Open File Envelope No. 11,410

EL 3447 / EL 4637

MOONAREE

ANNUAL REPORTS AND FINAL REPORT TO LICENCE SURRENDER, FOR THE PERIOD 15/11/2005 TO 10/1/2012

Submitted by
Quasar Resources Pty Ltd
2012

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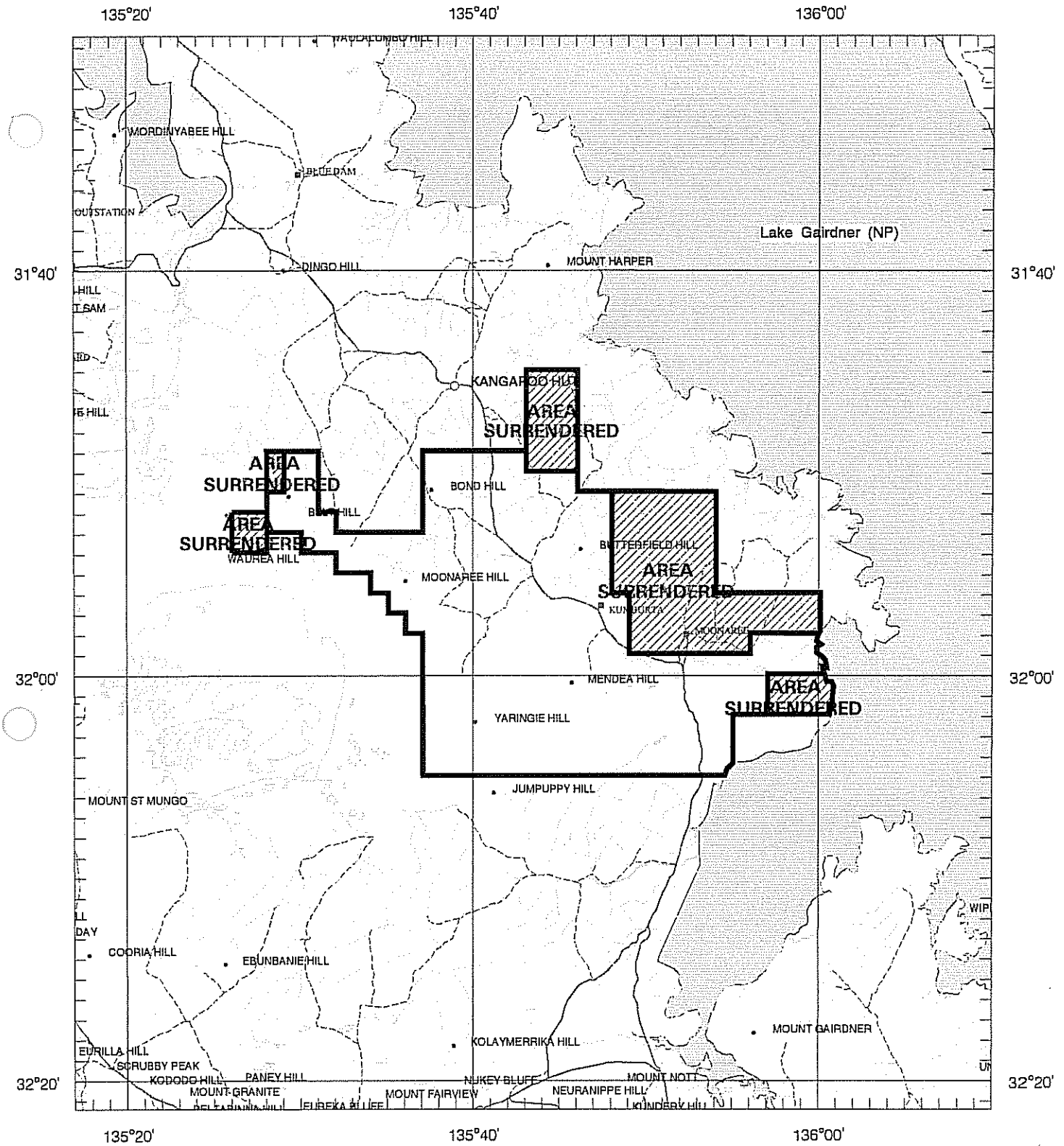
Resources and Energy Group
7th Floor
101 Grenfell Street, Adelaide 5000

Telephone: (08) 8463 3000
Facsimile: (08) 8204 1880

Government of South Australia
Department for Manufacturing, Innovation, Trade, Resources and Energy

SCHEDULE A



APPLICANT : **QUASAR RESOURCES PTY LTD**

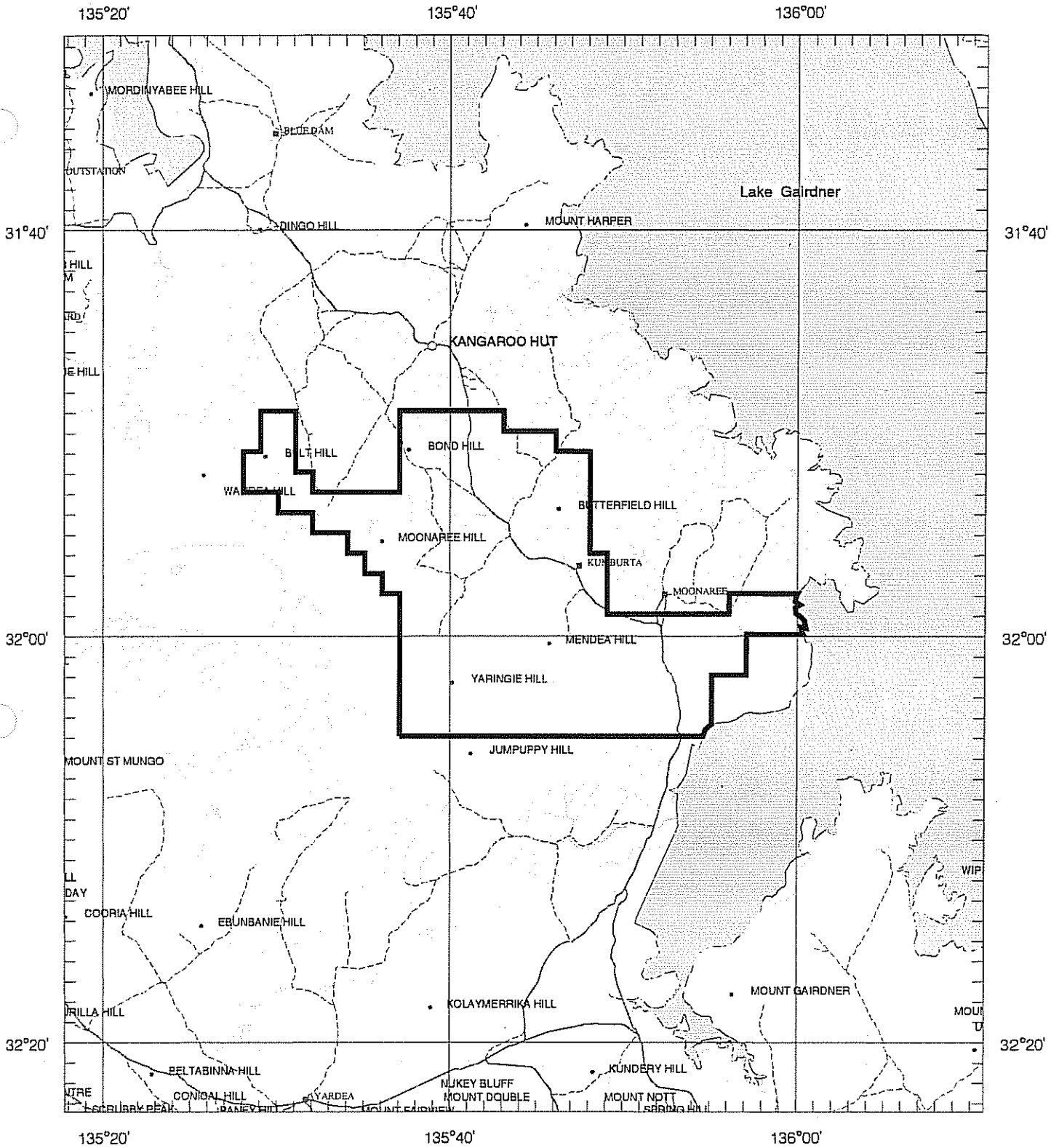
FILE REF : **203/05** TYPE : **MINERAL ONLY** AREA : **745** km² (approx.)

1:250000 MAPSHEETS : **GAIRDNER YARDEA**

LOCALITY : **MOONAREE AREA - Approximately 140 km southwest of Woomera**

DATE GRANTED : **15-Nov-2005** DATE EXPIRED : **14-Nov-2009** EL NO : **3447**

SCHEDULE A



SCALE 1 : 500 000

KILOMETRES 10 0 10 20 30 40 50 KILOMETRES

LICENCE GRANTED IN : DATUM AGD66

APPLICANT : **QUASAR RESOURCES PTY LTD**

FILE REF : **237/10** TYPE : **MINERAL ONLY** AREA : **745** km² (approx.)

1:250000 MAPSHEETS : **GAIRDNER YARDEA**

LOCALITY : **MOONAREE AREA - Approximately 140 km southwest of Woomera**

DATE GRANTED : **20-Dec-2010** DATE EXPIRED : **19-Dec-2012** EL NO : **4637**

EL 3447 MOONAREE
ANNUAL TECHNICAL REPORT

15 November 2005 – 14 November 2006

Quasar Resources Pty Ltd

Author: J Barnes
Date: 1 December 2006
Distribution: Quasar Resources (1)
PIRSA (2)

TABLE OF CONTENTS

BIBLIOGRAPHIC DATA SHEET

REPORT TITLE	Moonaree Project, Exploration Licence 3447 Annual Technical Report for the period 15 November 2005 – 14 November 2006.
PROSPECT NAME	Moonaree
TENEMENT NUMBER	3447
OWNER	Quasar Resources Pty Ltd
COMMODITIES	Uranium
TECTONIC UNITS	
STRATIGRAPHIC UNITS	
1:250 000 MAP SHEET	Gairdner
1:100 000 MAP SHEET	Moonaree and Yardea
KEYWORDS	

SUMMARY

Quasar Resources was granted tenure to Moonaree for the period of one year ending 14 November 2006.

Moonaree is considered prospective for sandstone-style uranium mineralisation hosted in unconsolidated palaeochannel sands incised into Precambrian basement.

Drill targeting of palaeochannel sands is planned for the next year of tenure for EL3447, Moonaree.

CONCLUSIONS AND RECOMMENDATIONS

Prospective palaeochannel sands above the unconformity should be targeted by mud-rotary drilling in order to test for sandstone-style uranium mineralisation.

INTRODUCTION

The Moonaree Exploration Licence (EL 3447) is situated in the Gawler Craton near Lake Gairdner (Figure 1).

Exploration Licence 3447 covers 999km² and is approximately 140kms southwest of Woomera. The project area lies approximately 160kms northwest of Iron Knob and access is gained by the unsealed Iron Knob to Kingoonya Road and the Mt Ive Station Tracks.

Quasar Resources was granted EL 3447 on 15 November 2005 for a period of one year.

GEOLOGY

The exploration licence is located in the Central Gawler Craton. The Gawler Craton is a stable crystalline basement province comprising Archaean to Meso-Proterozoic rocks obscured by Neo-Proterozoic to Cainozoic age sedimentary strata. The geology of the project area is predominantly outcrop of Yardea Dacite, the upper felsic member of the Mesproterozoic Gawler Range Volcanics ("GRV"). The Yardea Dacite is a sub-horizontal, several hundred metre thick sequence of subaerial volcanic extrusives. The unit is a coarsely porphyritic dacite, grading locally to rhyodacite and andesite, although within the licence it is notable in its uniformity. The Yardea Dacite is underlain by older Palaeoproterozoic and Archaean Basement.

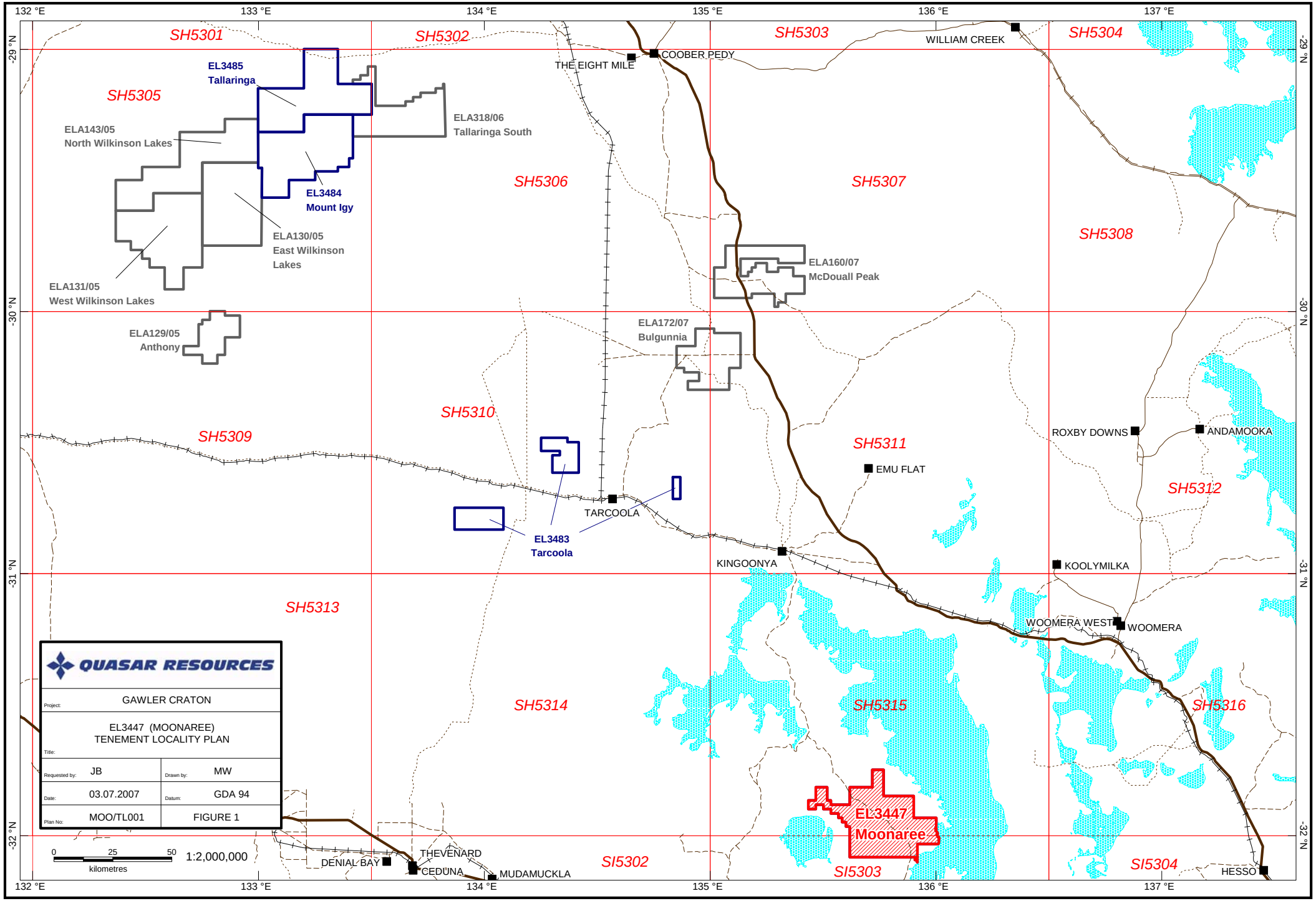
The GRV outcrops over a 25,000km² area and form a prominent range of hills, (the Gawler Ranges), which extend in an arcuate band south and west of a series of salt lakes comprising Lakes Gairdner, Acraman and Everard. A striking feature of the ranges is the extensive development of a roughly orthogonal joint system, which controls valley formation. This is particularly evident in the shuttle radar DTM (Figure 2). Bare, domical hills rise up to 300 m above the valley floors. Rapid erosion has produced extensive outcrop on the hills whilst broad flat valley floors are filled with talus and are characterised by poorly developed sandy calcareous soils. Calcrete development is extremely localised.

EXPENDITURE

A total of $30,709.66 was spent on this licence during the reporting period see the Table below.

Expenditure for EL 3447 1 November 2005 - 30 October 2006

	$
Consulting Fees	217.40
Consulting - Geophysics	271.19
Hire Equipment Charges	0.06
Licenses	6,626.50
Employee Medicals	54.60
Consumable Supplies	13.50
Freight & Shipping Charges	0.10
Motor Vehicle Repairs & Maint	10.00
Office Equip & Computer Repair	-2.45
Telephone - Mobile Sat Phone	0.89
Telephone - Satellite Phone	1.19
Travel - HR King Air Flights	343.57
Travel - M/Vehicle Taxi Fares	2.34
Books & Subscriptions	2.94
Capital Costs Expensed	7.27
Dues and Memberships	45.42
Management Fee	2,478.45
Manpower	18,732.69
Office Software & Comp Support	67.22
Seminars & Conferences	76.99
Stationery & Printing	5.02
Staff Training - External	104.77
Office Support	1,650.00
	$30,709.66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133 °E
134 °E
135 °E
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-29 °N
-30 °N
-31 °N
-32 °N
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SH5303
SH5304
SH5305
SH5306
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SH5311
SH5312
SH5313
SH5314
SH5315
SH5316
SI5302
SI5303
SI5304
EL3485
Tallaringa
ELA318/06
Tallaringa South
ELA143/05
North Wilkinson Lakes
EL3484
Mount Igy
ELA130/05
East Wilkinson
Lakes
ELA131/05
West Wilkinson Lakes
ELA129/05
Anthony
ELA160/07
McDouall Peak
ELA172/07
Bulgunnia
EL3483
Tarcoola
EL3447
Moonaree
THE EIGHT MILE
COOBER PEDY
WILLIAM CREEK
TARCOOLA
EMU FLAT
ROXBY DOWNS
ANDAMOOKA
KINGOONYA
KOOLYMILKA
WOOMERA WEST
WOOMERA
DENIAL BAY
THEVENARD
CEDUNA
MUDAMUCKLA
HESSO
QUASAR RESOURCES
Project: GAWLER CRATON
EL3447 (MOONAREE)
TENEMENT LOCALITY PLAN
Title:
Requested by: JB
Drawn by: MW
Date: 03.07.2007
Datum: GDA 94
Plan No: MOO/TL001
FIGURE 1
0 25 50
kilometres
1:2,000,000

EL 3447 MOONAREE
ANNUAL TECHNICAL REPORT

15 November 2006 – 14 November 2007

Quasar Resources Pty Ltd

Author: J Barnes
Date: 18 January 2007
Distribution: Quasar Resources (1)
PIRSA (2)

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BIBLIOGRAPHIC DATA SHEET

REPORT TITLE	Moonaree Project, Exploration Licence 3447 Annual Technical Report for the period 15 November 2006 – 14 November 2007.
PROSPECT NAME	Moonaree
TENEMENT NUMBER	3447
OWNER	Quasar Resources Pty Ltd
COMMODITIES	Uranium
TECTONIC UNITS	
STRATIGRAPHIC UNITS	
1:250 000 MAP SHEET	Gairdner
1:100 000 MAP SHEET	Moonaree and Yardea
KEYWORDS	

SUMMARY

Quasar Resources was granted tenure to Moonaree for the period of two years ending 14 November 2007. Licence has been reapplied for.

Moonaree is considered prospective for sandstone-style uranium mineralisation hosted in unconsolidated palaeochannel sands incised into Precambrian basement.

Flying of gravity stations to commence early in the next tenure year.

CONCLUSIONS AND RECOMMENDATIONS

Prospective palaeochannel sands above the unconformity should be targeted by mud-rotary drilling in order to test for sandstone-style uranium mineralisation.

INTRODUCTION

The Moonaree Exploration Licence (EL 3447) is situated in the Gawler Craton near Lake Gairdner (Figure 1).

Exploration Licence 3447 covers 999km² and is approximately 140kms southwest of Woomera. The project area lies approximately 160kms northwest of Iron Knob and access is gained by the unsealed Iron Knob to Kingoonya Road and the Mt Ive Station Tracks.

Quasar Resources was granted EL 3447 on 15 November 2005 for a period of two years with the option to renew.

GEOLOGY

The exploration licence is located in the Central Gawler Craton. The Gawler Craton is a stable crystalline basement province comprising Archaean to Meso-Proterozoic rocks obscured by Neo-Proterozoic to Cainozoic age sedimentary strata. The geology of the project area is predominantly outcrop of Yardea Dacite, the upper felsic member of the Mesproterozoic Gawler Range Volcanics ("GRV"). The Yardea Dacite is a sub-horizontal, several hundred metre thick sequence of subaerial volcanic extrusives. The unit is a coarsely porphyritic dacite, grading locally to rhyodacite and andesite, although within the licence it is notable in its uniformity. The Yardea Dacite is underlain by older Palaeoproterozoic and Archaean Basement.

The GRV outcrops over a 25,000km² area and form a prominent range of hills, (the Gawler Ranges), which extend in an arcuate band south and west of a series of salt lakes comprising Lakes Gairdner, Acraman and Everard. A striking feature of the ranges is the extensive development of a roughly orthogonal joint system, which controls valley formation. This is particularly evident in the shuttle radar DTM (Figure 2). Bare, domical hills rise up to 300 m above the valley floors. Rapid erosion has produced extensive outcrop on the hills whilst broad flat valley floors are filled with talus and are characterised by poorly developed sandy calcareous soils. Calcrete development is extremely localised.

EXPENDITURE

A total of $40,405.97 was spent on this licence during the reporting period see the Table below.

EL 3447 Expenditure 1 Nov 06 - 31 Oct 07

	$
Consulting Fees	3,716.32
Consulting - Geophysics	200.00
Licenses	4,143.93
Rents	79.50
Employee Medicals	27.25
Consumable Supplies	16.60
Data & Map Purchases	53.54
Telephone - Mobile Phone	6.54
Capital Costs Expensed	107.79
Exploration Supplies	230.00
Management Fee	3,867.62
Manpower	30,111.43
Seminars & Conferences	45.45
Office Support	1,800.00
	$44,405.97

QUASAR

EL 3447 MOONAREE
ANNUAL TECHNICAL REPORT

15 November 2007 – 14 November 2008

Quasar Resources Pty Ltd

Author: J Barnes
Date: 9 January 2009
Distribution: Quasar Resources (1)
PIRSA (1)

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FIGURES

APPENDICES

Appendix 1 Geophysics

07058_Quasar_Gawler_Craton.pdf

File of Gravity Data;
07058_QUASAR_RESOURCES_Moonarie_Final_Data_AHD_200_1500
07058_QUASAR_RESOURCES_Moonarie_Final_Data_AHD_200_1500.ers

File of Bouguer Gravity 2.67 t/m³ - First vertical derivative;
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BIBLIOGRAPHIC DATA SHEET

REPORT TITLE	Moonaree Project, Exploration Licence 3447 Annual Technical Report for the period 15 November 2007 – 14 November 2008.
PROSPECT NAME	Moonaree
TENEMENT NUMBER	3447
OWNER	Quasar Resources Pty Ltd
COMMODITIES	Uranium, Copper and Gold
TECTONIC UNITS	Gawler Craton Mesoproterozoic Intrusives
STRATIGRAPHIC UNITS	Gawler Range Volcanics, Yardea Dacite
1:250 000 MAP SHEET	Gairdner
1:100 000 MAP SHEET	Moonaree and Yardea
KEYWORDS	Moonaree, Uranium, palaeochannels, Gawler Craton

SUMMARY

Quasar Resources was granted tenure to Moonaree for the period of three years ending 14 November 2008. This licence has been reapplied for.

Moonaree is considered prospective for volcanic hosted, vein style uranium mineralisation as well as sandstone-style uranium mineralisation hosted in unconsolidated palaeochannel sands incised into Precambrian basement.

A helicopter assisted gravity survey was conducted during the reporting period. Gravity and GPS data were collected on a 1km x 1km spaced grid covering the entire exploration license. A total of 993 new gravity stations were collected.

CONCLUSIONS AND RECOMMENDATIONS

Gravity data has defined a number of discrete anomalies while the shuttle radar has more accurately outlined the drainage system with the tenement.

Prospective palaeochannel sands draining to the east above the unconformity should be targeted by mud-rotary drilling in order to test for sandstone-style uranium mineralisation, associated with reduced sediments if present.

Anomalies within the gravity data warrants further investigation for vein associated uranium mineralisation.

INTRODUCTION

The Moonaree Exploration Licence (EL 3447) is situated in the Gawler Craton near Lake Gairdner (Figure 1).

Exploration Licence 3447 covers 999km² and is approximately 140kms southwest of Woomera. The project area lies approximately 160kms northwest of Iron Knob and access is gained by the unsealed Iron Knob to Kingoonya Road and the Mt Ive Station Tracks.

Quasar Resources was granted EL 3447 on 15 November 2005 for a period of three years with the option to renew.

GEOLOGY

The exploration licence is located in the Central Gawler Craton. The Gawler Craton is a stable crystalline basement province comprising Archaean to Meso-Proterozoic rocks obscured by Neo-Proterozoic to Cainozoic age sedimentary strata. The geology of the project area is predominantly outcrop of Yardea Dacite, the upper felsic member of the Mesproterozoic Gawler Range Volcanics ("GRV"). The Yardea Dacite is a sub-horizontal, several hundred metre thick sequence of subaerial volcanic extrusives. The unit is a coarsely porphyritic dacite, grading locally to rhyodacite and andesite, although within the licence it is notable in its uniformity. The Yardea Dacite is underlain by older Palaeoproterozoic and Archaean Basement.

The GRV outcrops over a 25,000km² area and form a prominent range of hills, (the Gawler Ranges), which extend in an arcuate band south and west of a series of salt lakes comprising Lakes Gairdner, Acraman and Everard. A striking feature of the ranges is the extensive development of a roughly orthogonal joint system, which controls valley formation. This is particularly evident in the shuttle radar DTM (Figure 2). Bare, domical hills rise up to 300 m above the valley floors. Rapid erosion has produced extensive outcrop on the hills whilst broad flat valley floors are filled with talus and are characterised by poorly developed sandy calcareous soils. Calcrete development is extremely localised.

NATIVE TITLE

The Moonaree Exploration Licence is covered by the Gawler Ranges Ilua which Quasar Resources has signed, however this licence has a Section 12 and 23 covering small portions of it. A Section 12 and 23 requires Ministerial approval as well as more detailed clearance and due to the fact that there are registered sites on this licence.

GEOPHYSICS

A helicopter assisted gravity survey was conducted between18 and 27 November 2007. Gravity and GPS data were collected by DaishSat Pty Ltd on a 1km x 1km spaced grid covering the entire exploration licence. A total of 993 new gravity stations were collected. Figure 2 shows the location of the stations collected on this licence. Images of AHD and Bouguer gravity data are shown in Figures 3 and 4 respectively.

Digital data supplied from Daishsat is in Appendix 1. Data acquisition, processing and base station establishment details are contained in the logistics report – see Appendix 1.

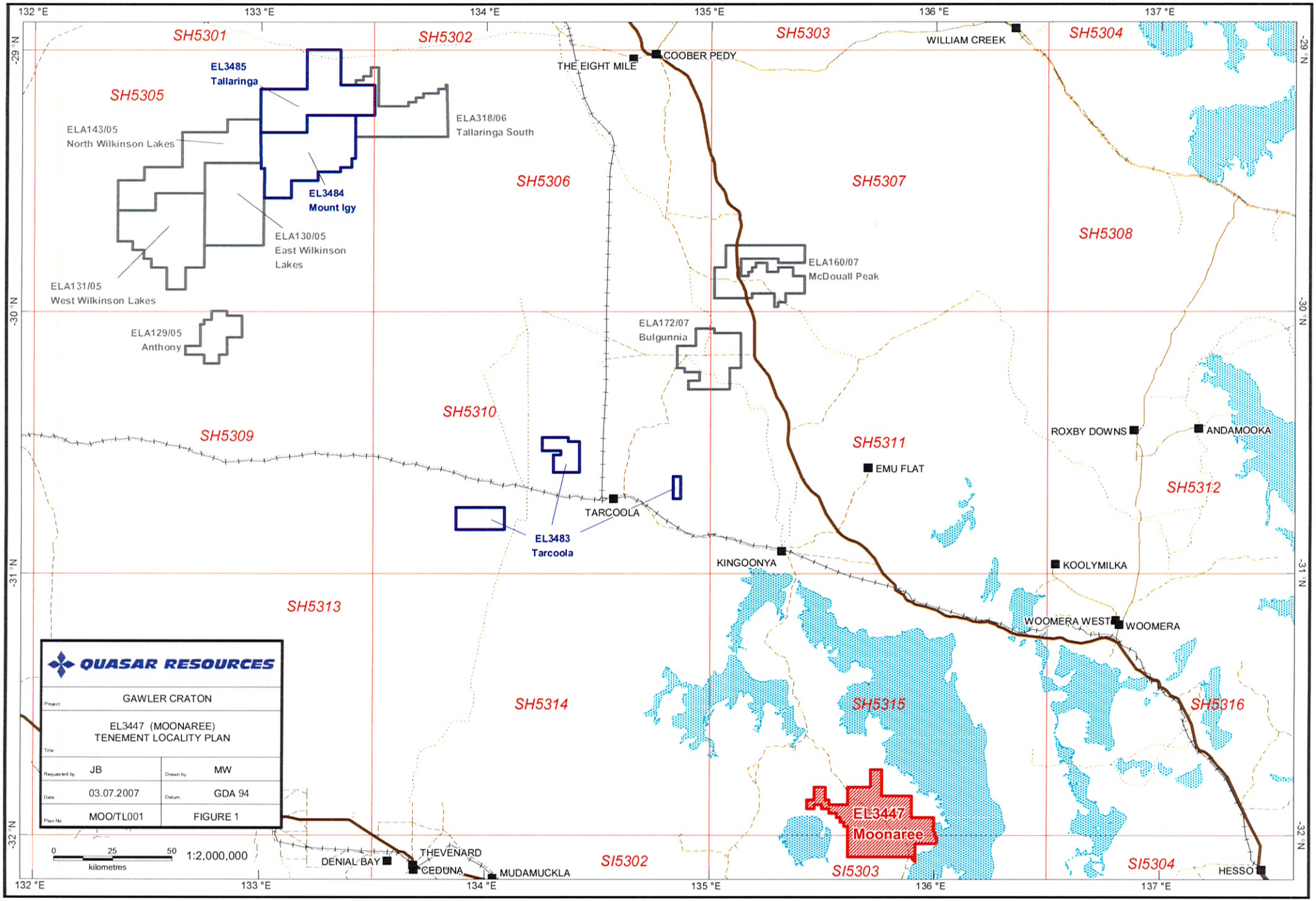
Merging of the data with the South Australian gravity database has been undertaken and interpretation in underway by Quasar geophysicist.

EXPENDITURE

A total of $127,308.72 was spent on this licence during the reporting period see the Table below.

