862	123	101370	447050	7898256	446569	7954693	56.4
862	123	101380	446185	7954688	446659	7898277	56.4
862	120	101390	446261	7898281	445758	7954687	56.4
862	120	101400	445375	7954702	445861	7898268	56.4
862	120	101410	445460	7898251	444961	7954683	56.4
862	120	101420	444581	7954683	445059	7898275	56.4
862	120	101430	444677	7898262	444159	7954678	56.4
862	120	101440	443769	7954681	444258	7898263	56.4
862	120	101450	443875	7898254	443365	7954684	56.4
862	120	101460	442980	7954688	443459	7898274	56.4
862	120	101470	443060	7898256	442563	7954666	56.4
862	111	101480	442167	7954684	442659	7898259	56.4
862	111	101490	442261	7898269	441769	7954669	56.4
862	111	101500	441353	7954683	441859	7898243	56.4
862	111	101510	441461	7898266	440969	7954675	56.4
862	111	101520	440565	7954662	441057	7898241	56.4
862	111	101530	440661	7898258	440159	7954653	56.4
862	111	101540	439768	7954672	440258	7898246	56.4

862	111	101550	439861	7898259	439364	7954659	56.4
862	111	101560	438965	7954649	439460	7898244	56.4
862	111	101570	439047	7898263	438569	7954660	56.4
862	111	101580	438165	7954673	438657	7898237	56.4
862	111	101590	438257	7898255	437765	7954648	56.4
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862	207	201220	368116	7731885	366103	7954346	222.5
862	207	201230	365732	7954359	367709	7731909	222.5
862	207	201231	367308	7731876	365333	7952777	221.0
862	207	201240	365354	7954368	365395	7950161	4.2
862	207	201250	364970	7954349	366911	7731894	222.5
862	208	201260	366504	7731874	364571	7954347	222.6
862	208	201270	364170	7954342	366110	7731889	222.5
862	209	201280	365710	7731868	363769	7954361	222.5
862	209	201290	363370	7954357	365305	7731875	222.5
862	257	201301	364910	7731879	362967	7954338	222.5
862	249	201310	362567	7954357	364513	7731871	222.5
862	250	201320	362165	7954346	364109	7731869	222.5
862	251	201330	363722	7731869	361768	7954350	222.5
862	252	201340	361372	7954340	363311	7731873	222.5
862	252	201350	360968	7954332	362908	7731864	222.5
862	253	201360	362515	7731858	360509	7954338	222.5
862	253	201370	360168	7954338	362112	7731846	222.5
862	254	201380	361678	7731842	359769	7954328	222.5
862	230	201390	359364	7954331	361312	7731855	222.5
862	230	201400	360911	7731833	358955	7954340	222.5
862	230	201401	358569	7954341	359959	7837077	117.4
862	229	201410	359972	7836723	360509	7731846	105.0
862	229	201420	360111	7731847	358163	7954333	222.5
862	228	201430	357767	7954342	359709	7731833	222.5
862	228	201440	359314	7731835	357366	7954314	222.5
862	228	201450	356964	7954313	358909	7731846	222.5
862	228	201460	358510	7731820	356564	7954312	222.6
862	227	201470	356166	7954320	358112	7731825	222.5
862	227	201480	357705	7731819	355669	7954315	222.6
862	227	201490	355361	7954321	357306	7731833	222.5
862	227	201500	356906	7731821	354783	7954302	222.6
862	226	201510	354562	7954316	356511	7731814	222.5

862	226	201520	356098	7731810	354156	7954320	222.6
862	226	201530	353761	7954312	355700	7731806	222.6
862	226	201540	355316	7731798	353366	7954314	222.6
862	225	201550	352968	7954310	354909	7731811	222.5
862	225	201560	354504	7731793	352558	7954309	222.5
862	225	201570	352167	7954315	354109	7731795	222.5
862	225	201580	353705	7731794	351768	7954290	222.5
