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EL 3655 / 4882

KINGOONYA

THIRD PARTIAL SURRENDER REPORT, FOR THE PERIOD 27/11/2006 TO 26/11/2014

Submitted by
Stellar Resources Ltd
2014

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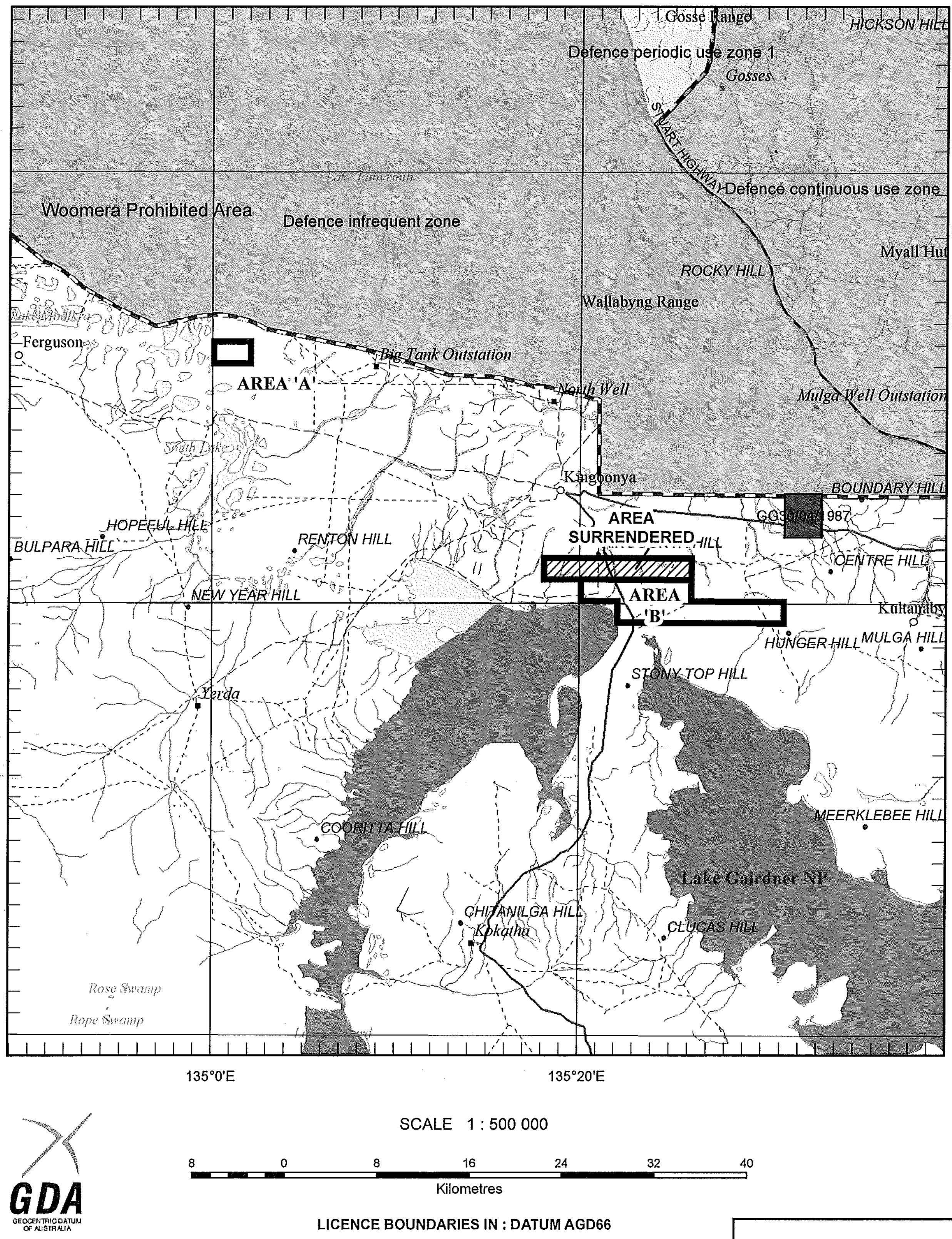
Government of South Australia
Department of State Development

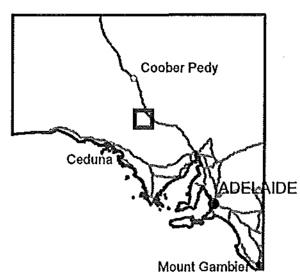
SCHEDULE A



GDA
GEOCENTRIC DATUM OF AUSTRALIA

LICENCE BOUNDARIES IN : DATUM AGD66

LOCALITY



APPLICANT : **HILTABA GOLD PTY LTD**

FILE REF : **2011/00252** TYPE : **MINERAL ONLY**

AREA : **50** sq km (approx)

1 : 250 000 MAPSHEETS : **KINGOONYA**

LOCALITY : **KINGOONYA AREA - Approximately 70 km southeast of Tarcoola**

DATE GRANTED: **27-Nov-2011** DATE EXPIRED: **26-Nov-2014** EL NO: **4882**

Hiltaba Gold Pty Ltd
ACN 099 086 683
a subsidiary of Stellar Resources Limited

Level 17, 530 Collins Street
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21 October 2014

Department of State Development,
Minerals Resources Division,
GPO Box 320,
Adelaide,
SA. 5001.

Dear Sir/Madam,

EL4882 Kingoonya
Relinquishment Area Report - 26/11/2014

This report is for exploration activities conducted on the relinquishment area of EL4882 to 26/11/2014.

Tenement Summary

EL4882 is approximately 300km north-west of Port Augusta and is centred on the small settlement of Kingoonya on the Trans Australian Railway. The tenement consists of two blocks: Block A (western) centred 30km NW of Kingoonya, and Block E (eastern) centred 13km SE of Kingoonya which lie north of Lake Harris and Lake Gairdner. The blocks are covered by 1:250k map sheets Kingoonya SH53-11 and Gairdner SH53-15. Access is via the sealed Stuart Highway (30km to the north and east) and the Trans Australian Railway access road to Kingoonya, with local access along station tracks and fence line tracks. The topography is flat lying with scattered small salt lakes. The relinquishment area is for part of Block E (Figure 1).

EL4882 (as prior EL3655) was granted to Gingertom Resources Pty Ltd, a wholly owned subsidiary of UraniumSA Limited (USA) on 27/11/2006. The tenement originally covered 499km^2 in six sections, and was subsequently reduced to an area of 377.1km^2 in five sections. Ownership was transferred to Hiltaba Gold Pty Ltd (wholly owned by Stellar Resources Ltd) from 26/10/2009. EL3655 was renewed as subsequent licence EL4882 in 27/11/2011 for the same area. Upon renewal in 2013 the area was reduced from 377km^2 to 73km^2, and upon renewal in 2014 was further reduced to 49.5km^2 (Figure 1).

The tenement was subject to a farm-in and joint venture agreement between Hiltaba Gold Pty Ltd and AngloGold Ashanti Australia Limited (AGA) from 4/10/2010 to 28/02/2013.

Geological Summary

EL4882 lies within the Pre-Cambrian Gawler Craton, which underlies a large part of South Australia, and is dominated by felsic volcanic rocks of the Gawler Range Volcanics (GRV) to the south and arenaceous sediments of the Pandurra Formation to the north and east (figure 4). The relinquishment area consists of Lower Gawler Range Volcanics. These are of Mesoproterozoic age (approx 1593Ma) and consist primarily of calc-alkaline dacite-rhyodacite-rhyolite pyroclastic rocks deposited sub-aerially on an older late Archaean to Palaeoproterozoic basement (Blissett et al, 1993). Basement comprises Archaean gneisses of the Mulgathing Suite and Archaean mafic to ultramafic rocks of the Harris Greenstone Sequence (Tonkin, D., 2006).

AGA were targeting Hiltaba age lithologies hosted by Archaean and Palaeoproterozoic rocks that may have been “smoke” marginal to a major Au±Cu deposit concealed beneath the GRV in the southern part of the eastern block of the licence. Their focus was on a broad, diffuse magnetic “shellback” anomaly which was interpreted to be similar to that which hosts the Carrapateena, Olympic Dam and Osborne IOCG deposits.

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Exploration Summary

Prior to Hiltaba and AGA, earlier exploration work was undertaken by SADME and Pima Mining Ltd. A summary of work done on the relinquishment area of Block E follows (Figures 2, 3, 4):

- Regional aeromagnetics and gravity surveys, SADME;
- Calcrete sampling x 24, assayed for As, Au, Cu, Pima 1999, 1000m spacings.

As part of AGA's 2011 IOCG exploration programme, AGA undertook an aeromagnetic survey (Figure 5) and a ground gravity survey (Figure 6). Data for the surveys was supplied to DMITRE with the EL3655 2011 Annual Technical Report.

- Aeromagnetic/radiometric survey: 662 line kilometres on n/s 100m spaced lines within EL3655, with the northern 1.4km falling within the relinquishment area.
- Gravity survey: 386 stations at 400m spacings within EL3655, with 147 within the relinquishment area.

Exploration Conclusions

AGA concluded that airborne magnetic and ground gravity surveys had defined more detailed anomalies within the targeted broad “shell-back” magnetic feature for potential IOCG mineralisation. The anomalies were interpreted to relate mainly to 827Ma, NNW-trending Gairdner Suite mafic dykes, which are not related to any known mineralisation. They recommended further interpretation of the geophysical datasets, possibly with follow-up detailed geophysical surveying of selected targets, before any drilling targets could be finalised. AGA did no further field work for EL3655 or EL4573.