EL 3447 Moonaree Expenditure 1 Nov 2007 – 31 October 2008	
	$
Exploration HO - Cost Alloc	40.36
Consulting - Geology	10,723.33
External Services	3,367.31
Data & Map Purchases	10.00
Legal Fees	2,132.17
Licenses	6,156.05
Management Fee	14,086.39
Manpower	18,544.00
Repairs & Maint - General	799.90
Salaries & Wages- Bonus/ICP	5,028.06
Office Support	1,800.00
Surveying-Geophysical Airborne	64,092.00
Travel - Accommodation & Meals	529.15
Total	$127,308.72

Table 1 Expenditure for the period 1 November 2007 to 31 October 2008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SH5315
SH5316
SI5302
SI5303
SI5304
EL3485
Tallaringa
ELA318/06
Tallaringa South
ELA143/05
North Wilkinson Lakes
EL3484
Mount Igy
ELA130/05
East Wilkinson
Lakes
ELA131/05
West Wilkinson Lakes
ELA129/05
Anthony
ELA160/07
McDouall Peak
ELA172/07
Bulgunnia
EL3483
Tarcoola
EL3447
Moonaree
THE EIGHT MILE
COOBER PEDY
WILLIAM CREEK
TARCOOLA
EMU FLAT
ROXBY DOWNS
ANDAMOOKA
KINGOONYA
KOOLYMILKA
WOOMERA WEST
WOOMERA
DENIAL BAY
THEVENARD
CEDUNA
MUDAMUCKLA
HESSO
QUASAR RESOURCES
Project
GAWLER CRATON
Title
EL3447 (MOONAREE)
TENEMENT LOCALITY PLAN
Requested by
JB
Drawn by
MW
Date
03.07.2007
Datum
GDA 94
Plan No
MOO/TL001
FIGURE 1
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kilometres
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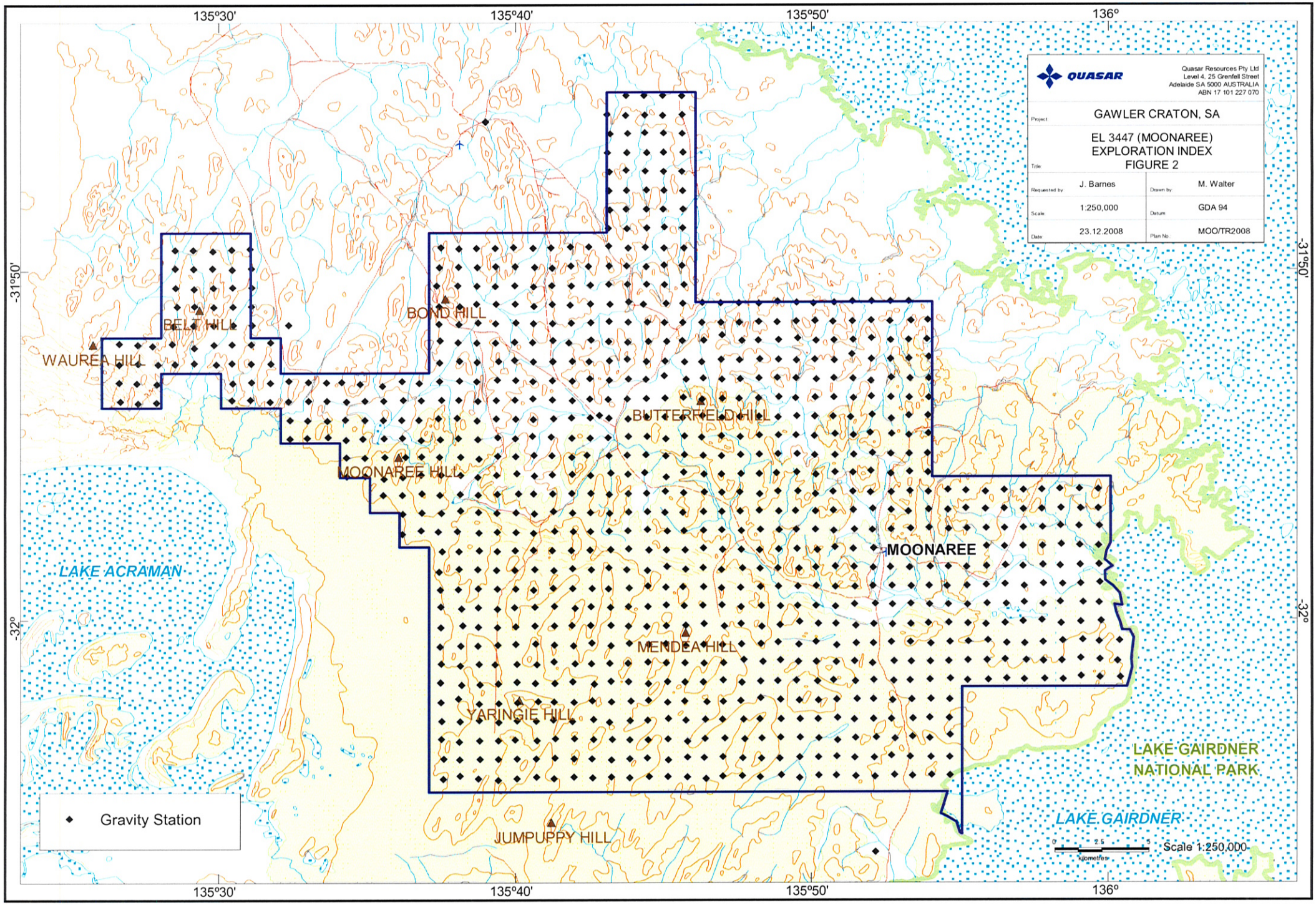
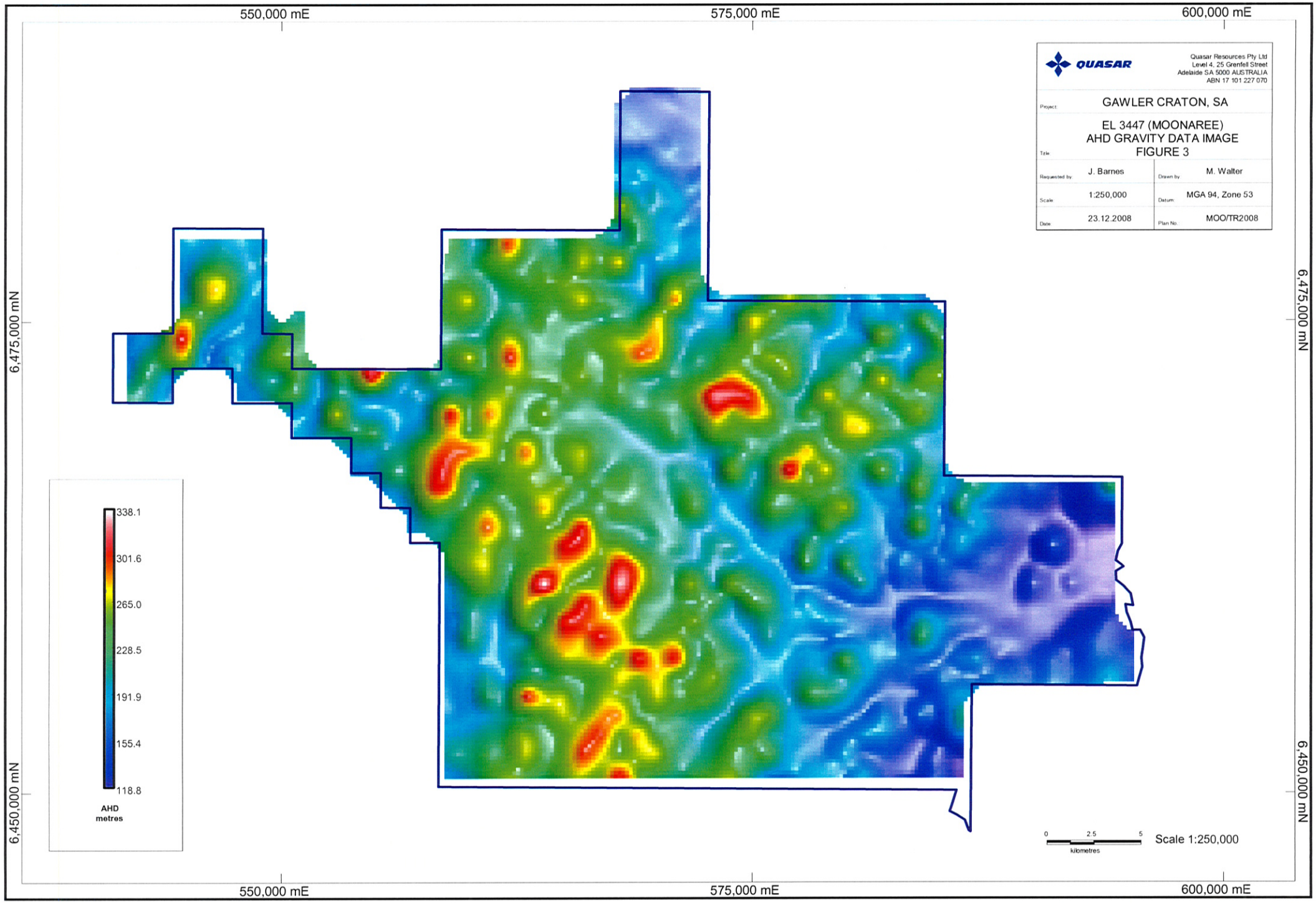
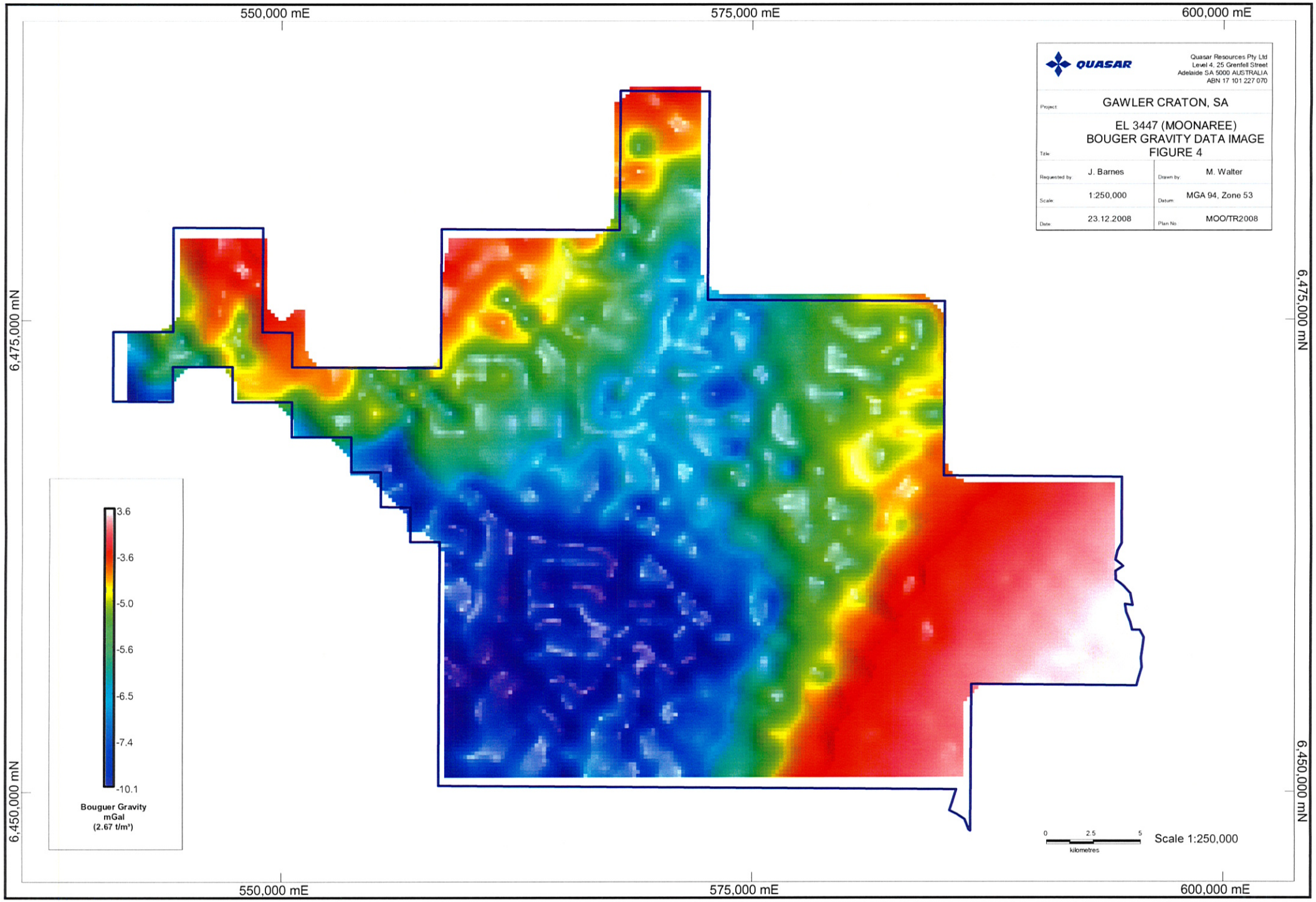

135°30'
135°40'
135°50'
136°
-31°50'
-32°
QUASAR
Quasar Resources Pty Ltd
Level 4, 25 Grenfell Street
Adelaide SA 5000 AUSTRALIA
ABN 17 101 227 070
Project: GAWLER CRATON, SA
Title: EL 3447 (MOONAREE)
EXPLORATION INDEX
FIGURE 2
Requested by: J. Barnes
Drawn by: M. Walter
Scale: 1:250,000
Datum: GDA 94
Date: 23.12.2008
Plan No: MOO/TR2008
BELT HILL
BOND HILL
WAUREA HILL
BUTTERFIELD HILL
MOONAREE HILL
MOONAREE
LAKE ACRAMAN
MENDEA HILL
YARINGIE HILL
JUMPUPPY HILL
LAKE GAIRDNER
NATIONAL PARK
LAKE GAIRDNER
Gravity Station
0 2.5 5
Kilometres
Scale 1:250,000


550,000 mE
575,000 mE
600,000 mE
6,475,000 mN
6,450,000 mN
QUASAR
Quasar Resources Pty Ltd
Level 4, 25 Grenfell Street
Adelaide SA 5000 AUSTRALIA
ABN 17 101 227 070
Project: GAWLER CRATON, SA
Title: EL 3447 (MOONAREE)
AHD GRAVITY DATA IMAGE
FIGURE 3
Requested by: J. Barnes
Drawn by: M. Walter
Scale: 1:250,000
Datum: MGA 94, Zone 53
Date: 23.12.2008
Plan No.: MOO/TR2008
338.1
301.6
265.0
228.5
191.9
155.4
118.8
AHD
metres
0
2.5
5
kilometres
Scale 1:250,000


550,000 mE
575,000 mE
600,000 mE
6,475,000 mN
6,450,000 mN
QUASAR
Quasar Resources Pty Ltd
Level 4, 25 Grenfell Street
Adelaide SA 5000 AUSTRALIA
ABN 17 101 227 070
Project: GAWLER CRATON, SA
Title: EL 3447 (MOONAREE)
BOUGER GRAVITY DATA IMAGE
FIGURE 4
Requested by: J. Barnes
Drawn by: M. Walter
Scale: 1:250,000
Datum: MGA 94, Zone 53
Date: 23.12.2008
Plan No: MOO/TR2008
3.6
-3.6
-5.0
-5.6
-6.5
-7.4
-10.1
Bouguer Gravity
mGal
(2.67 t/m³)
0
2.5
5
kilometres
Scale 1:250,000

QUASAR RESOURCES
HELICOPTER GRAVITY SURVEYS 2007

Gawler Craton Projects

November – December 2007

Report Number 07058

A. McCarthy

CLIENT

QUASAR RESOURCES

CLIENT CONTACT

Lynelle Beinke
Level 9, 45 Grenfell St
Adelaide, SA, 5000
Ph: 08 8212 2155
Fax: 08 8212 5559

SURVEY CONTRACTOR

DAISHSAT PTY. LTD
P.O. Box 766
MURRAY BRIDGE S.A. 5253
Tel: (08) 8531 0349
Fax: (08) 8531 0684

CONTRACTOR CONTACT

Mr. David Daish
Mob: 0418 800 122
Email: david.daish@daishsat.com

CONFIDENTIAL

FOR QUASAR RESOURCES USE ONLY

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1. INTRODUCTION

A precision GPS-Gravity survey was carried out for Quasar Resources between October and November 2007. A total of 2,701 new gravity stations were surveyed in the Gawler Ranges and Woomera Prohibited Area of South Australia. The survey was conducted in four stages from three base locations.

Gravity data were acquired using a Scintrex CG-3 automated gravity meter. Position and level data were obtained using Leica 1230GG geodetic grade GPS receivers collecting GPS and GLONASS positional information. All receivers were operating in post-processed kinematic mode. Data were acquired using Daishsat helicopter-borne methods.

Gravity data were reduced using standard reductions on the ISOGAL84 gravity network. GPS data were reduced to MGA coordinates with levels expressed as metres above the Australian Height Datum.

Photo 1: Typical terrain in the survey area.

2. SURVEY OVERVIEW

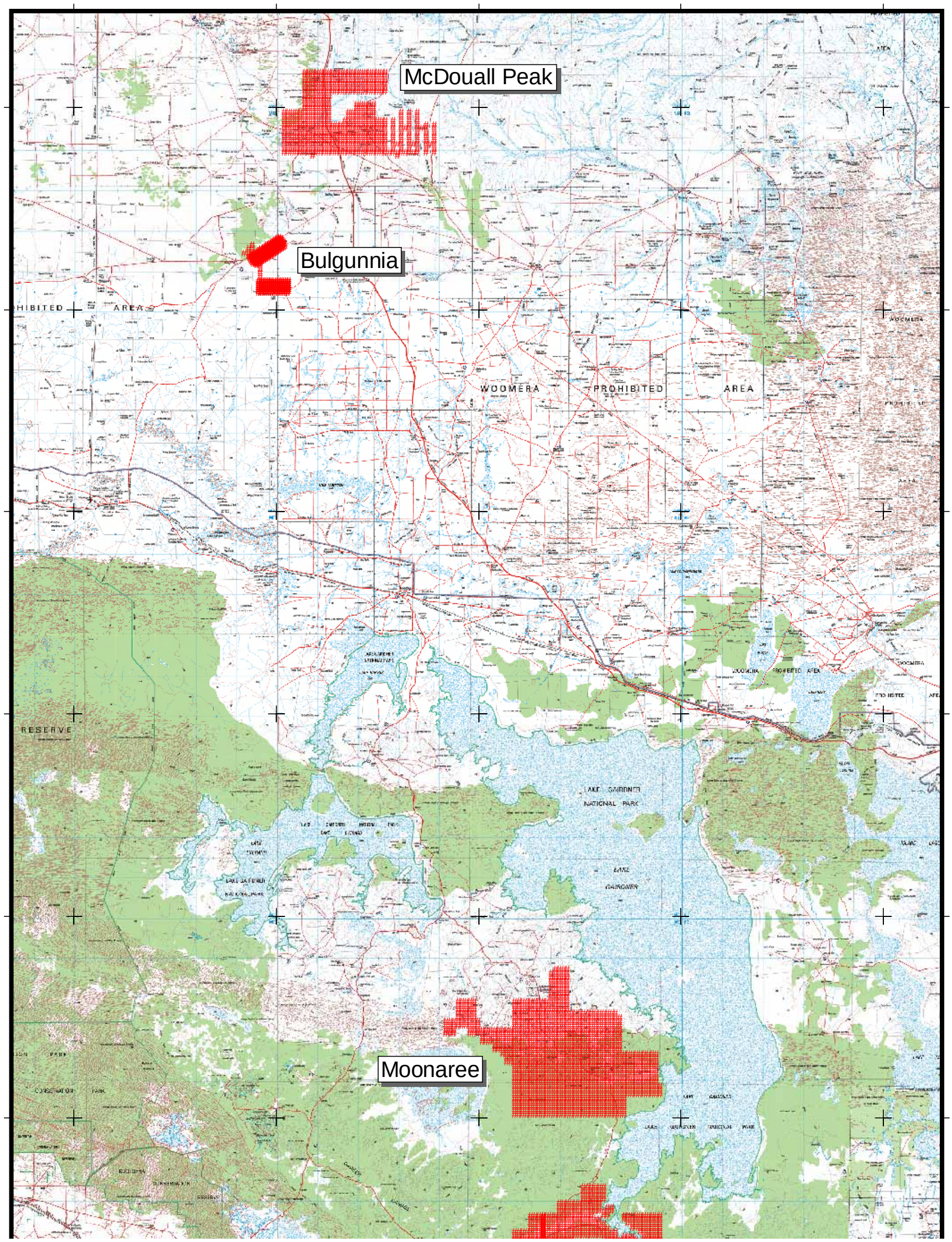
The initial survey comprised of four survey areas with a total coverage of 2,500km^2 The survey areas encompassed large areas of grazing land in the Gawler ranges and the Woomera prohibited area.

The surveys were based around four grazing properties, Mt Ive, Moonaree, Bulgunnia and McDouall Peak Stations. The location of the survey is shown in Figure 1.

The terrain encountered across the survey areas ranged from relatively open ground with rolling hills and expanses of flat rocky ground through to rocky peaks punctuated areas of dense scrubby vegetation and deep creeks.

Gravity surveying was conducted on variety of station spacing's ranging from a 1.0km square grid configuration down to a 400m diagonal grid. Appendix A contains a plot of the final station locations. Appendix C contains the specifications for the survey.

Photo 2: Typical terrain in the survey area.


McDouall Peak
Bulgunnia
Moonaree
WOOMERA
PROHIBITED
AREA
RESERVE
LAKE GAIRDNER
NATIONAL PARK

3. PERSONNEL AND EQUIPMENT

3.1 Personnel

The supervisors in charge of the project were Andrew McCarthy and Nick Moir. Andrew and Nick were responsible for daily management of the job and for nightly data processing to ensure quality and integrity. Gravity and GPS measurements were carried out by:

Andrew McCarthy
Nick Moir
Mark Rosewall
Matt Hunter

Four Helicopter pilots were used for the project

Andrew Catt
Rick Keece
Peter McDonald
Carl Harpes

Final data reduction, inspection and reporting were performed by the company Geophysicist, Grant Coopes.

3.2 Survey equipment

The following survey equipment was utilised on the gravity survey:

- Scintrex CG-3 digital gravity metes (G and S meters)
- Leica 1230 dual frequency GPS receivers with GLONASS capability
- Notebook computers for data processing and backup
- Garmin 296 GPS receivers for helicopter navigation
- Garmin Handheld GPS receivers for vehicle navigation
- Various chargers, solar cells and batteries

3.3 Vehicles

Due to the type of terrain and remote locations, 4WD Landcruiser and 4WD Isuzu Trucks were utilized as support vehicles for the surveys. To maintain the high Daishsat safety record, vehicles were fitted with a range of safety equipment including:

- One 20l jerry can of water
- Dual fuel tanks
- Two spare tyres
- UHF radio and satellite phone with car kit
- Self-recovery equipment including winches, snatch straps chains etc.
- Tyre pliers to effect tyre repairs in the field
- Tools and spares to enable field repairs as necessary
- Survival kits with EPIRB emergency locator beacons
- Trans track satellite vehicle monitoring and reporting systems

3.4 Helicopter

Due to the scale and accessibility of the stations within the survey areas the most efficient method of transport between stations is by helicopter.
Daishsat utilizes Robinson R-44 Helicopters, a medium size utility helicopter with good maneuverability and proven reliability in harsh operating conditions typical of gravity survey operations.

Photo 3: Robinson R-44 Helicopter VH-HEM and gravity acquisition.

3.5 Accommodation

The crews were accommodated as close as practical to the survey areas with accommodation provided by “Mt Ive”, “Kangaroo Well” and “The Twins” in shearer’s quarters and un-used farm houses where available.

3.6 Communications

The survey crew and support vehicles were equipped with hand-held Iridium satellite phones as well as UHF and VHF transceivers. “Omnitrack” satellite based tracking was used on all vehicles (including helicopters) to enable asset monitoring via a web interface.

Scheduled communications were made by the crew to the communications centre at the base camp at hourly intervals. Communication with the Perth and Murray Bridge offices was ongoing for the duration of the job.

Photo 4: View from VH HZH looking east towards Lake Gairdner.

4. GPS SURVEYING AND PROCESSING

4.1 Set out of the grid

This was done concurrently with the gravity data acquisition using navigation grade receivers operating in autonomous mode. Where possible, the readings were taken as close to the ideal coordinates as possible. As the receivers were operating in autonomous mode, set out accuracy was usually better than 10m.

Raw kinematic GPS data were logged by a twin dual-frequency Leica 1230GG receivers inside the helicopter cabin, with the GPS antennas mounted on the tail boom. Static GPS data were logged at the base station using two Leica System 1230GG GPS receivers for later post-processing. The Leica 1230GG is a new generation GPS receiver making use of both the traditional US GPS satellite constellation and the newly available GLONASS satellite constellations for higher positional accuracy and reduced periods of poor satellite coverage.

Repeat stations were placed throughout the surveys to monitor any variations in positional accuracy. Repeats are placed with a washer tied with flagging and marked with the station number was used for future identification. At each station, the station number, position and RL were recorded digitally by the crew.

4.2 Survey datum and control

The gravity surveying, and hence any gravity reductions, used the Australian Height Datum (AHD) as the reference datum. New GPS/Gravity base stations were established at each of the three bases using three days worth of static data and connections to ITRF stations using Geoscience Australia's online GPS processing system, AUSPOS. For more information on this system, please visit the Geoscience Australia website at http://www.ga.gov.au/geodesy/sgc/wwwgps/. Final deviations of better than 5mm were obtained for x, y and z, for all occupations. Appendix D contains the GPS base station information.

4.3 Processing of the position and level data

The raw GPS data were recorded onto the internal RAM of the GPS receivers. The data were downloaded nightly onto laptop computer for post processing using Waypoint Grafnav v7.80.

Waypoint combines the processing components, GrafNav and GrafNet, in a complete package.

GrafNav processes data for one baseline (e.g. one base and one remote). GrafNav is normally used for kinematic data which it is extremely well suited for. It can also process single static baselines. Receiver types can be mixed and matched via the use of a common format. This component of Waypoint was used for processing the kinematic data acquired each day.
GrafNav and GrafNet share the same processing engine that has been under continuous development since its original inception by Waypoint in 1992. The core of this robust engine is its carrier phase kinematic (CPK) Kalman filter. Some of the major advantages of Waypoint's kernel are:

Fast processing - The GrafNav kernel is one of the fastest on the market. It will process ~0.8 epochs per MHz per second on a Pentium II.
Robust Kalman filter - From experience with processing GPS data from fast jets and NASA sounding rockets, the processing kernel has become extremely robust. Efforts have been made to account for all of the various data error possibilities given the different types of GPS receivers that GrafNav/GrafNet can handle.
Reliable OTF - Waypoint's on-the-fly (OTF) algorithm, called Kinematic Ambiguity Resolution (KAR), has had years of development and stresses reliability. Variations are implemented for both single and dual frequencies, and numerous options are available to control this powerful feature
Accurate Static Processing - Three modes of static processing are implemented in the processing kernel. Fixed static is the most accurate. A quick static solution is also available as an alternative, while the float and iono-free float solution is useful for long baselines.
Dual Frequency - Full dual frequency support comes with GrafNav/GrafNet. For ambiguity resolution, this entails wide/narrow lane solutions for KAR, fixed static and quick static. Ionospheric processing is very important with the peak of the ionosphere's cycle occurring in 2000. The GrafNav kernel implements two ionospheric processing modes including the iono-free and relative models. The relative model is especially useful for airborne applications where initialization is near the base station, and this method is much less susceptible to L2 phase cycle slips.
Forward and Reverse - Processing can be performed in both the forward and reverse directions. Both GrafNav and GrafNet also have the ability to combine these two solutions to obtain a globally optimum one.
Velocity Determination - Since the GrafNav kernel includes the L1 Doppler measurement in its Kalman filter, velocity determination is very accurate. In addition to this, a considerable about of code has been added specifically for the detection and removal of Doppler errors.
Long Baseline - Because precise ephemeris and dual frequency processing is supported, long baselines accuracies can be as good as 0.1 PPM.

For more information about Waypoint processing software, and in particular, Grafnav, please visit the Waypoint http://www.waypnt.com/grafnav_d.html.

Simple transformations to MGA and AHD were done using the GPS derived WGS84 positions.

MGA94 coordinates were obtained by simply projecting the GPS-derived WGS84 coordinates using a UTM projection with zone 53S. For all practicable purposes, the WGS84 geodetic coordinates are equivalent to GDA94 geodetic coordinates, so no transformation is necessary. For more information about GDA94 and MGA94, please visit http://www.ga.gov.au/geodesy/datums/gda.jsp.
AHD heights were calculated via Waypoint software using the latest geoid model for Australia, AUSGEOID98. Information about the geoid and the modeling process used to extract separations (N values) can be found at http://www.ga.gov.au/geodesy/ausgeoid/. To obtain AHD heights, the modeled N value is subtracted from the GPS derived WGS84 ellipsoidal height (Figure 2).

$$H_{AHD}=h_{WGS84}-N$$

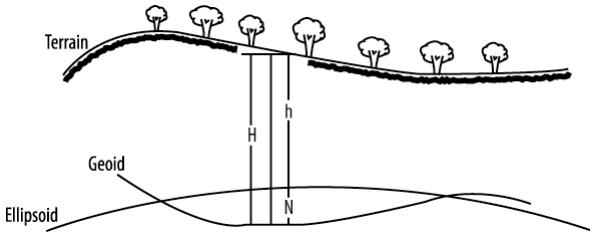


Figure: 2: Geoid-Ellipsoid separation

4.4 GPS Performance

Performance from the 1230GG receivers was excellent. There were no stations that required repeating due to GPS failure or poor coordinate quality.

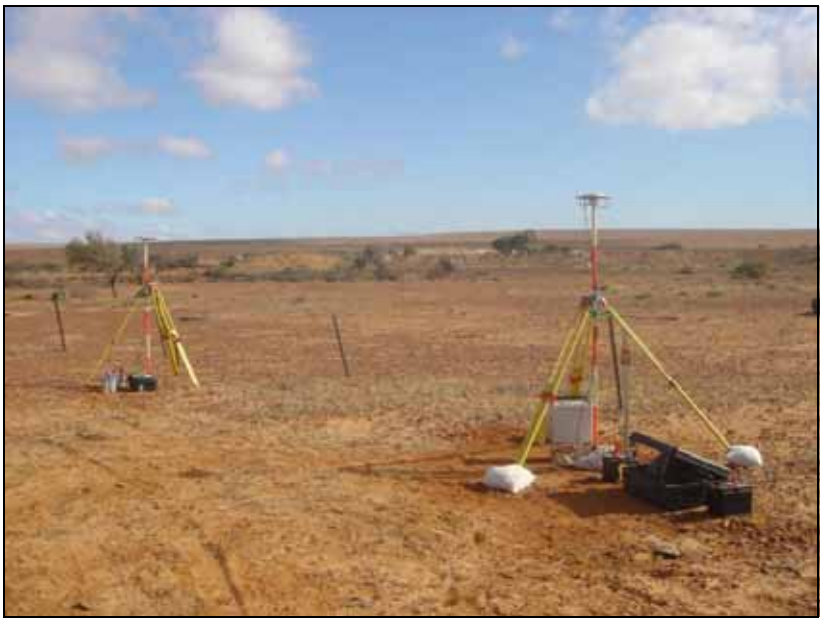


Photo 4: Post process GPS base setup with CG-3 gravimeter.

5. GRAVITY SURVEYING AND PROCESSING

5.1 Gravity data acquisition

Gravity observations were made concurrently with the GPS measurements. Two observations were made for each station, with each observation consisting of a 20-second or greater stacking time. Multiple observations were made at each station so that any seismic or instrumental noise could be immediately detected. The tolerance between readings was set at 0.05 of a dial reading (0.05 mGals). Vertical and horizontal levels were restricted to 5 arc seconds at all times. At each station, the station number, time and two gravity readings (in dial units) were recorded in DAISHSAT carbon-copy gravity field books. The Scintrex meters also automatically record the station, time and readings digitally to allow for downloading to computer.

5.2 Gravity base station

A gravity base station was used for calculation of absolute gravity and drift determination. Details of the gravity bases are contained in Appendix D. When in the field, a base station reading was taken in the morning before observing and at evening after the last observation. When taking a base station reading, the observed gravity values were stacked over 60 seconds to ensure accuracy. Observations were repeated until the readings repeated to 0.010 of a dial reading or less.

The gravity base stations were set up at Mt Ive Station, Kangaroo Well, and The Twins homestead as close as practical to the helicopter landing areas. Each base station was established via multiple ABA ties to the AFGN stations at Glendambo and Noning Station. Expected accuracy of the tie control surveys would be better than 0.01 mGals.

5.3 Gravity data processing

Raw gravity data were processed on a daily basis to check for quality and integrity. This interim process produced a set of Bouguer Anomaly values which were contoured and imaged to provide a check for any anomalous readings that would need repeating. Geosoft GRAVRED software was used for the gravity reduction in the field. Other software used on this project includes Arcview, ChrisDBF, Waypoint and Oasis Montaj. The formulae used for final processing are listed below:

Instrument scale factor: This correction was used to correct a gravity reading (in dial units) to a relative gravity unit value based on the meter calibration.

Tidal correction: This correction was used to correct for background variations due to changes in the relative position of the moon and sun. The Scintrex calculated ETC was removed and a new ETC calculated using Geosoft Formulae and the surveyed GPS latitude. The formulae used are too complex to list here.

Instrument Drift: Since gravity meters are mechanical, they are prone to drift (extension of the spring with heat, obeying Hooke's law). If two base readings are taken one can assume that the drift between the two readings is linear and can therefore be calculated. The drift and tidal corrected value is referred to as the *observed gravity*.

Normal Gravity: The theoretical value of gravity was calculated using the 1967 variant of the International Gravity Formula and used to latitude correct the observed gravity.

$$Gn=9,780,318.456*(1+0.005\ 278\ 895*\sin^2\phi+0.000\ 023\ 462*\sin^4\phi)$$

where ϕ represents degrees of latitude;

Free-Air Correction: Since gravity varies inversely with the square of distance, it is necessary to correct for changes in elevation between stations to reduce field readings to a datum surface (in this case, AHD).

$(3.08768 – 0.00440\ \sin^2\phi)*h – 0.000001442*h^2\ \mu ms^{-2}$ per metre

Bouguer Correction: This correction accounts for the attraction of material between the station and datum plane that is ignored in the free-air calculation. A value of 2.67 tm^3 was used in the correction.

$$0.4191*\rho\ \mu ms^{-2} \text{ per metre}$$

where ρ = density 2.67 tm^3

Free Air Anomaly: This is obtained by applying the free air correction (FAC) to the observed gravity reading.

$$FAA=G_{OBSG84}-Gn+FAC$$

Bouguer Anomaly: This is obtained when all the preceding reductions or corrections have been applied to the observed gravity reading.

$$BA267=G_{OBSG84}-Gn+FAC-BC$$

5.4 Gravity meter calibration and scale factors

The gravity meter used had previously been calibrated over a number of calibration ranges in WA and SA. A derived scale factor from these calibrations is shown below:

Serial No.	(G)	**408275**	Scale Factor	**1.000427**
	(S)	**9711410**	Scale Factor	**0.999408**

6. RESULTS

Raw and processed GPS and gravity data are contained on CDROM as Appendix E. Hardcopy plots of station location and coloured images are contained in Appendix A.

6.1 Stations Surveyed and Survey Progress

In total, 2,701 new stations were acquired during the survey comprising of 502 stations collected at McDouall Peak, 357 Stations at Bulgunnia, 993 stations at Moonaree and 844 stations at Mt Ive. Of the 2701 stations 179 were revisited to ensure data quality.

A brief production summary for the survey is show in Table 1 below.

Generally, production was excellent with the crew averaging over 150 stations per day. Due to CASA regulations restricting duty hours for pilots, some time was lost from direct production although the crews used this downtime to conduct helicopter and equipment maintenance and review the acquired data.
Strong winds and rocky terrain made landing and gravity acquisition difficult in some instances, hindering production.

Over the four survey areas and a total of 26 days on site three days were lost to a minor mechanical failure, with the helicopter heading to Port Augusta for repair.
There was also one day of crew standby brought about by a total fire ban across the survey area prohibiting the landing of the helicopter in unprepared landing areas. There was no downtime due to geophysical or GPS equipment failure.