862	225	201581	351368	7954303	353309	7776604	177.8
862	224	201590	353306	7776307	353307	7731803	44.6
862	224	201600	352916	7731799	350965	7954303	222.5
862	223	201610	350568	7954301	352507	7731798	222.5
862	223	201620	352118	7731792	350021	7954295	222.6
862	223	201630	349765	7954308	351708	7731782	222.6
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862	221	201650	348974	7954296	350917	7731783	222.6
862	221	201660	350519	7731761	348573	7954281	222.6
862	221	201670	348172	7954295	350110	7731775	222.6
862	221	201680	349712	7731762	347773	7954287	222.6
862	220	201690	347365	7954293	349306	7731773	222.6
862	220	201700	348907	7731748	346972	7954272	222.5
862	220	201710	346537	7954289	348506	7731757	222.6
862	220	201720	348134	7731770	346166	7954277	222.5
862	219	201730	345766	7954274	347706	7731760	222.5
862	219	201740	347330	7731764	345349	7954261	222.5
862	219	201750	344982	7954276	346909	7731752	222.6
862	219	201760	346513	7731751	344563	7954278	222.6
862	218	201770	344167	7954262	346112	7731751	222.5
862	218	201780	345712	7731740	343762	7954273	222.6
862	218	201790	343364	7954273	345310	7731731	222.6
862	218	201800	344909	7731725	342953	7954270	222.6
862	217	201810	342572	7954260	344505	7731730	222.6
862	217	201820	344099	7731723	342166	7954254	222.5
862	216	201830	341766	7954261	343709	7731740	222.5
862	216	201840	343306	7731711	341366	7954250	222.6
862	292	290060	340969	7954250	342910	7731732	222.5
862	292	290070	486854	7756006	414511	7755983	72.4
862	292	290080	414491	7760001	486840	7760004	72.4
862	292	290090	484401	7763984	414473	7764009	70.0
862	292	290100	414452	7768000	479788	7767997	65.4
862	293	290110	475232	7771969	394478	7771617	80.9
862	293	290120	394476	7776010	465139	7776011	70.7
862	293	290130	454595	7780012	394477	7779977	60.1
862	293	290140	394489	7784010	448671	7784005	54.2
862	293	290150	447786	7788015	394491	7788006	53.3
862	293	290160	420390	7792009	481068	7791996	60.7
862	293	290170	481074	7795980	421589	7796009	59.5
862	294	290180	422730	7799980	481068	7800010	58.4
862	294	290190	423918	7803994	481045	7803990	57.2
862	294	290200	481062	7808010	425078	7808011	56.0
862	294	290201	426254	7812002	481058	7812002	54.8
862	294	290210	492781	7812000	500950	7812015	8.2
862	294	290220	500965	7816012	427434	7816005	73.6
862	294	290230	428603	7819997	500957	7820001	72.4
862	294	290240	500942	7824001	429776	7824001	71.2
862	294	290250	476229	7827998	500936	7828000	24.7
862	294	290260	500963	7832002	476235	7831999	24.7
862	301	300010	476240	7835994	500942	7835996	24.7
862	301	300020	500527	7732432	500355	7750195	17.8
862	301	300030	499956	7750194	500110	7732442	17.8
862	301	300040	499703	7732420	499555	7750199	17.8
862	301	300050	499144	7750209	499307	7732438	17.8
862	301	300060	498909	7732433	498755	7750204	17.8
862	301	300070	498356	7750210	498508	7732437	17.8
862	301	300080	498105	7732437	497957	7750195	17.8
862	303	300091	497541	7750216	497706	7732424	17.8
862	302	300100	497362	7732426	497131	7750189	17.8
862	302	300110	496757	7750216	496908	7732438	17.8
862	302	300120	496511	7732415	496336	7750205	17.8
862	302	300130	495949	7750207	496108	7732444	17.8
862	302	300140	495700	7732416	495553	7750214	17.8
862	302	300150	495160	7750199	495305	7732436	17.8