Appendix 1

Gravity report and gravity data

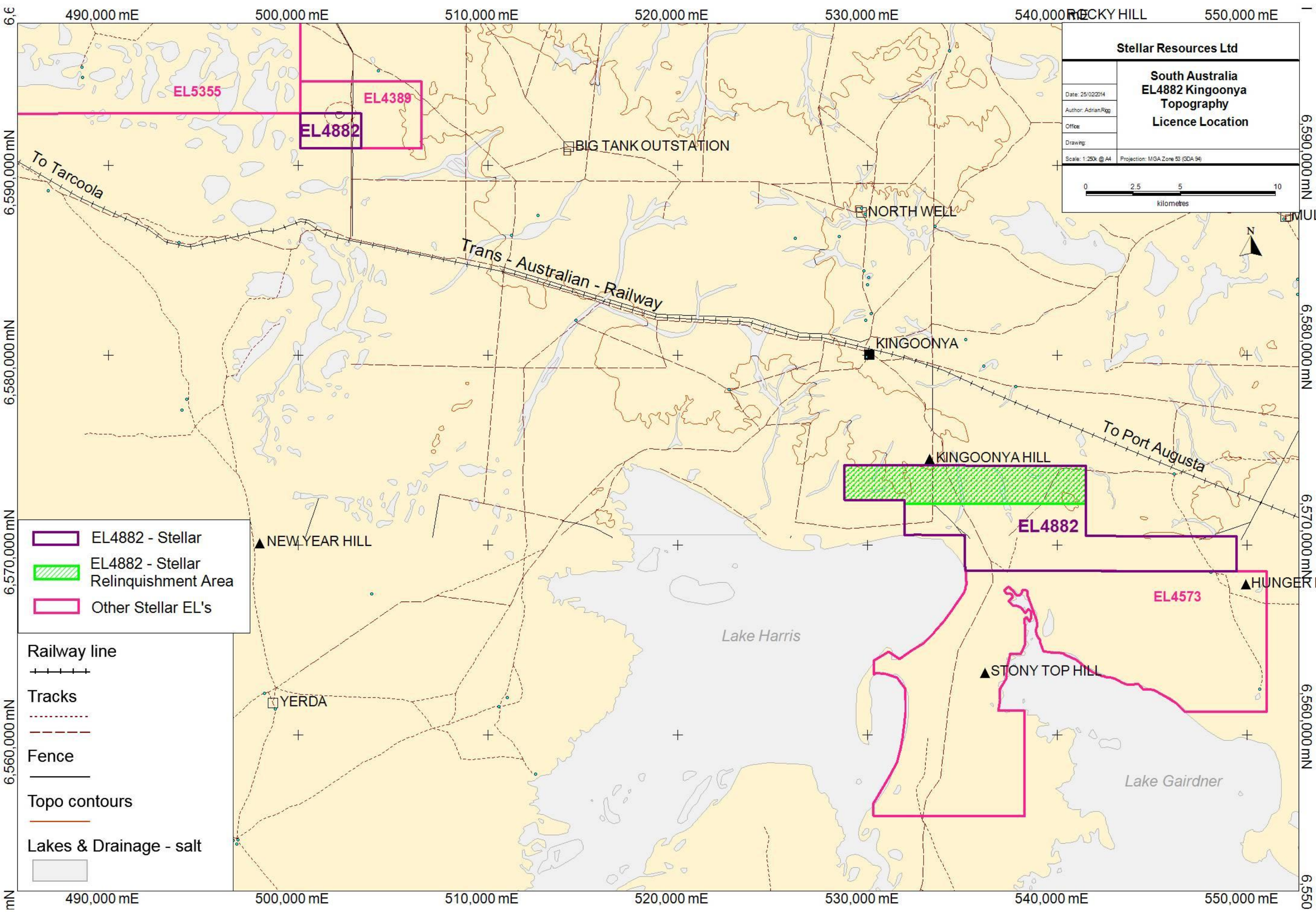

Figure 1. EL4882 Kingoonya: Topography 2014 Relinquishment Area Location

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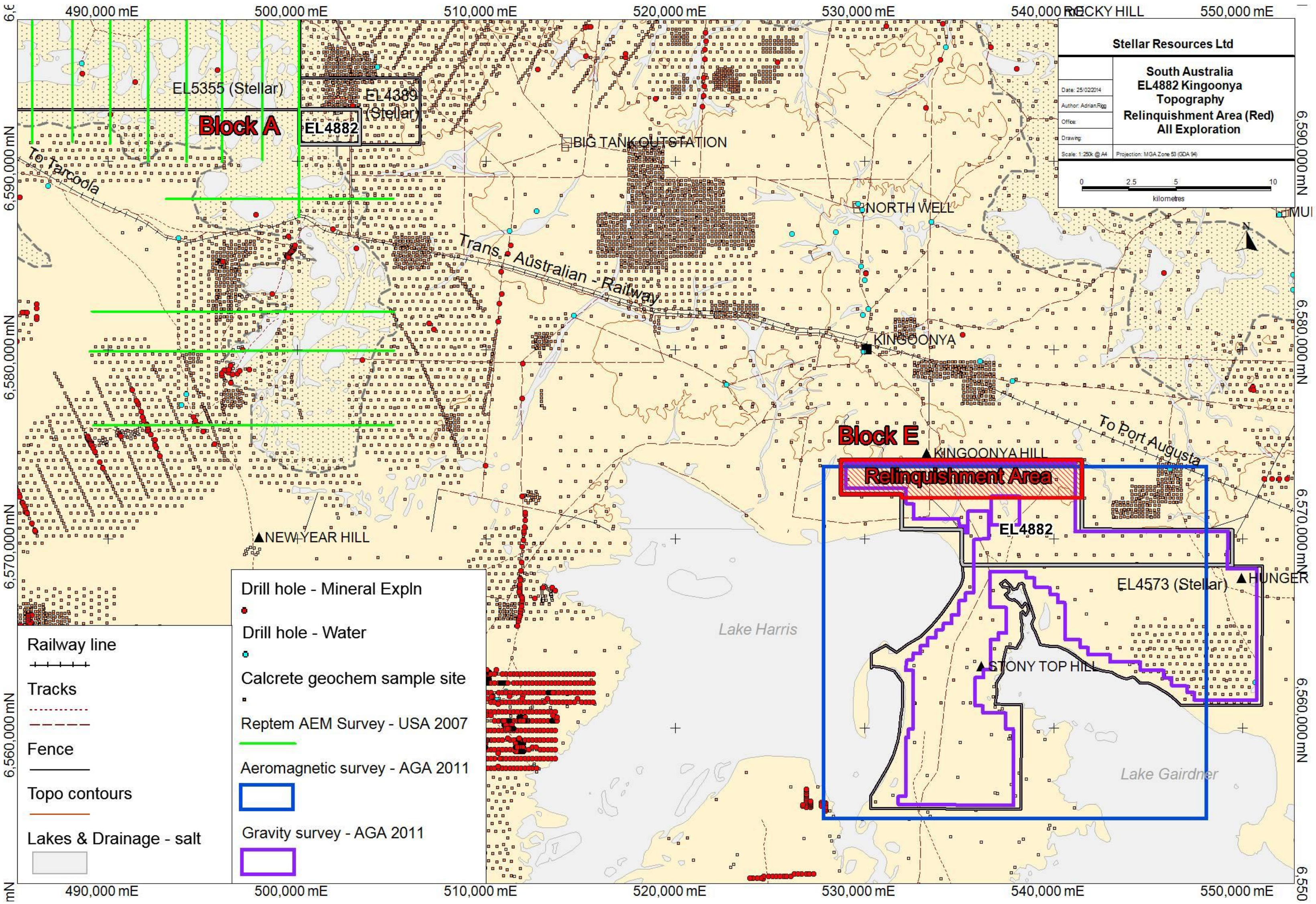

Figure 2. EL4882 Kingoonya: Topography, Relinquishment Area Exploration

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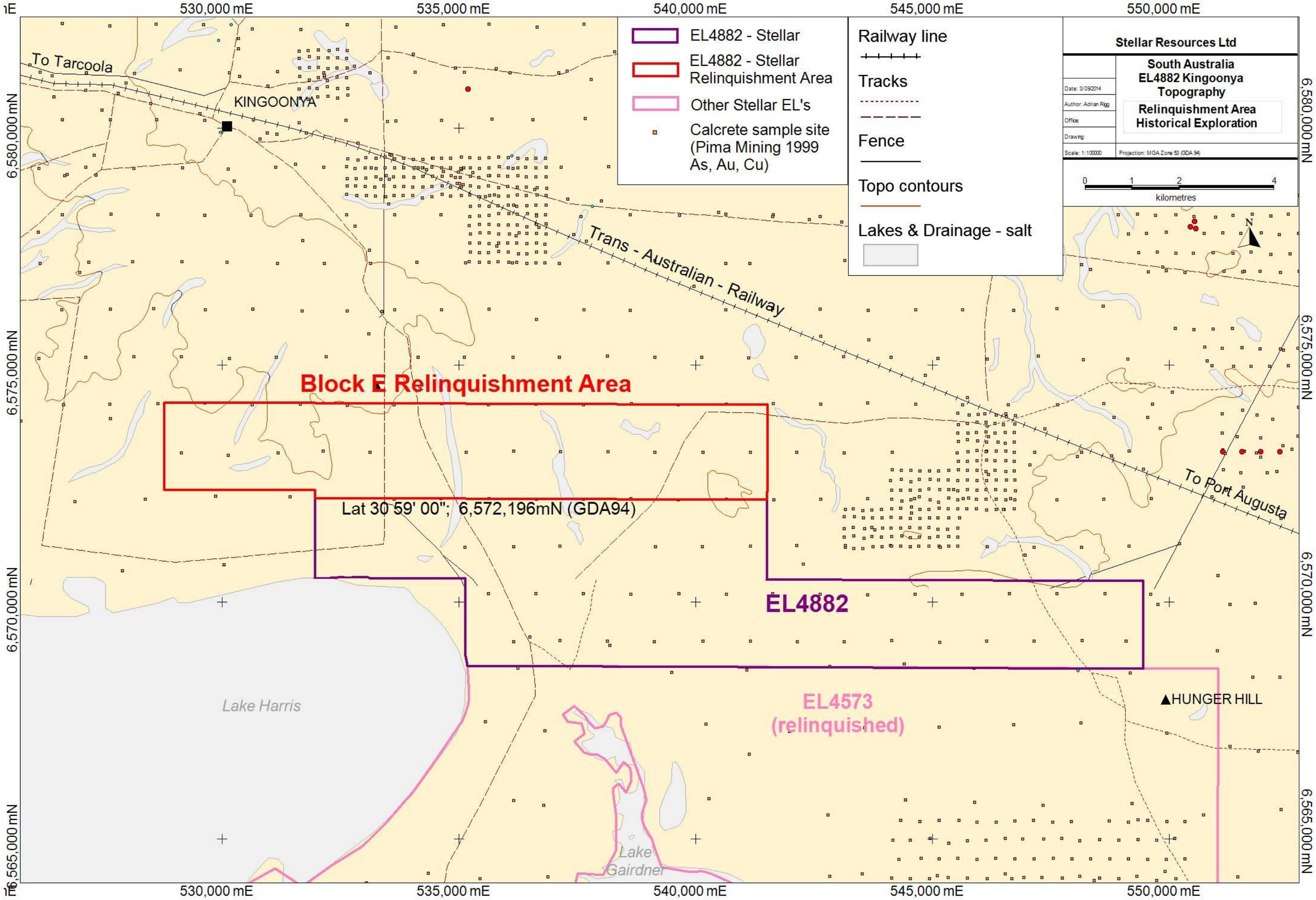