Oak Dam Gravity Survey 2007		
Gravity stations acquired (including repeats)	**2880**	stations
Gravity station repeats	**179**	6.2%
New gravity stations acquired	**2701**	stations
Total accidents	**0**	accidents
Total hours lost from accidents	**0**	hours

Table 1: Gravity Production Summary

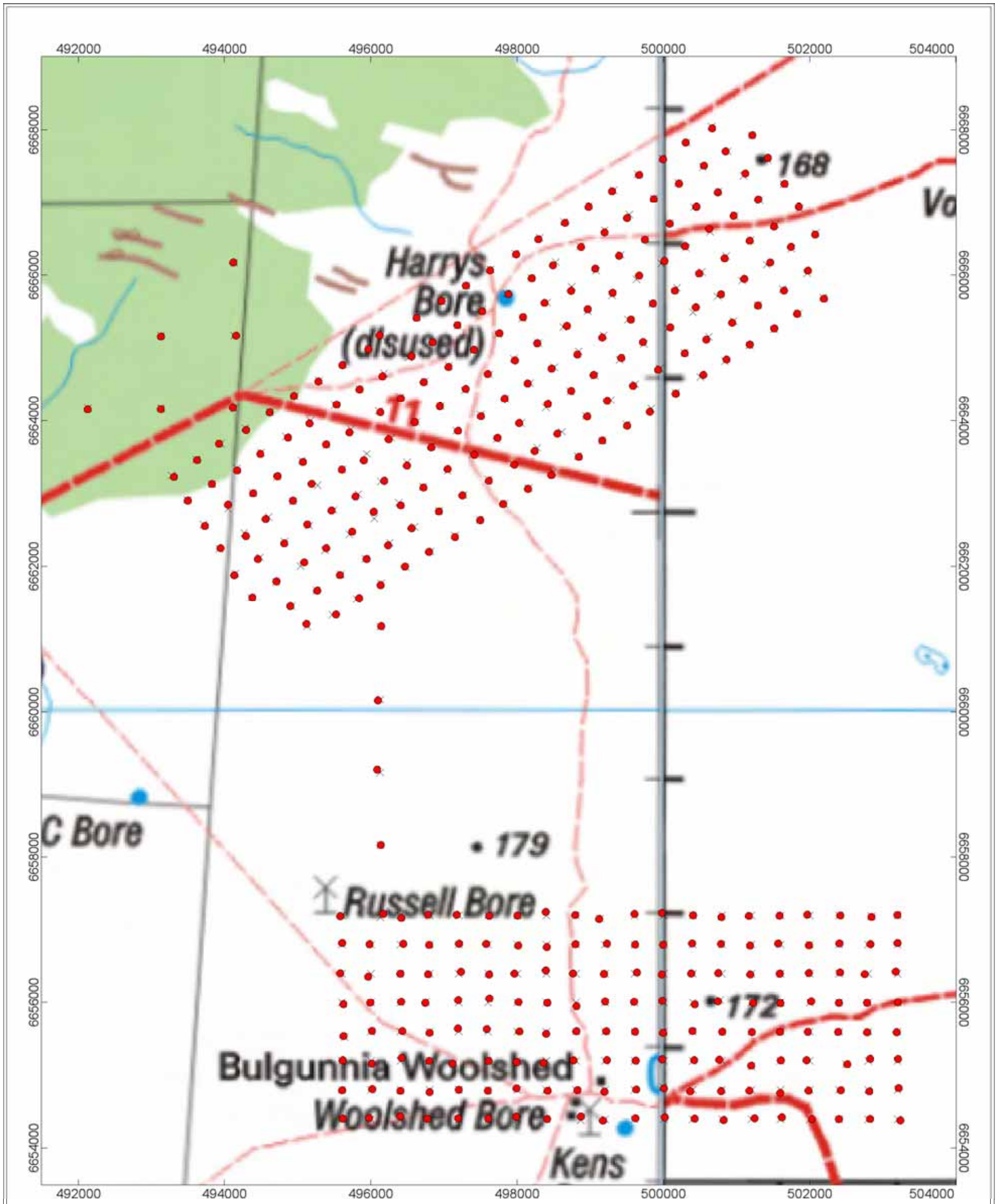
6.2 Data Repeatability

Analysis of the repeat data shows that measurement repeatability is very good for both GPS and gravity observations. Appendix B contains histograms and summary statistics from the analysis. Based on the repeat data, one can assume the following typical accuracies for the observables:

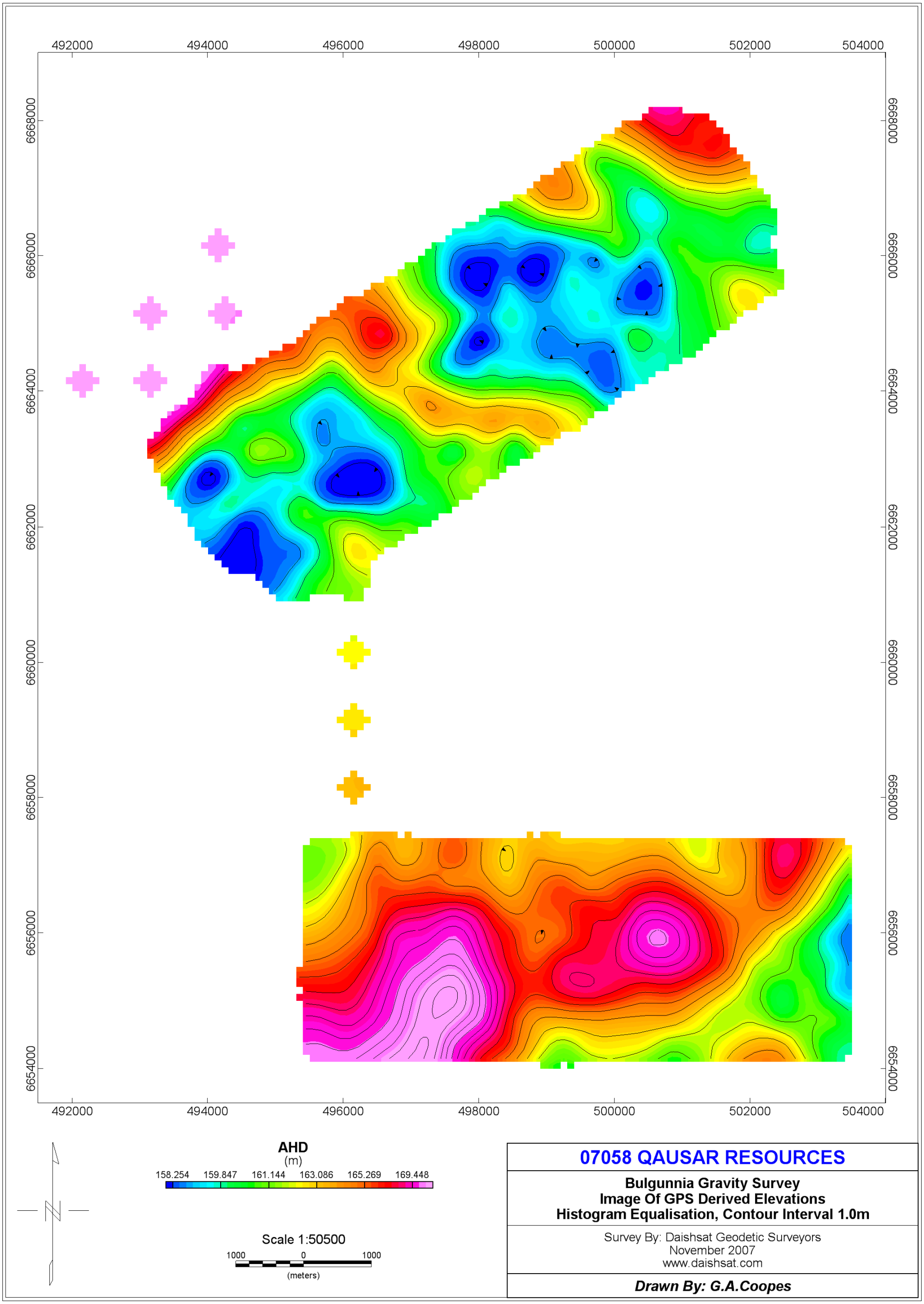
Z position observation: < 0.060 m
Gravity observation: < 0.025 mGals

APPENDIX A

Plots of station location / Images



07058 QUASAR RESOURCES
Bulgunnia Gravity Survey **Plot Of Station Locations**
Survey By: Daishsat Geodetic Surveyors November 2007 www.daishsat.com
Drawn By: G.A.Coopes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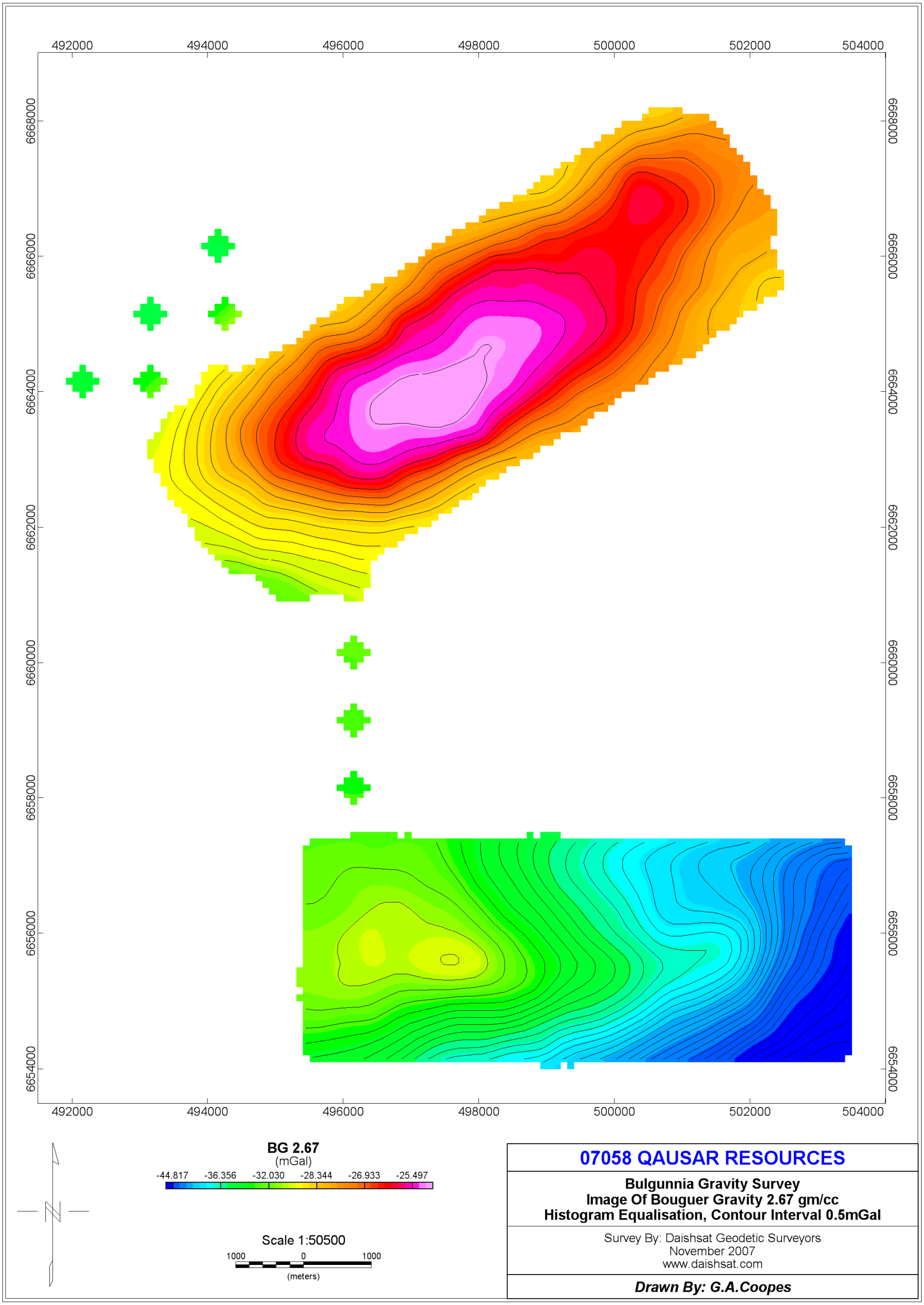
07058 QAUSAR RESOURCES
Bulgunnia Gravity Survey
Image Of GPS Derived Elevations
Histogram Equalisation, Contour Interval 1.0m
Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com
Drawn By: G.A.Coopes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07058 QAUSAR RESOURCES
Bulgunnia Gravity Survey
Image Of Bouguer Gravity 2.67 gm/cc
Histogram Equalisation, Contour Interval 0.5mGal
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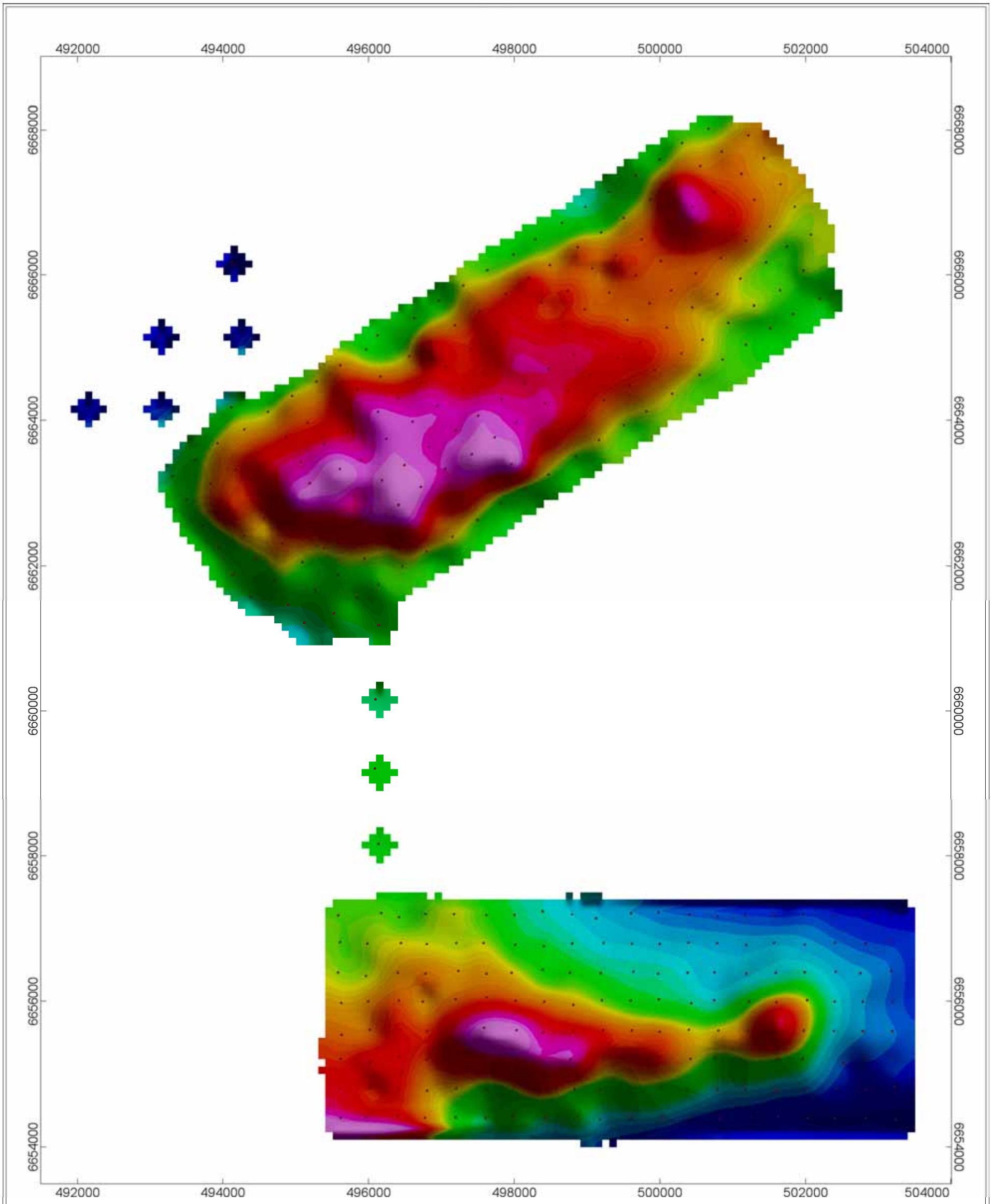
November 2007
www.daishsat.com
Drawn By: G.A.Coopes



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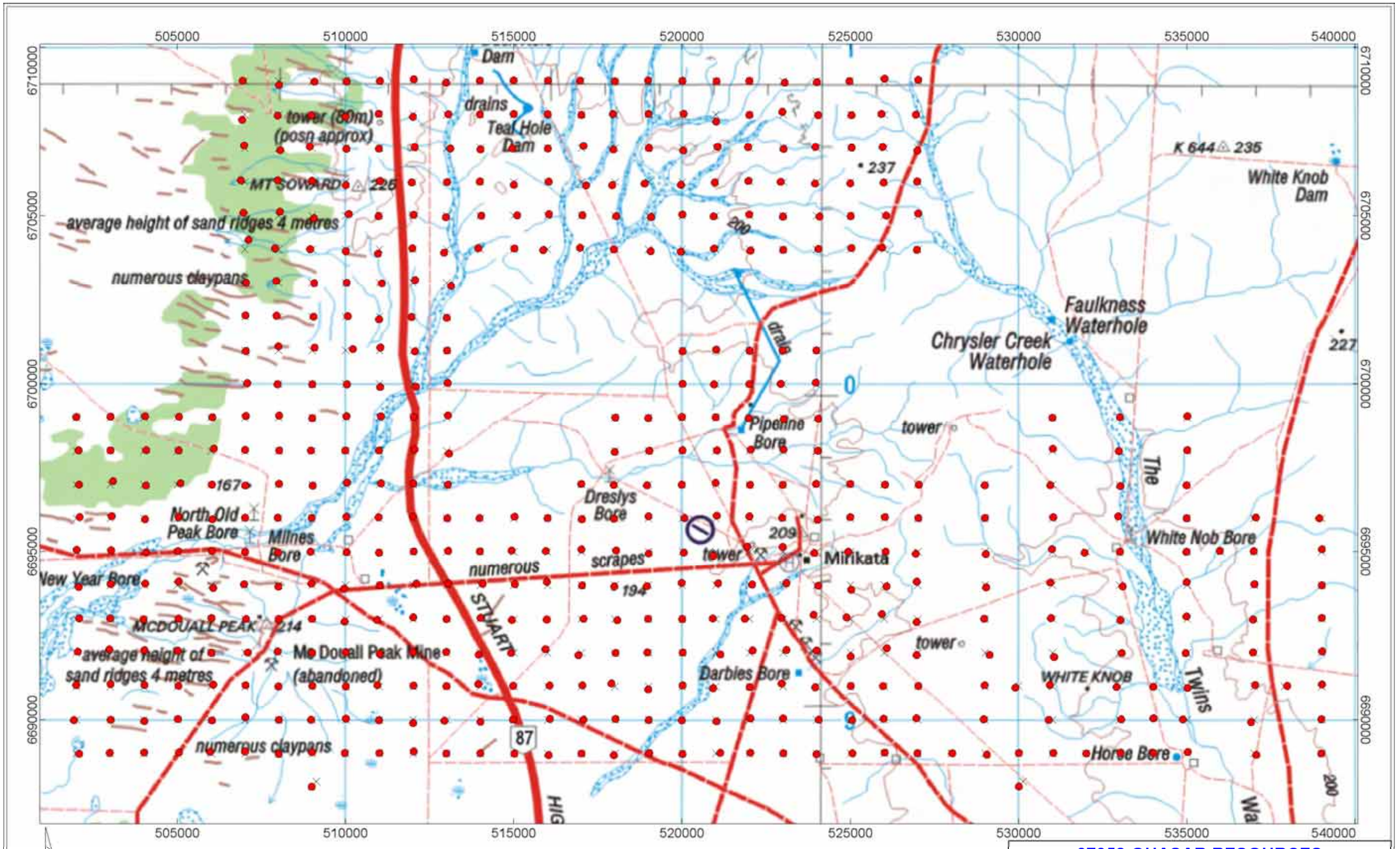
07058 QUASAR RESOURCES

Bulgunnia Gravity Survey
Image Of 1VD Of Bouguer Gravity 2.67 gm/cc
Histogram Equalisation, NE Sunshading

Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com

Drawn By: G.A.Coopes



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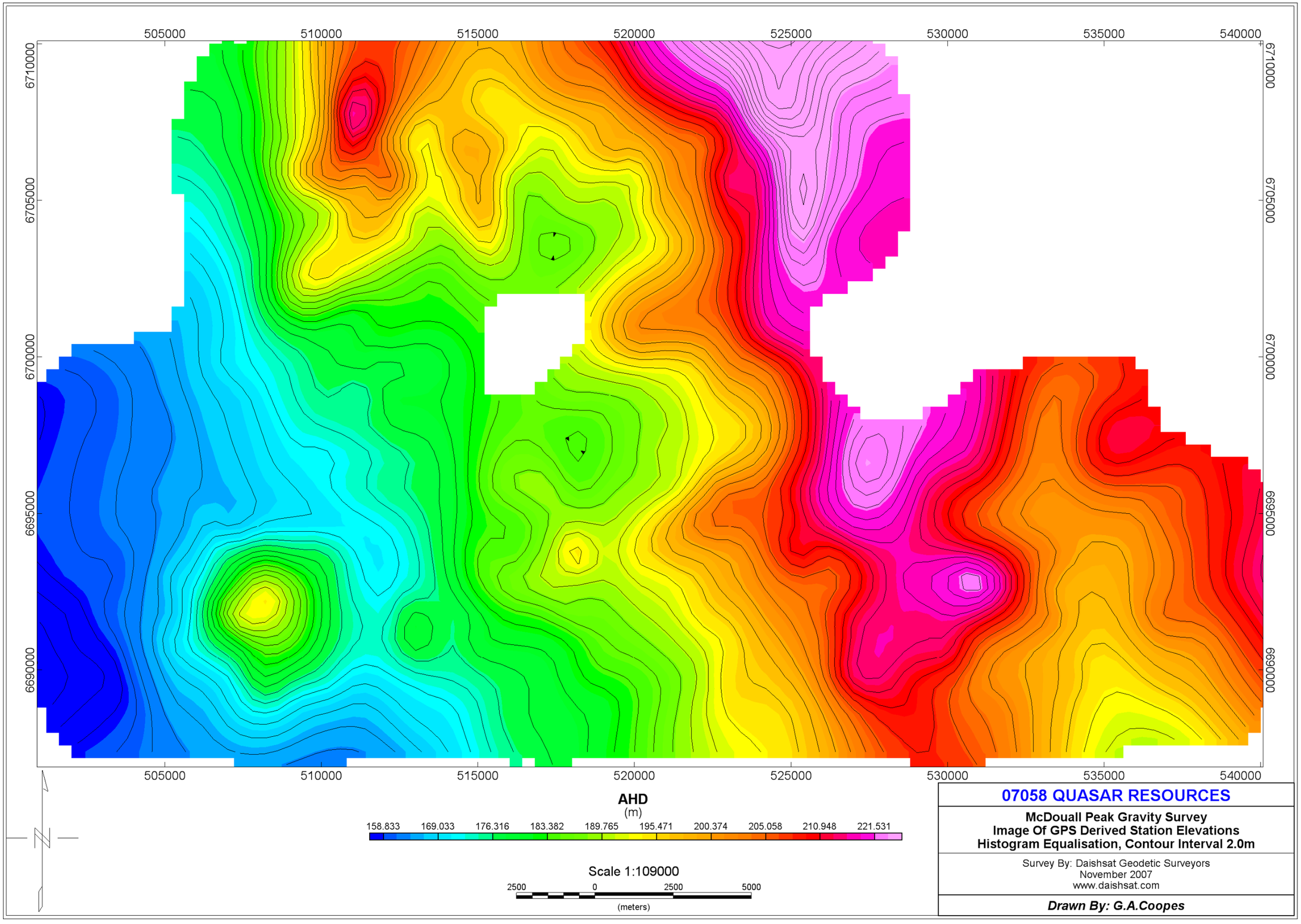
(meters)

07058 QUASAR RESOURCES

McDouall Peak Gravity Survey
Plot Of Station Locations

Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com

Drawn By: G.A.Coopes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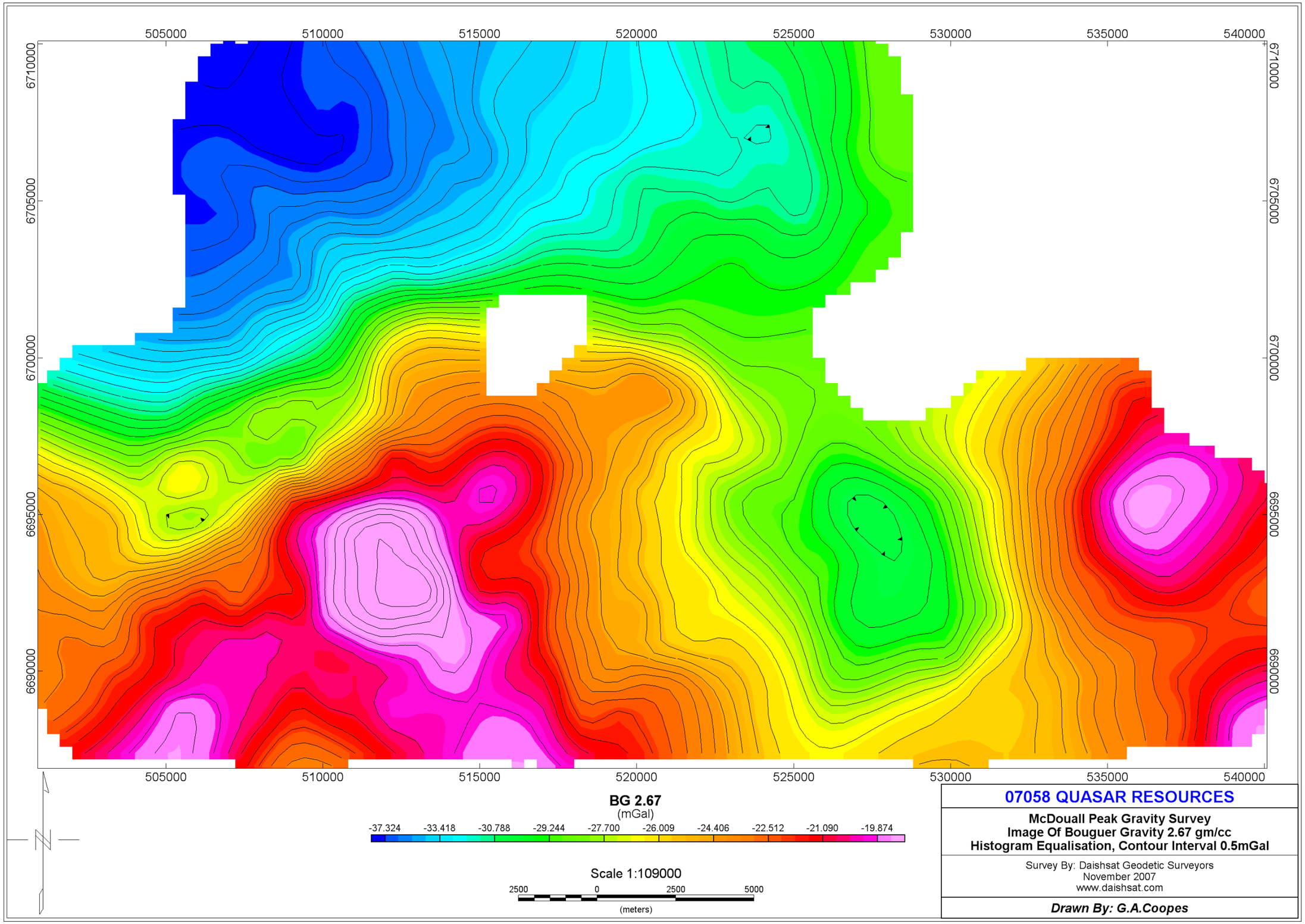
07058 QUASAR RESOURCES
McDouall Peak Gravity Survey
Image Of GPS Derived Station Elevations
Histogram Equalisation, Contour Interval 2.0m
Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com
Drawn By: G.A.Coopes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07058 QUASAR RESOURCES
McDouall Peak Gravity Survey
Image Of Bouguer Gravity 2.67 gm/cc
Histogram Equalisation, Contour Interval 0.5mGal
Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com
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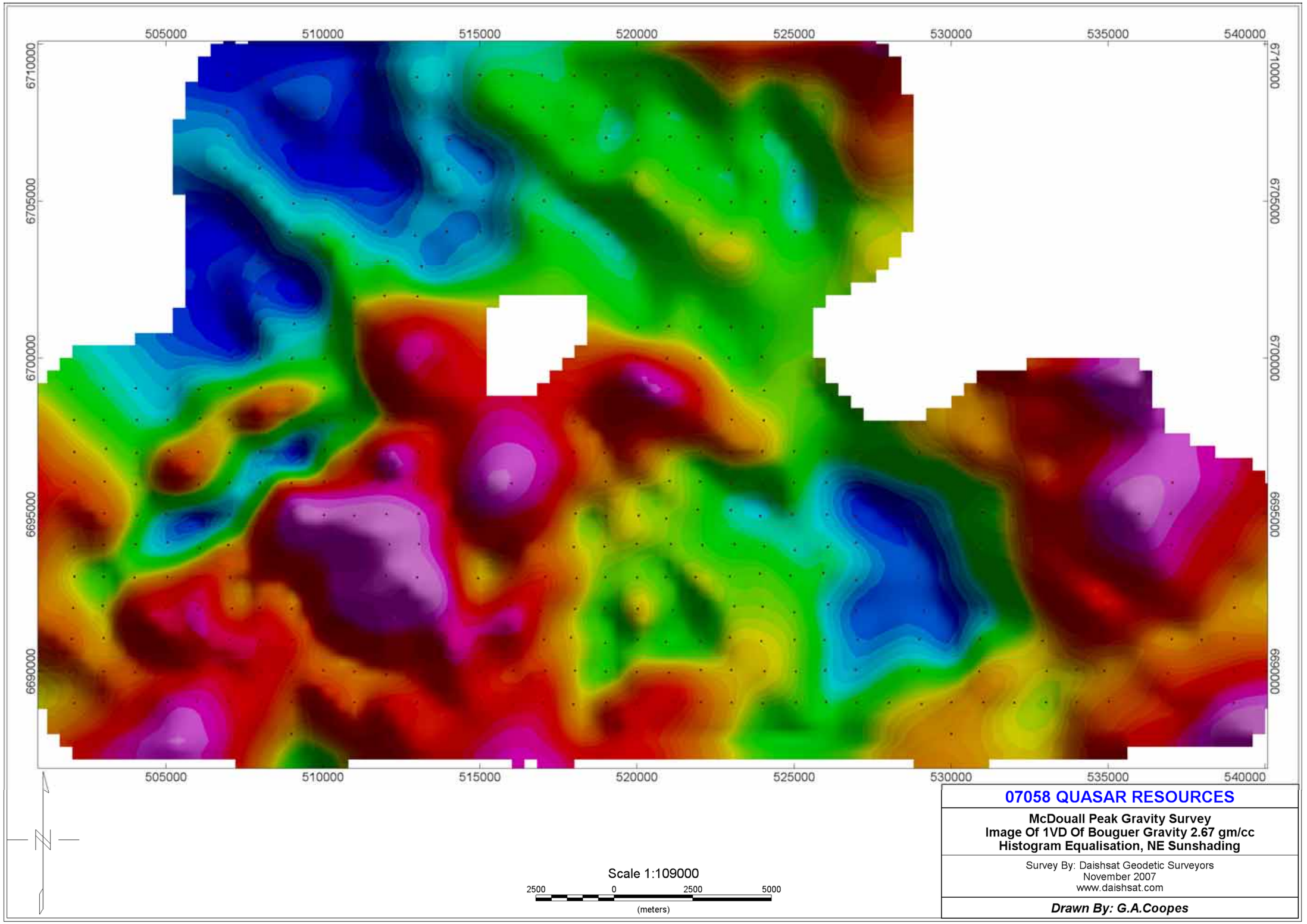

07058 QUASAR RESOURCES

McDouall Peak Gravity Survey
Image Of 1VD Of Bouguer Gravity 2.67 gm/cc
Histogram Equalisation, NE Sunshading

Survey By: Daishsat Geodetic Surveyors
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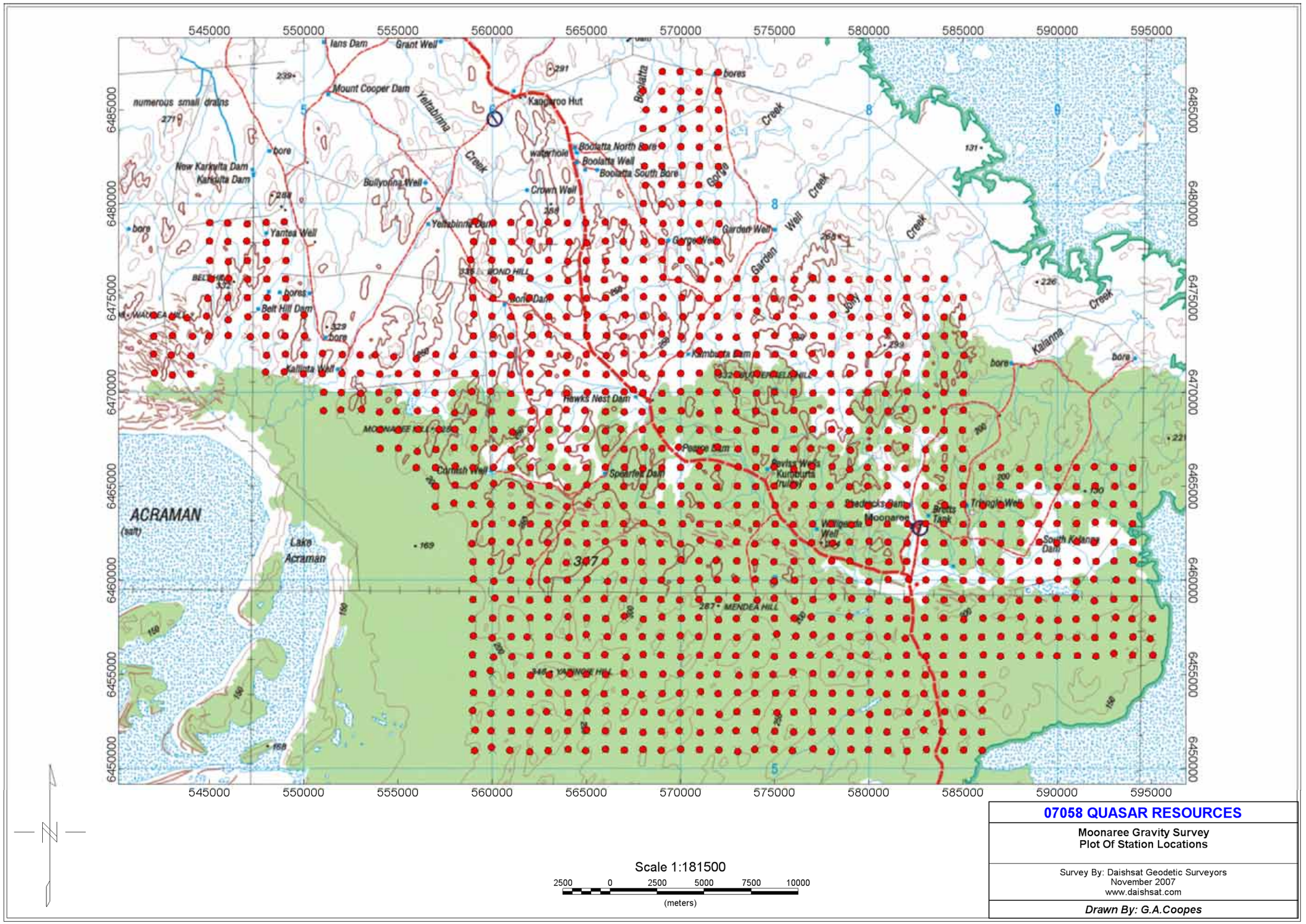
www.daishsat.com