862	302	300160	494916	7732421	494738	7750191	17.8
862	302	300170	494370	7750210	494507	7732426	17.8
862	302	300180	494112	7732411	493868	7750193	17.8
862	302	300190	493550	7750204	493718	7732433	17.8
862	302	300200	493297	7732411	493114	7750214	17.8
862	303	300210	492781	7750205	492909	7732415	17.8
862	321	300221	492355	7750375	492512	7732418	18.0
862	321	300231	492104	7732416	491952	7750613	18.2
862	321	300241	491549	7750880	491701	7732425	18.5
862	321	300251	491301	7732426	491143	7751146	18.7
862	321	300261	490752	7751432	490908	7732410	19.0

862	321	300271	490506	7732409	490332	7751700	19.3
862	321	300281	489955	7751937	490114	7732422	19.5
862	321	300291	489707	7732414	489538	7752216	19.8
862	321	300301	489134	7752476	489304	7732406	20.1
862	305	300310	488910	7732405	488729	7752754	20.4
862	305	300320	488513	7732402	488322	7753030	20.6
862	305	300330	487916	7753291	488100	7732423	20.9
862	305	300340	487717	7732399	487529	7753538	21.1
862	305	300350	487116	7753818	487299	7732404	21.4
862	305	300360	486916	7732405	486675	7754436	22.0
862	305	300370	486251	7762070	486503	7732416	29.7
862	306	300381	486116	7732413	485811	7762465	30.1
862	306	300390	485709	7732398	485443	7762785	30.4
862	306	300400	485025	7763147	485307	7732398	30.8
862	306	300410	484914	7732409	484640	7763479	31.1
862	306	300420	484236	7763830	484507	7732404	31.4
862	306	300430	484113	7732393	483833	7764168	31.8
862	307	300440	483428	7764516	483709	7732402	32.1
862	307	300450	483022	7764884	483307	7732419	32.5
862	307	300460	482909	7732412	482624	7765209	32.8
862	307	300470	482228	7765572	482505	7732403	33.2
862	307	300480	482100	7732396	481818	7765921	33.5
862	307	300490	481699	7732402	481418	7766254	33.9
862	308	300500	481012	7766601	481307	7732406	34.2
862	308	300510	480909	7732391	480602	7766957	34.6
862	308	300520	480221	7767286	480511	7732402	34.9
862	308	300530	480131	7732405	479804	7767660	35.3
862	308	300540	479392	7768022	479717	7732386	35.6
862	309	300551	479304	7732392	478990	7768346	36.0
862	309	300560	478886	7732387	478598	7768703	36.3
862	309	300570	478190	7769064	478505	7732405	36.7
862	309	300580	478107	7732397	477791	7769390	37.0
862	309	300590	477383	7769753	477711	7732405	37.4
862	310	300600	477173	7732375	476989	7770098	37.8
862	310	300610	476577	7770441	476909	7732404	38.0
862	310	300620	476507	7732380	476172	7770809	38.4
862	310	300630	475772	7771143	476109	7732386	38.8
862	310	300640	475710	7732395	475365	7771501	39.1
862	311	300650	475310	7732375	474966	7771838	39.5
862	311	300660	474556	7772210	474909	7732397	39.8
862	311	300670	474510	7732383	474160	7772534	40.2
862	311	300680	473747	7772868	474107	7732383	40.5
862	311	300690	473708	7732387	473356	7773016	40.6
862	312	300700	473309	7732381	472953	7773184	40.8
862	312	300710	472908	7732386	472541	7773335	41.0
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862	313	300760	470544	7774094	470902	7732389	41.7
862	313	300770	470510	7732379	470147	7774248	41.9
862	313	300780	469743	7774384	470109	7732379	42.0
862	313	300790	469708	7732385	469344	7774538	42.2
862	314	300800	469300	7732372	468937	7774681	42.3
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862	314	300820	468139	7775002	468512	7732376	42.6