Figure 3. EL4882 Kingoonya: Topography, Block E Relinquishment Area Pre-Hiltaba Exploration

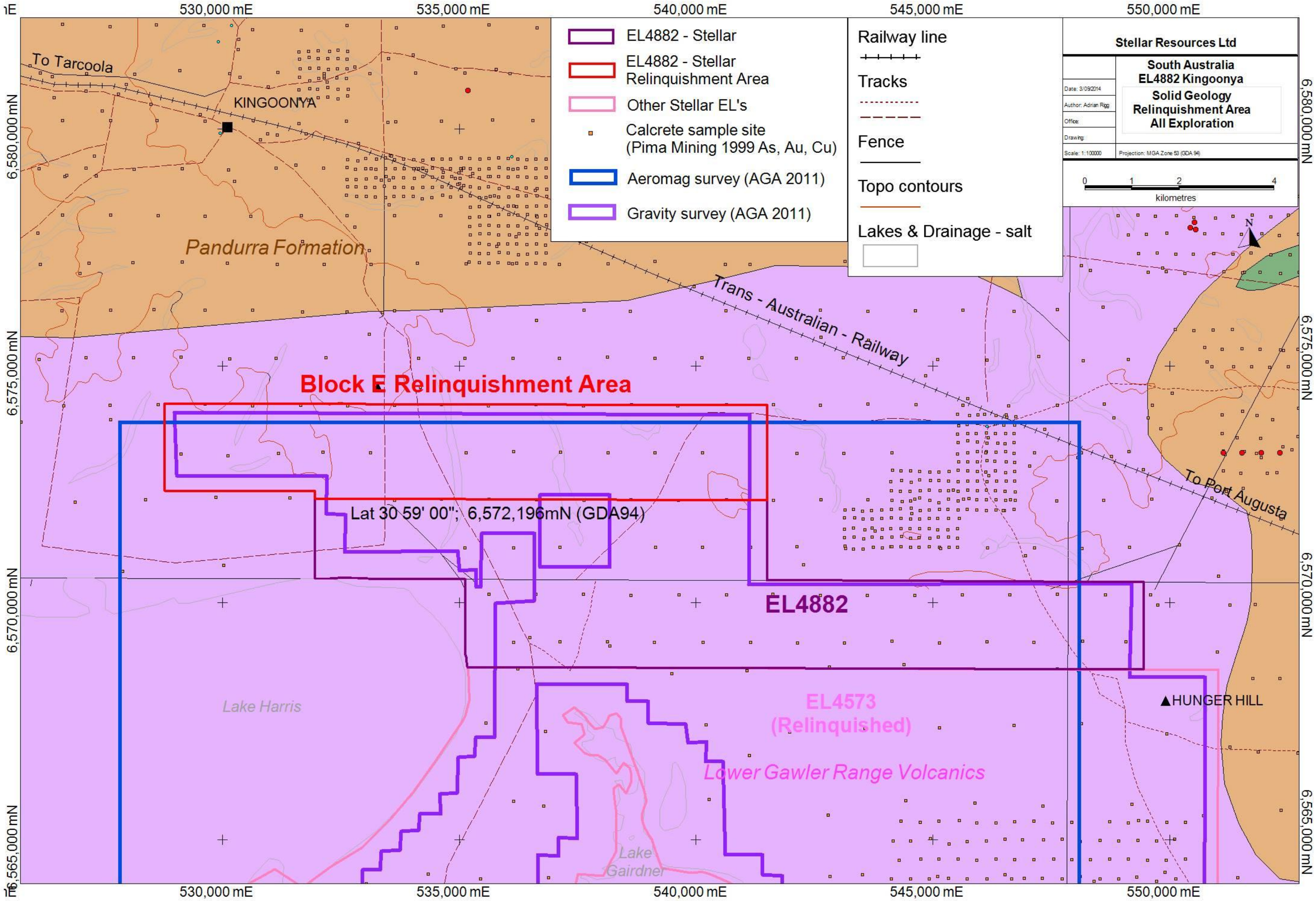

Figure 4. EL4882 Kingoonya: Solid Geology, Block E Relinquishment Area All Exploration

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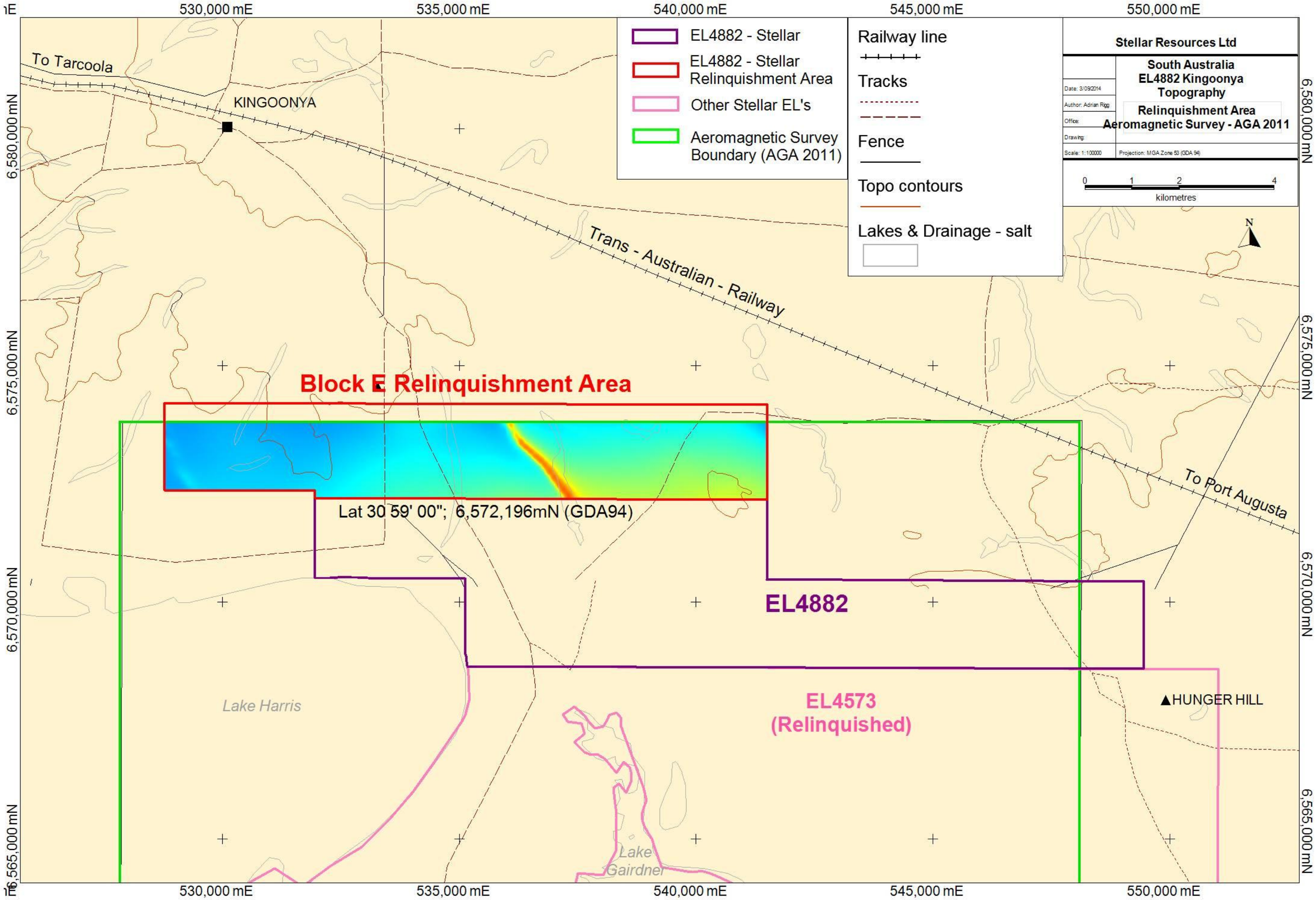

Figure 5. EL4882 Kingoonya: Aeromagnetics, Block E Relinquishment Area AGA Exploration