Drawn By: G.A.Coopes

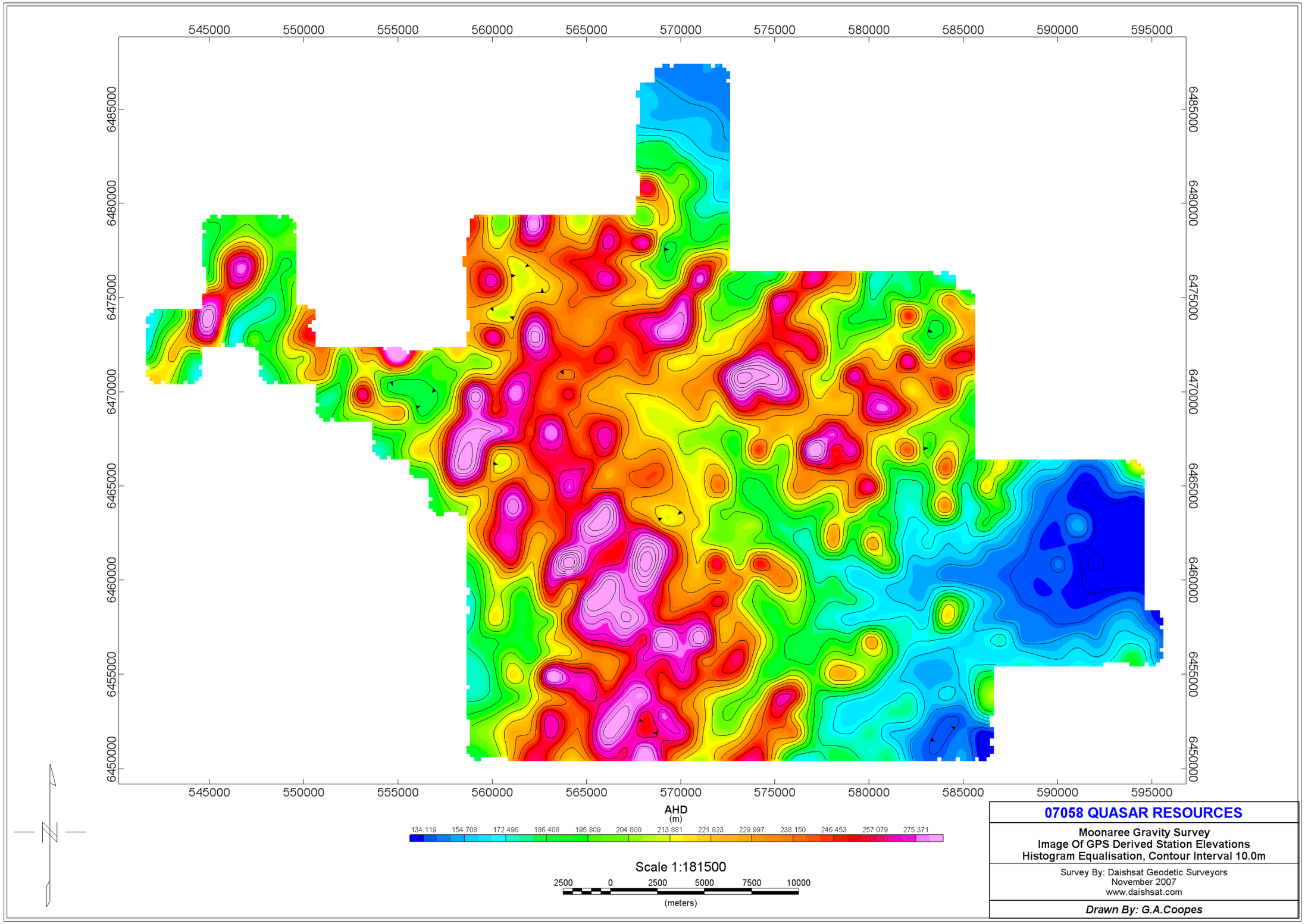


07058 QUASAR RESOURCES

Moonaree Gravity Survey
Plot Of Station Locations

Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com

Drawn By: G.A.Coopes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07058 QUASAR RESOURCES
Moonaree Gravity Survey
Image Of GPS Derived Station Elevations
Histogram Equalisation, Contour Interval 10.0m
Survey By: Daishsat Geodetic Surveyors
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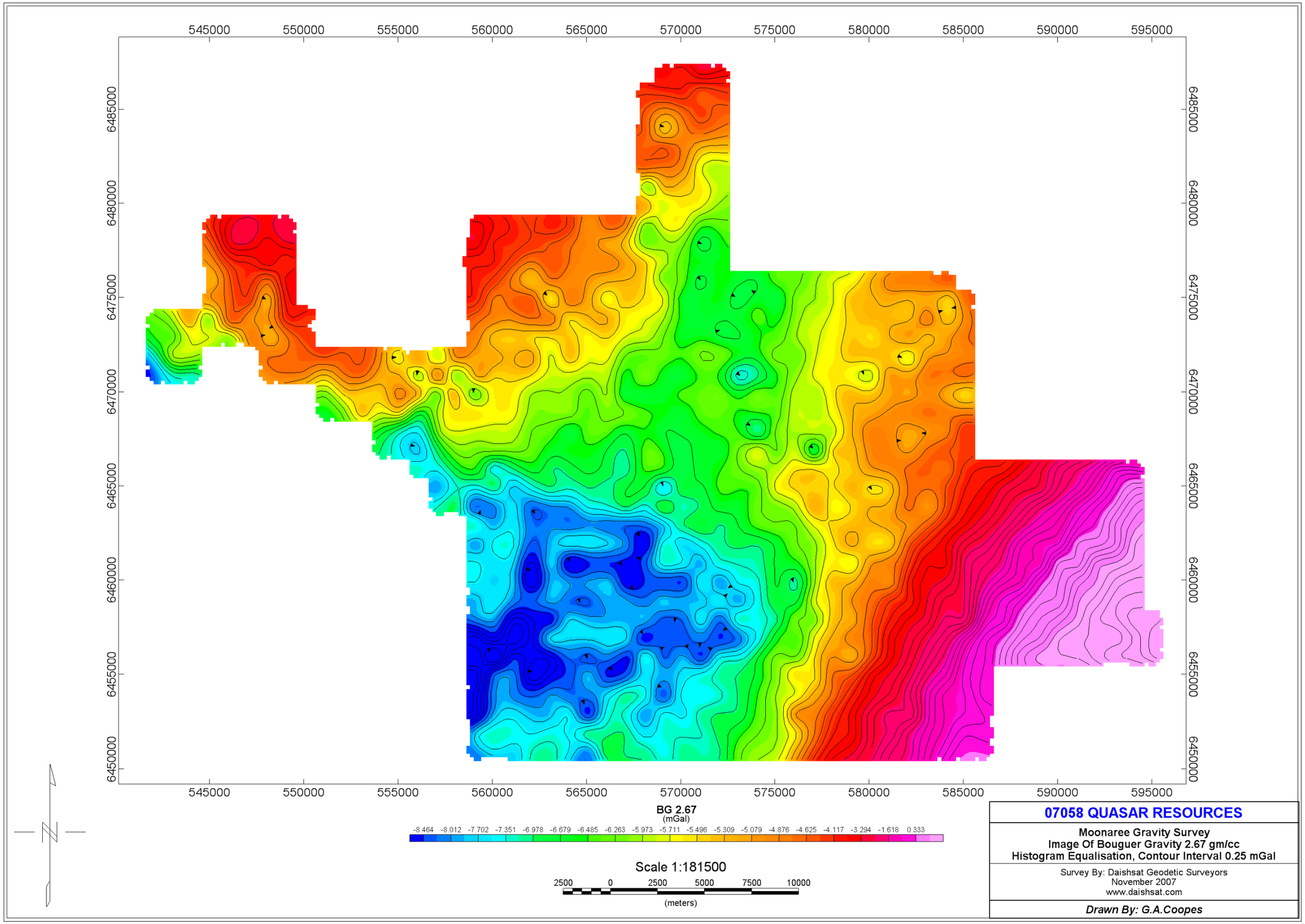
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07058 QUASAR RESOURCES
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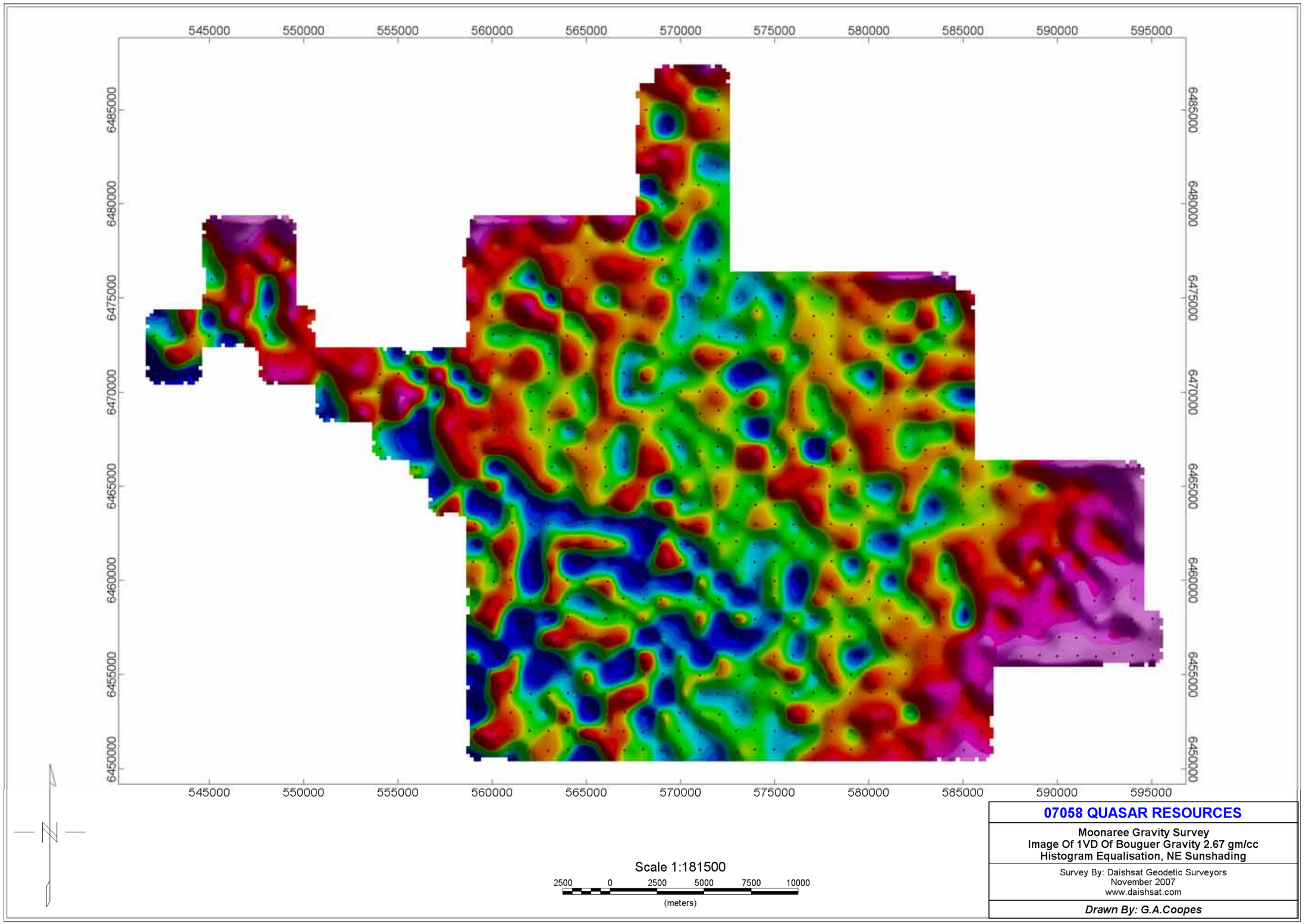
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07058 QUASAR RESOURCES
Moonaree Gravity Survey
Image Of 1VD Of Bouguer Gravity 2.67 gm/cc
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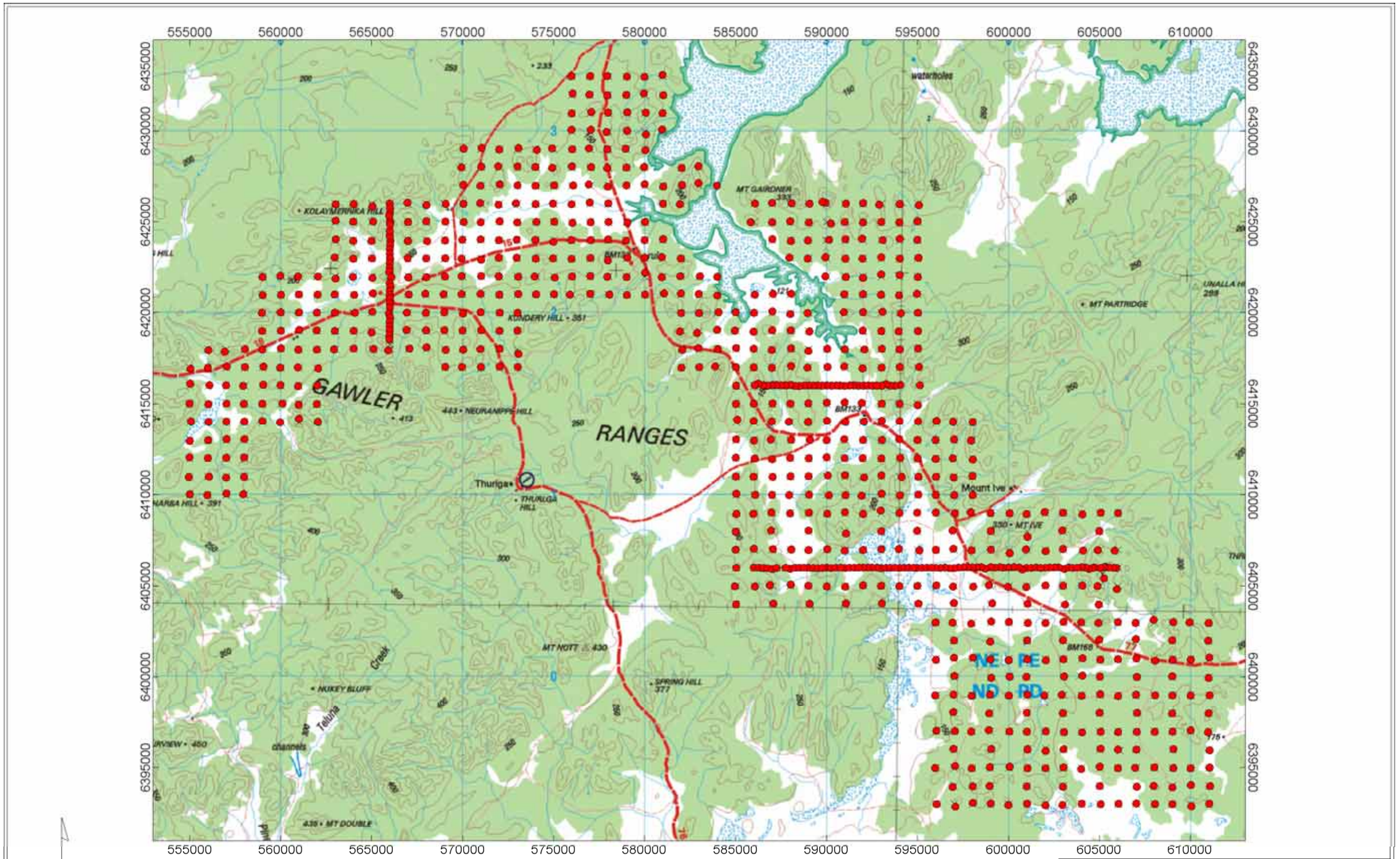

07058 QUASAR RESOURCES

Mt Ive Gravity Survey
Plot Of Station Locations

Survey By: Daishsat Geodetic Surveyors
November 2007
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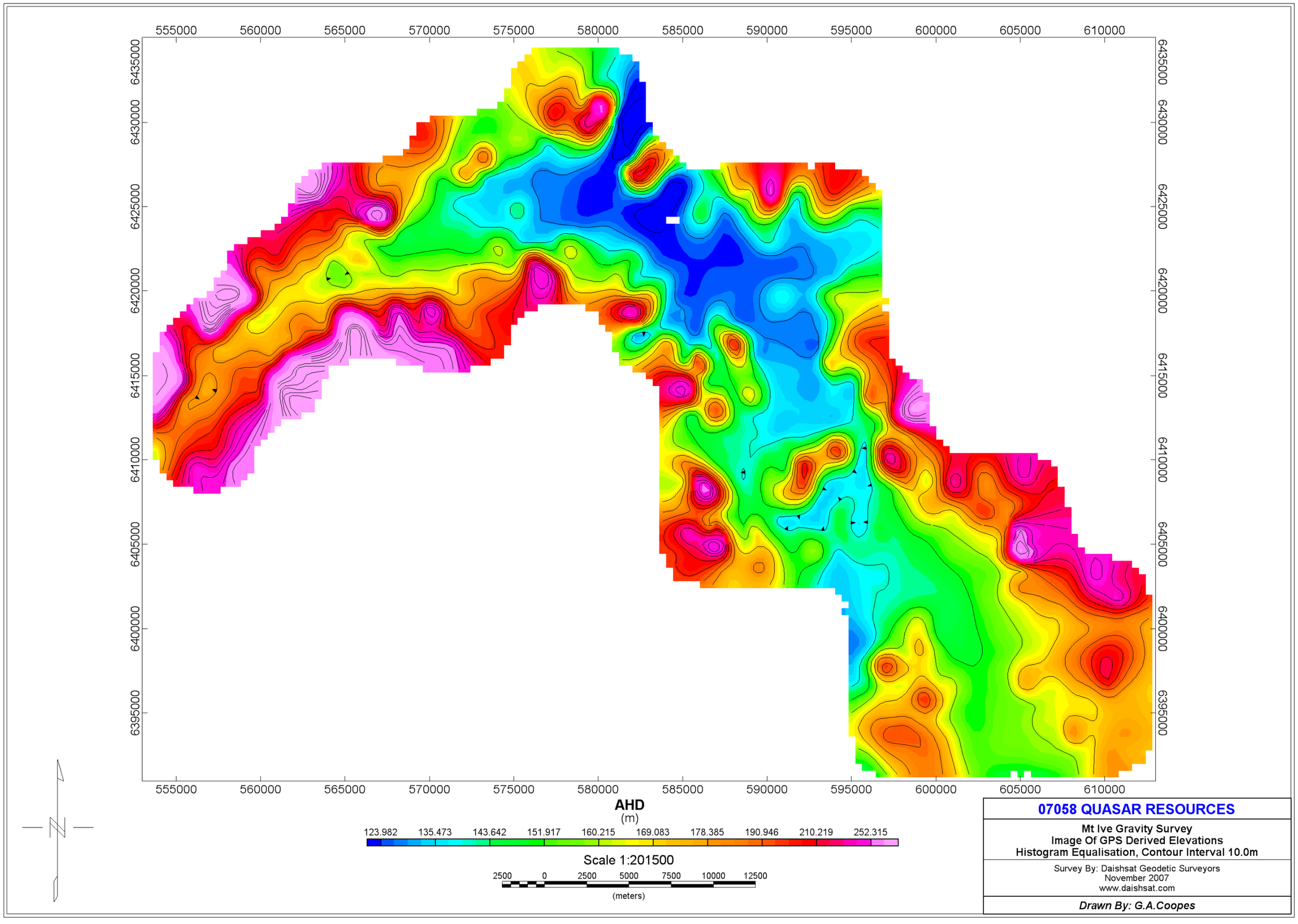
Drawn By: G.A.Coopes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07058 QUASAR RESOURCES
Mt Ive Gravity Survey
Image Of GPS Derived Elevations
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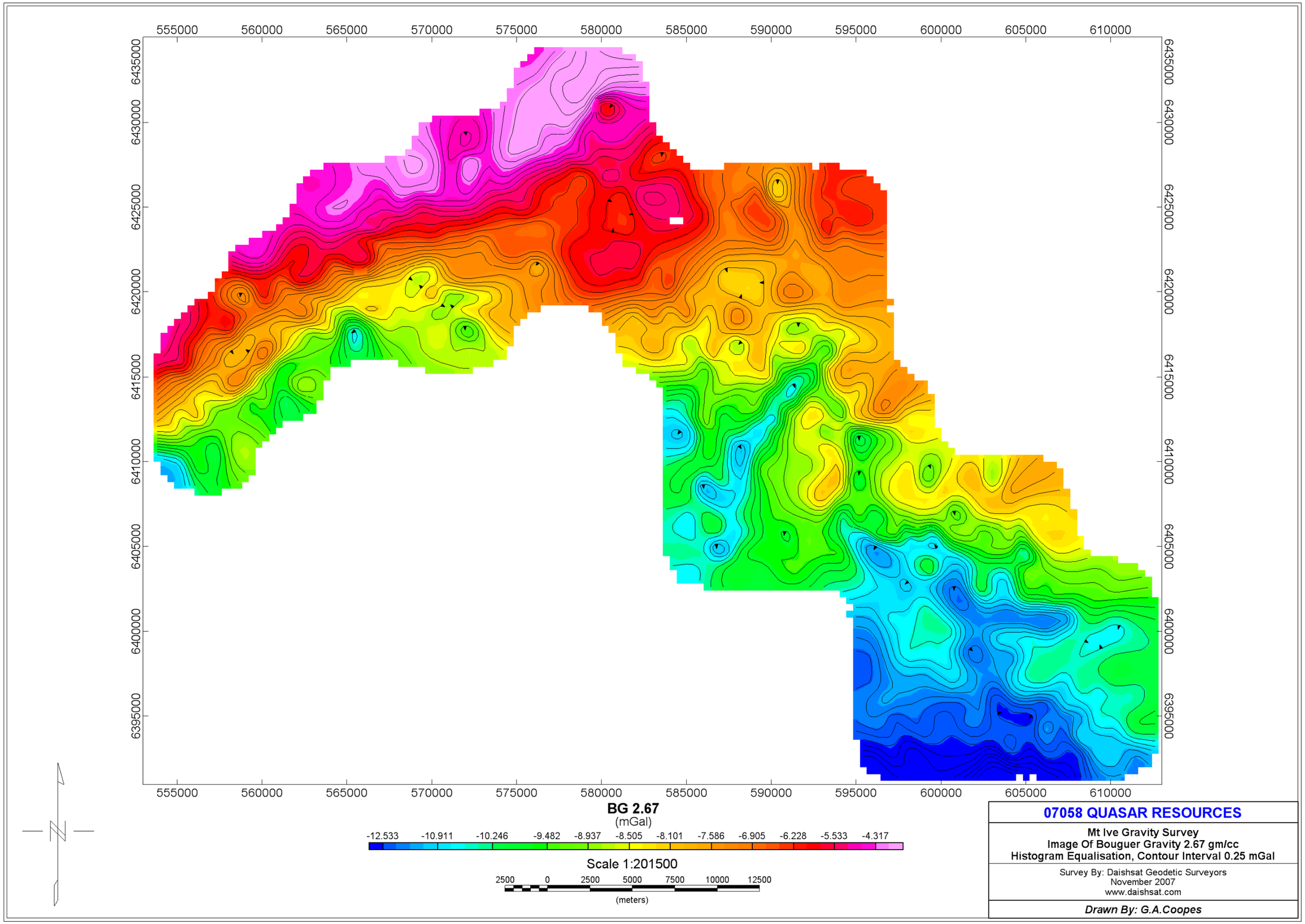
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7500
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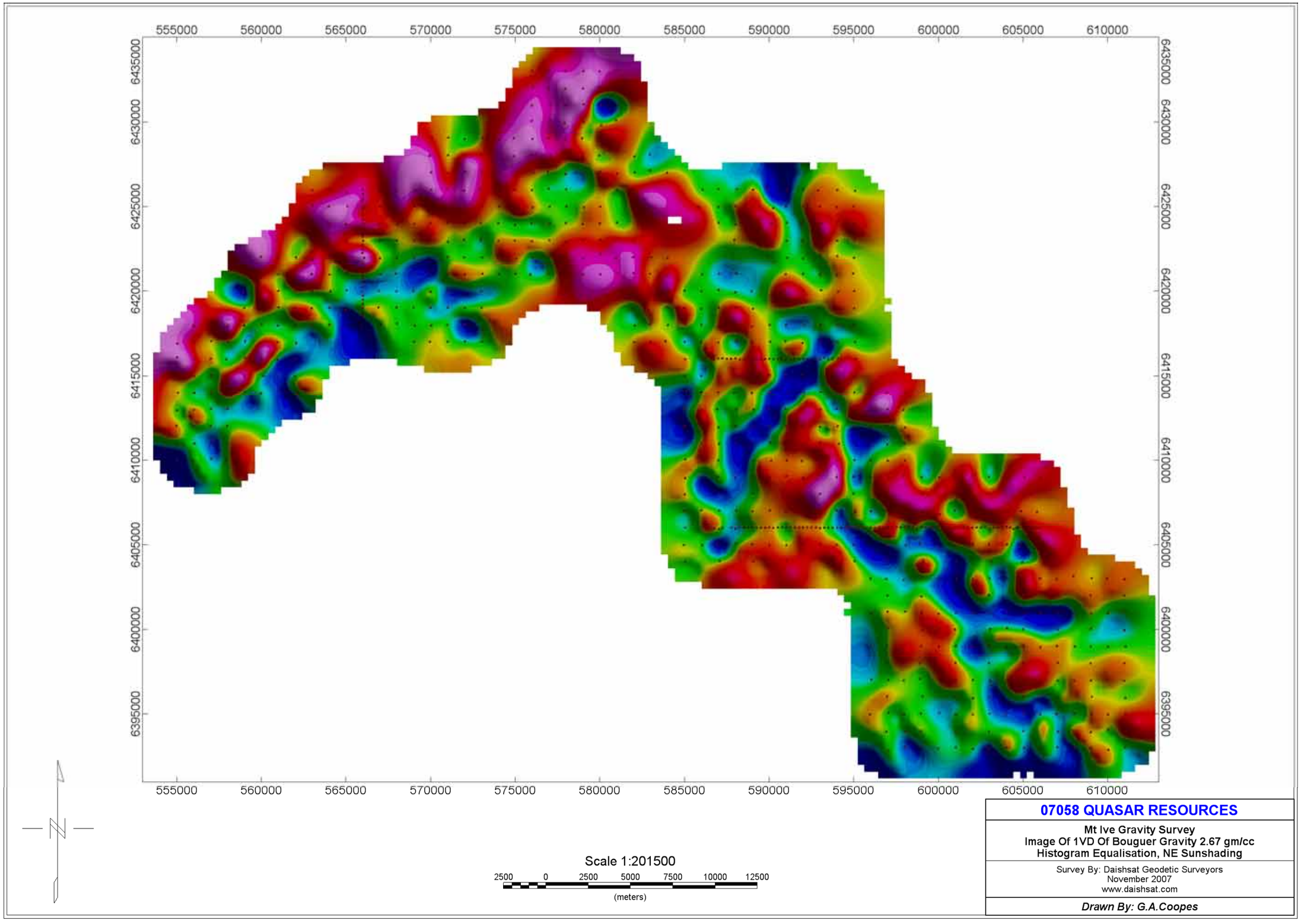
12500
(meters)
07058 QUASAR RESOURCES
Mt Ive Gravity Survey
Image Of Bouguer Gravity 2.67 gm/cc
Histogram Equalisation, Contour Interval 0.25 mGal
Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com
Drawn By: G.A.Coopes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6400000
6395000
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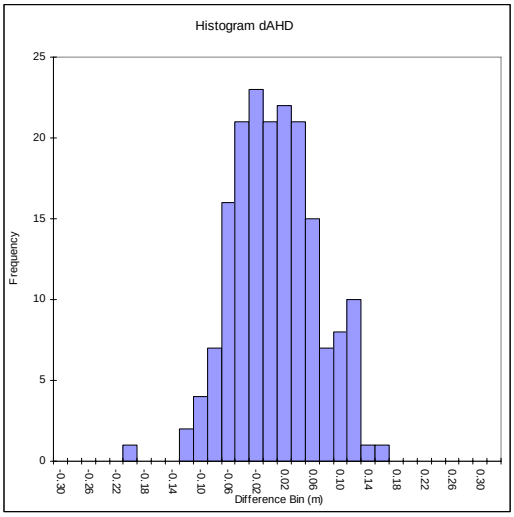
(meters)
07058 QUASAR RESOURCES
Mt Ive Gravity Survey
Image Of 1VD Of Bouguer Gravity 2.67 gm/cc
Histogram Equalisation, NE Sunshading
Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com
Drawn By: G.A.Coopes

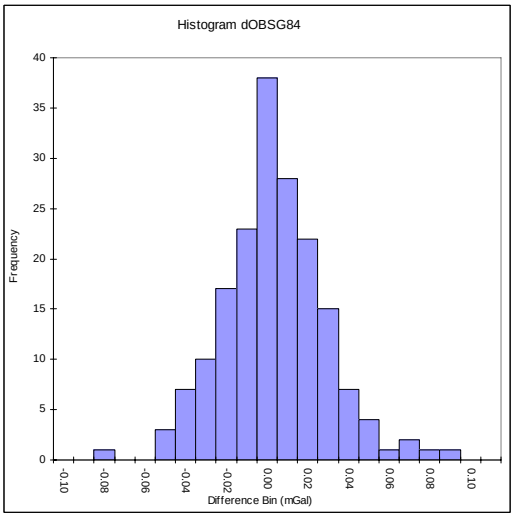
APPENDIX B

Repeat Tabulation and Analysis

Histogram dAHD



Histogram dOBSG84



Summary Statistics

Summary Table	*dAHD*	*dOBSG*
Mean	-0.002	0.000
Standard Error	0.004	0.002
Median	-0.004	-0.001
Mode	0.029	-0.002
Standard Deviation	0.060	0.025
Sample Variance	0.004	0.001
Kurtosis	0.153	1.112
Skewness	-0.010	0.247
Range	0.364	0.170
Minimum	-0.214	-0.081
Maximum	0.150	0.089
Sum	-0.367	-0.014
Count	**179**	**179**

APPENDIX C
Survey Specifications

Bulgunnia Station Gravity Survey

Client	Heathgate Resources
Survey Name	Bulgunnia
Operators	NM, MR, MH, - Pilots AC, RK, PM, CH
Techniques Employed	GPS, Gravity
Station Spacing	400m
Line Spacing	400m
Gravity Meter	Scintrex CG-3M (G-meter) 408278, (S-meter) 9711410
GPS	Leica 1230GG Base & Rovers
Number of Points Surveyed	374
Gravity Base	Daishsat Base 0375
Date of Survey	17th November to 28th November 2007

McDouall Peak Gravity Survey

Client	Heathgate Resources
Survey Name	McDouall Peak
Operators	NM, MR, MH, - Pilots AC, RK, PM, CH
Techniques Employed	GPS, Gravity
Station Spacing	400m
Line Spacing	400m
Gravity Meter	Scintrex CG-3M (G-meter) 408278, (S-meter) 9711410
GPS	Leica 1230GG Base & Rovers
Number of Points Surveyed	535
Gravity Base	Daishsat Base 0375
Date of Survey	17th November to 28th November 2007

Mt Ive Gravity Survey

Client	Heathgate Resources
Survey Name	Mt Ive
Operators	NM, MR, MH, - Pilots AC, RK, PM, CH
Techniques Employed	GPS, Gravity
Station Spacing	1.0km
Line Spacing	1.0km & 250m
Gravity Meter	Scintrex CG-3M (G-meter) 408278, (S-meter) 9711410
GPS	Leica 1230GG Base & Rovers
Number of Points Surveyed	942
Gravity Base	Daishsat Base 0373
Date of Survey	11th November to 17th November 2007

Moonaree Gravity Survey

Client	Heathgate Resources
Survey Name	Moonaree
Operators	NM, MR, MH, - Pilots AC, RK, PM, CH
Techniques Employed	GPS, Gravity
Station Spacing	1.0km
Line Spacing	1.0km
Gravity Meter	Scintrex CG-3M (G-meter) 408278, (S-meter) 9711410
GPS	Leica 1230GG Base & Rovers
Number of Points Surveyed	1086
Gravity Base	Daishsat Base 0374
Date of Survey	17th November to 28th November 2007

APPENDIX D
Base Station Information

GPS Gravity Base 0373 Mt Ive Station

MGA94		GDA94	
EASTING (m)	600478.447	LATITUDE (DMS)	32^0 26' 21.62796" S
NORTHING (m)	6410362.199	LONGITUDE (DMS)	136^0 04' 07.92633"E
ZONE (UTM)	53	GDAHT (m)	170.481
HEIGHT (AHD, m)	170.581	N (AUSGEOID98, m)	-0.100
OBSERVED GRAVITY		**SURVEYED BY**	
979476.508 mGals		GPS - Daishsat using a multiple static sessions and the AUSPOS online GPS Processing system. Expected accuracy of station coordinates better than 0.005m. Gravity – Daishsat using ABA ties with AFGN station at Nonning Station. Expected accuracy better than 0.01 mGals.	

MISCELLANEOUS DETAILS

The base is located on Mt Ive Station to the west of Port Augusta, and to the south of Lake Gairdner. The base location is to the right of the gate that accesses the air strip at Mt Ive station.

This station consists of a small star picket protruding 15cm out of the ground, and is witnessed by a larger star picket positioned 30cm to the right. A circular concrete slab located beside the star pickets is the gravity base.

The base may be accessed by driving to Mt Ive Station. The drive from Pt Augusta to Mt Ive station takes 2.5 hours. Head towards Iron Knob then take the first right 200m after going past the turn off to Iron Knob. There is 122km of dirt road before you turn right into Mt Ive station. The airstrip is located to the south east of the main farm buildings.

Photo of Daishsat Base 0373 showing distinguishing features

GPS Gravity Base 0374 Kangaroo Well

MGA94		GDA94	
EASTING (m)	561492.902	LATITUDE (DMS)	31^0 45' 45.61696" S
NORTHING (m)	6485686.468	LONGITUDE (DMS)	135^0 38' 57.67040"E
ZONE (UTM)	53	GDAHT (m)	194.831
HEIGHT (AHD, m)	194.886	N (AUSGEOID98, m)	-0.035
OBSERVED GRAVITY		**SURVEYED BY**	
979422.845 mGals		GPS - Daishsat using a multiple static sessions and the AUSPOS online GPS Processing system. Expected accuracy of station coordinates better than 0.005m. Gravity – Daishsat using ABA ties with AFGN station at Nonning Station. Expected accuracy better than 0.01 mGals.	

MISCELLANEOUS DETAILS

The base is located in on Moonaree Station at Kangaroo Well to the west of Pt Augusta directly west of Lake Gairdner. The base location is in the run next to the station horse yards. The station is located about 100m to the NW of the guess house near the cattle yards.

This station consists of a small star picket protruding 15cm out of the ground, and is witnessed by a larger star picket positioned 30cm to the right. A circular concrete slab located beside the star pickets is the gravity base.

The base may be accessed by driving north from Mt Ive to Kangaroo Well. The drive from Pt Augusta to the station takes 3.5 hours. Head towards Iron Knob then take the first right 200m after going past the turn off to Iron Knob. The station is about 230km along the dirt access road. Kangaroo well is well signposted.

Photo of Daishsat Base 0374 showing distinguishing features

GPS Gravity Base 0375 The Twins

MGA94		GDA94	
EASTING (m)	538257.255	LATITUDE (DMS)	29^0 59' 41.98226" S
NORTHING (m)	6681703.033	LONGITUDE (DMS)	135^0 23' 47.91036"E
ZONE (UTM)	53	GDAHT (m)	188.127
HEIGHT (AHD, m)	185.769	N (AUSGEOID98, m)	2.325
OBSERVED GRAVITY		**SURVEYED BY**	
979268.001 mGals		GPS - Daishsat using a multiple static sessions and the AUSPOS online GPS Processing system. Expected accuracy of station coordinates better than 0.005m. Gravity – Daishsat using ABA ties with AFGN station at Nonning Station. Expected accuracy better than 0.01 mGals.	

MISCELLANEOUS DETAILS

The base is located in on the Twins station to the north of Glendambo and south of Coober Pedy. The base location is by the fence to the west of the shearer's quarters which is just past the homestead. The homestead is approximately 25km off the Stuart Highway.

This station consists of a small star picket protruding 15cm out of the ground, and is witnessed by a larger star picket positioned 30cm to the right. A circular concrete slab located beside the star pickets is the gravity base.

The base may be accessed by driving to The Twins Station. This is about 165km to the north of Glendambo and 165km to the south of Coober Pedy.

Photo of Daishsat Base 0375 showing distinguishing features

APPENDIX E

Data CD
(Attached To Back Cover)

QUASAR

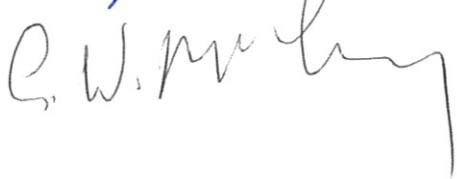
EL 3447 MOONAREE
ANNUAL TECHNICAL REPORT
including PARTIAL (25%) RELINQUISHMENT REPORT

15 November 2008 – 14 November 2009

Quasar Resources Pty Ltd

Author: L Kropinski
Date: 12 January 2010
Distribution: Quasar Resources (1)
PIRSA (1)
CR: 356

Submitted By 

Approved By 

EL 3447 MOONAREE
ANNUAL TECHNICAL REPORT
including PARTIAL (25%) RELINQUISHMENT REPORT

15 November 2008 – 14 November 2009

Quasar Resources Pty Ltd

Author: L Kropinski
Date: 12 January 2010
Distribution: Quasar Resources (1)
PIRSA (1)
CR: 356

Submitted By

Approved By

TABLE OF CONTENTS

FIGURES

BIBLIOGRAPHIC DATA SHEET

REPORT TITLE	Moonaree Project, Exploration Licence 3447 Annual Technical Report for the period 15 November 2008 – 14 November 2009 including Partial (25%) Relinquishment Report.
PROSPECT NAME	Moonaree
TENEMENT NUMBER	3447
OWNER	Quasar Resources Pty Ltd
COMMODITIES	Uranium, Copper and Gold
TECTONIC UNITS	Gawler Craton Mesoproterozoic Intrusives
STRATIGRAPHIC UNITS	Gawler Range Volcanics, Yardea Dacite
1:250 000 MAP SHEET	Gairdner
1:100 000 MAP SHEET	Moonaree and Yardea
KEYWORDS	Moonaree, Uranium, palaeochannels, Gawler Craton

SUMMARY

Quasar Resources was granted tenure to Moonaree for the period of four years ending 14 November 2009. This licence has been reapplied for with a partial relinquishment of 25% as per statutory requirements.