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862	315	300850	467262	7732377	466944	7775455	43.1
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862	329	301030	459727	7778179	460113	7732371	45.8
862	329	301040	459696	7732352	459310	7778338	46.0
862	329	301050	458932	7778476	459305	7732345	46.1
862	329	301060	458910	7732357	458507	7778648	46.3
862	329	301070	458122	7778795	458509	7732354	46.5
862	329	301080	458104	7732349	457697	7778955	46.6

862	329	301090	457293	7779102	457723	7732345	46.8
862	327	301100	457314	7732339	456899	7779261	46.9
862	327	301110	456493	7779420	456904	7732364	47.1
862	327	301120	456501	7732352	456098	7779551	47.2
862	327	301130	455686	7779705	456120	7732345	47.4
862	327	301140	455705	7732331	455286	7779875	47.6
862	327	301150	454882	7780027	455299	7732336	47.7
862	326	301160	454909	7732346	454498	7780153	47.8
862	326	301170	454090	7780310	454508	7732354	48.0
862	326	301180	454098	7732350	453697	7780455	48.1
862	326	301190	453281	7780637	453704	7732339	48.3
862	326	301200	453300	7732350	452899	7780769	48.4
862	326	301210	452480	7780931	452908	7732345	48.6
862	324	301220	452504	7732346	452082	7781065	48.7
862	324	301230	451691	7781227	452106	7732347	48.9
862	324	301240	451711	7732340	451275	7781383	49.0
862	324	301250	450881	7781527	451311	7732343	49.2
862	324	301260	450933	7732324	450479	7781673	49.4
862	324	301270	450034	7781866	450506	7732340	49.5
862	324	301280	450099	7732335	449671	7781996	49.7
862	324	301290	449265	7782159	449710	7732331	49.8
862	316	301300	449307	7732340	448876	7782289	50.0
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862	316	301320	448512	7732338	447672	7827588	95.3
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862	326	301340	446875	7827573	447705	7732346	95.2
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862	327	301360	446916	7732313	446075	7827569	95.3
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862	338	301450	443313	7732308	442478	7827553	95.3
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862	338	301470	442501	7732314	441644	7827557	95.3
862	338	301480	441265	7827561	442107	7732331	95.3
862	338	301490	441710	7732311	440872	7827570	95.3
862	337	301500	440476	7827570	441305	7732310	95.3
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862	336	301580	437268	7827567	438110	7732320	95.3
862	336	301590	437707	7732296	436880	7827553	95.3
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862	336	301610	436907	7732303	436075	7827544	95.3
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862	335	301630	436101	7732308	435253	7827539	95.3
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862	330	301740	430906	7825003	431712	7732290	92.7
862	330	301750	431304	7732286	430491	7823588	91.3
862	330	301760	430117	7822310	430912	7732307	90.0
862	331	301770	430515	7732301	429731	7821002	88.7
862	331	301780	429360	7819733	430108	7732292	87.5
862	331	301790	429702	7732303	428954	7818346	86.1
862	331	301800	428558	7816986	429300	7732287	84.7
862	331	301810	428878	7732292	428185	7815720	83.5
862	331	301820	427796	7814383	428438	7740124	74.3
862	332	301830	428041	7740414	427405	7813050	72.7
862	332	301840	427001	7811665	427635	7740725	71.0