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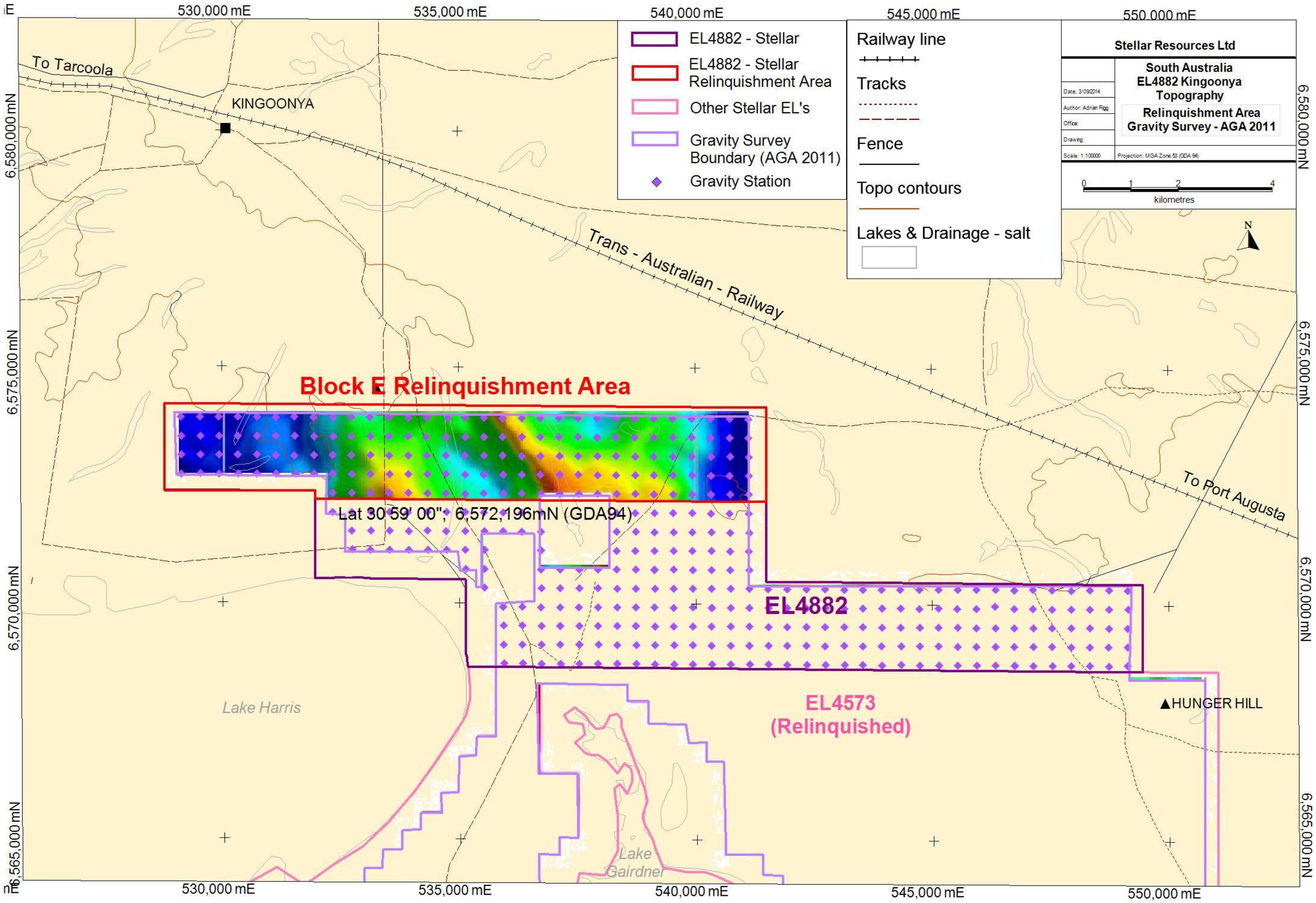

Figure 6. EL4882 Kingoonya: Gravity, Block E Relinquishment Area AGA Exploration

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References:

Blisset, A.H., Creaser, R.A., Daly, S.J., Flint, R.B. & Parker, A.J., 1993. Gawler Range Volcanics. In Drexel, J.F., Priess, W.V. & Parker, A.J. (eds), The Geology of South Australia, Volume 1, The Precambrian, pp107-124.

Morant, P., 2011, Gairdner Project, EL3655, Annual Report for the Period 27 November 2010 to 26 November 2011, AngloGold Ashanti Australia Ltd.

Tonkin, D., 2006, Independent Geologists Report. Replacement Prospectus. UraniumSA Ltd (unpub).

Warland, N.G., 2008, Annual Technical Report for the period ending 26th November 2007, EL 3655 'Kingoonya', UraniumSA Ltd.

Yours sincerely,

Peter Blight
Managing Director

Atlas Geophysics Memorandum M2011015

Gairdner Gravity Survey

AngloGold Ashanti Limited

Memo completed by:

Nathan Porter
Database Manager/Processor

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27 September 2011

TABLE OF CONTENTS

APPENDICES

1.0 Project Brief

Project P2011015 required the acquisition and processing of 1,142 gravity stations over tenements held by AngloGold Ashanti Limited. The gravity survey was located over an area known as Gairdner, about 10km south of Kingoonya, in central South Australia (Figure 1). The survey area can be accessed using an unsealed road that travels SE from Kingoonya town site and Trans Continental Road.

Acquisition commenced on 23rd April 2011 and was completed 29th April 2011 with final data delivered shortly thereafter.

Gravity data were acquired using a 400m square grid configuration, with all points covering one single area. Appendix B contains a plot of the locations of acquired gravity stations.

Acquisition was carried out using two ATV's, each with a single operator. The crew were accommodated and messed at the Kingoonya Hotel.

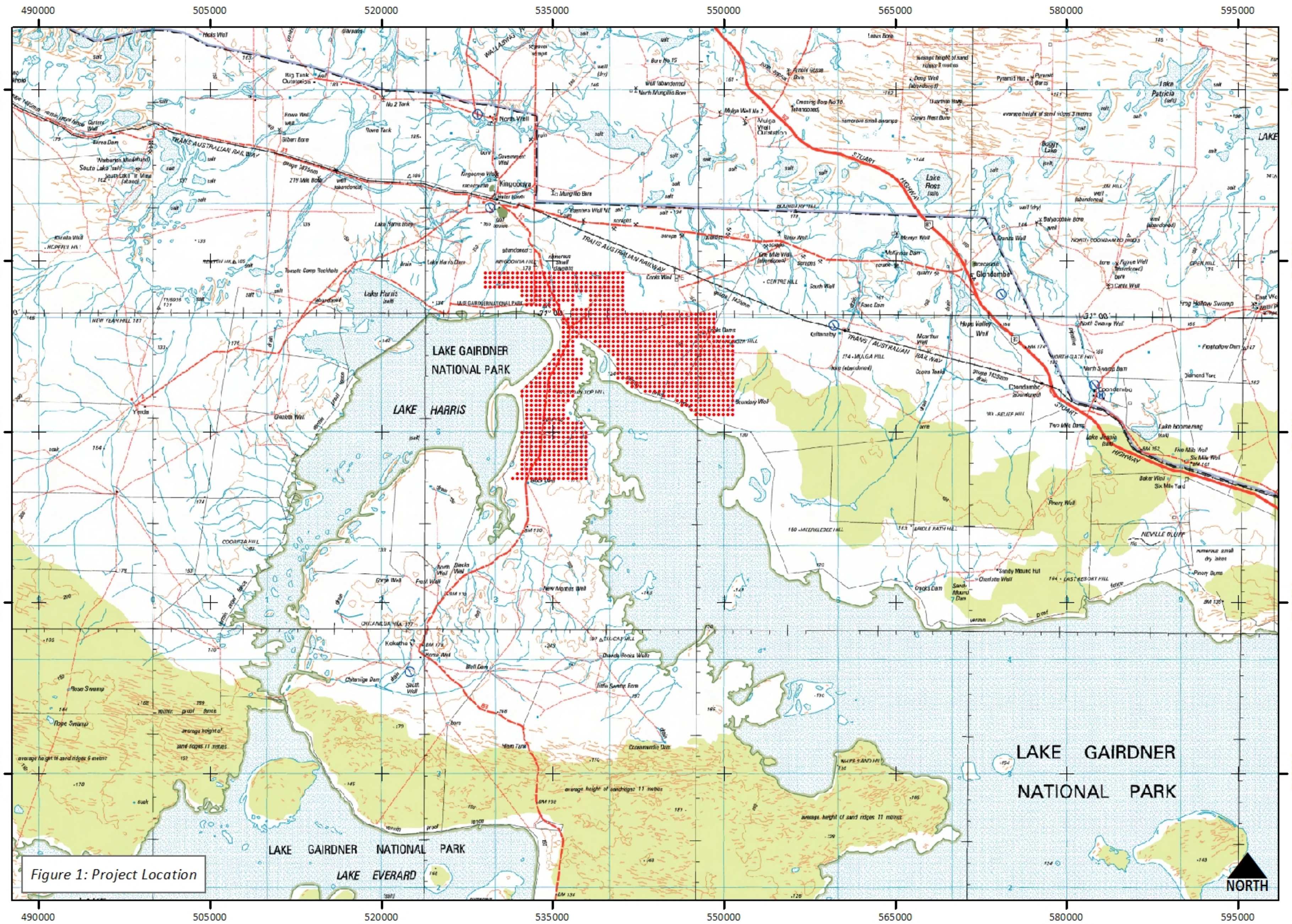


Figure 1: Project Location

2.0 Equipment and Instrumentation

The following instrumentation was used for acquisition of the gravity data:

- Two Scintrex CG5 Autograv Gravity Meters (Serial Numbers 40298, 40269, SF 1.000000)
- Three Leica System 1200 GPS-Glonass receivers
- One Leica System 500 GPS receiver

Ancillary equipment included:

- Two HP Laptop computers for data download and processing
- Magellan FX324 autonomous GPS receivers for navigation
- Iridium satellite phones for long distance communications
- Personal Protective Equipment for all personnel
- Batteries, battery chargers, solar cells, UPS System
- Survey consumables
- Tools, engineering and maintenance equipment for vehicle servicing
- First aid and survival kits
- Tyres and recovery equipment
- GeoPro satellite tracking devices for long distance communication and tracking

3.0 Calibration and Control

The gravity meters used for survey have been recently calibrated on the Guildford Cemetery – Helena Valley Primary School calibration range (2010990117- 2010990217) in Western Australia. The calibration process has validated the gravity meter's scale factor to ensure reduction of the survey data produces correct Observed Gravities from measured dial reading values.

A single GPS-Gravity control station (201101500001 Kingoonya) was established on 22nd April, 2011 to control field observations. Appendix A contains a description for the station.

Primary GPS control was established by submitting static data to Geoscience Australia's AUSPOS processing system to produce first-order geodetic coordinates accurate to better than 10mm for the x, y and z observables. Multiple days of static GPS data have been submitted to ensure accuracy and reliability of the solution. The details of the control process have been summarised in a table included in Appendix C.

Primary gravity control was established at the same location as the primary GPS control station. Once tied to the Australian Fundamental Gravity Network (AFGN), the gravity control station allowed all field gravity observations to be tied to the Australian Absolute Gravity Datum 2007 (AAGD07). An accurate observed or absolute gravity value for the control station was established via "ABA" ties with the project gravity meters to AFGN "1994932503" at the Mobil Roadhouse in Glendambo, on the 22nd and 30th April 2011. Expected accuracy of the tie survey would be 0.01 mGal (0.1gu).

4.0 GPS-Gravity Acquisition

Gravity data were acquired concurrently with GPS data using two Scintrex CG5 gravity meters. Data were acquired in a single shift of 10 hours duration, with each shift consisting of a single loop controlled by observations at the gravity control station. Each loop contained a minimum of two repeated readings so that an interlocking network of closed loops was formed. A total of **5.52%** repeats were acquired for quality control purposes. Repeat readings were evenly distributed on a time-basis throughout each of the gravity loops.