Moonaree is considered prospective for volcanic hosted, vein style uranium mineralisation as well as sandstone-style uranium mineralisation hosted in unconsolidated palaeochannel sands incised into Precambrian basement.

CONCLUSIONS AND RECOMMENDATIONS

Prospective palaeochannel sands draining to the east above the unconformity should be targeted by mud-rotary drilling in order to test for sandstone-style uranium mineralisation, associated with reduced sediments if present.

Gravity data from the previous reporting year defined a number of discrete anomalies while the shuttle radar has more accurately outlined the drainage system within the tenement.

Anomalies within the gravity data from the previous reporting year still warrant further investigation for vein associated uranium mineralisation.

INTRODUCTION

The Moonaree Exploration Licence (EL 3447) is situated in the Gawler Craton near Lake Gairdner (Figure 1).

Exploration Licence 3447 covers 999km² and is approximately 140kms southwest of Woomera. The project area lies approximately 160kms northwest of Iron Knob and access is gained by the unsealed Iron Knob to Kingoonya Road and the Mt Ive Station Tracks.

Quasar Resources was granted EL 3447 on 15 November 2005 for a period of four years with the option to renew.

GEOLOGY

The exploration licence is located in the Central Gawler Craton. The Gawler Craton is a stable crystalline basement province comprising Archaean to Meso-Proterozoic rocks obscured by Neo-Proterozoic to Cainozoic age sedimentary strata. The geology of the project area is predominantly outcrop of Yardea Dacite, the upper felsic member of the Mesproterozoic Gawler Range Volcanics ("GRV"). The Yardea Dacite is a sub-horizontal, several hundred metre thick sequence of subaerial volcanic extrusives. The unit is a coarsely porphyritic dacite, grading locally to rhyodacite and andesite, although within the licence it is notable in its uniformity. The Yardea Dacite is underlain by older Palaeoproterozoic and Archaean Basement.

The GRV outcrops over a 25,000km² area and form a prominent range of hills, (the Gawler Ranges), which extend in an arcuate band south and west of a series of salt lakes comprising Lakes Gairdner, Acraman and Everard. A striking feature of the ranges is the extensive development of a roughly orthogonal joint system, which controls valley formation. This is particularly evident in the shuttle radar DTM (Figure 2). Bare, domical hills rise up to 300 m above the valley floors. Rapid erosion has produced extensive outcrop on the hills whilst broad flat valley floors are filled with talus and are characterised by poorly developed sandy calcareous soils. Calcrete development is extremely localised.

NATIVE TITLE

The Moonaree Exploration Licence is covered by the Gawler Ranges Ilua which Quasar Resources has signed, however this licence has a Section 12 and 23 covering small portions of it. A Section 12 and 23 requires Ministerial approval as well as more detailed clearance and due to the fact that there are registered sites on this licence.

Numerous discussions have been held with the Native Title holders in respect to organising a clearance for the Exploration Licence.

RELINQUISHMENT

Statutory requirements necessitate a 25% reduction of the exploration licence. Originally the exploration licence was 999km^2; with the 25% reduction of 254.4km^2 this brings the licence to 744.6km^2. Figure 2 shows the areas that are to be excluded. These areas in particular have been chosen to be excluded as they do not cover areas of intended exploration and also due to the location of known Native Title sites within these areas.

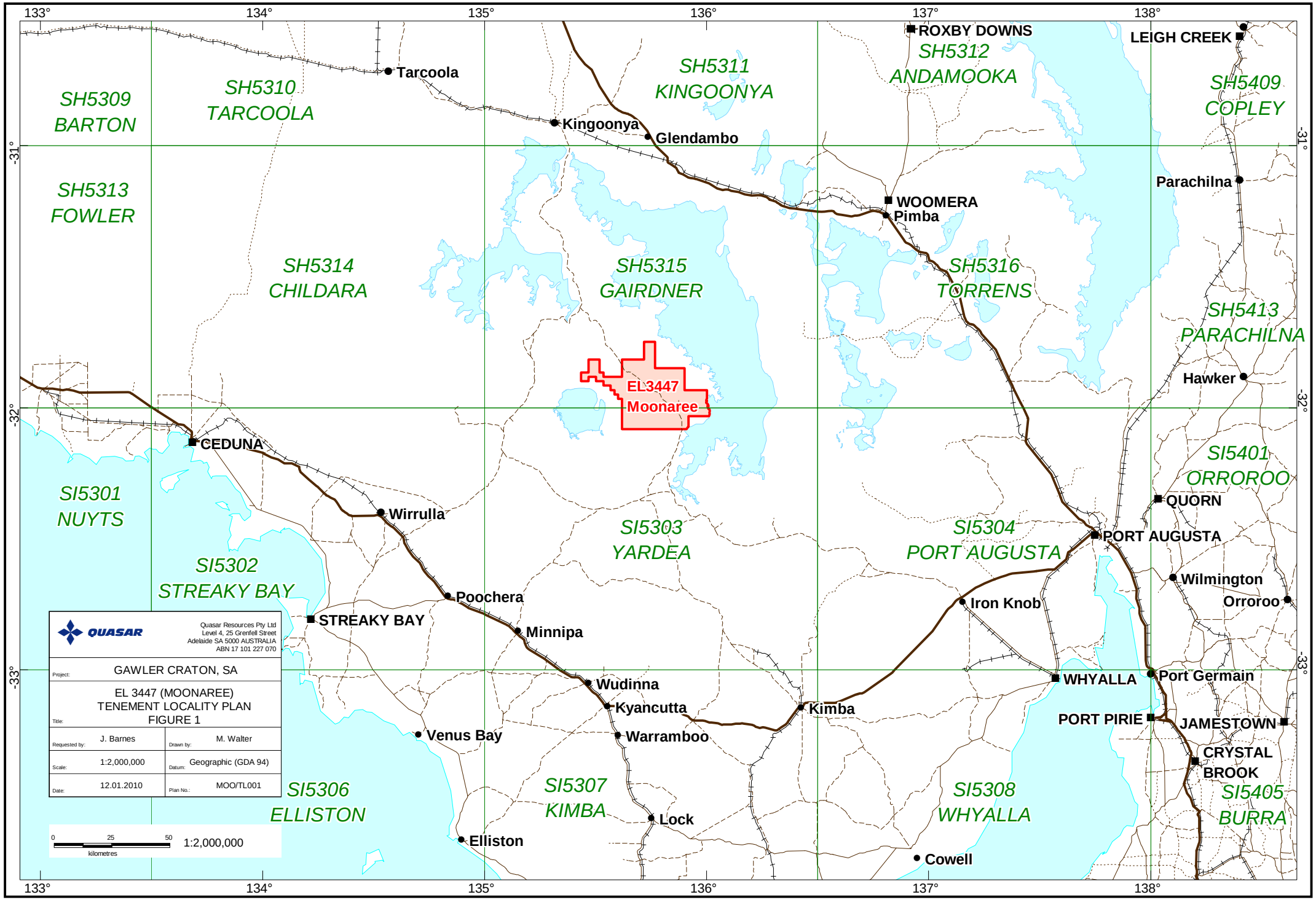
EXPENDITURE

A total of $17 515.54 was spent on this licence during the reporting period see the Table below.

EL 3447 Moonaree Expenditure
1 November 2008 - 31 October 2009

	$
Management Fee	1,876.67
Manpower	6,946.37
Rents	7,692.40
Repairs & Maint - General	-799.90
Office Support	1,800.00
Total	$17,515.54

Table 1 Expenditure for the period 1 November 2008 to 31 October 2009


133°
134°
135°
136°
137°
138°
-31°
-32°
-33°
ROXBY DOWNS
LEIGH CREEK
Tarcoola
Kingoonya
Glendambo
Parachilna
WOOMERA
Pimba
Hawker
CEDUNA
Wirrulla
Poochera
STREAKY BAY
Minnipa
Wudinna
Kyancutta
Warramboo
Venus Bay
Kimba
Iron Knob
QUORN
PORT AUGUSTA
Wilmington
Orroroo
WHYALLA
Port Germain
PORT PIRIE
JAMESTOWN
CRYSTAL BROOK
Lock
Elliston
Cowell
EL3447
Moonaree
SH5309 BARTON
SH5310 TARCOOLA
SH5311 KINGOONYA
SH5312 ANDAMOOKA
SH5313 FOWLER
SH5314 CHILDARA
SH5315 GAIRDNER
SH5316 TORRENS
SH5409 COPLEY
SH5413 PARACHILNA
SI5301 NUYTS
SI5302 STREAKY BAY
SI5303 YARDEA
SI5304 PORT AUGUSTA
SI5306 ELLISTON
SI5307 KIMBA
SI5308 WHYALLA
SI5401 ORROROO
SI5405 BURRA
QUASAR
Quasar Resources Pty Ltd
Level 4, 25 Grenfell Street
Adelaide SA 5000 AUSTRALIA
ABN 17 101 227 070
Project: GAWLER CRATON, SA
Title: EL 3447 (MOONAREE) TENEMENT LOCALITY PLAN FIGURE 1
Requested by: J. Barnes
Drawn by: M. Walter
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Date: 12.01.2010
Plan No.: MOO/TL001
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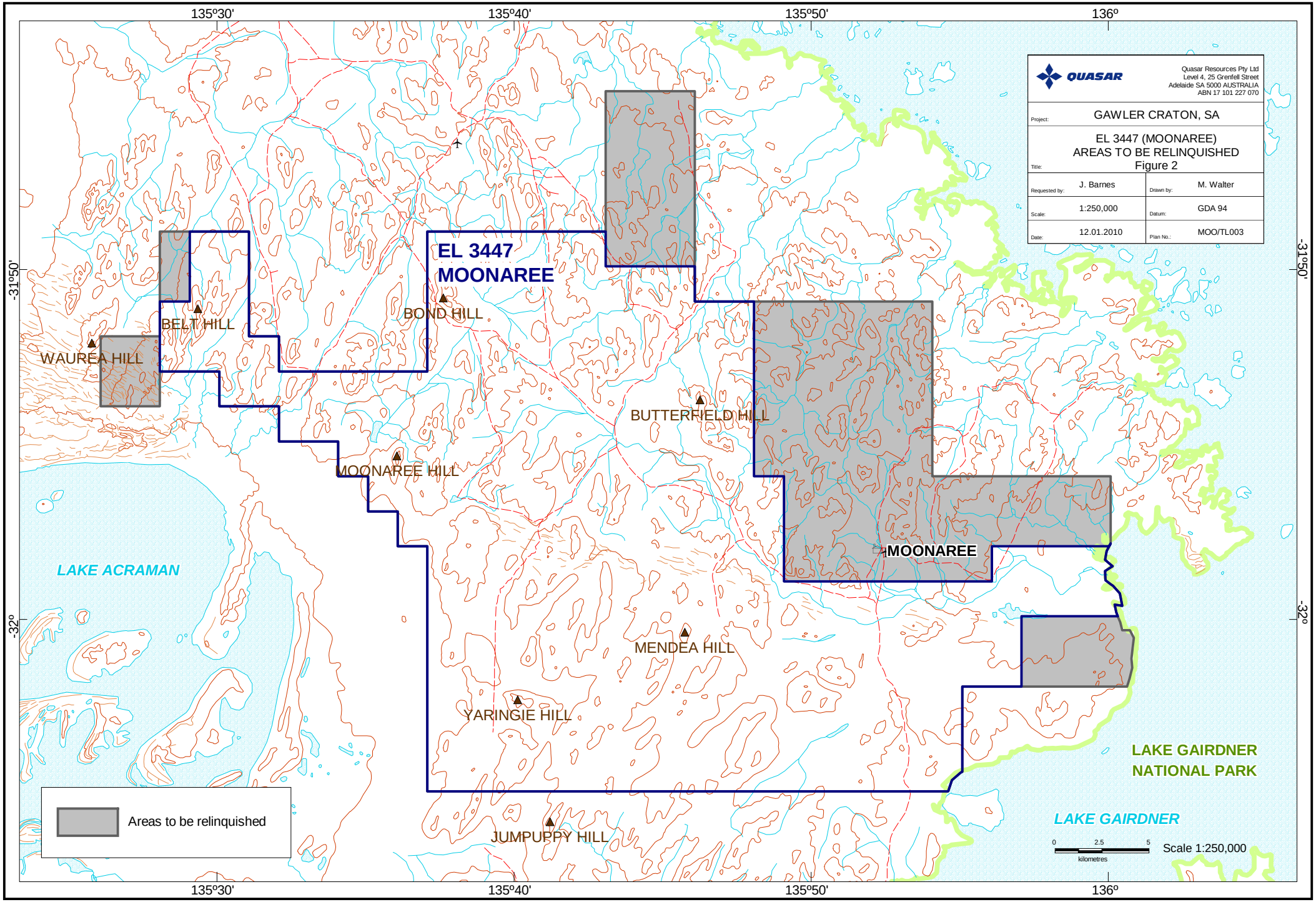
kilometres
1:2,000,000


135°30'
135°40'
135°50'
136°
-31°50'
-32°
EL 3447
MOONAREE
BELT HILL
WAUREA HILL
BOND HILL
BUTTERFIELD HILL
MOONAREE HILL
MOONAREE
LAKE ACRAMAN
MENDEA HILL
YARINGIE HILL
JUMPUPPY HILL
LAKE GAIRDNER
NATIONAL PARK
LAKE GAIRDNER
Areas to be relinquished
0 2.5 5
kilometres
Scale 1:250,000
QUASAR
Quasar Resources Pty Ltd
Level 4, 25 Grenfell Street
Adelaide SA 5000 AUSTRALIA
ABN 17 101 227 070
Project: GAWLER CRATON, SA
Title: EL 3447 (MOONAREE)
AREAS TO BE RELINQUISHED
Figure 2
Requested by: J. Barnes
Drawn by: M. Walter
Scale: 1:250,000
Datum: GDA 94
Date: 12.01.2010
Plan No.: MOO/TL003

HEATHGATE

7 December 2010

PIRSA Mineral Records
GPO Box 1671
ADELAIDE SA 5000

Dear Sir/Madam

Annual Technical Report EL 3447 Moonaree

Heathgate Resources Pty Ltd are acting as Managers for Quasar Resources in relation to Exploration Licence 3447 Moonaree.

During the reporting period there was no field work completed. This licence is within the Woomera Prohibited Area and discussions regarding a Deed of Access had not proceeded to the signing stage. The expenditure for this period is $11, 837.61.

EL 3447 Moonaree Expenditure
1 November 2009 - 31 October 2010

	$
Exploration HO - Cost Alloc	29.14
Licences	538.00
Management Fee	1,268.31
Manpower	3,712.66
Office Support	300.00
Rents	5,989.50
	$11,837.61

If you require any further information please contact the writer.

Yours sincerely

Joy Barnes.

Joy Barnes
Executive Assistant/Tenement Manager

QUASAR

6 February 2012

DMITRE Mineral Records
GPO Box 1264
ADELAIDE SA 5000

Dear Sir/Madam

Annual Technical Report EL 4637 Moonaree

Heathgate Resources Pty Ltd are acting as Managers for Quasar Resources in relation to Exploration Licence 4637 Moonaree.

During the reporting period there was no field work completed. Quasar is currently doing a desk top review of all work on this licence to go towards work plans for 2012. The expenditure for this period is $8,663.95.

EL 4637 Moonaree expenditure for the period
1 Jan 2011 - 31 December 2011

	$
Exploration HO - Cost Alloc	432.09
Management Fee	928.29
Manpower	898.32
Rents	6,405.25
	$8,663.95

If you require any further information please contact the writer.

Yours sincerely

Joy Barnes

Joy Barnes
Executive Assistant/Tenement Manager

QUASAR

EL 3447 MOONAREE
SURRENDER REPORT

15 November 2005 – 10 January 2012

Quasar Resources Pty Ltd

Author: J Barnes
Date: 7 February 2012
Distribution: Quasar Resources (1)
DMITRE (1)

Submitted By:

Approved By:

CR00532

EL 3447 MOONAREE
SURRENDER REPORT

15 November 2005 – 10 January 2012

Quasar Resources Pty Ltd

Author: J Barnes
Date: 7 February 2012
Distribution: Quasar Resources (1)
DMITRE (1)

Submitted By:

Approved By:

CR00532

Contents

FIGURES

APPENDICES

Appendix 1 Geophysics

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07058_QUASAR_RESOURCES_Moonarie_Final_Data_BG267_200_1500.ers

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BIBLIOGRAPHIC DATA SHEET

REPORT TITLE	Moonaree Project, Exploration Licence 3447 and 4637 Surrender Report for the period 15 November 2005 – 10 January 2012.
PROSPECT NAME	Moonaree
TENEMENT NUMBER	3447 & 4637
OWNER	Quasar Resources Pty Ltd
COMMODITIES	Uranium
TECTONIC UNITS	
STRATIGRAPHIC UNITS	
1:250 000 MAP SHEET	Gairdner
1:100 000 MAP SHEET	Moonaree and Yardea
KEYWORDS	Moonaree, Gravity, uranium, Gawler Craton

SUMMARY

Quasar Resources was granted tenure to Moonaree for the period of seven year's ending 10 January 2012.

Moonaree is considered prospective for sandstone-style uranium mineralisation hosted in unconsolidated palaeochannel sands incised into Precambrian basement.

A helicopter assisted gravity survey was conducted between 18 and 27 November 2007. Gravity and GPS data were collected on a 1km x 1km spaced grid covering the entire exploration licence. A total of 993 new gravity stations were collected

1. INTRODUCTION

The Moonaree Exploration Licence (EL 3447/ EL 4637) is situated in the Gawler Craton near Lake Gairdner (Figure 1).

Exploration Licence 3447 covered an area of 999km² when first granted on the 15 November 2005. During the seven year term the exploration licence was reduced by size and on surrender it covered an area of 745km^2.(Figure 2) The project area lies approximately 160kms northwest of Iron Knob and approximately 140kms southwest of Woomera. Access is gained by the unsealed Iron Knob to Kingoonya Road and the Mt Ive Station Tracks.

2. GEOLOGY

The exploration licence is located in the Central Gawler Craton. The Gawler Craton is a stable crystalline basement province comprising Archaean to Meso-Proterozoic rocks obscured by Neo-Proterozoic to Cainozoic age sedimentary strata. The geology of the project area is predominantly outcrop of Yardea Dacite, the upper felsic member of the Mesproterozoic Gawler Range Volcanics ("GRV"). The Yardea Dacite is a sub-horizontal, several hundred metre thick sequence of subaerial volcanic extrusives. The unit is a coarsely porphyritic dacite, grading locally to rhyodacite and andesite, although within the licence it is notable in its uniformity. The Yardea Dacite is underlain by older Palaeoproterozoic and Archaean Basement.

The GRV outcrops over a 25,000km² area and form a prominent range of hills, (the Gawler Ranges), which extend in an arcuate band south and west of a series of salt lakes comprising Lakes Gairdner, Acraman and Everard. A striking feature of the ranges is the extensive development of a roughly orthogonal joint system, which controls valley formation. This is particularly evident in the shuttle radar DTM. Bare, domical hills rise up to 300 m above the valley floors. Rapid erosion has produced extensive outcrop on the hills whilst broad flat valley floors are filled with talus and are characterised by poorly developed sandy calcareous soils. Calcrete development is extremely localised.

3. NATIVE TITLE

The Moonaree Exploration Licence is covered by the Gawler Ranges Ilua which Quasar Resources has signed, however this licence has a Section 12 and 23 covering small portions of it. A Section 12 and 23 requires Ministerial approval as well as more detailed clearance there are registered sites on this licence.

Numerous discussions were held with the Native Title holders in respect to organising a clearance for the Exploration Licence, but was not successful.

4. GEOPHYSICS

A helicopter assisted gravity survey was conducted between18 and 27 November 2007. Gravity and GPS data were collected by DaishSat Pty Ltd on a 1km x 1km spaced grid

covering the entire exploration licence. A total of 993 new gravity stations were collected. Figure 3 shows the location of the stations collected on this licence. Images of AHD and Bouguer gravity data are shown in Figures 4 and 5 respectively.

Digital data supplied from Daishsat. Data acquisition, processing and base station establishment details are contained in the logistics report – see 2008 annual report.

Merging of the data with the South Australian gravity database has been undertaken and interpretation in underway by Quasar geophysicist.

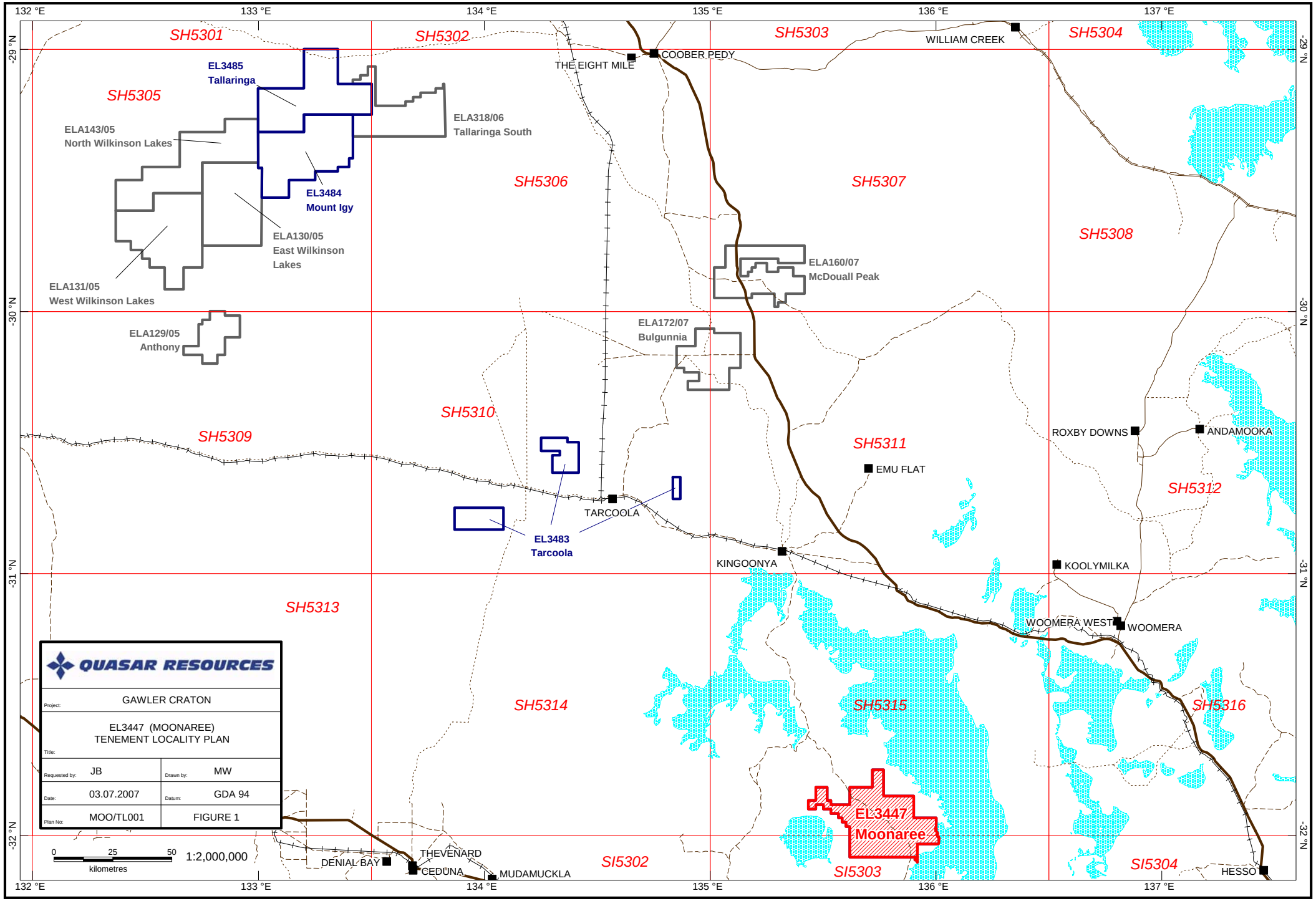
5. RELINQUISHMENT

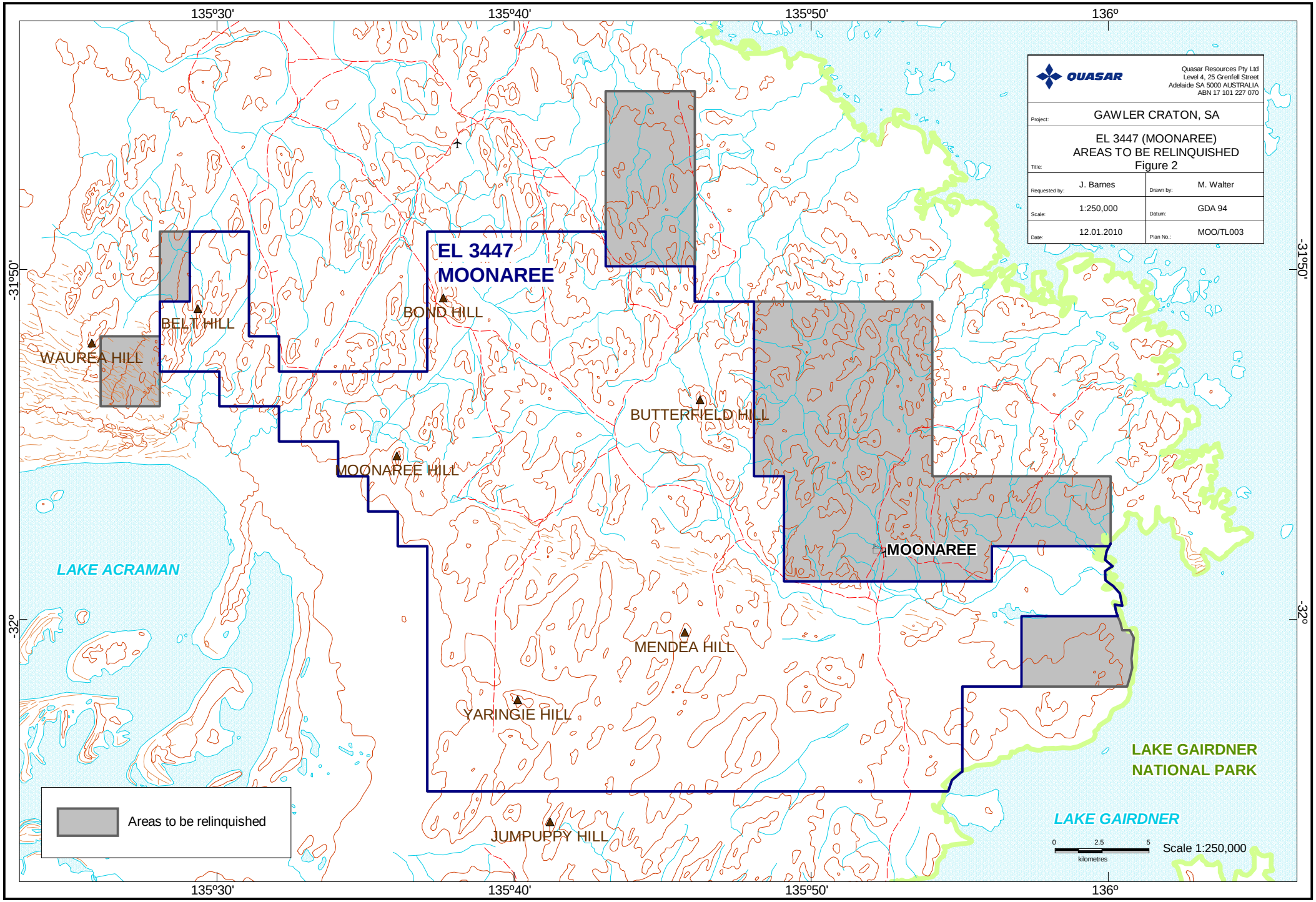
Statutory requirements necessitate a 25% reduction of the exploration licence. Originally the exploration licence was 999km^2; with the 25% reduction of 254.4km^2 this brought the licence to 744.6km^2. These areas in particular have been chosen to be excluded as they do not cover areas of intended exploration and also due to the location of known Native Title sites within these areas.

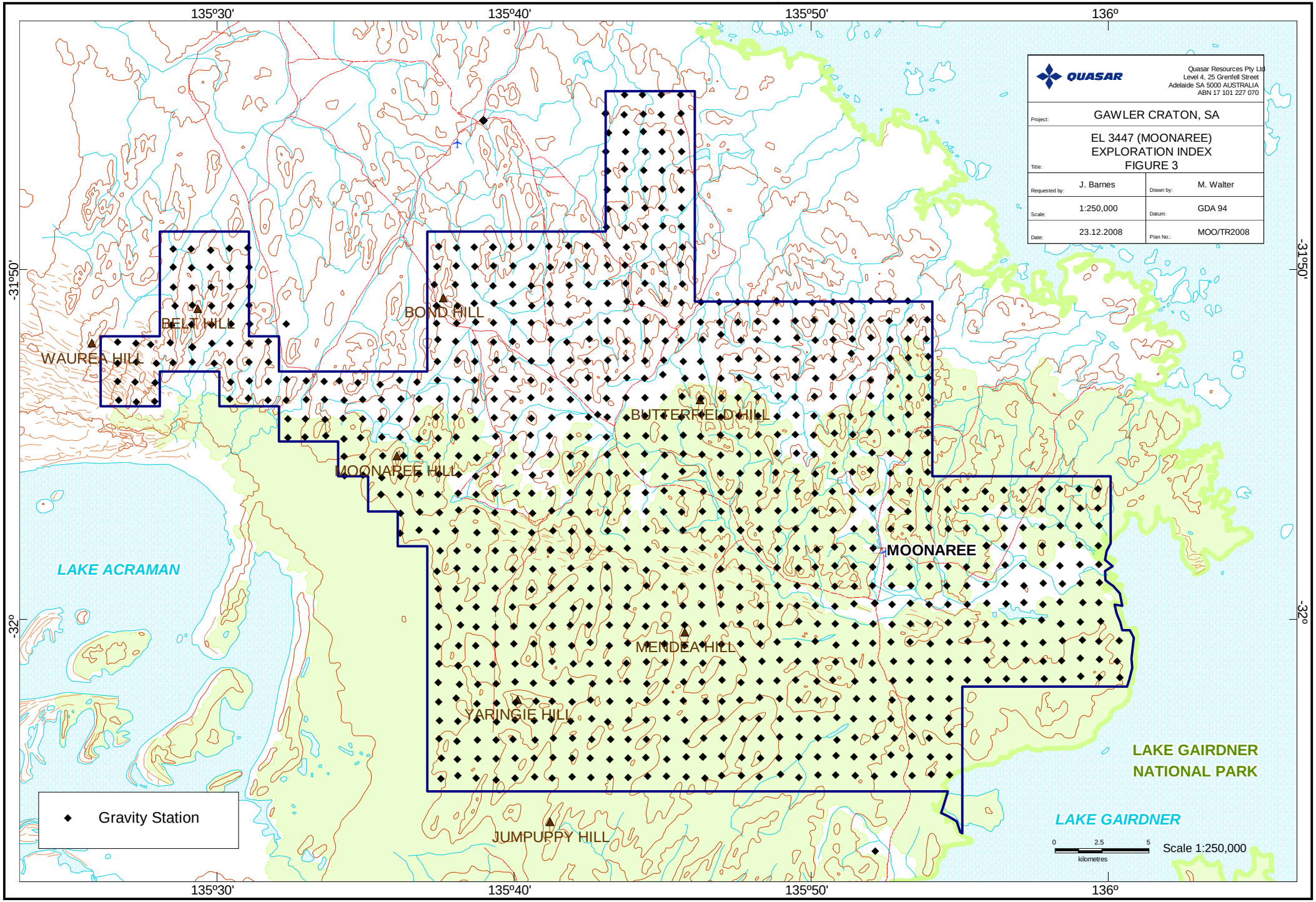
6. EXPENDITURE

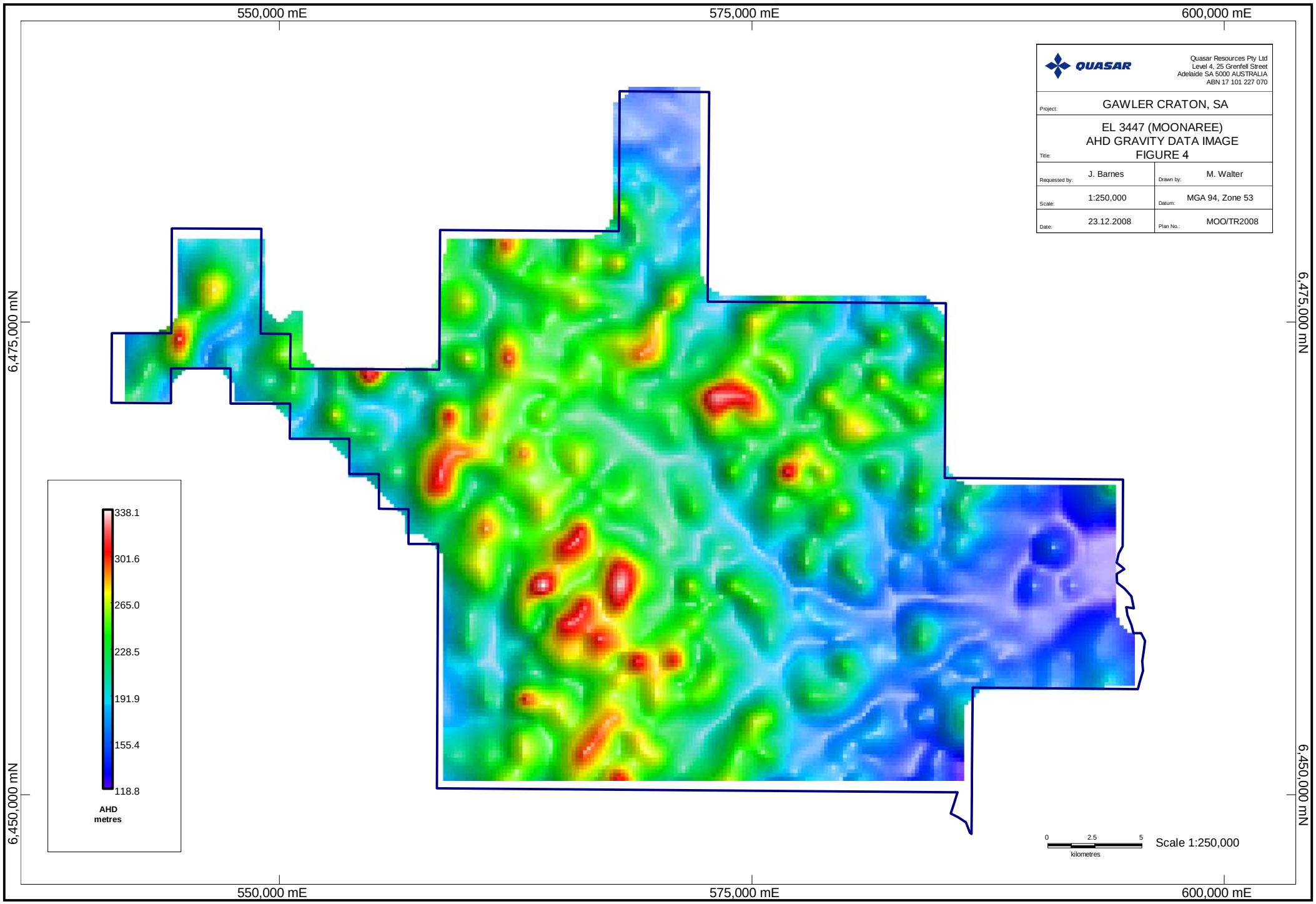
Exploration Licence 4637 expenditure for the period
1 November 2005 - 31 January 2012