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862	332	301860	426248	7809111	426830	7741333	67.8
862	332	301870	426421	7741652	425848	7807719	66.1
862	332	301880	425471	7806457	426020	7741945	64.5
862	332	301890	425640	7742240	425060	7805042	62.8
862	332	301900	424672	7803731	425216	7742569	61.2

862	333	301910	424748	7742914	424287	7802408	59.5
862	333	301920	424413	7743175	423906	7801097	57.9
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862	333	301950	422757	7797187	423206	7744075	53.1
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862	334	301980	421992	7744987	421504	7792909	47.9
862	334	301990	421591	7745285	421177	7791779	46.5
862	334	302000	420803	7790522	421185	7745610	44.9
862	334	302010	420785	7745898	420415	7788999	43.1
862	334	302020	420014	7788757	420377	7746221	42.5
862	334	302030	420005	7746493	419572	7788755	42.3
862	334	302040	419225	7788761	419581	7746815	42.0
862	334	302050	419182	7747120	418815	7788745	41.6
862	334	302060	418434	7788739	418768	7747444	41.3
862	335	302070	418375	7747718	417998	7788740	41.0
862	335	302080	417970	7748029	417617	7788740	40.7
862	325	302090	417223	7788727	417574	7748343	40.4
862	325	302100	417157	7748645	416791	7788742	40.1
862	325	302110	416401	7788740	416759	7748953	39.8
862	325	302120	416350	7749248	416000	7788736	39.5
862	323	302130	415605	7788737	415960	7749553	39.2
862	323	302140	415205	7788731	415553	7749866	38.9
862	325	302150	415154	7750165	414812	7788726	38.6
862	325	302160	414600	7768184	414415	7788730	20.5
862	325	302170	414021	7788729	414199	7768201	20.5
862	325	302180	413797	7768196	413616	7788711	20.5
862	325	302190	413211	7788717	413396	7768204	20.5
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862	325	302220	412202	7768178	412006	7788698	20.5
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862	323	302340	407389	7768147	407213	7788695	20.6
862	323	302350	406815	7788690	406993	7768168	20.5
862	323	302360	406575	7768143	406377	7788693	20.6
862	323	302370	406025	7788688	406194	7768149	20.5
862	323	302380	405792	7768142	405615	7788683	20.5
862	323	302390	405218	7788680	405389	7768133	20.5
862	323	302400	404996	7768142	404816	7788683	20.5
862	323	302410	404406	7788668	404595	7768129	20.5
862	323	302420	404192	7768145	404011	7788674	20.5
862	322	302430	403616	7788665	403789	7768133	20.5
862	322	302440	403395	7768116	403171	7788671	20.6
862	322	302450	402821	7788666	402991	7768133	20.5
862	322	302460	402597	7768124	402411	7788654	20.5
862	322	302470	401994	7788659	402199	7768129	20.5
862	322	302480	401754	7768124	401568	7788650	20.5
862	322	302490	401219	7788671	401392	7768123	20.6
862	322	302500	401000	7768105	400813	7788653	20.6
862	322	302510	400418	7788647	400589	7768127	20.5
862	322	302520	400159	7768110	400010	7788646	20.5
862	322	302530	399614	7788638	399793	7768109	20.5
862	322	302540	399397	7768100	399148	7788640	20.5
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862	391	390030	500947	7739999	428381	7740008	72.6
862	391	390040	423097	7744007	500956	7743996	77.9
862	391	390050	500951	7748001	417805	7748006	83.2
862	401	400010	415145	7751949	490294	7752015	75.2
862	401	400020	500382	7837619	500642	7809350	28.3