GPS data were acquired with the rover receivers operating in post-process kinematic (PPK) mode. When carrying out acquisition with an ATV, the GPS-Glonass sensor is mounted on the front of the ATV (fixed antenna heights of 1.49m and 1.545m) and the PPK data are logged by the receivers inside a protective case mounted to the front of the ATV. Static data were logged at the control station for submission to AUSPOS for delivery of final coordinates.

5.0 GPS Processing and QA

The acquired GPS and Glonass raw data were processed nightly in the field using Novatel Waypoint GrafNav v8.3 post-processing software. The resulting data (in Atlas Geophysics PPK standard format) were then imported into Atlas Geophysics Reduction and Interpretation Software (AGRIS) for QA and use in the reduction of the gravity data.

Projection from GPS-Glonass derived WGS84/GDA94 coordinates to Map Grid of Australia (MGA) coordinates was performed in GrafNav. For most practical applications where a horizontal accuracy of only a metre or greater is required, GDA94 coordinates can be considered the same as WGS84. MGA coordinates were obtained by projecting the GPS-derived WGS84 coordinates onto MGA Zone 53S using a Universal Transverse Mercator (UTM) projection. Elevations above the Australian Height Datum (AHD) were modelled using GrafNav software and the AUSGEOID98 geoid model.

A module built into AGRIS allowed the user to import the positional data from GrafNav and examine quality factors such as station repeatability between multiple control stations, coordinate velocity, dilution of precision, coordinate quality factor and standard error for each gravity station location. The procedure is carried out before merging the positional data with gravity data for final reduction to Bouguer anomaly. Comprehensive statistics, repeatability analysis and histogram plotting are also performed.

Quality control procedures were applied to the GPS-Glonass data on a daily basis and any gravity stations not conforming to the quoted specifications were repeated by the company at no cost to the client.

6.0 Gravity Processing and QA

The acquired gravity data were processed using the company's in-house gravity pre-processing and reduction software, AGRIS. This software allows for full data pre-processing, reduction to Bouguer Anomaly, repeatability and statistical analysis, as well as full quality analysis of the output dataset.

Once downloaded from the gravity meter, the data are analysed for consistency and preliminary QA is performed to check that observations meet specification for standard deviation, reading rejection, temperature and tilt values. Once the data are verified, the software averages the multiple readings and performs a merge with the GPS data (which it has also previously verified) and performs a linear drift correction and earth tide correction. Any gravity stations not conforming to the quoted specifications were repeated by the company at no cost to the client.

The following corrections were applied to the dataset to produce Spherical Cap Bouguer Anomalies on the GRS80 ellipsoid and AAGD07 gravity datum. For legacy reasons, Geoidal Bouguer Anomalies on the Australian Height Datum (AHD) and ISOGAL84 gravity datum have also been calculated. The formulae below produce data in μms^{-2} or gravity units. To convert to mGal, divide by a factor of 10.

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

$$r_c = 10 \cdot (r \cdot S(r))$$

where,

r_c	corrected reading in gravity units
r	gravity meter reading in dial units
$S(r)$	scale factor (dial units/milliGal)

Earth Tide Correction: The earth is subject to variations in gravity due to the gravitational attraction of the Sun and the Moon. These background variations can be corrected for using a predictive formula which utilises the gravity observation position and time of observation. The Scintrex CG5 gravity meter automatically calculates ETC but uses only an approximate position for the gravity observation so is not entirely accurate. For this reason, the Scintrex ETC is subtracted from the reading and a new correction calculated within AGRIS software.

$$r_t = r_c + g_{tide}$$

where,

r_t	tide corrected reading in gravity units
r_c	scale factor corrected reading in gravity units
g_{tide}	Earth Tide Correction (ETC) in gravity units

Instrument Drift Correction: Since all gravity meters are mechanical they are all prone to instrument drift. Drift can be caused by mechanical stresses and strains in the spring mechanism as the meter is moved, knocked, reset, subjected to temperature extremes, subjected to vibration, unclamped etc. The most common cause of instrument drift is due to extension of the sensor spring with changes in temperature (obeying Hooke's law). To calculate and correct for daily instrument drift, the difference between the gravity control station readings (closure error) is used to assume the drift and a linear correction is applied.

$$ID = \frac{r_{cs2} - r_{cs1}}{t_{cs2} - t_{cs1}}$$

where,

ID	Instrument Drift in gu/hour
r_{cs2}	control station 2nd reading in gravity units
r_{cs1}	control station 1st reading in gravity units
t_{cs2}	control station 2 time
t_{cs1}	control station 1 time

Observed Gravity: The preceding corrections are applied to the raw gravity reading to calculate the earth's absolute gravitational attraction at each gravity station. The corrections produced Observed Gravities on the AAGD07 and ISOGAL84 datums.

$$G_o = g_{cs1} + (r_t - r_{cs1}) - (t - t_{cs1}) \cdot ID$$

where,

G_o	Observed Gravity in gravity units (ISOGAL84 or AAGD07)
g_{cs1}	control station 1 known Observed Gravity in gravity units
r_t	tide corrected reading in gravity units
r_{cs1}	control station 1 reading in gravity units
t	reading time
t_{cs1}	control station 1 time
ID	instrument drift in gravity units/hour

Theoretical Gravity 1980: The theoretical (or normal) gravity value at each gravity station is calculated based on the assumption that the Earth is a homogeneous ellipsoid. The closed form of the 1980 International Gravity Formula is used to approximate the theoretical gravity at each station location and essentially produce a latitude correction. Gravity values vary with latitude as the earth is not a perfect sphere and the polar radius is much smaller than the equatorial radius. The effect of centrifugal acceleration is also different at the poles versus the equator.

$$G_{t80} = 9780326.7715((1 + 0.001931851353(sin^2 l)/(SQRT(1 - 0.0066943800229(sin^2 l)))$$

where,

G_{t80}	Theoretical Gravity 1980 in gravity units
l	GDA94 latitude at the gravity station in decimal degrees

Theoretical Gravity 1967: The theoretical (or normal) gravity value at each gravity station is calculated based on the assumption that the Earth is a homogeneous ellipsoid. The 1967 variant of the International Gravity Formula is used to approximate the theoretical gravity at each station location and essentially produce a latitude correction. Gravity values vary with latitude as the earth is not a perfect sphere and the polar radius is much smaller than the equatorial radius. The effect of centrifugal acceleration is also different at the poles versus the equator.

$$G_{t67} = (9780318.456 \cdot \left(1 + 0.005278895 \cdot sin^2(l) + 0.000023462 \cdot sin^4(l)\right))$$

where,
G_{t67} Theoretical Gravity 1967 in gravity units
l GDA94 latitude at the gravity station in decimal degrees

Atmospheric Correction: The gravity effect of the atmosphere above the ellipsoid can be calculated with an atmospheric model and is subtracted from the theoretical gravity.

$$AC = 8.74 - 0.00099 \cdot h + 0.0000000356 \cdot h^2$$

where,
AC Atmospheric Correction in gravity units
h elevation above the GRS80 ellipsoid in metres

Ellipsoidal Free Air Correction: Since the gravity field varies inversely with the square of distance, it is necessary to correct for elevation changes from the reference ellipsoid (GRS80). Gravitational attraction decreases as the elevation above the reference ellipsoid increases.

$$EFAC = -(3.087691 - 0.004398\, sin^2 l) \cdot h + 7.2125 \cdot 10^{-7} \cdot h^2$$

where,
$EFAC$ Ellipsoidal Free Air Correction in gravity units
l GDA94 latitude at the gravity station in decimal degrees
h elevation above the GRS80 ellipsoid in metres

Geoidal Free Air Correction: Since the gravity field varies inversely with the square of distance, it is necessary to correct for elevation changes from the reference geoid (AHD). Gravitational attraction decreases as the elevation above the reference geoid increases.

$$GFAC = \left(3.08768 - 0.00440 sin^2(l)\right) \cdot h - 0.000001442 \cdot h^2$$

where,
$GFAC$ Free Air Correction in gravity units
l GDA94 latitude at the gravity station in decimal degrees
h elevation above the reference geoid (AHD) in metres

Spherical Cap Bouguer Correction: If a gravity observation is made above the reference ellipsoid, the effect of rock material between the observation and the ellipsoid must be taken into account. The mass of rock makes a positive contribution to the gravity value. The correction is calculated using the closed form equation for the gravity effect of a spherical cap of radius 166.7km, based on a spherical Earth with a mean radius of 6,371.0087714km, height relative the ellipsoid and rock densities of 2.67, 2.40 and 2.20 tm^{-3} (gm/cc).

$$SCBC = 2\pi G\rho((1 + \mu) \cdot h - \lambda R)$$

where,

$SCBC$ Spherical Cap Bouguer Correction in gravity units
G gravitational constant = $6.67428 \cdot 10^{-11} m^3 kg^{-1} s^{-2}$
ρ rock density (2.67, 2.40 and 2.20 tm^{-3})
h elevation above the GRS80 ellipsoid in metres
R $(R_o + h)$ the radius of the earth at the station
R_o mean radius of the earth = 6,371.0087714 km (on the GRS80 ellipsoid)
μ & λ are dimensionless coefficients defined by:

$$\mu = ((1/3) \cdot \eta^2 - \eta)$$

where,

η h/R

$$\lambda = (1/3)\{(d + f\delta + \delta^2)[(f - \delta)^2 + k]^{\frac{1}{2}} + p + m \cdot ln(n/(f - \delta + [(f - \delta)^2 + k]^{\frac{1}{2}})\}$$

where,

d $3 \cdot cos^2\alpha - 2$
f $cos\alpha$
k $sin^2\alpha$
p $-6 \cdot cos^2\alpha \cdot \sin(\alpha/2) + 4 \cdot sin^3(\alpha/2)$
δ (R_o/R)
m $-3 \cdot k \cdot f$
n $2 \cdot [sin\,(\alpha/2) - sin^2(\alpha/2)]$
α S/R_o with S = Bullard B Surface radius = 166.735 km

Geoidal Bouguer Correction: If a gravity observation is made above the reference geoid, the effect of rock material between the observation and the ellipsoid must be taken into account. The mass of rock makes a positive contribution to the gravity value. The slab of rock makes a positive contribution to the gravity value. Rock densities of 2.67, 2.40 and 2.20 t/m^{-3} (gm/cc) were used in the correction.

$$GBC = 0.4191 \cdot \rho \cdot h$$

where,

GBC Geoidal Bouguer Correction in gravity units
ρ rock density (2.67, 2.40 and 2.20 tm^{-3})
h elevation above the reference geoid (AHD) in m

Terrain Correction: The terrain correction accounts for variations in gravity values caused by variations in topography near the observation point. The correction accounts for the attraction of material above the assumed Bouguer slab and for the over-correction made by the Bouguer correction when in valleys. The terrain correction is positive regardless of whether the local topography consists of a mountain or a valley. Terrain corrections were not applied on this project as the survey area was flat and devoid of any appreciable topography.