	$
Aircraft Services - Cost Alloc	343.57
Books & Subscriptions	2.94
Capital Costs Expensed	115.06
Consulting - Geology	10,723.33
Consulting - Geophysics	471.19
Consulting Fees	3,933.72
Consumable Supplies	30.10
Data & Map Purchases	63.54
Dues & Memberships	45.42
Employee Medicals	81.85
Exploration HO - Cost Alloc	601.29
Exploration Supplies	230.00
External Services	3,367.31
Freight & Shipping Charges	0.10
Hire Equipment Charges	0.06
Legal Fees	2,132.17
Licenses	17,464.48
Management Fee	25,417.46
Manpower	79,754.55
Motor Vehicle Repairs & Maint	10.00
Office Equip & Computer Repair	-2.45
Office Software & Comp Support	67.22
Office Support	7,350.00
Rents	26,855.65
Salaries & Wages- Bonus/ICP	5,028.06
Seminars & Conferences	122.44
Staff Training - External	104.77
Stationery & Printing	5.02
Surveying-Geophysical Airborne	64,092.00
Telephone - Mobile Phone	7.43
Telephone - Satellite Phone	1.19
Travel - Accommodation & Meals	529.15
Travel - M/ Vehicle Taxi Fares	2.34
	$248,950.96


132 °E
133 °E
134 °E
135 °E
136 °E
137 °E
-29 °N
-30 °N
-31 °N
-32 °N
SH5301
SH5302
SH5303
SH5304
SH5305
SH5306
SH5307
SH5308
SH5309
SH5310
SH5311
SH5312
SH5313
SH5314
SH5315
SH5316
SI5302
SI5303
SI5304
EL3485
Tallaringa
ELA318/06
Tallaringa South
ELA143/05
North Wilkinson Lakes
EL3484
Mount Igy
ELA130/05
East Wilkinson
Lakes
ELA131/05
West Wilkinson Lakes
ELA129/05
Anthony
ELA160/07
McDouall Peak
ELA172/07
Bulgunnia
EL3483
Tarcoola
EL3447
Moonaree
THE EIGHT MILE
COOBER PEDY
WILLIAM CREEK
TARCOOLA
EMU FLAT
ROXBY DOWNS
ANDAMOOKA
KINGOONYA
KOOLYMILKA
WOOMERA WEST
WOOMERA
DENIAL BAY
THEVENARD
CEDUNA
MUDAMUCKLA
HESSO
QUASAR RESOURCES
Project: GAWLER CRATON
EL3447 (MOONAREE)
TENEMENT LOCALITY PLAN
Title:
Requested by: JB
Drawn by: MW
Date: 03.07.2007
Datum: GDA 94
Plan No: MOO/TL001
FIGURE 1
0 25 50
kilometres
1:2,000,000


135°30'
135°40'
135°50'
136°
-31°50'
-32°
EL 3447
MOONAREE
BELT HILL
WAUREA HILL
BOND HILL
BUTTERFIELD HILL
MOONAREE HILL
MOONAREE
LAKE ACRAMAN
MENDEA HILL
YARINGIE HILL
JUMPUPPY HILL
LAKE GAIRDNER
NATIONAL PARK
LAKE GAIRDNER
Areas to be relinquished
0 2.5 5
kilometres
Scale 1:250,000
QUASAR
Quasar Resources Pty Ltd
Level 4, 25 Grenfell Street
Adelaide SA 5000 AUSTRALIA
ABN 17 101 227 070
Project: GAWLER CRATON, SA
Title: EL 3447 (MOONAREE)
AREAS TO BE RELINQUISHED
Figure 2
Requested by: J. Barnes
Drawn by: M. Walter
Scale: 1:250,000
Datum: GDA 94
Date: 12.01.2010
Plan No.: MOO/TL003

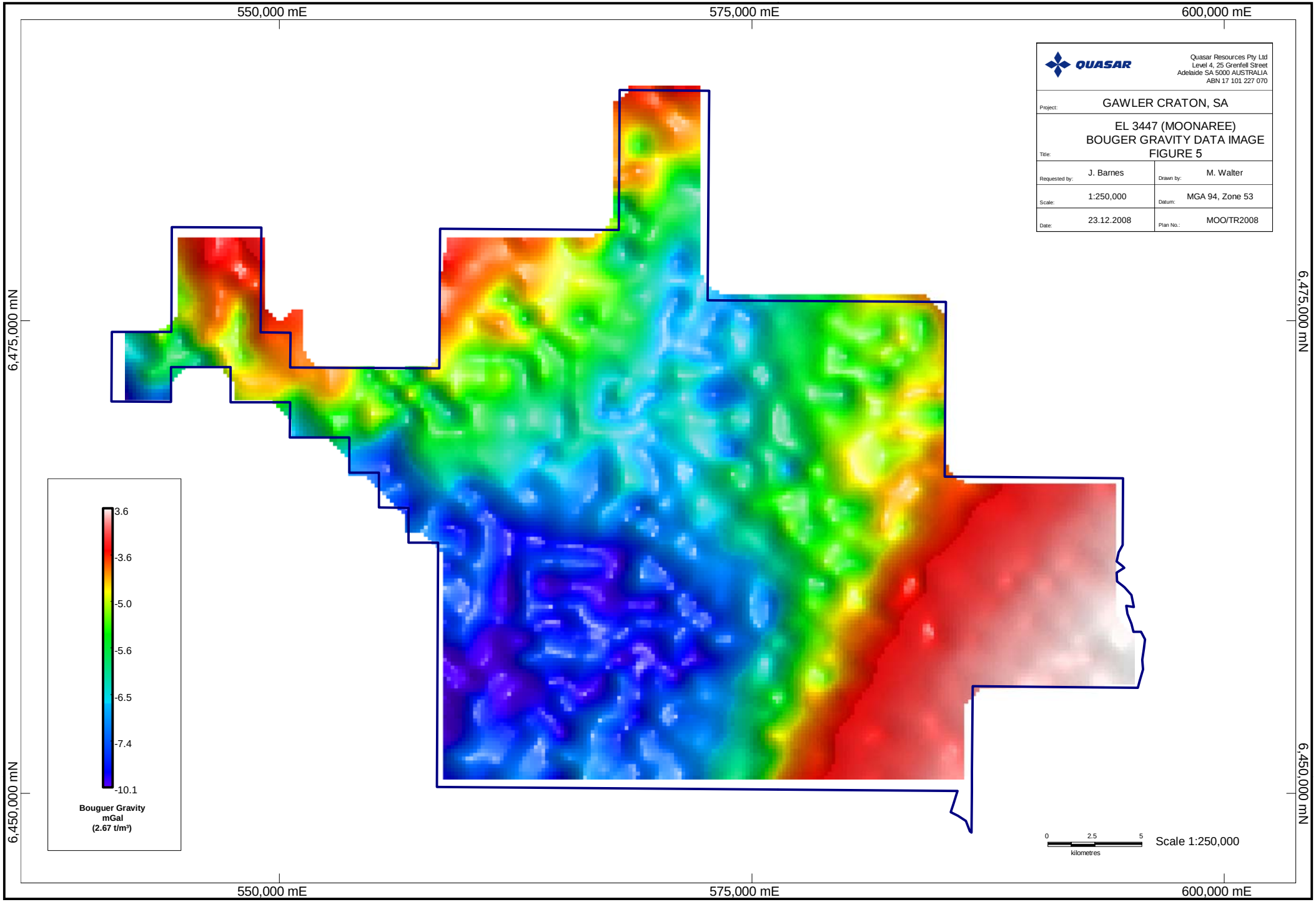

135°30'
135°40'
135°50'
136°
-31°50'
-32°
QUASAR
Quasar Resources Pty Ltd
Level 4, 25 Grenfell Street
Adelaide SA 5000 AUSTRALIA
ABN 17 101 227 070
Project: GAWLER CRATON, SA
Title: EL 3447 (MOONAREE) EXPLORATION INDEX FIGURE 3
Requested by: J. Barnes
Drawn by: M. Walter
Scale: 1:250,000
Datum: GDA 94
Date: 23.12.2008
Plan No.: MOO/TR2008
BELT HILL
BOND HILL
WAUREA HILL
BUTTERFIELD HILL
MOONAREE HILL
MOONAREE
LAKE ACRAMAN
MENDEA HILL
YARINGIE HILL
JUMPUPPY HILL
LAKE GAIRDNER NATIONAL PARK
LAKE GAIRDNER
Gravity Station
0 2.5 5
kilometres
Scale 1:250,000



QUASAR

Quasar Resources Pty Ltd
Level 4, 25 Grenfell Street
Adelaide SA 5000 AUSTRALIA
ABN 17 101 227 070

Project:	GAWLER CRATON, SA
Title:	EL 3447 (MOONAREE) AHD GRAVITY DATA IMAGE FIGURE 4
Requested by: J. Barnes	Drawn by: M. Walter
Scale: 1:250,000	Datum: MGA 94, Zone 53
Date: 23.12.2008	Plan No.: MOO/TR2008


550,000 mE
575,000 mE
600,000 mE
6,475,000 mN
6,450,000 mN
QUASAR
Quasar Resources Pty Ltd
Level 4, 25 Grenfell Street
Adelaide SA 5000 AUSTRALIA
ABN 17 101 227 070
Project: GAWLER CRATON, SA
Title: EL 3447 (MOONAREE)
BOUGER GRAVITY DATA IMAGE
FIGURE 5
Requested by: J. Barnes
Drawn by: M. Walter
Scale: 1:250,000
Datum: MGA 94, Zone 53
Date: 23.12.2008
Plan No.: MOO/TR2008
3.6
-3.6
-5.0
-5.6
-6.5
-7.4
-10.1
Bouguer Gravity
mGal
(2.67 t/m³)
0
2.5
5
kilometres
Scale 1:250,000

QUASAR RESOURCES
HELICOPTER GRAVITY SURVEYS 2007

Gawler Craton Projects

November – December 2007

Report Number 07058

A. McCarthy

CLIENT

QUASAR RESOURCES

CLIENT CONTACT

Lynelle Beinke
Level 9, 45 Grenfell St
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Ph: 08 8212 2155
Fax: 08 8212 5559

SURVEY CONTRACTOR

DAISHSAT PTY. LTD
P.O. Box 766
MURRAY BRIDGE S.A. 5253
Tel: (08) 8531 0349
Fax: (08) 8531 0684

CONTRACTOR CONTACT

Mr. David Daish
Mob: 0418 800 122
Email: david.daish@daishsat.com

CONFIDENTIAL

FOR QUASAR RESOURCES USE ONLY

TABLE OF CONTENTS

1. INTRODUCTION

A precision GPS-Gravity survey was carried out for Quasar Resources between October and November 2007. A total of 2,701 new gravity stations were surveyed in the Gawler Ranges and Woomera Prohibited Area of South Australia. The survey was conducted in four stages from three base locations.

Gravity data were acquired using a Scintrex CG-3 automated gravity meter. Position and level data were obtained using Leica 1230GG geodetic grade GPS receivers collecting GPS and GLONASS positional information. All receivers were operating in post-processed kinematic mode. Data were acquired using Daishsat helicopter-borne methods.

Gravity data were reduced using standard reductions on the ISOGAL84 gravity network. GPS data were reduced to MGA coordinates with levels expressed as metres above the Australian Height Datum.

Photo 1: Typical terrain in the survey area.

2. SURVEY OVERVIEW

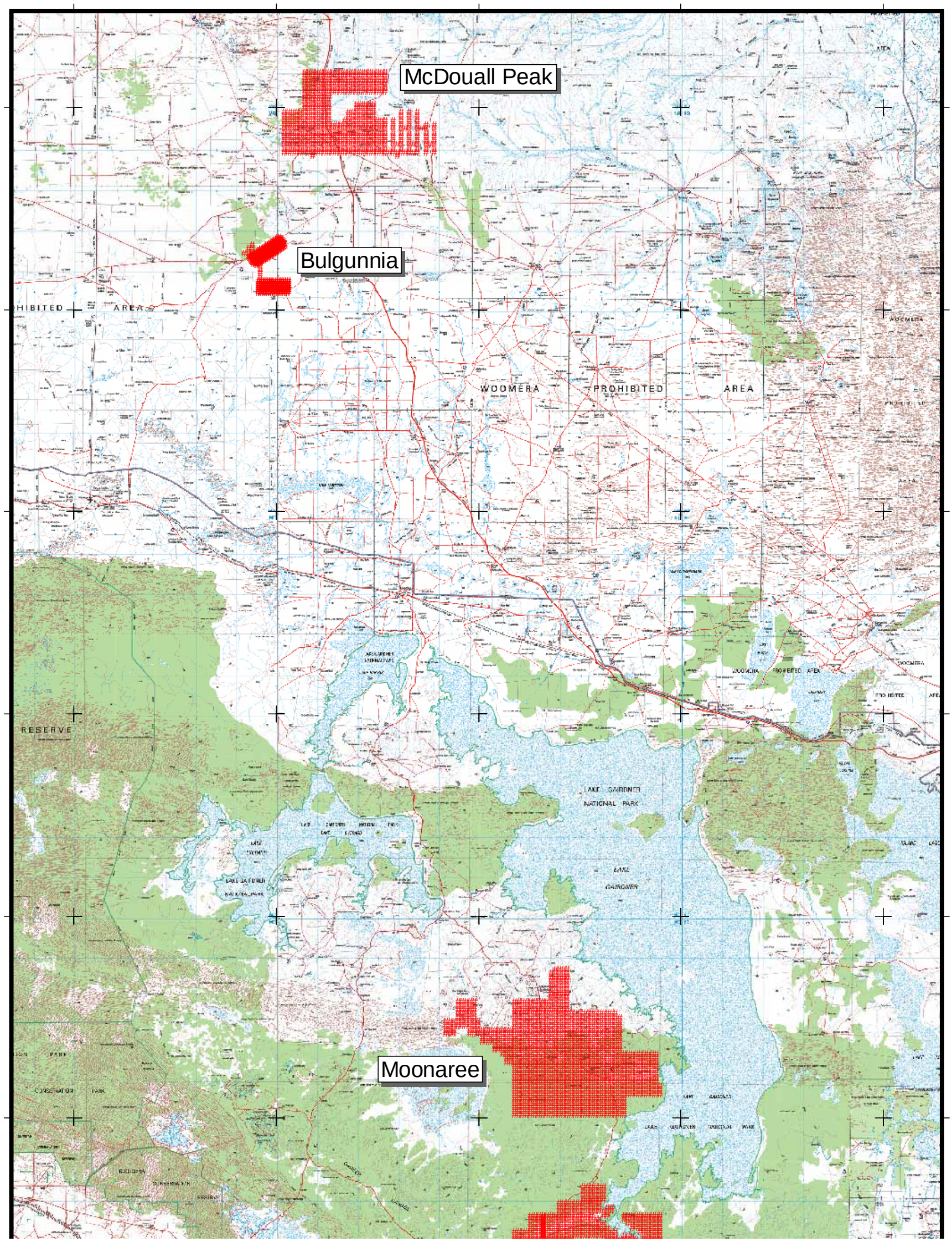
The initial survey comprised of four survey areas with a total coverage of 2,500km^2 The survey areas encompassed large areas of grazing land in the Gawler ranges and the Woomera prohibited area.

The surveys were based around four grazing properties, Mt Ive, Moonaree, Bulgunnia and McDouall Peak Stations. The location of the survey is shown in Figure 1.

The terrain encountered across the survey areas ranged from relatively open ground with rolling hills and expanses of flat rocky ground through to rocky peaks punctuated areas of dense scrubby vegetation and deep creeks.

Gravity surveying was conducted on variety of station spacing's ranging from a 1.0km square grid configuration down to a 400m diagonal grid. Appendix A contains a plot of the final station locations. Appendix C contains the specifications for the survey.

Photo 2: Typical terrain in the survey area.


McDouall Peak
Bulgunnia
Moonaree
WOOMERA
PROHIBITED
AREA
RESERVE
LAKE GAIRDNER
NATIONAL PARK

3. PERSONNEL AND EQUIPMENT

3.1 Personnel

The supervisors in charge of the project were Andrew McCarthy and Nick Moir. Andrew and Nick were responsible for daily management of the job and for nightly data processing to ensure quality and integrity. Gravity and GPS measurements were carried out by:

Andrew McCarthy
Nick Moir
Mark Rosewall
Matt Hunter

Four Helicopter pilots were used for the project

Andrew Catt
Rick Keece
Peter McDonald
Carl Harpes

Final data reduction, inspection and reporting were performed by the company Geophysicist, Grant Coopes.

3.2 Survey equipment

The following survey equipment was utilised on the gravity survey:

- Scintrex CG-3 digital gravity metes (G and S meters)
- Leica 1230 dual frequency GPS receivers with GLONASS capability
- Notebook computers for data processing and backup
- Garmin 296 GPS receivers for helicopter navigation
- Garmin Handheld GPS receivers for vehicle navigation
- Various chargers, solar cells and batteries

3.3 Vehicles

Due to the type of terrain and remote locations, 4WD Landcruiser and 4WD Isuzu Trucks were utilized as support vehicles for the surveys. To maintain the high Daishsat safety record, vehicles were fitted with a range of safety equipment including:

- One 20l jerry can of water
- Dual fuel tanks
- Two spare tyres
- UHF radio and satellite phone with car kit
- Self-recovery equipment including winches, snatch straps chains etc.
- Tyre pliers to effect tyre repairs in the field
- Tools and spares to enable field repairs as necessary
- Survival kits with EPIRB emergency locator beacons
- Trans track satellite vehicle monitoring and reporting systems

3.4 Helicopter

Due to the scale and accessibility of the stations within the survey areas the most efficient method of transport between stations is by helicopter.
Daishsat utilizes Robinson R-44 Helicopters, a medium size utility helicopter with good maneuverability and proven reliability in harsh operating conditions typical of gravity survey operations.

Photo 3: Robinson R-44 Helicopter VH-HEM and gravity acquisition.

3.5 Accommodation

The crews were accommodated as close as practical to the survey areas with accommodation provided by “Mt Ive”, “Kangaroo Well” and “The Twins” in shearer’s quarters and un-used farm houses where available.

3.6 Communications

The survey crew and support vehicles were equipped with hand-held Iridium satellite phones as well as UHF and VHF transceivers. “Omnitrack” satellite based tracking was used on all vehicles (including helicopters) to enable asset monitoring via a web interface.

Scheduled communications were made by the crew to the communications centre at the base camp at hourly intervals. Communication with the Perth and Murray Bridge offices was ongoing for the duration of the job.

Photo 4: View from VH HZH looking east towards Lake Gairdner.

4. GPS SURVEYING AND PROCESSING

4.1 Set out of the grid

This was done concurrently with the gravity data acquisition using navigation grade receivers operating in autonomous mode. Where possible, the readings were taken as close to the ideal coordinates as possible. As the receivers were operating in autonomous mode, set out accuracy was usually better than 10m.

Raw kinematic GPS data were logged by a twin dual-frequency Leica 1230GG receivers inside the helicopter cabin, with the GPS antennas mounted on the tail boom. Static GPS data were logged at the base station using two Leica System 1230GG GPS receivers for later post-processing. The Leica 1230GG is a new generation GPS receiver making use of both the traditional US GPS satellite constellation and the newly available GLONASS satellite constellations for higher positional accuracy and reduced periods of poor satellite coverage.

Repeat stations were placed throughout the surveys to monitor any variations in positional accuracy. Repeats are placed with a washer tied with flagging and marked with the station number was used for future identification. At each station, the station number, position and RL were recorded digitally by the crew.

4.2 Survey datum and control

The gravity surveying, and hence any gravity reductions, used the Australian Height Datum (AHD) as the reference datum. New GPS/Gravity base stations were established at each of the three bases using three days worth of static data and connections to ITRF stations using Geoscience Australia's online GPS processing system, AUSPOS. For more information on this system, please visit the Geoscience Australia website at http://www.ga.gov.au/geodesy/sgc/wwwgps/. Final deviations of better than 5mm were obtained for x, y and z, for all occupations. Appendix D contains the GPS base station information.

4.3 Processing of the position and level data

The raw GPS data were recorded onto the internal RAM of the GPS receivers. The data were downloaded nightly onto laptop computer for post processing using Waypoint Grafnav v7.80.

Waypoint combines the processing components, GrafNav and GrafNet, in a complete package.

GrafNav processes data for one baseline (e.g. one base and one remote). GrafNav is normally used for kinematic data which it is extremely well suited for. It can also process single static baselines. Receiver types can be mixed and matched via the use of a common format. This component of Waypoint was used for processing the kinematic data acquired each day.
GrafNav and GrafNet share the same processing engine that has been under continuous development since its original inception by Waypoint in 1992. The core of this robust engine is its carrier phase kinematic (CPK) Kalman filter. Some of the major advantages of Waypoint's kernel are:

Fast processing - The GrafNav kernel is one of the fastest on the market. It will process ~0.8 epochs per MHz per second on a Pentium II.
Robust Kalman filter - From experience with processing GPS data from fast jets and NASA sounding rockets, the processing kernel has become extremely robust. Efforts have been made to account for all of the various data error possibilities given the different types of GPS receivers that GrafNav/GrafNet can handle.
Reliable OTF - Waypoint's on-the-fly (OTF) algorithm, called Kinematic Ambiguity Resolution (KAR), has had years of development and stresses reliability. Variations are implemented for both single and dual frequencies, and numerous options are available to control this powerful feature
Accurate Static Processing - Three modes of static processing are implemented in the processing kernel. Fixed static is the most accurate. A quick static solution is also available as an alternative, while the float and iono-free float solution is useful for long baselines.
Dual Frequency - Full dual frequency support comes with GrafNav/GrafNet. For ambiguity resolution, this entails wide/narrow lane solutions for KAR, fixed static and quick static. Ionospheric processing is very important with the peak of the ionosphere's cycle occurring in 2000. The GrafNav kernel implements two ionospheric processing modes including the iono-free and relative models. The relative model is especially useful for airborne applications where initialization is near the base station, and this method is much less susceptible to L2 phase cycle slips.
Forward and Reverse - Processing can be performed in both the forward and reverse directions. Both GrafNav and GrafNet also have the ability to combine these two solutions to obtain a globally optimum one.
Velocity Determination - Since the GrafNav kernel includes the L1 Doppler measurement in its Kalman filter, velocity determination is very accurate. In addition to this, a considerable about of code has been added specifically for the detection and removal of Doppler errors.
Long Baseline - Because precise ephemeris and dual frequency processing is supported, long baselines accuracies can be as good as 0.1 PPM.

For more information about Waypoint processing software, and in particular, Grafnav, please visit the Waypoint http://www.waypnt.com/grafnav_d.html.

Simple transformations to MGA and AHD were done using the GPS derived WGS84 positions.

MGA94 coordinates were obtained by simply projecting the GPS-derived WGS84 coordinates using a UTM projection with zone 53S. For all practicable purposes, the WGS84 geodetic coordinates are equivalent to GDA94 geodetic coordinates, so no transformation is necessary. For more information about GDA94 and MGA94, please visit http://www.ga.gov.au/geodesy/datums/gda.jsp.
AHD heights were calculated via Waypoint software using the latest geoid model for Australia, AUSGEOID98. Information about the geoid and the modeling process used to extract separations (N values) can be found at http://www.ga.gov.au/geodesy/ausgeoid/. To obtain AHD heights, the modeled N value is subtracted from the GPS derived WGS84 ellipsoidal height (Figure 2).

$$H_{AHD}=h_{WGS84}-N$$

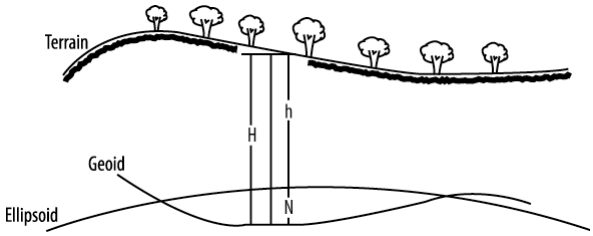


Figure: 2: Geoid-Ellipsoid separation

4.4 GPS Performance

Performance from the 1230GG receivers was excellent. There were no stations that required repeating due to GPS failure or poor coordinate quality.

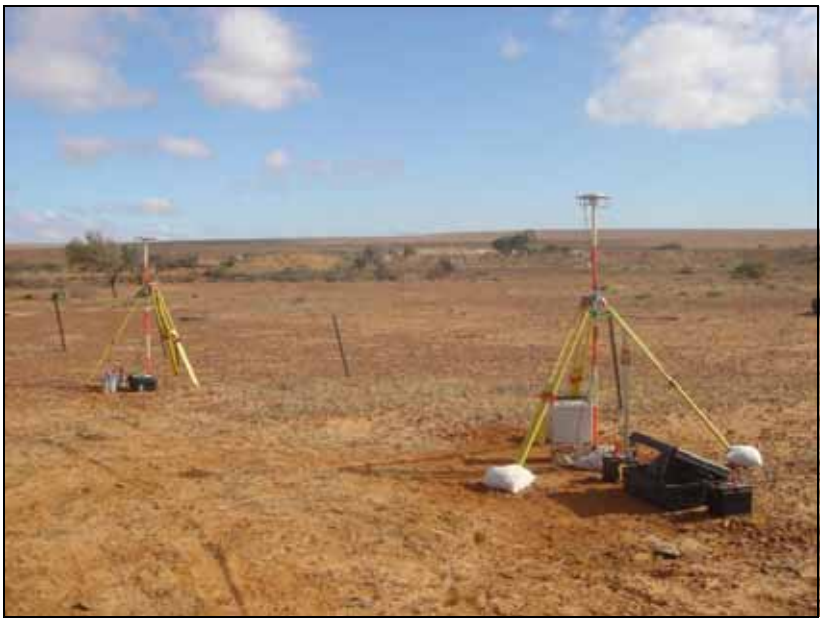


Photo 4: Post process GPS base setup with CG-3 gravimeter.

5. GRAVITY SURVEYING AND PROCESSING

5.1 Gravity data acquisition

Gravity observations were made concurrently with the GPS measurements. Two observations were made for each station, with each observation consisting of a 20-second or greater stacking time. Multiple observations were made at each station so that any seismic or instrumental noise could be immediately detected. The tolerance between readings was set at 0.05 of a dial reading (0.05 mGals). Vertical and horizontal levels were restricted to 5 arc seconds at all times. At each station, the station number, time and two gravity readings (in dial units) were recorded in DAISHSAT carbon-copy gravity field books. The Scintrex meters also automatically record the station, time and readings digitally to allow for downloading to computer.

5.2 Gravity base station

A gravity base station was used for calculation of absolute gravity and drift determination. Details of the gravity bases are contained in Appendix D. When in the field, a base station reading was taken in the morning before observing and at evening after the last observation. When taking a base station reading, the observed gravity values were stacked over 60 seconds to ensure accuracy. Observations were repeated until the readings repeated to 0.010 of a dial reading or less.

The gravity base stations were set up at Mt Ive Station, Kangaroo Well, and The Twins homestead as close as practical to the helicopter landing areas. Each base station was established via multiple ABA ties to the AFGN stations at Glendambo and Noning Station. Expected accuracy of the tie control surveys would be better than 0.01 mGals.

5.3 Gravity data processing

Raw gravity data were processed on a daily basis to check for quality and integrity. This interim process produced a set of Bouguer Anomaly values which were contoured and imaged to provide a check for any anomalous readings that would need repeating. Geosoft GRAVRED software was used for the gravity reduction in the field. Other software used on this project includes Arcview, ChrisDBF, Waypoint and Oasis Montaj. The formulae used for final processing are listed below:

Instrument scale factor: This correction was used to correct a gravity reading (in dial units) to a relative gravity unit value based on the meter calibration.

Tidal correction: This correction was used to correct for background variations due to changes in the relative position of the moon and sun. The Scintrex calculated ETC was removed and a new ETC calculated using Geosoft Formulae and the surveyed GPS latitude. The formulae used are too complex to list here.

Instrument Drift: Since gravity meters are mechanical, they are prone to drift (extension of the spring with heat, obeying Hooke's law). If two base readings are taken one can assume that the drift between the two readings is linear and can therefore be calculated. The drift and tidal corrected value is referred to as the *observed gravity*.

Normal Gravity: The theoretical value of gravity was calculated using the 1967 variant of the International Gravity Formula and used to latitude correct the observed gravity.

$$Gn=9,780,318.456*(1+0.005\ 278\ 895*\sin^2\phi+0.000\ 023\ 462*\sin^4\phi)$$

where ϕ represents degrees of latitude;

Free-Air Correction: Since gravity varies inversely with the square of distance, it is necessary to correct for changes in elevation between stations to reduce field readings to a datum surface (in this case, AHD).

$(3.08768 – 0.00440\ \sin^2\phi)*h – 0.000001442*h^2\ \mu ms^{-2}$ per metre

Bouguer Correction: This correction accounts for the attraction of material between the station and datum plane that is ignored in the free-air calculation. A value of 2.67 tm^3 was used in the correction.

$$0.4191*\rho\ \mu ms^{-2} \text{ per metre}$$

where ρ = density 2.67 tm^3

Free Air Anomaly: This is obtained by applying the free air correction (FAC) to the observed gravity reading.

$$FAA=G_{OBSG84}-Gn+FAC$$

Bouguer Anomaly: This is obtained when all the preceding reductions or corrections have been applied to the observed gravity reading.

$$BA267=G_{OBSG84}-Gn+FAC-BC$$

5.4 Gravity meter calibration and scale factors

The gravity meter used had previously been calibrated over a number of calibration ranges in WA and SA. A derived scale factor from these calibrations is shown below:

Serial No.	(G)	**408275**	Scale Factor	**1.000427**
	(S)	**9711410**	Scale Factor	**0.999408**

6. RESULTS

Raw and processed GPS and gravity data are contained on CDROM as Appendix E. Hardcopy plots of station location and coloured images are contained in Appendix A.

6.1 Stations Surveyed and Survey Progress

In total, 2,701 new stations were acquired during the survey comprising of 502 stations collected at McDouall Peak, 357 Stations at Bulgunnia, 993 stations at Moonaree and 844 stations at Mt Ive. Of the 2701 stations 179 were revisited to ensure data quality.

A brief production summary for the survey is show in Table 1 below.

Generally, production was excellent with the crew averaging over 150 stations per day. Due to CASA regulations restricting duty hours for pilots, some time was lost from direct production although the crews used this downtime to conduct helicopter and equipment maintenance and review the acquired data.
Strong winds and rocky terrain made landing and gravity acquisition difficult in some instances, hindering production.

Over the four survey areas and a total of 26 days on site three days were lost to a minor mechanical failure, with the helicopter heading to Port Augusta for repair.
There was also one day of crew standby brought about by a total fire ban across the survey area prohibiting the landing of the helicopter in unprepared landing areas. There was no downtime due to geophysical or GPS equipment failure.