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862	401	400040	499576	7837641	499842	7809337	28.3
862	401	400050	499432	7809356	499177	7837616	28.3
862	401	400060	498796	7837617	499035	7809350	28.3
862	401	400070	498644	7809347	498389	7837620	28.3
862	401	400080	497997	7837629	498234	7809356	28.3
862	401	400090	497846	7809333	497601	7837632	28.3
862	401	400100	497179	7837618	497441	7809357	28.3
862	401	400110	497055	7809349	496722	7837621	28.3
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862	402	400140	495598	7837639	495835	7809362	28.3
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862	402	400160	494792	7837619	495037	7810037	27.6
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862	402	400210	493015	7812385	492812	7837630	25.3
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862	402	400250	491385	7814276	491180	7837612	23.3
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862	402	400280	490009	7837617	490177	7815427	22.2
862	403	400290	489793	7815433	489580	7837625	22.2
862	403	400300	489379	7815418	489204	7837615	22.2
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862	403	400350	487172	7837624	487382	7815446	22.2
862	403	400360	486944	7815436	486790	7837626	22.2
862	403	400370	486298	7837628	486582	7815424	22.2
862	403	400380	486153	7815429	485993	7837628	22.2
862	403	400390	485589	7837634	485783	7815440	22.2
862	403	400400	485329	7815428	485197	7837628	22.2
862	403	400410	484818	7837633	484980	7815418	22.2
862	403	400420	484559	7815413	484386	7837620	22.2
862	403	400430	483990	7837628	484183	7815424	22.2
862	403	400440	483787	7815413	483596	7837620	22.2
862	403	400450	483203	7837624	483389	7815441	22.2
862	403	400460	482941	7815423	482777	7837627	22.2
862	403	400470	482394	7837626	482587	7815425	22.2
862	403	400480	482169	7815429	482008	7837615	22.2
862	403	400490	481679	7837611	481785	7815426	22.2
862	404	400500	481331	7815413	481191	7837612	22.2
862	404	400510	480790	7837610	480990	7815415	22.2
862	404	400520	480801	7790511	480389	7837621	47.1
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862	404	400540	479985	7790510	479510	7837601	47.1
862	404	400550	479213	7837624	479602	7790527	47.1
862	404	400560	479203	7790524	478806	7837604	47.1
862	404	400570	478393	7837625	478798	7790527	47.1
862	404	400580	478395	7790511	477974	7837614	47.1
862	404	400590	477598	7837611	478004	7790520	47.1
862	405	400600	477617	7790515	477119	7837602	47.1
862	405	400610	476787	7837611	477208	7790527	47.1
862	405	400620	476788	7790518	476408	7827638	37.1
862	405	400630	476097	7827648	476398	7790510	37.1
862	405	400640	476004	7790501	475630	7827656	37.2
862	405	400650	475263	7827645	475603	7790517	37.1
862	405	400660	475197	7790510	474876	7827637	37.1
862	405	400670	474488	7827643	474809	7790525	37.1
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862	405	400690	473676	7827662	474000	7790512	37.2
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862	406	400720	472813	7790502	472446	7827647	37.2
862	406	400730	472072	7827639	472403	7790514	37.1
862	406	400740	471984	7790507	471674	7827627	37.1
862	406	400750	471290	7827643	471612	7790518	37.1
862	406	400760	471168	7790493	470879	7827646	37.2
862	406	400770	470486	7827634	470803	7790497	37.1