Ellipsoidal Free Air Anomaly: The Ellipsoidal Free Air Anomaly is the difference between the observed gravity and theoretical gravity that has been computed for latitude and corrected for the elevation of the gravity station above or below the reference ellipsoid.

$$EFAA = G_{oAAGD07} - (G_{t80} - AC) - EFAC$$

where,

$EFAA$ Ellipsoidal Free Air Anomaly in gravity units
G_o Observed Gravity on the AAGD07 datum in gravity units
G_{t80} Theoretical Gravity 1980 in gravity units
AC Atmospheric Correction in gravity units
$EFAC$ Ellipsoidal Free Air Correction in gravity units

Geoidal Free Air Anomaly: The Geoidal Free Air Anomaly is the difference between the observed gravity and theoretical gravity that has been computed for latitude and corrected for the elevation of the gravity station above or below the reference geoid.

$$GFAA = G_{oISOGAL84} - G_{t67} + GFAC$$

where,

$GFAA$ Free Air Anomaly in gravity units
G_o Observed Gravity on the ISOGAL84 datum in gravity units
G_{t67} Theoretical Gravity 1967 in gravity units
$GFAC$ Geoidal Free Air Correction in gravity units

Spherical Cap Bouguer Anomaly: The Spherical Cap Bouguer Anomaly is computed from the Ellipsoidal Free Air Anomaly above by removing the attraction of the spherical cap calculated by the Spherical Cap Bouguer Correction.

$$SCBA = EFAA - SCBC$$

where,

$SCBA$ Spherical Cap Bouguer Anomaly in gravity units
$EFAA$ Ellipsoidal Free Air Anomaly in gravity units
$SCBC$ Bouguer Correction in gravity units

Geoidal Bouguer Anomaly: The Geoidal Bouguer Anomaly is computed from the Geoidal Free Air Anomaly above by removing the attraction of the slab calculated by the Geoidal Bouguer Correction.

$$GBA = GFAA - GBC$$

where,

GBA Geoidal Bouguer Anomaly in gravity units
$GFAA$ Geoidal Free Air Anomaly in gravity units
GBC Geoidal Bouguer Correction in gravity units

Complete Bouguer Anomaly: This is obtained by adding the terrain correction to the Bouguer Anomaly (Spherical Cap or Geoidal). The Complete Bouguer Anomaly is the most interpretable value derived from a gravity survey as changes in the anomaly can be directly attributed to lateral density contrasts within the geology below the observation point.

$$CBA = BA + TC$$

where,

CBA Complete Bouguer Anomaly in gravity units

BA Bouguer Anomaly in gravity units

TC Terrain Correction in gravity units

7.0 Results

The gravity survey was completed with seven days of acquisition, with only a two hour delay to production during this period due to a small mechanical problem with one of the ATV's. An average acquisition rate of 82 stations per crew for each day of production was achieved over the duration of the project. A copy of the full production report is contained on the data DVD.

Final raw data have met and exceeded quoted project specifications. Repeatability of the data was good, with the standard deviation of the elevation repeats at 0.035m and the standard deviation of the gravity repeats at 0.025 mGals. The production report contains summary statistics and histograms for repeatability.

8.0 Data Formats and Deliverables

Final reduced ASCII data for the project have been delivered in standard Atlas format. Table 2 overleaf details the format of the final gravity database supplied. All fields are comma delimited.

Appendix B contains plots of final station locations, images of GPS Derived Elevation (GRS80), Spherical Cap Bouguer Anomaly and first vertical derivative of Spherical Cap Bouguer Anomaly.

Raw GPS-GNSS and gravity data in their respective native formats have been included on the data DVD as Appendix D. Table 1 below summarises the deliverables.

Final Delivered Data	Format	Data DVD	Hardcopy
Gravity Database	Comma Space Delimited .csv	•	
Gravity Database	Geosoft Database .gdb	•	
Raw Positional Data	AGRIS format, comma delimited	•	
Raw Gravity Data	Scintrex CG5 format	•	
Final Grids	ER Mapper Grids .ers	•	
Final Images	Mapinfo Compatible .tif	•	•
Acquisition Memo	PDF .pdf	•	•

Table 1: Final Deliverables

Field Header	Field Description	Format	Units
PROJECT	Atlas Geophysics Project Number	A9	None
STATION	Unique Station ID	I8	None
STATIONCODE	Unique Station Code	A13	None
TYPE	Observation Type : Base, Field or Repeat	A8	None
MGAEAST	Coordinate Easting MGA94/GDA94	F11.3	m
MGANORTH	Coordinate Northing MGA94/GDA94	F12.3	m
ZONE	MGA Zone Number	F8.0	NA
GDA94LAT	Coordinate Latitude GDA94	F15.10	DD
GDA94LONG	Coordinate Longitude GDA94	F15.10	DD
ORTHOHTM	Coordinate Elevation Orthometric	F9.3	m
GRS80HTM	Coordinate Elevation Ellipsoidal	F9.3	m
NAG98	Geoid Separation	F8.3	m
AMG84EAST	Coordinate Easting AMG84	F11.3	m
AMG84NORTH	Coordinate Northing AMG84	F12.3	m
DATE	Observation Date	I8	None
TIME	Observation Time	I8	None
DIALMGAL	Gravity Dial Reading	F9.3	mGal
ETCMGAL	Earth Tide Correction (Longman)	F8.3	mGal
SCALE	Scale Factor Applied to Dial Reading	F9.6	None
OBSG84MGAL	Observed Gravity ISOGAL84	F11.3	mGal
OBSG84GU	Observed Gravity ISOGAL84	F11.2	gu
OBSGAAGD07GU	Observed Gravity AAGD07	F13.2	gu
OBSGAAGD007MGAL	Observed Gravity AAGD07	F16.3	mGal
DRIFTMGAL	Drift Applied to Dial Readings	F10.3	mGal
TGRAV67GU	Theoretical Gravity 1967	F11.2	gu
TGRAV67MGAL	Theoretical Gravity 1967	F12.3	mGal
TGRAV80GU	Theoretical Gravity 1980	F11.2	gu
GFACGU	Geoidal Free Air Correction	F8.2	gu
GFACMGAL	Geoidal Free Air Correction	F9.3	mGal
GFAAGU	Geoidal Free Air Anomaly	F8.2	gu
GFAAMGAL	Geoidal Free Air Anomaly	F9.3	mGal
GBC267GU	Geoidal Bouguer Correction 2.67 tm^-3	F9.2	gu
GBC240GU	Geoidal Bouguer Correction 2.40 tm^-3	F9.2	gu
GBC220GU	Geoidal Bouguer Correction 2.20 tm^-3	F9.2	gu
GBC267MGAL	Geoidal Bouguer Correction 2.67 tm^-3	F11.3	mGal
GBC240MGAL	Geoidal Bouguer Correction 2.40 tm^-3	F11.3	mGal
GBC220MGAL	Geoidal Bouguer Correction 2.20 tm^-3	F11.3	mGal
GBA267GU	Geoidal Bouguer Anomaly 2.67 tm^-3	F9.2	gu
GBA240GU	Geoidal Bouguer Anomaly 2.40 tm^-3	F9.2	gu
GBA220GU	Geoidal Bouguer Anomaly 2.20 tm^-3	F9.2	gu
GBA267MGAL	Geoidal Bouguer Anomaly 2.67 tm^-3	F11.3	mGal
GBA240MGAL	Geoidal Bouguer Anomaly 2.40 tm^-3	F11.3	mGal
GBA220MGAL	Geoidal Bouguer Anomaly 2.20 tm^-3	F11.3	mGal
TGRAV80ACGU	Theoretical Gravity 1980 Atmospheric Corrected	F11.2	gu
EFACGU	Ellipsoidal Free Air Correction	F9.2	gu
EFAAGU	Ellipsoidal Free Air Anomaly	F8.2	gu
SCBC267GU	Spherical Cap Bouguer Correction 2.67 tm^-3	F10.2	gu
SCBC240GU	Spherical Cap Bouguer Correction 2.40 tm^-3	F10.2	gu
SCBC220GU	Spherical Cap Bouguer Correction 2.20 tm^-3	F10.2	gu
SCBA267GU	Spherical Cap Bouguer Anomaly 2.67 tm^-3	F10.2	gu
SCBA240GU	Spherical Cap Bouguer Anomaly 2.40 tm^-3	F10.2	gu
SCBA220GU	Spherical Cap Bouguer Anomaly 2.20 tm^-3	F10.2	gu
SCBA267MGAL	Spherical Cap Bouguer Anomaly 2.67 tm^-3	F12.3	mGal
SCBA240MGAL	Spherical Cap Bouguer Anomaly 2.40 tm^-3	F12.3	mGal
SCBA220MGAL	Spherical Cap Bouguer Anomaly 2.20 tm^-3	F12.3	mGal
TCINNERGU	Inner Terrain Correction	F8.2	gu
TCINNERMGAL	Inner Terrain Correction	F8.3	mGal
QFINNER	Quality Factor Inner TC	I2	None
TCOUTERGU	Outer Terrain Correction	F8.2	gu
TCOUTERMGAL	Outer Terrain Correction	F8.3	mGal
QFOUTER	Quality Factor Outer TC	F2	None
TCTOTALGU	Total Terrain Correction	F8.2	gu
TCTOTALMGAL	Total Terrain Correction	F8.3	mGal
CGBA267GU	Complete Geiodal Bouguer Anomaly 2.67 tm^-3	F11.3	gu
CGBA267MGAL	Complete Geiodal Bouguer Anomaly 2.67 tm^-3	F11.3	mGal
CSCBA267GU	Complete Spherical Cap Bouguer Anomaly 2.67 tm^-3	F12.2	gu
CSCBA267MGAL	Complete Spherical Cap Bouguer Anomaly 2.67 tm^-3	F12.2	mGal
DIFFEASTM	Repeat Error for Easting Observation	F8.3	m
DIFFNORTHM	Repeat Error for Northing Observation	F8.3	m
DIFFHTM	Repeat Error for Elevation Observation	F8.3	m
DIFFOBSGMGAL	Repeat Error for Observed Gravity	F8.3	mGal
DIFFOBSGGU	Repeat Error for Observed Gravity	F8.2	gu
METERSN	Serial Number of Gravity Instrument	I8	None
CLOSUREGU	Loop Closure in gu	F8.2	gu
CLOSUREMGAL	Loop Closure in mGal	F8.3	mGal
GRVBASE	Gravity Base	A11	None
GPSBASE	GPS Base	A11	None

Table 2: Final Gravity Database Format

9.0 Project Safety

Prior to survey commencement, a Hazard Identification and Risk Assessment (HIRA) was carried out for all new tasks not covered under Atlas Geophysics Standard Operating Procedures (SOP's) or the company's Health Safety Environment (HSE) field manual.