Oak Dam Gravity Survey 2007		
Gravity stations acquired (including repeats)	**2880**	stations
Gravity station repeats	**179**	6.2%
New gravity stations acquired	**2701**	stations
Total accidents	**0**	accidents
Total hours lost from accidents	**0**	hours

Table 1: Gravity Production Summary

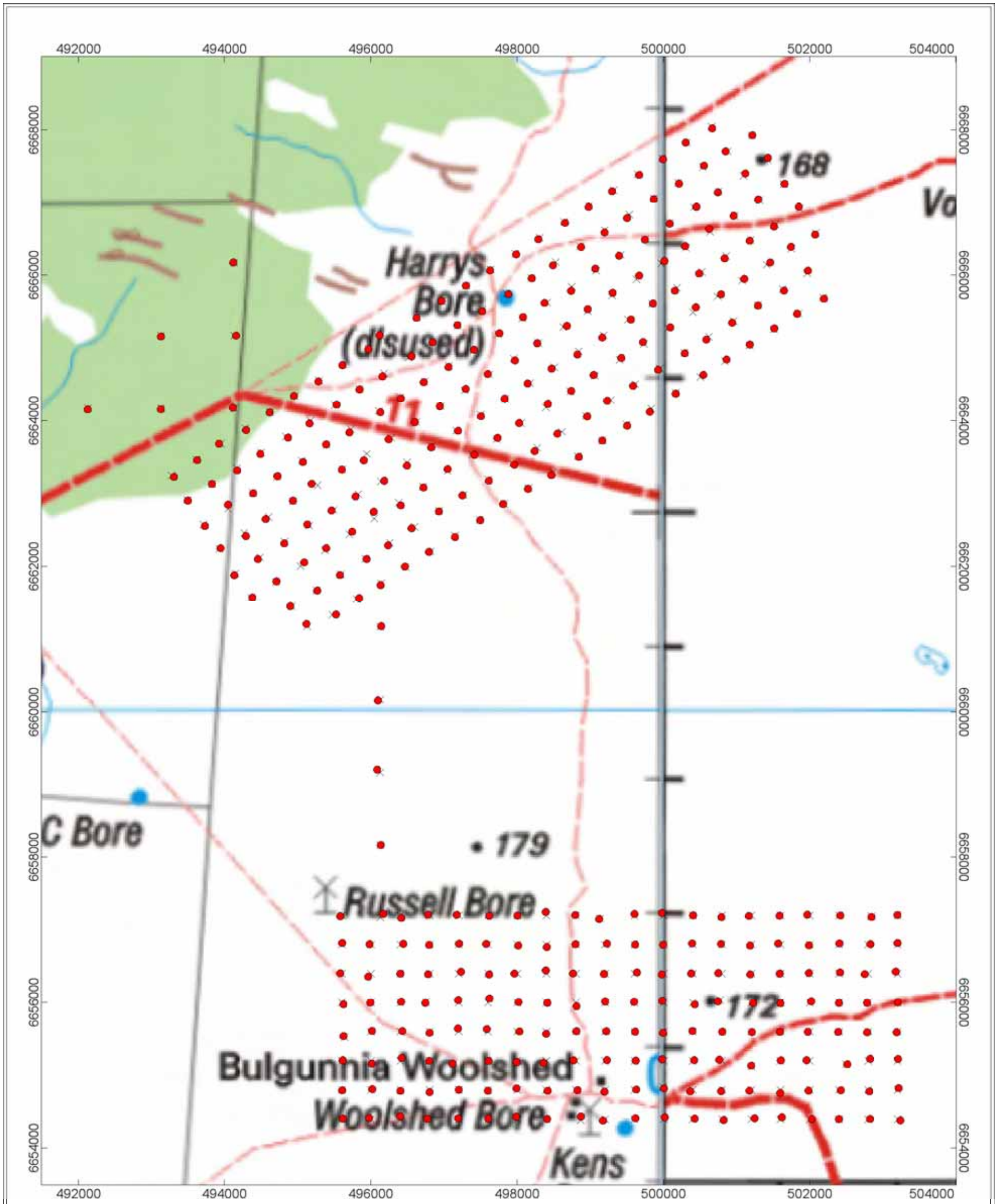
6.2 Data Repeatability

Analysis of the repeat data shows that measurement repeatability is very good for both GPS and gravity observations. Appendix B contains histograms and summary statistics from the analysis. Based on the repeat data, one can assume the following typical accuracies for the observables:

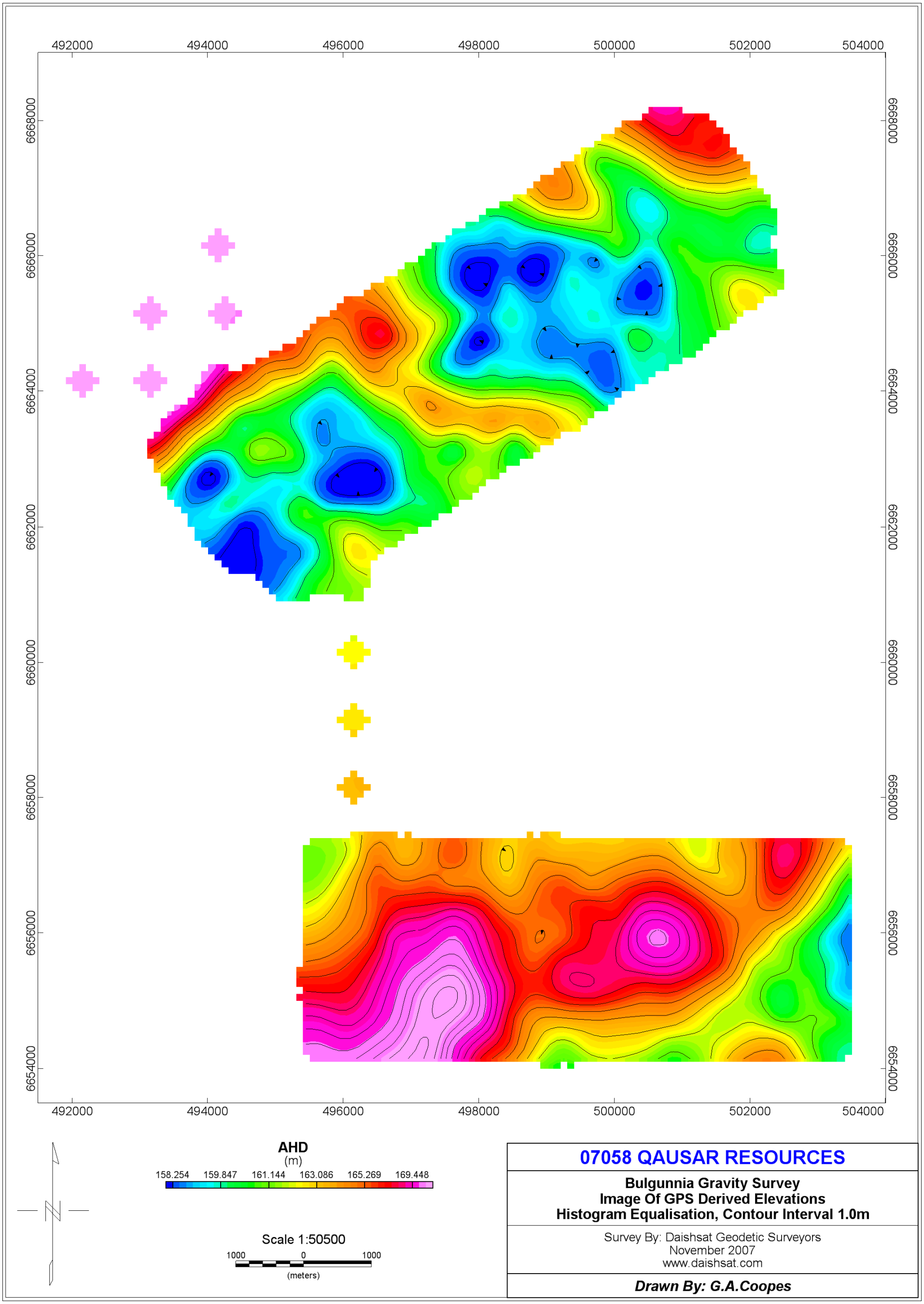
Z position observation: < 0.060 m
Gravity observation: < 0.025 mGals

APPENDIX A

Plots of station location / Images



07058 QUASAR RESOURCES
Bulgunnia Gravity Survey **Plot Of Station Locations**
Survey By: Daishsat Geodetic Surveyors November 2007 www.daishsat.com
Drawn By: G.A.Coopes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6664000
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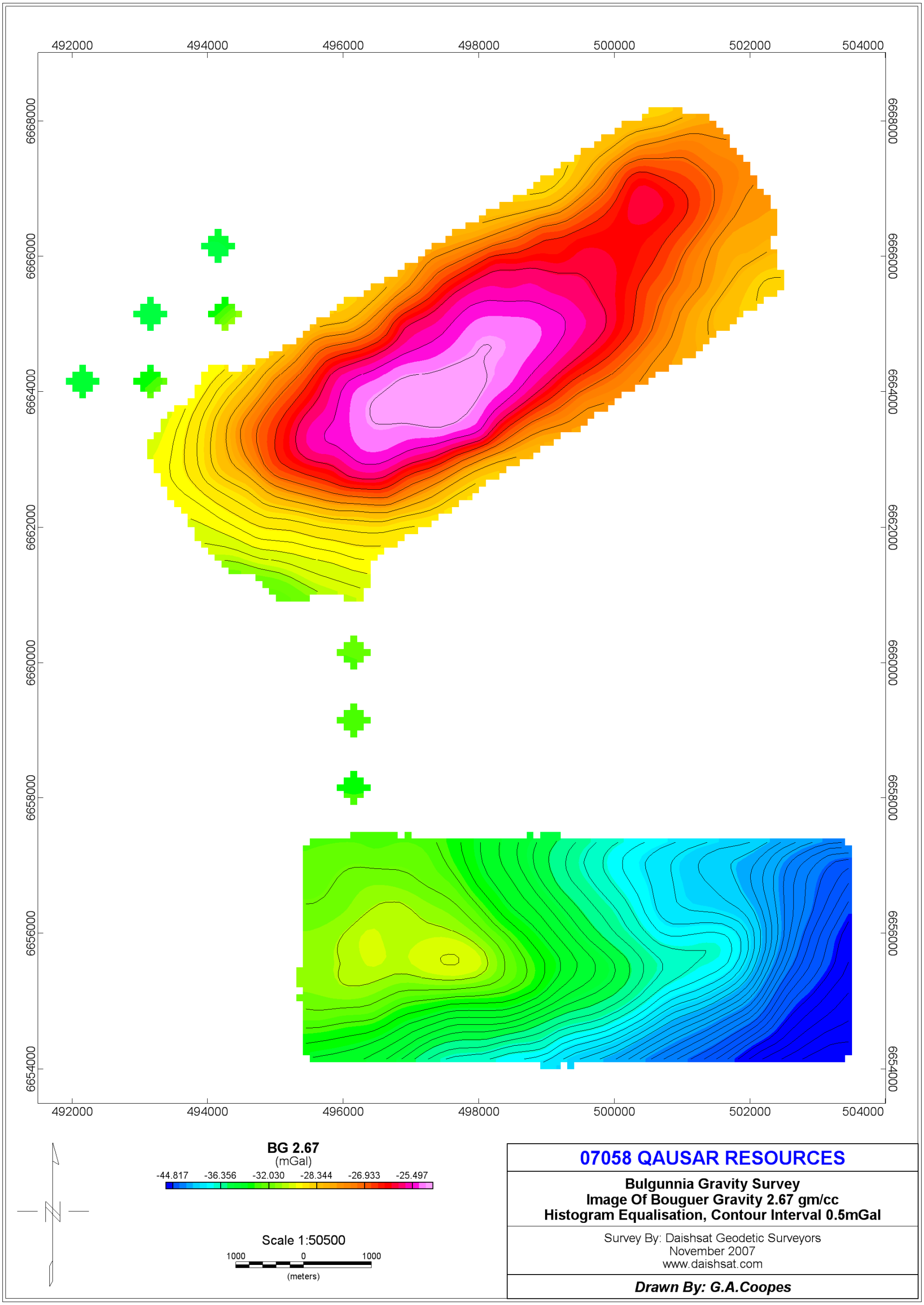
AHD
(m)
158.254
159.847
161.144
163.086
165.269
169.448
Scale 1:50500
1000
0
1000
(meters)
07058 QAUSAR RESOURCES
Bulgunnia Gravity Survey
Image Of GPS Derived Elevations
Histogram Equalisation, Contour Interval 1.0m
Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com
Drawn By: G.A.Coopes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6662000
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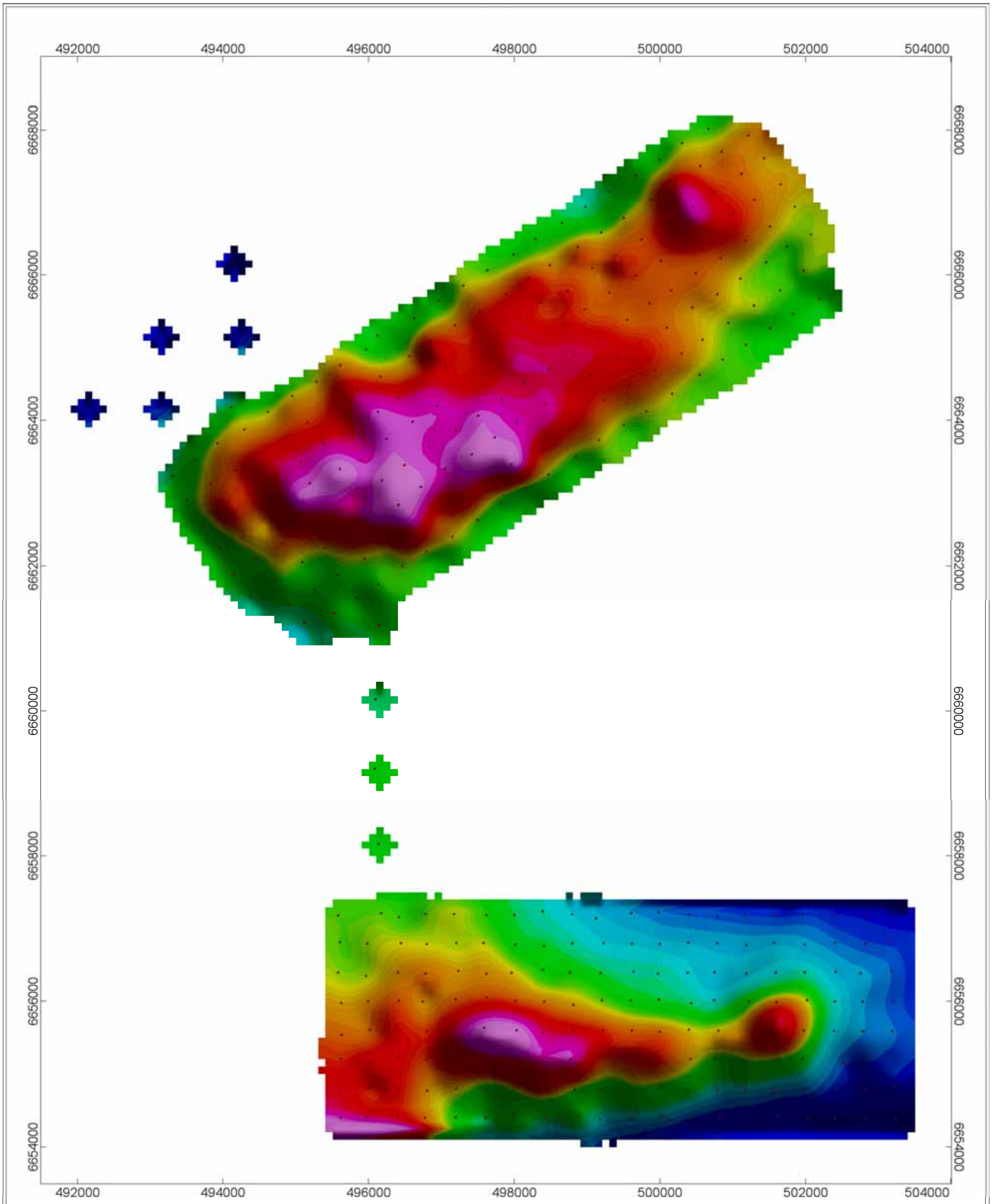
6654000
BG 2.67
(mGal)
-44.817
-36.356
-32.030
-28.344
-26.933
-25.497
Scale 1:50500
1000
0
1000
(meters)
07058 QAUSAR RESOURCES
Bulgunnia Gravity Survey
Image Of Bouguer Gravity 2.67 gm/cc
Histogram Equalisation, Contour Interval 0.5mGal
Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com
Drawn By: G.A.Coopes



Scale 1:50500

1000 0 1000

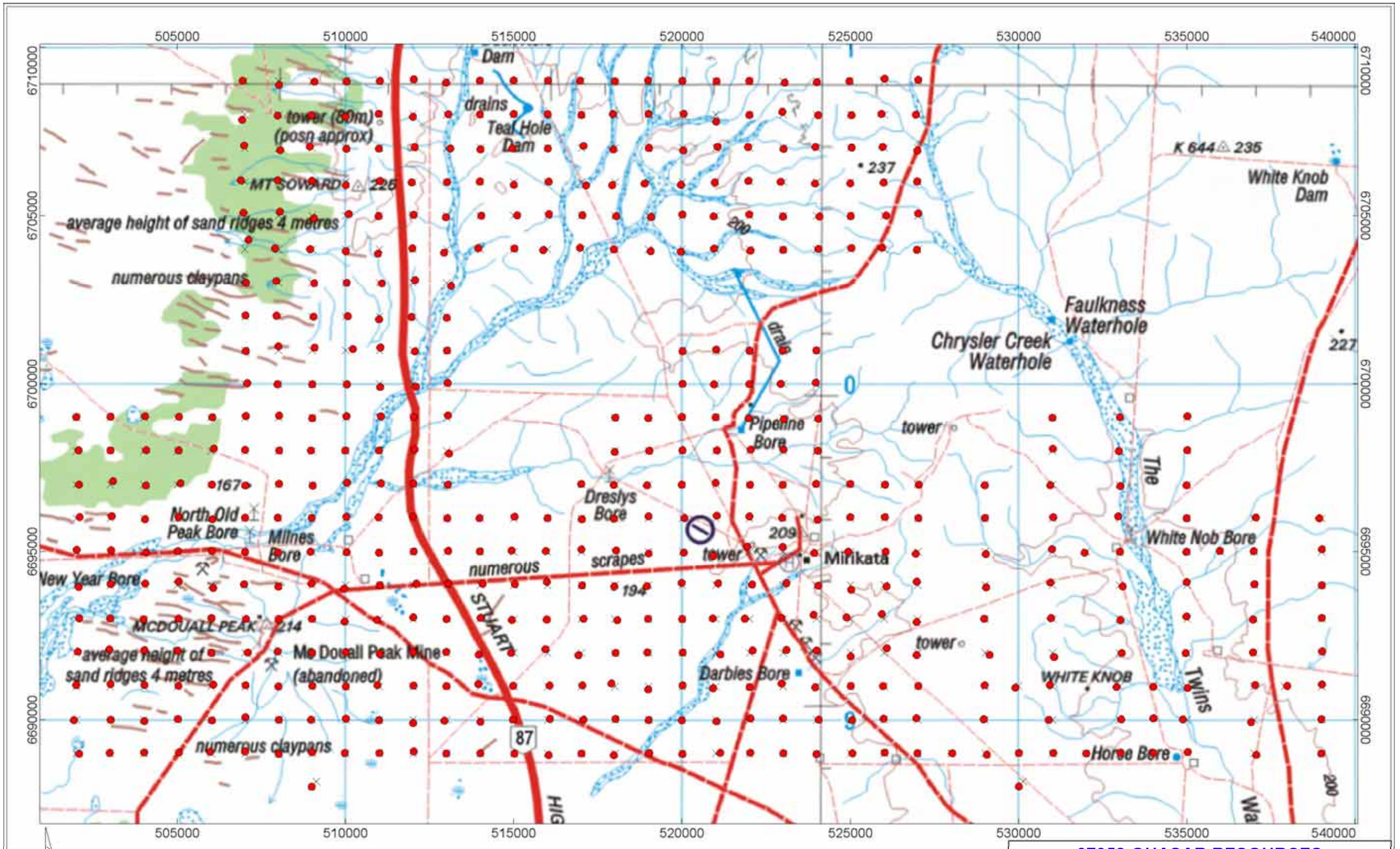
(meters)

07058 QUASAR RESOURCES

Bulgunnia Gravity Survey
Image Of 1VD Of Bouguer Gravity 2.67 gm/cc
Histogram Equalisation, NE Sunshading

Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com

Drawn By: G.A.Coopes



Scale 1:109000

2500 0 2500 5000

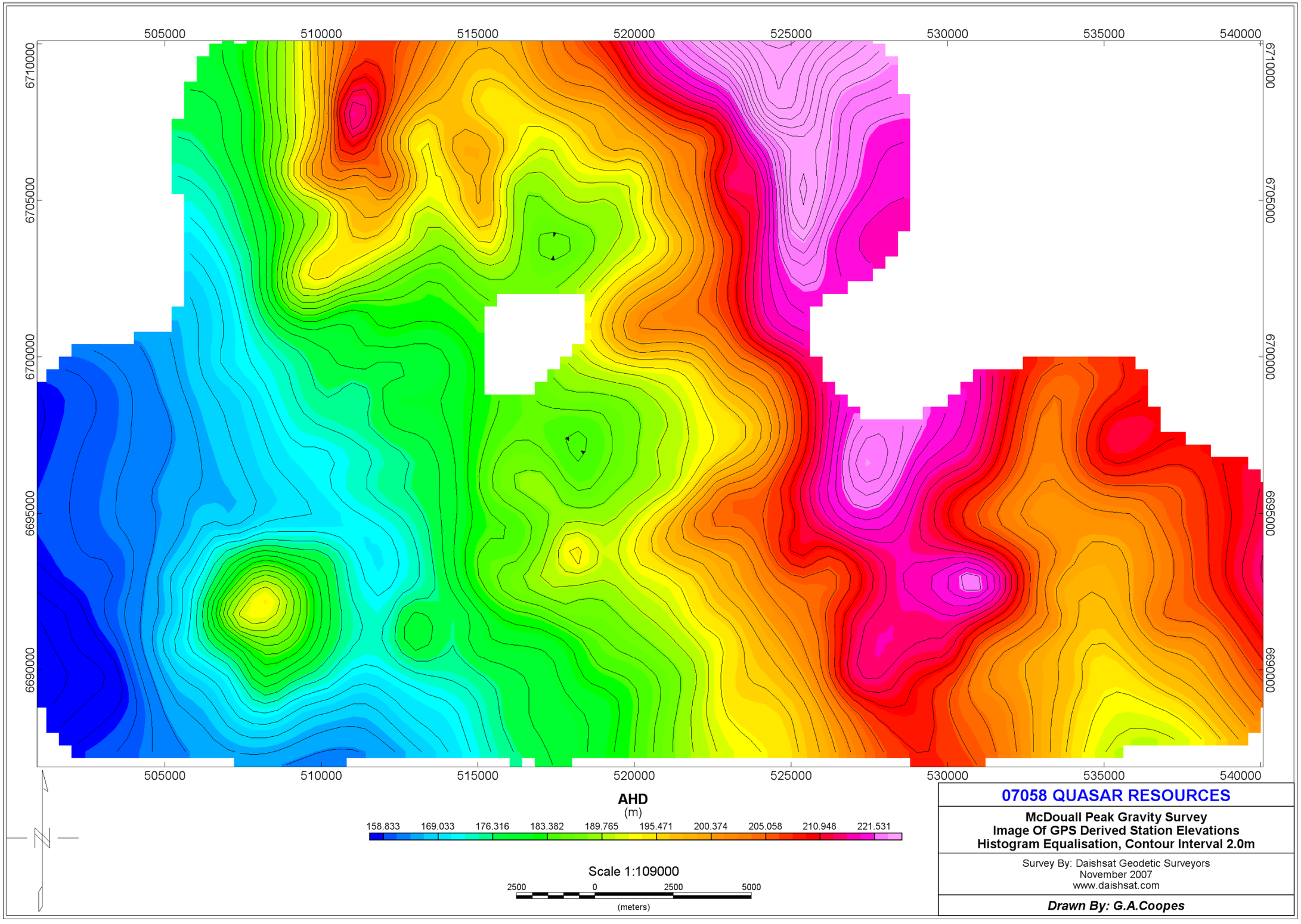
(meters)

07058 QUASAR RESOURCES

McDouall Peak Gravity Survey
Plot Of Station Locations

Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com

Drawn By: G.A.Coopes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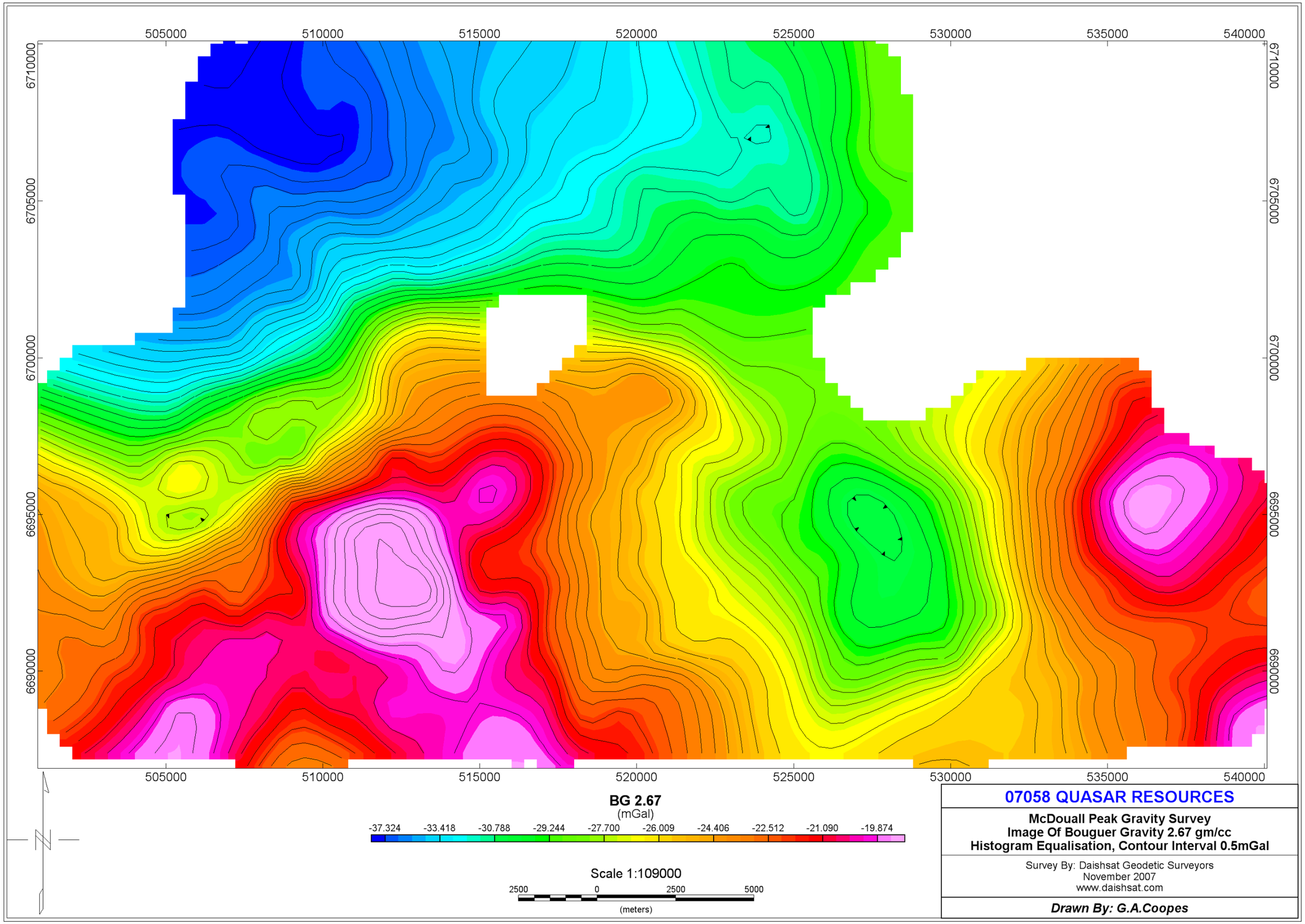
(meters)
07058 QUASAR RESOURCES
McDouall Peak Gravity Survey
Image Of GPS Derived Station Elevations
Histogram Equalisation, Contour Interval 2.0m
Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com
Drawn By: G.A.Coopes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(mGal)
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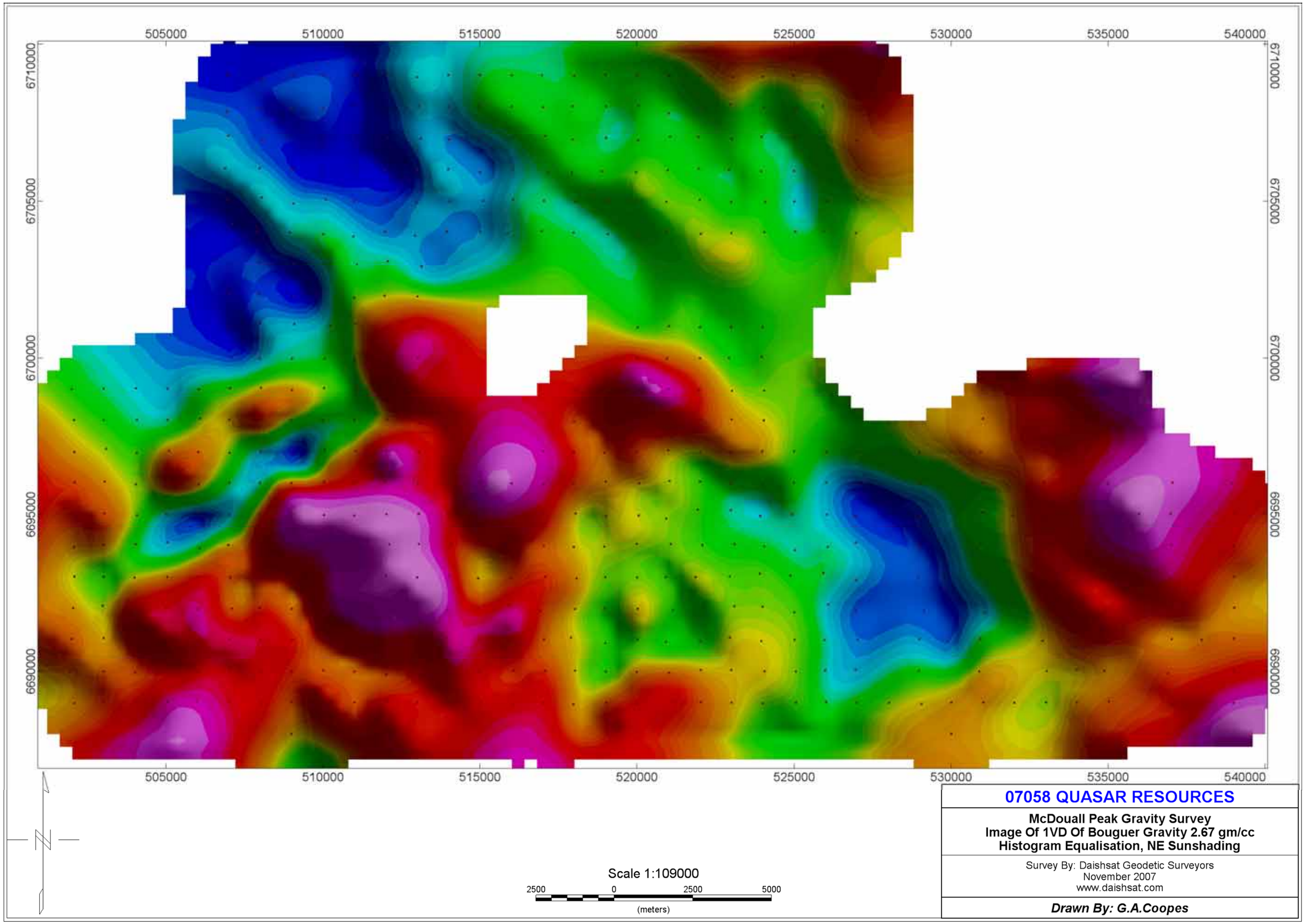
(meters)
07058 QUASAR RESOURCES
McDouall Peak Gravity Survey
Image Of Bouguer Gravity 2.67 gm/cc
Histogram Equalisation, Contour Interval 0.5mGal
Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com
Drawn By: G.A.Coopes

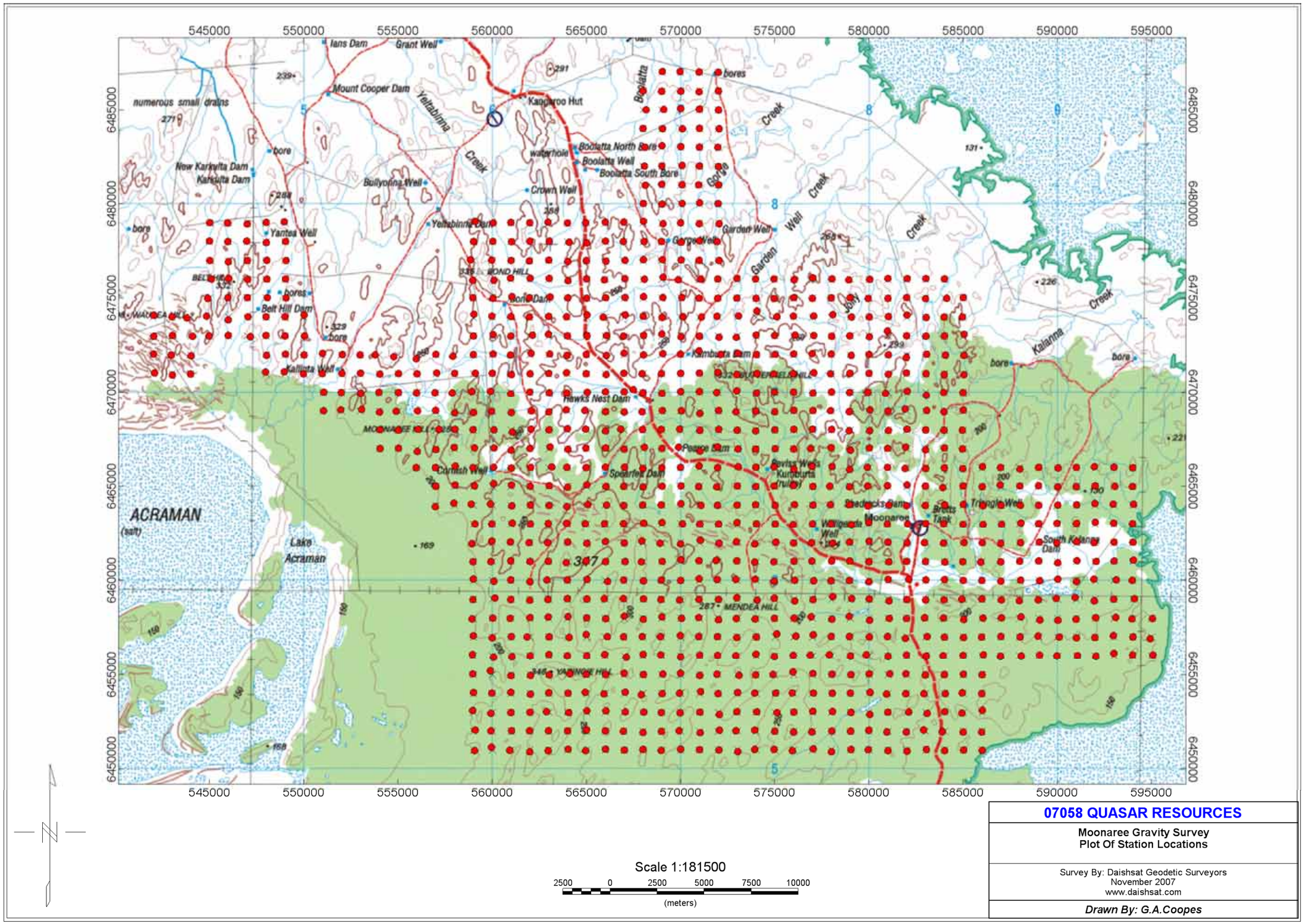


07058 QUASAR RESOURCES

McDouall Peak Gravity Survey
Image Of 1VD Of Bouguer Gravity 2.67 gm/cc
Histogram Equalisation, NE Sunshading

Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com

Drawn By: G.A.Coopes

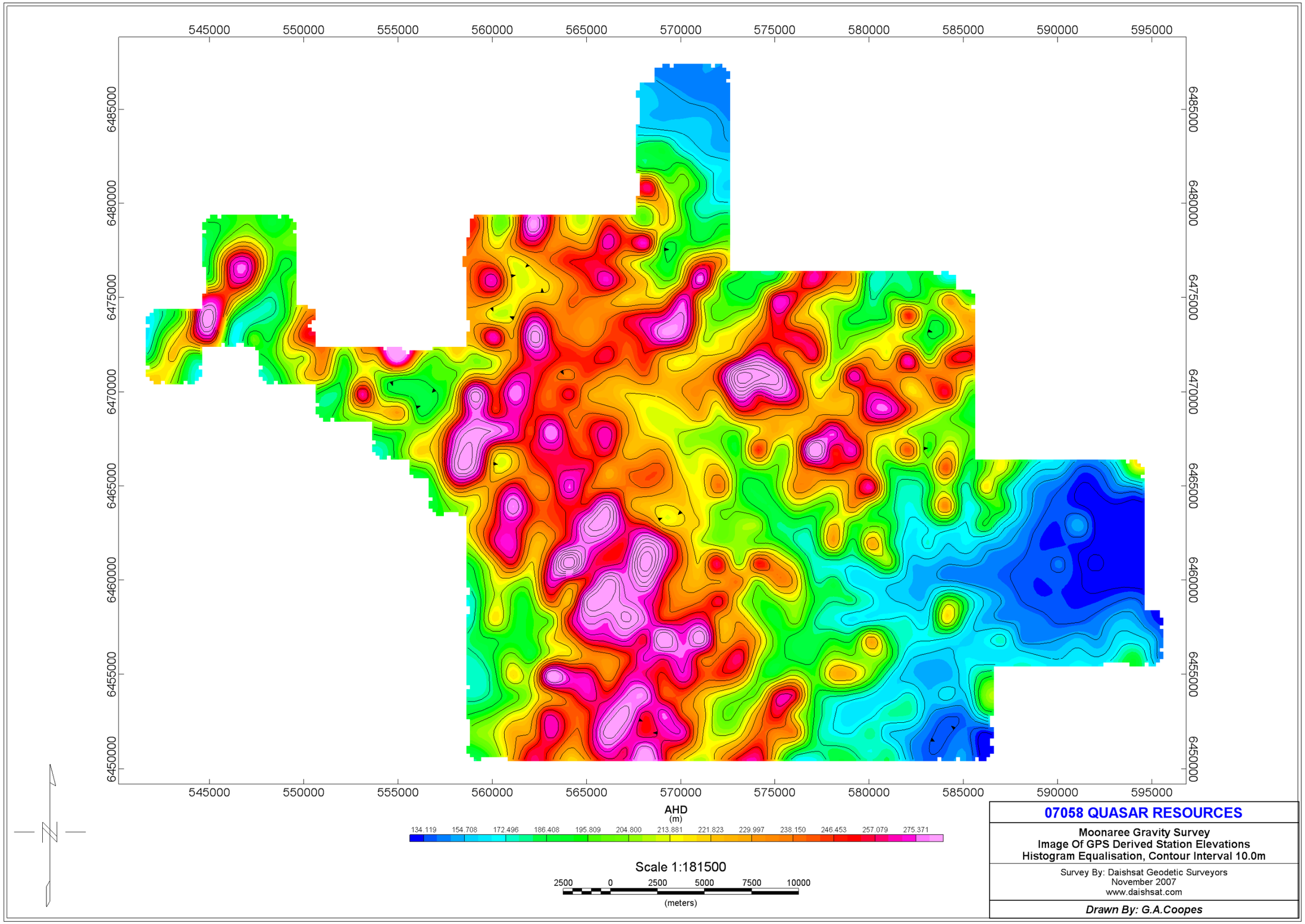


07058 QUASAR RESOURCES

Moonaree Gravity Survey
Plot Of Station Locations

Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com

Drawn By: G.A.Coopes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172.496
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204.800
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Scale 1:181500
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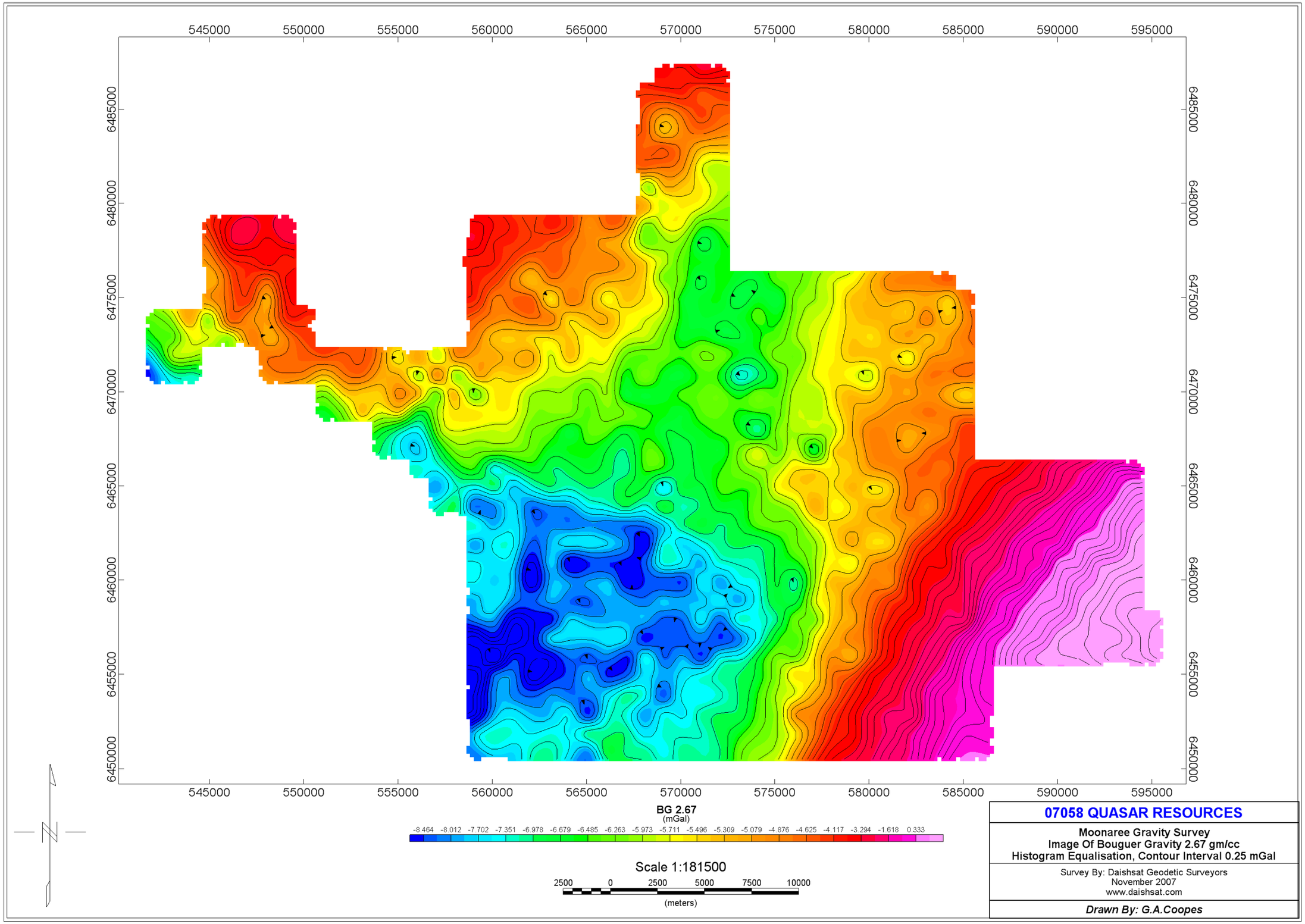
10000
(meters)
07058 QUASAR RESOURCES
Moonaree Gravity Survey
Image Of GPS Derived Station Elevations
Histogram Equalisation, Contour Interval 10.0m
Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com
Drawn By: G.A.Coopes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BG 2.67
(mGal)
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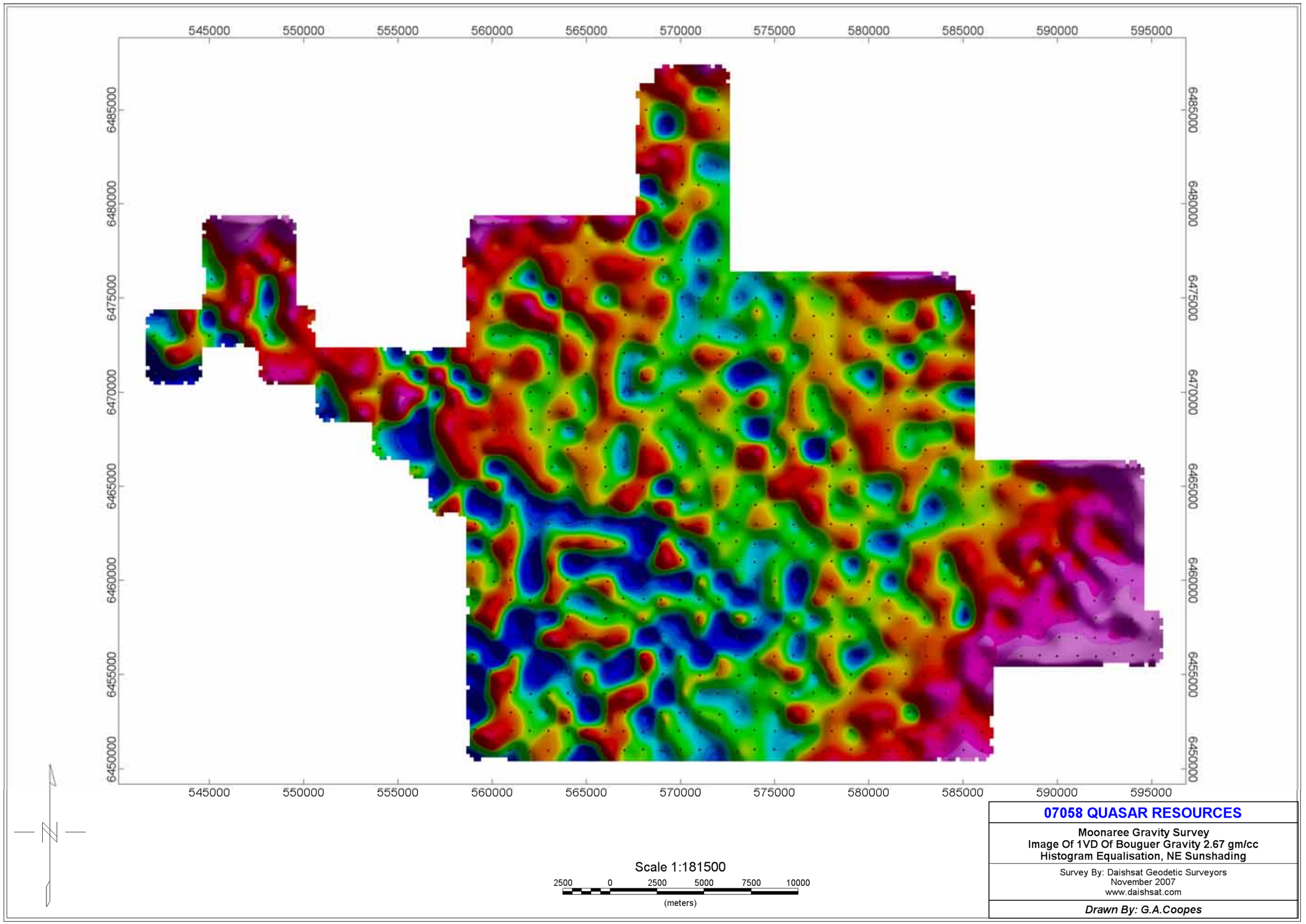
Scale 1:181500
2500 0 2500 5000 7500 10000
(meters)
07058 QUASAR RESOURCES
Moonaree Gravity Survey
Image Of Bouguer Gravity 2.67 gm/cc
Histogram Equalisation, Contour Interval 0.25 mGal
Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com
Drawn By: G.A.Coopes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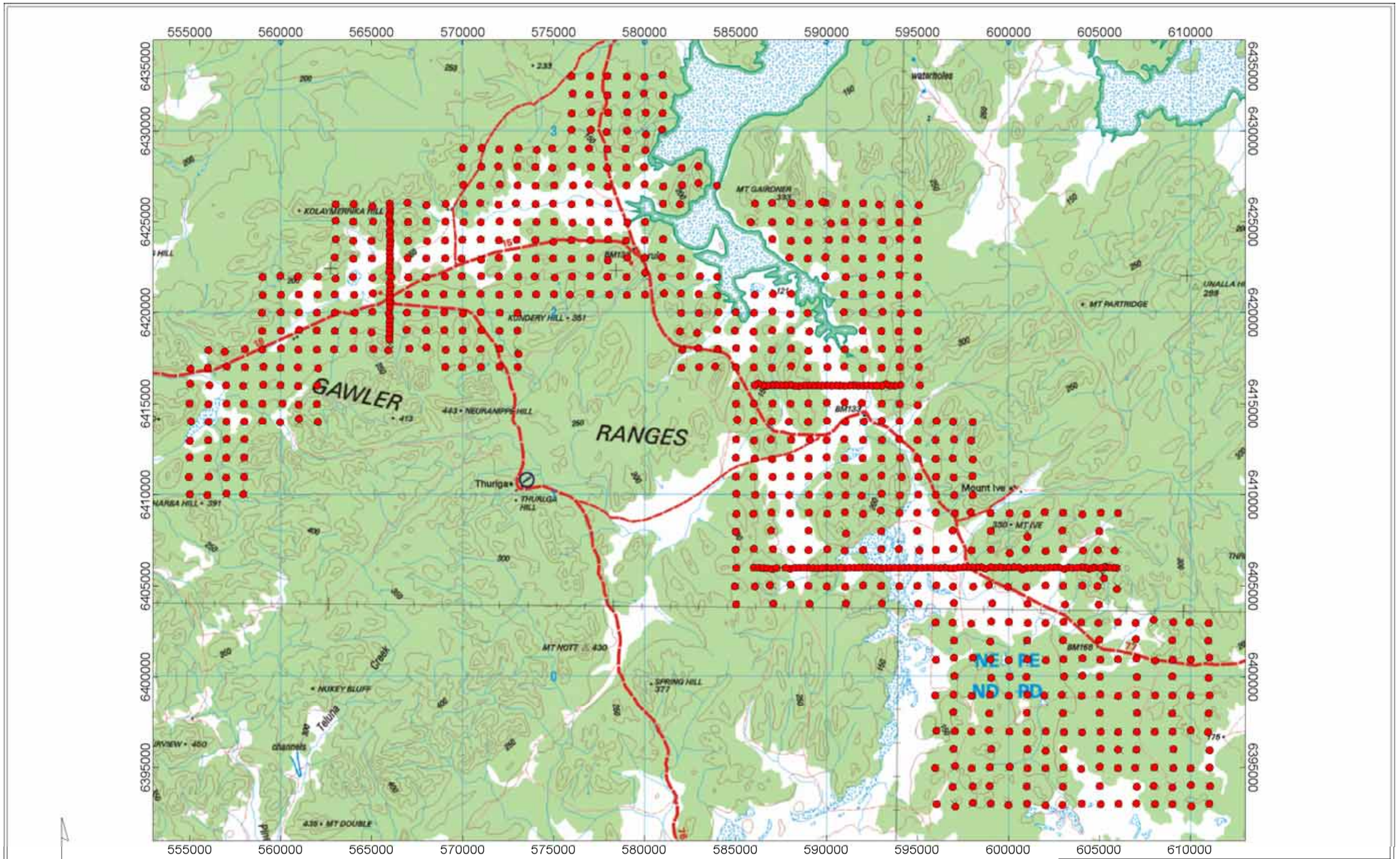
Scale 1:181500
2500 0 2500 5000 7500 10000
(meters)
07058 QUASAR RESOURCES
Moonaree Gravity Survey
Image Of 1VD Of Bouguer Gravity 2.67 gm/cc
Histogram Equalisation, NE Sunshading
Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com
Drawn By: G.A.Coopes

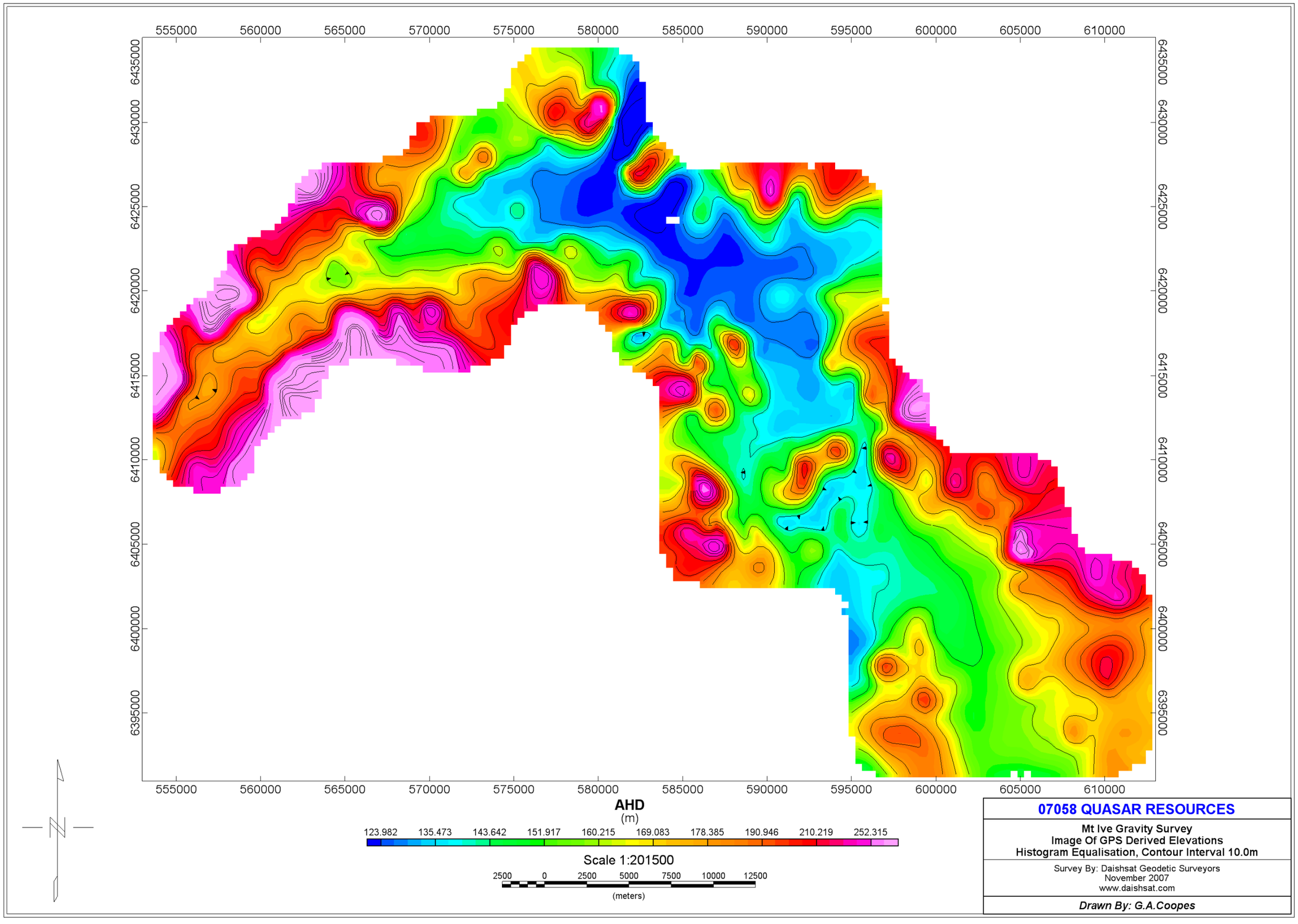


07058 QUASAR RESOURCES

Mt Ive Gravity Survey
Plot Of Station Locations

Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com

Drawn By: G.A.Coopes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(m)
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143.642
151.917
160.215
169.083
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190.946
210.219
252.315
Scale 1:201500
2500
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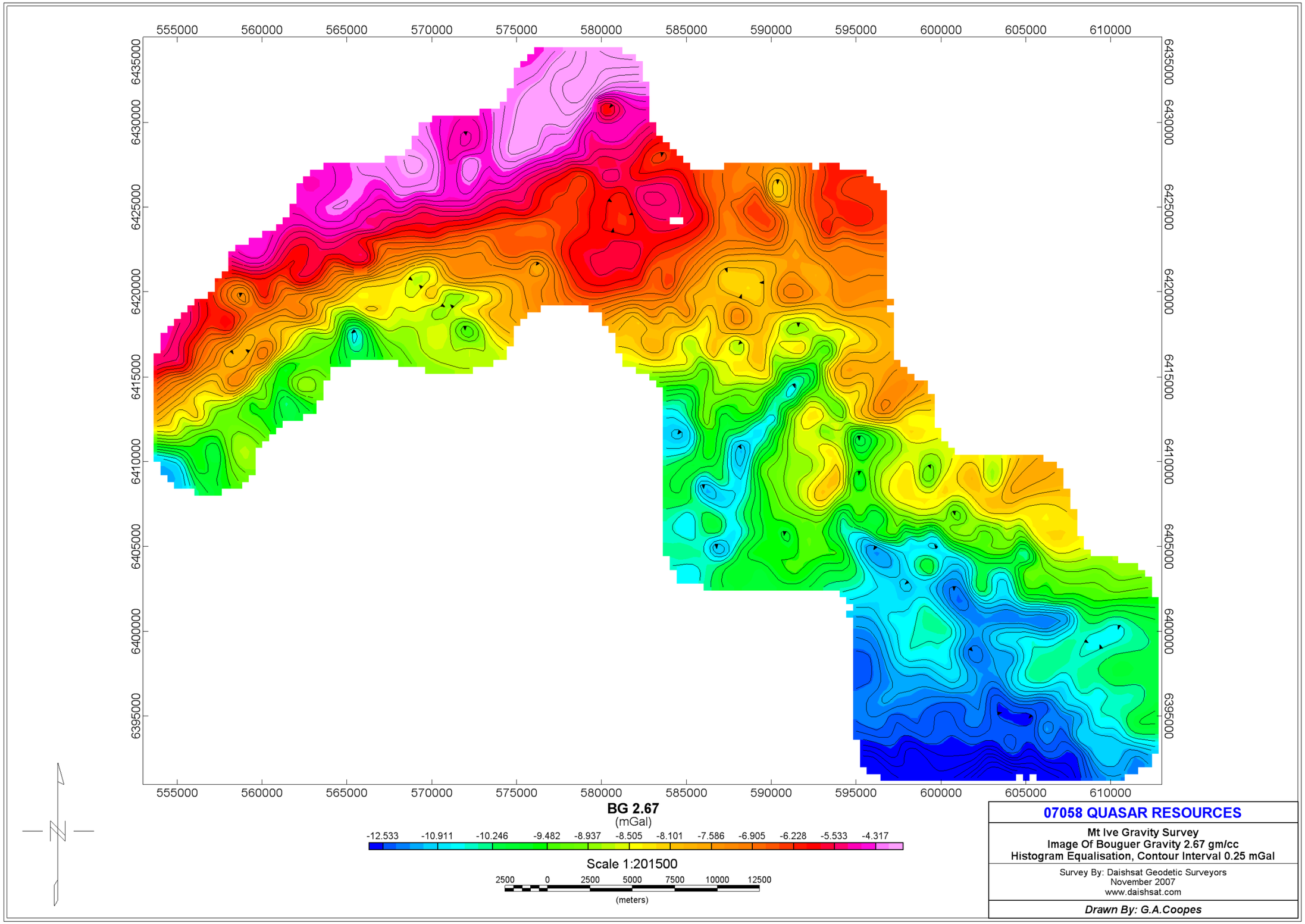
2500
5000
7500
10000
12500
(meters)
07058 QUASAR RESOURCES
Mt Ive Gravity Survey
Image Of GPS Derived Elevations
Histogram Equalisation, Contour Interval 10.0m
Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com
Drawn By: G.A.Coopes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BG 2.67
(mGal)
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-8.937
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-8.101
-7.586
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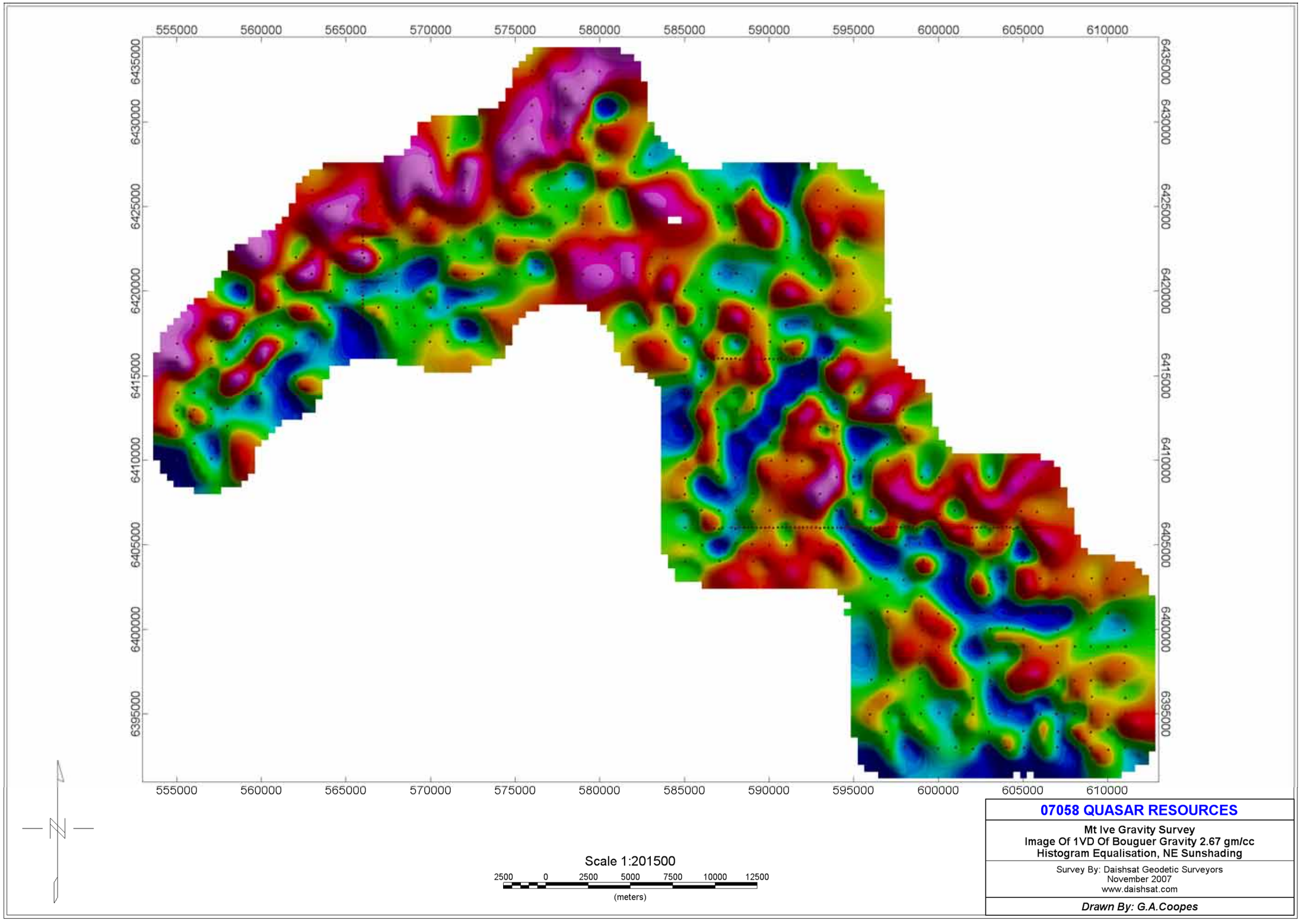
5000
7500
10000
12500
(meters)
07058 QUASAR RESOURCES
Mt Ive Gravity Survey
Image Of Bouguer Gravity 2.67 gm/cc
Histogram Equalisation, Contour Interval 0.25 mGal
Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com
Drawn By: G.A.Coopes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Scale 1:201500
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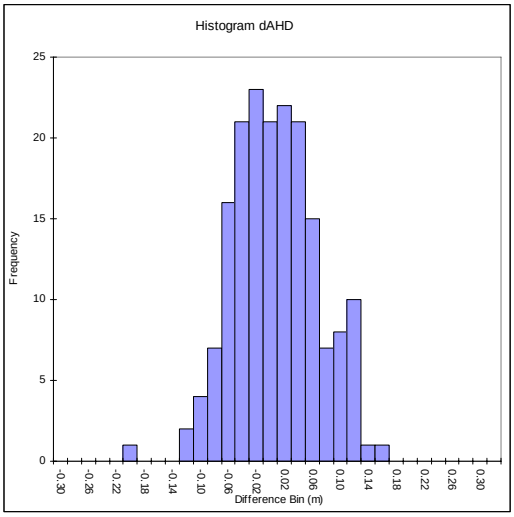
(meters)
07058 QUASAR RESOURCES
Mt Ive Gravity Survey
Image Of 1VD Of Bouguer Gravity 2.67 gm/cc
Histogram Equalisation, NE Sunshading
Survey By: Daishsat Geodetic Surveyors
November 2007
www.daishsat.com
Drawn By: G.A.Coopes

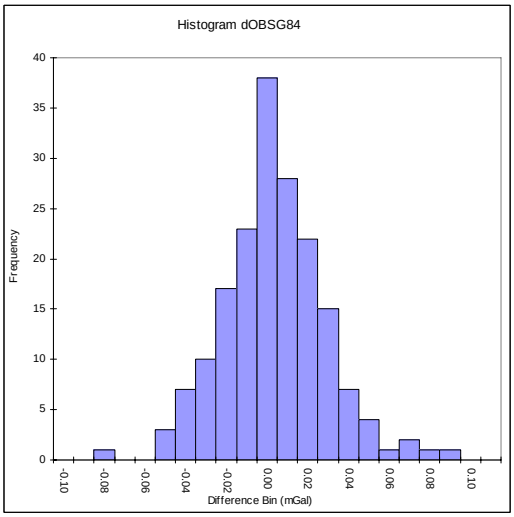
APPENDIX B

Repeat Tabulation and Analysis

Histogram dAHD



Histogram dOBSG84



Summary Statistics

Summary Table	*dAHD*	*dOBSG*
Mean	-0.002	0.000
Standard Error	0.004	0.002
Median	-0.004	-0.001
Mode	0.029	-0.002
Standard Deviation	0.060	0.025
Sample Variance	0.004	0.001
Kurtosis	0.153	1.112
Skewness	-0.010	0.247
Range	0.364	0.170
Minimum	-0.214	-0.081
Maximum	0.150	0.089
Sum	-0.367	-0.014
Count	**179**	**179**

APPENDIX C
Survey Specifications

Bulgunnia Station Gravity Survey

Client	Heathgate Resources
Survey Name	Bulgunnia
Operators	NM, MR, MH, - Pilots AC, RK, PM, CH
Techniques Employed	GPS, Gravity
Station Spacing	400m
Line Spacing	400m
Gravity Meter	Scintrex CG-3M (G-meter) 408278, (S-meter) 9711410
GPS	Leica 1230GG Base & Rovers
Number of Points Surveyed	374
Gravity Base	Daishsat Base 0375
Date of Survey	17th November to 28th November 2007

McDouall Peak Gravity Survey

Client	Heathgate Resources
Survey Name	McDouall Peak
Operators	NM, MR, MH, - Pilots AC, RK, PM, CH
Techniques Employed	GPS, Gravity
Station Spacing	400m
Line Spacing	400m
Gravity Meter	Scintrex CG-3M (G-meter) 408278, (S-meter) 9711410
GPS	Leica 1230GG Base & Rovers
Number of Points Surveyed	535
Gravity Base	Daishsat Base 0375
Date of Survey	17th November to 28th November 2007

Mt Ive Gravity Survey

Client	Heathgate Resources
Survey Name	Mt Ive
Operators	NM, MR, MH, - Pilots AC, RK, PM, CH
Techniques Employed	GPS, Gravity
Station Spacing	1.0km
Line Spacing	1.0km & 250m
Gravity Meter	Scintrex CG-3M (G-meter) 408278, (S-meter) 9711410
GPS	Leica 1230GG Base & Rovers
Number of Points Surveyed	942
Gravity Base	Daishsat Base 0373
Date of Survey	11th November to 17th November 2007

Moonaree Gravity Survey

Client	Heathgate Resources
Survey Name	Moonaree
Operators	NM, MR, MH, - Pilots AC, RK, PM, CH
Techniques Employed	GPS, Gravity
Station Spacing	1.0km
Line Spacing	1.0km
Gravity Meter	Scintrex CG-3M (G-meter) 408278, (S-meter) 9711410
GPS	Leica 1230GG Base & Rovers
Number of Points Surveyed	1086
Gravity Base	Daishsat Base 0374
Date of Survey	17th November to 28th November 2007

APPENDIX D
Base Station Information

GPS Gravity Base 0373 Mt Ive Station

MGA94		GDA94	
EASTING (m)	600478.447	LATITUDE (DMS)	32^0 26' 21.62796" S
NORTHING (m)	6410362.199	LONGITUDE (DMS)	136^0 04' 07.92633"E
ZONE (UTM)	53	GDAHT (m)	170.481
HEIGHT (AHD, m)	170.581	N (AUSGEOID98, m)	-0.100
OBSERVED GRAVITY		**SURVEYED BY**	
979476.508 mGals		GPS - Daishsat using a multiple static sessions and the AUSPOS online GPS Processing system. Expected accuracy of station coordinates better than 0.005m. Gravity – Daishsat using ABA ties with AFGN station at Nonning Station. Expected accuracy better than 0.01 mGals.	

MISCELLANEOUS DETAILS

The base is located on Mt Ive Station to the west of Port Augusta, and to the south of Lake Gairdner. The base location is to the right of the gate that accesses the air strip at Mt Ive station.

This station consists of a small star picket protruding 15cm out of the ground, and is witnessed by a larger star picket positioned 30cm to the right. A circular concrete slab located beside the star pickets is the gravity base.

The base may be accessed by driving to Mt Ive Station. The drive from Pt Augusta to Mt Ive station takes 2.5 hours. Head towards Iron Knob then take the first right 200m after going past the turn off to Iron Knob. There is 122km of dirt road before you turn right into Mt Ive station. The airstrip is located to the south east of the main farm buildings.

Photo of Daishsat Base 0373 showing distinguishing features

GPS Gravity Base 0374 Kangaroo Well

MGA94		GDA94	
EASTING (m)	561492.902	LATITUDE (DMS)	31^0 45' 45.61696" S
NORTHING (m)	6485686.468	LONGITUDE (DMS)	135^0 38' 57.67040"E
ZONE (UTM)	53	GDAHT (m)	194.831
HEIGHT (AHD, m)	194.886	N (AUSGEOID98, m)	-0.035
OBSERVED GRAVITY		**SURVEYED BY**	
979422.845 mGals		GPS - Daishsat using a multiple static sessions and the AUSPOS online GPS Processing system. Expected accuracy of station coordinates better than 0.005m. Gravity – Daishsat using ABA ties with AFGN station at Nonning Station. Expected accuracy better than 0.01 mGals.	

MISCELLANEOUS DETAILS

The base is located in on Moonaree Station at Kangaroo Well to the west of Pt Augusta directly west of Lake Gairdner. The base location is in the run next to the station horse yards. The station is located about 100m to the NW of the guess house near the cattle yards.

This station consists of a small star picket protruding 15cm out of the ground, and is witnessed by a larger star picket positioned 30cm to the right. A circular concrete slab located beside the star pickets is the gravity base.

The base may be accessed by driving north from Mt Ive to Kangaroo Well. The drive from Pt Augusta to the station takes 3.5 hours. Head towards Iron Knob then take the first right 200m after going past the turn off to Iron Knob. The station is about 230km along the dirt access road. Kangaroo well is well signposted.

Photo of Daishsat Base 0374 showing distinguishing features

GPS Gravity Base 0375 The Twins

MGA94		GDA94	
EASTING (m)	538257.255	LATITUDE (DMS)	29^0 59' 41.98226" S
NORTHING (m)	6681703.033	LONGITUDE (DMS)	135^0 23' 47.91036"E
ZONE (UTM)	53	GDAHT (m)	188.127
HEIGHT (AHD, m)	185.769	N (AUSGEOID98, m)	2.325
OBSERVED GRAVITY		**SURVEYED BY**	
979268.001 mGals		GPS - Daishsat using a multiple static sessions and the AUSPOS online GPS Processing system. Expected accuracy of station coordinates better than 0.005m. Gravity – Daishsat using ABA ties with AFGN station at Nonning Station. Expected accuracy better than 0.01 mGals.	

MISCELLANEOUS DETAILS

The base is located in on the Twins station to the north of Glendambo and south of Coober Pedy. The base location is by the fence to the west of the shearer's quarters which is just past the homestead. The homestead is approximately 25km off the Stuart Highway.

This station consists of a small star picket protruding 15cm out of the ground, and is witnessed by a larger star picket positioned 30cm to the right. A circular concrete slab located beside the star pickets is the gravity base.

The base may be accessed by driving to The Twins Station. This is about 165km to the north of Glendambo and 165km to the south of Coober Pedy.

Photo of Daishsat Base 0375 showing distinguishing features

APPENDIX E

Data CD
(Attached To Back Cover)