862	406	400780	470342	7790487	470077	7827645	37.2
862	406	400790	469694	7827650	470001	7790496	37.2
862	406	400800	469581	7790496	469281	7827641	37.2
862	406	400810	468881	7827642	469194	7790491	37.2
862	406	400820	468797	7790502	468476	7827629	37.1
862	406	400830	468093	7827631	468399	7790491	37.1
862	407	400840	467897	7790495	467679	7827618	37.1
862	407	400850	467271	7827629	467598	7790491	37.1
862	407	400860	467187	7790497	466879	7827615	37.1
862	407	400870	466478	7827623	466827	7790486	37.1
862	407	400880	466369	7790488	466053	7827624	37.2
862	407	400890	465685	7827625	466008	7790495	37.1
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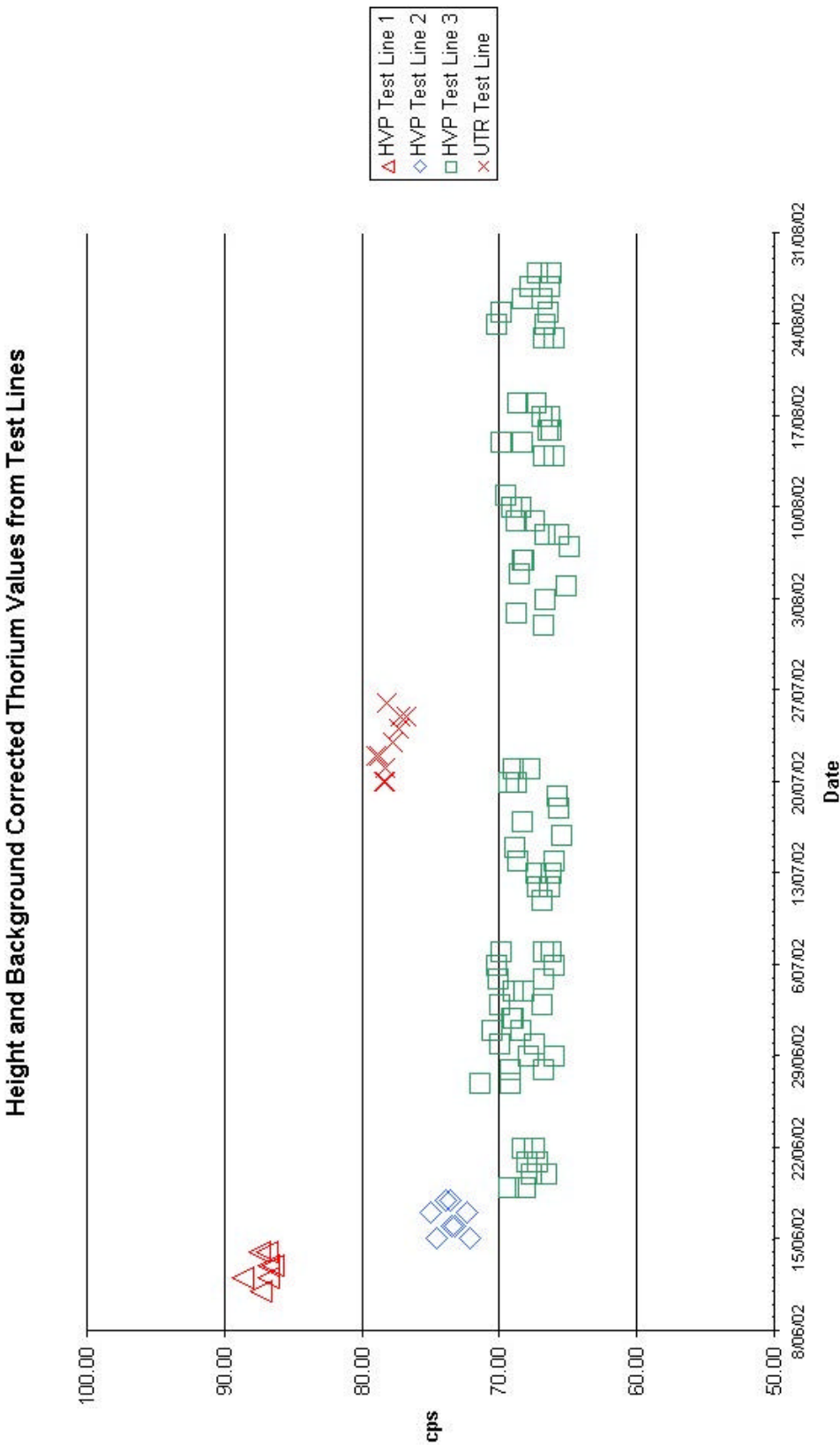
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862	408	401000	461584	7790488	461214	7827607	37.1
862	408	401010	460879	7827613	461203	7790491	37.1
862	408	401020	460805	7790469	460352	7827604	37.2
862	408	401030	460075	7827616	460401	7790474	37.2
862	408	401040	460007	7790468	459613	7827603	37.2
862	408	401050	459262	7827622	459608	7790485	37.2
862	408	401060	459212	7790475	458845	7827605	37.1
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862	408	401080	458391	7790489	458075	7827603	37.2
862	408	401090	457690	7827612	458006	7790468	37.2
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862	409	401110	456872	7827612	457200	7790489	37.1
862	409	401120	456799	7790460	456468	7827605	37.2
862	409	401130	456077	7827620	456388	7790478	37.2
862	409	401140	456008	7790481	455675	7827607	37.1
862	409	401150	455277	7827598	455601	7790462	37.1
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862	409	401180	454399	7790480	454086	7827595	37.1
862	409	401190	453681	7827588	454004	7790483	37.1
862	409	401200	453607	7790477	453267	7827601	37.1
862	409	401210	452877	7827598	453199	7790468	37.1
862	410	401220	452781	7790451	452465	7827590	37.2
862	410	401230	452078	7827591	452403	7790471	37.1
862	410	401240	451933	7790469	451626	7827603	37.1
862	410	401250	451298	7827588	451603	7790460	37.1
862	410	401260	451086	7790460	450875	7827586	37.1
862	410	401270	450459	7827606	450801	7790454	37.2
862	410	401280	450380	7790455	450079	7827591	37.1
862	410	401290	449642	7827590	449996	7790476	37.1
862	410	401300	449572	7790465	449278	7827573	37.1
862	410	401310	448876	7827586	449191	7790459	37.1
862	410	401320	448757	7790446	448479	7827580	37.1
862	410	401320	448052	7827575	448393	7790457	37.1

TOTALS BY FLIGHT

FLIGHT	LINE KM
1	1935.2
2	2251.2
3	1253.2
4	1567.8
5	2301.0
6	1523.4
7	2892.2
8	1818.3
9	1640.0
10	2000.2
11	1323.9
12	1158.6
13	824.2
14	1680.2
15	1611.1
16	1269.6
17	1341.3
18	1745.6
19	1747.9
20	1580.4
21	1741.3
22	923.9
23	1537.4
24	1708.5
25	1957.0
26	1370.9
27	1365.5
28	1461.6
29	960.8
30	997.0
31	933.4
32	967.1
33	762.6
34	1083.3
35	680.8
36	571.5
37	1016.5
38	794.2

39	825.9
40	444.9
41	444.9
42	444.9
43	444.9
44	222.4
45	671.0
46	444.9
47	445.0
48	222.5
49	222.5
50	222.5
51	222.5
52	445.0
53	445.1
54	445.0
55	444.9
56	113.1
57	222.5
58	222.5
91	1031.1
92	1002.7
93	1167.6
94	944.4
95	506.0
96	545.7
97	375.1
98	601.8
TOTAL	68090.0

APPENDIX H – RADIOMETRIC TEST LINE SUMMARY





Test Line Location Map

APPENDIX I – NASVD COMPONENTS