Weekly toolbox meetings were held to discuss project safety and address any staff member concerns. No incidents were reported on this project.

APPENDIX A
Control Station Descriptions

201101500001 – Kingoonya

GDA94/GRS80		MGA Z53		AMG Z53	
Latitude	-31 00 56.0383	*Easting*	537,296.550	*Easting*	537,167.912
Longitude	135 23 26.6665	*Northing*	6,568,607.409	*Northing*	6,568,436.214
Ellipsoidal Height	130.395	*Orthometric Height*	131.315	*Orthometric Height*	131.315

OBSERVED GRAVITY		Date established: 22/04/2011
gu AAGD07	9793533.44	
mGal ISOGAL84	979353.422	

Occupation Method/Location Details

At this control station, the GPS control point consists of a steel picket driven into the ground with approximately 15cm protruding. The gravity control point consists of a small concrete slab set into the ground, opposite the GPS control point. The control station is witnessed by an Atlas Geophysics survey plaque (reading 201101500001) attached to a 1.5 metre steel picket placed within 0.5m of the both control points.

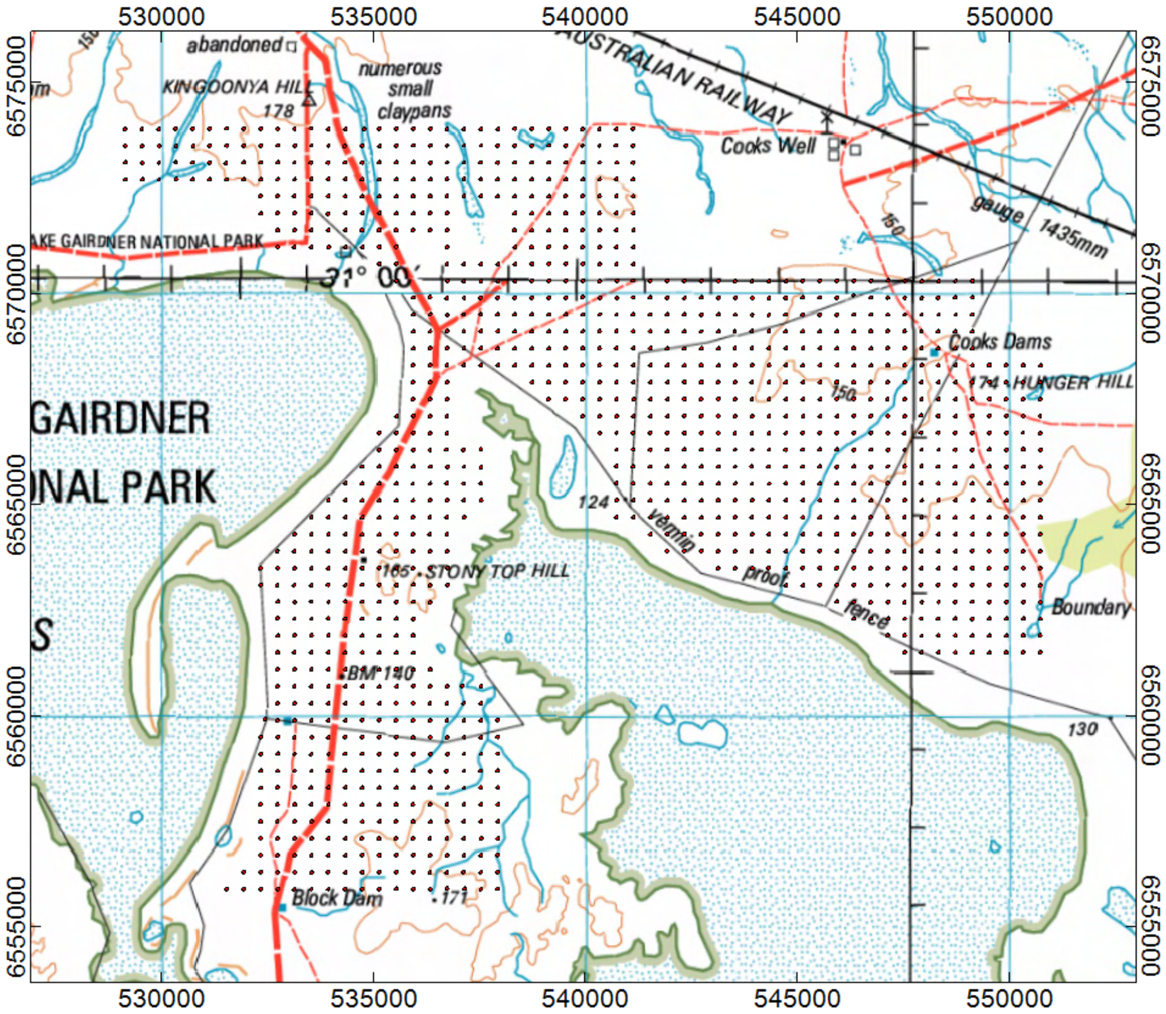
Gravity Control was established via multiple ABA loops with the project meters to AFGN "1994932503" at the Mobil Roadhouse in Glendambo on 22nd and 30th April, 2011. Expected accuracy would be better than 0.01 mGal.

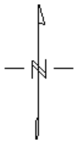
GPS Control was established using AUSPOS. Three separate 10 hour sessions were submitted to AUSPOS's online processing systems where returned coordinates were accurate to better than 0.01m.

The station can be reached by the following directions: From the Kingoonya Hotel, travel 12km south east along Jacob Street towards Yardea. Just prior to reaching the second cattle grid you will find a fence line track leading east. Take this track for approximately 1km and you will find the control station on the southern side of the track, between the fence and track.

Photograph of Control Station 201101500001 and surrounds

APPENDIX B
Plots





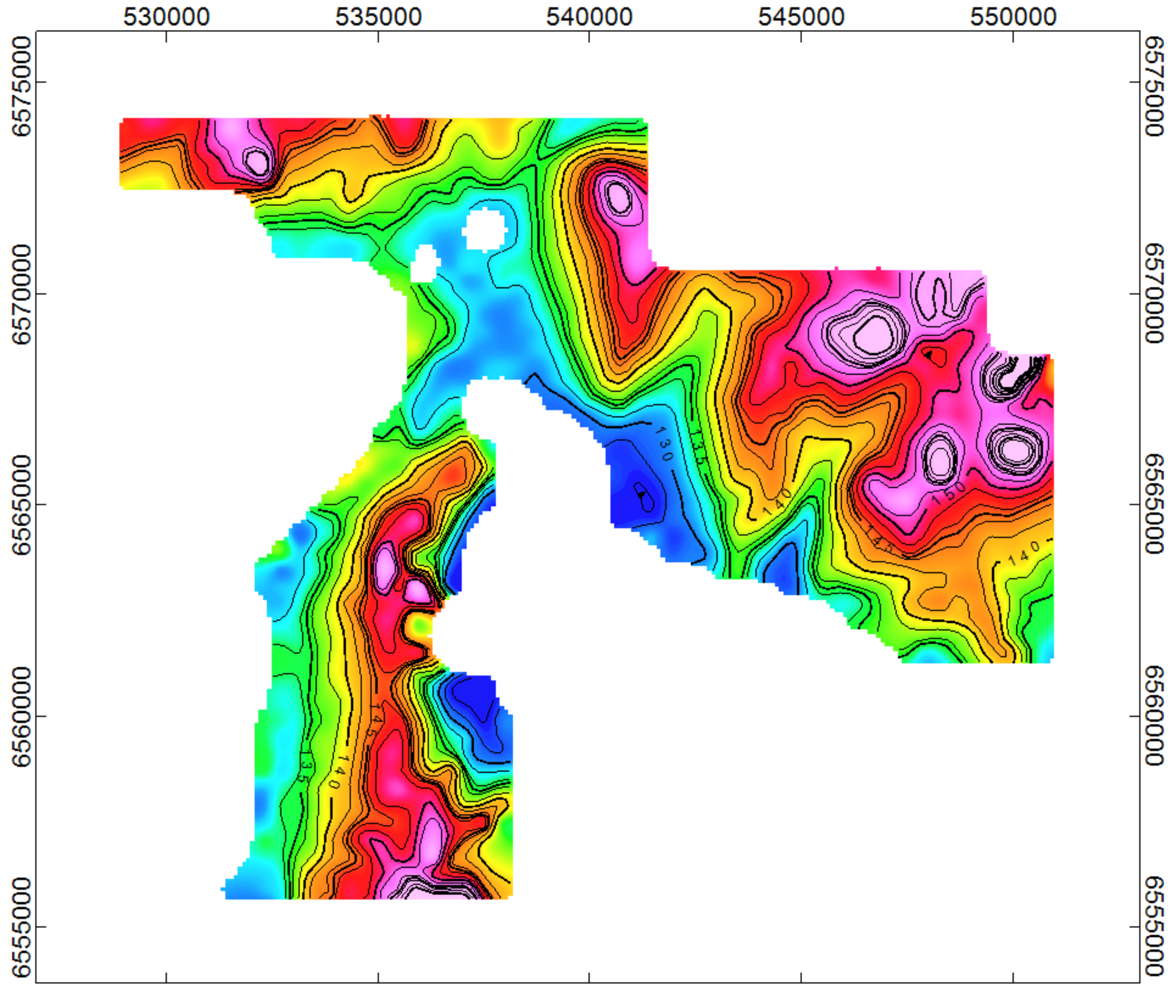
Scale 1:170000

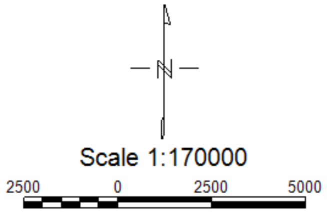
2500 0 2500 5000

(meters)

GDA94 / MGA zone 53

ANGLOGOLD ASHANTI LIMITED
P2011015 Gairdner Gravity Survey Plot of Gained Gravity Stations 400m x 400m Station spacing
ATLAS GEOPHYSICS PTY LTD FINAL DATA RELEASE www.atlasgeo.com.au
drawn by : NJP





GRS80HT
(m)

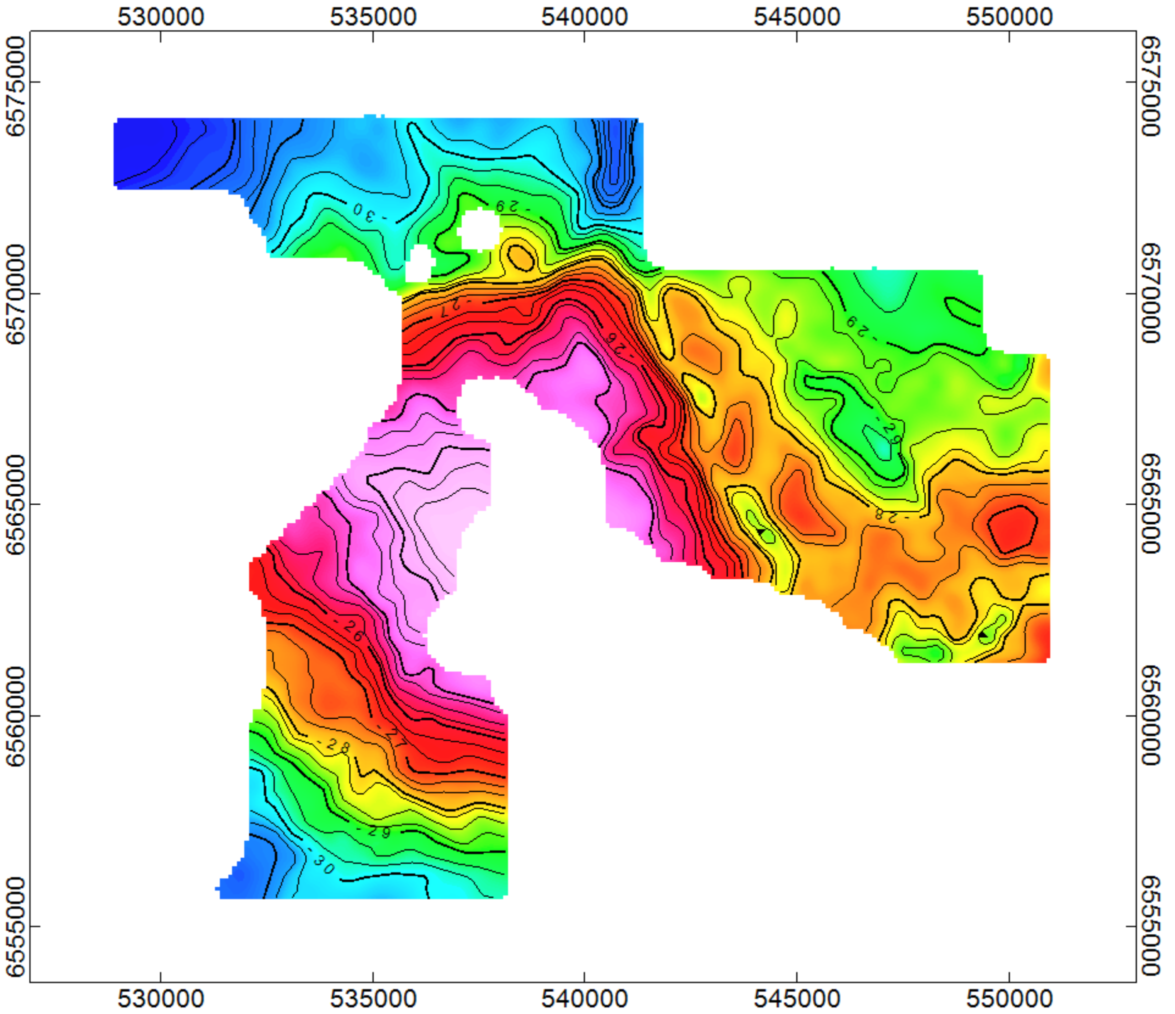
ANGLOGOLD ASHANTI LIMITED

P2011015 Gairdner Gravity Survey

Pseudocoloured image of GPS Derived Elevation (GRS80)
Shade = None, Contours = 2m, Histo = Equalised

ATLAS GEOPHYSICS PTY LTD
FINAL DATA RELEASE
www.atlasgeo.com.au

drawn by : NJP



Scale 1:170000

2500 0 2500 5000

(meters)

GDA94 / MGA zone 53

SCBA267
(mGal)

-33.3 -30.0 -29.0 -28.4 -27.7 -27.0 -23.0

ANGLOGOLD ASHANTI LIMITED

P2011015 Gairdner Gravity Survey

Pseudocoloured image of SC Bouguer Anomaly 2.67gm/cc
Shade = None, Contours = 0.3mGal, Histo = Equalised

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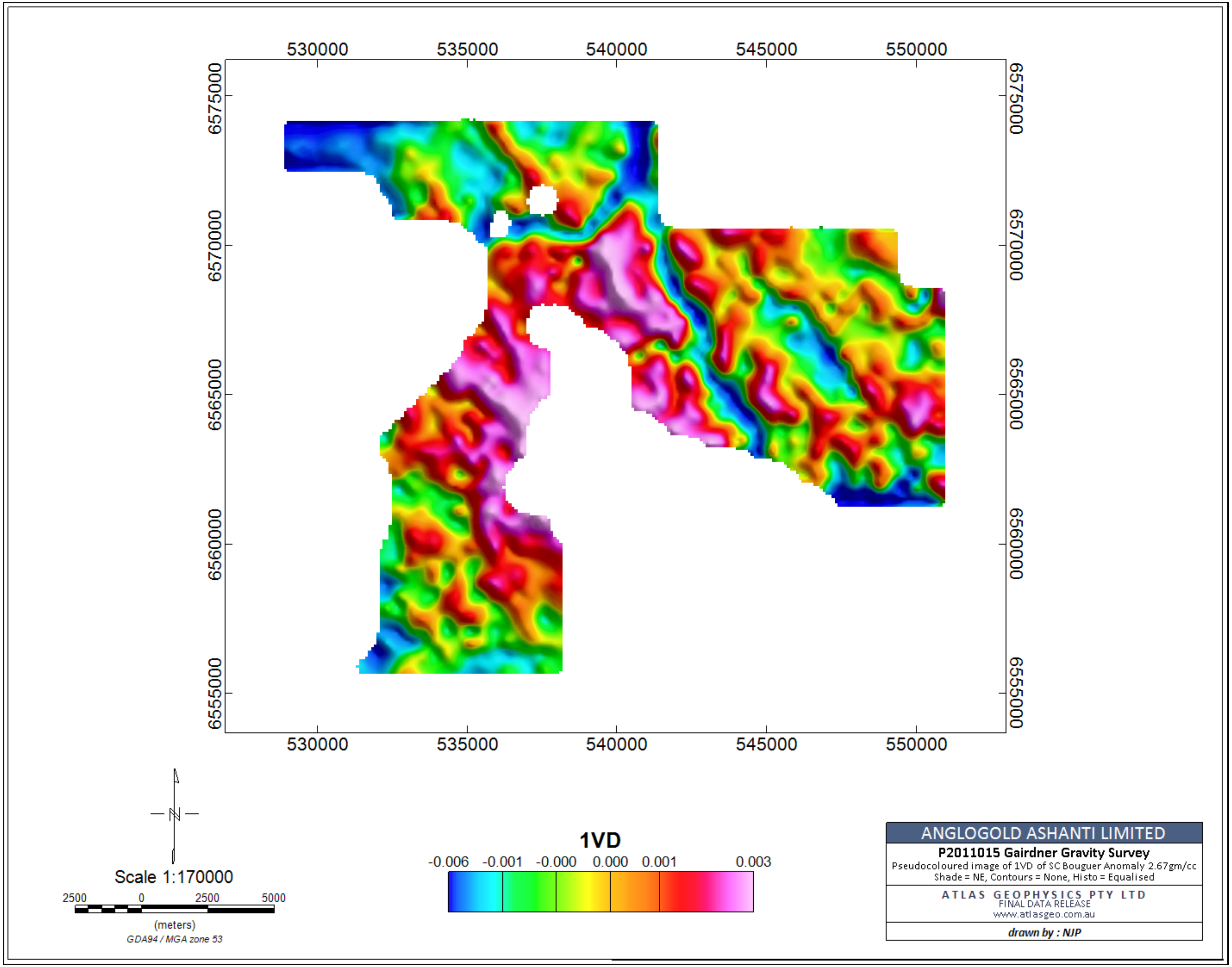
drawn by : NJP


530000
535000
540000
545000
550000
6575000
6570000
6565000
6560000
6555000
Scale 1:170000
2500
0
2500
5000
(meters)
GDA94 / MGA zone 53
1VD
-0.006
-0.001
-0.000
0.000
0.001
0.003
ANGLOGOLD ASHANTI LIMITED
P2011015 Gairdner Gravity Survey
Pseudocoloured image of 1VD of SC Bouguer Anomaly 2.67gm/cc
Shade = NE, Contours = None, Histo = Equalised
ATLAS GEOPHYSICS PTY LTD
FINAL DATA RELEASE
www.atlasgeo.com.au
drawn by : NJP

APPENDIX C
GPS Control Information

201101500001
0001 -31 00 56.03832 135 23 26.66653 130.398 131.318 GDA94
0001 -31 00 56.03835 135 23 26.66653 130.395 131.315 GDA94
0001 -31 00 56.03830 135 23 26.66654 130.393 131.313 GDA94

GDA94AVE
-31 0 56.0383
135 23 26.6665

-31.01556619
135.39074069

GRS80HT
130.395

AHDHT
131.315

N
-0.920

MGA53
537296.550
6568607.409

AMG53
537167.912
6568436.214