

# **Open File Envelope**

## **No. 12,626**

**EL 3680**

**BLYTH CREEK**

**PACE 2020 DISCOVERY DRILLING 2012**

**YEAR 7 DRILLING PARTNERSHIP NO. 26 –  
DRILLING OF BC4 GRAVITY ANOMALY**

**PROJECT FINAL REPORT**

Submitted by  
Energia Minerals Limited  
2013

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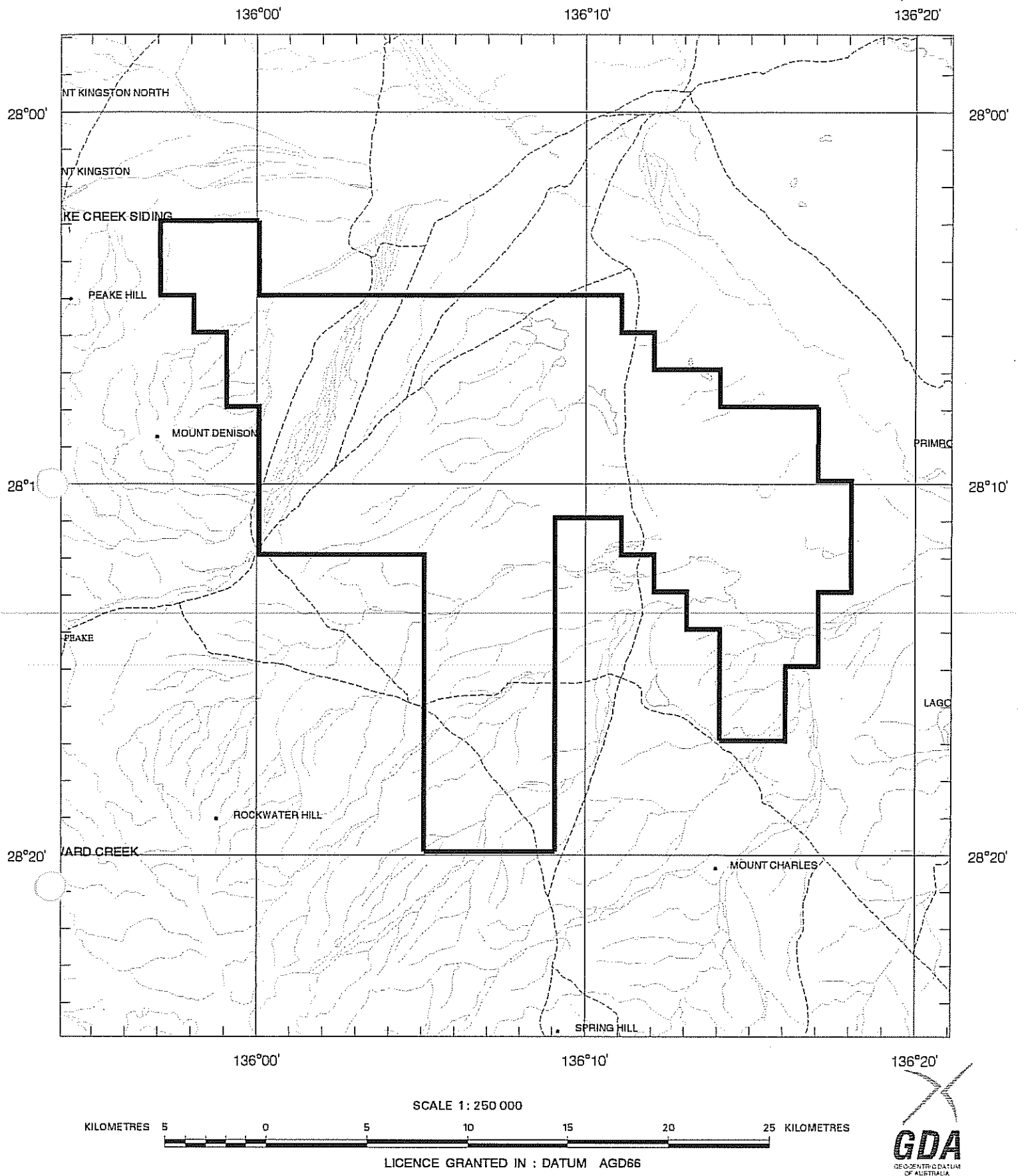
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**Government of South Australia**  
Department of State Development

# SCHEDULE A



**APPLICANT : METEX RESOURCES LTD**

**FILE REF : 144/06**

**TYPE : MINERAL ONLY**

**AREA : 496 km<sup>2</sup> (approx.)**

**1:250000 MAPSHEETS : WARRINA**

**LOCALITY : BLYTH CREEK AREA - Approximately 90 km southeast of Oodnadatta**

**DATE GRANTED : 02-Jan-2007**

**DATE EXPIRED : 01-Jan-2008**

**EL NO : 3680**



## **ENERGIA MINERALS LIMITED**

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### **GAWLER CRATON PROJECT**

#### **INTERIM AND FINAL PACE DRILLING REPORT Project DPY7-26**

**EL3680 (now EL5112)**

**BLYTH CREEK**

**for JULY 2012**

|                  |                                                                      |
|------------------|----------------------------------------------------------------------|
| Date of Report:  | January 2013                                                         |
| Tenement Holder: | Energia Minerals Ltd                                                 |
| Operator:        | Energia Minerals Ltd                                                 |
| Prepared By:     | P. Sauter - Sauter Geological Services Pty Ltd                       |
| Authorised By:   | D Andreazza                                                          |
| Map References:  | Warrina (SH5303) 1:250,000<br>Umbum (6141), Warrina (6041) 1:100,000 |
| Distribution:    | 1. PIRSA<br>2. Energia Minerals Ltd                                  |

## **Bibliographic Data Sheet**

|                             |                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Project Name:</b>        | Gawler Craton Project – Blyth Creek                                                                                                                                                                                                                                                                                                                                      |
| <b>Tenement Number:</b>     | EL5112                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Tenement Operator:</b>   | Energia Minerals Ltd                                                                                                                                                                                                                                                                                                                                                     |
| <b>Tenement Holder:</b>     | Energia Minerals Ltd                                                                                                                                                                                                                                                                                                                                                     |
| <b>Report Type:</b>         | Annual                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Report Title:</b>        | Gawler Craton Project, Interim and Final PACE Drilling Report, Project DPY7-26, EL3680 (now EL5112), Blyth Creek, for July 2012.                                                                                                                                                                                                                                         |
| <b>Report Period:</b>       | July 2012                                                                                                                                                                                                                                                                                                                                                                |
| <b>Author:</b>              | P. Sauter, Sauter Geological Services Pty Ltd                                                                                                                                                                                                                                                                                                                            |
| <b>Date of Report:</b>      | January 2013                                                                                                                                                                                                                                                                                                                                                             |
| <b>1:250 000 map sheet:</b> | Warrina (SH5303)                                                                                                                                                                                                                                                                                                                                                         |
| <b>1:100 000 map sheet:</b> | Warrina (6041), Umbum (6141)                                                                                                                                                                                                                                                                                                                                             |
| <b>Target Commodity:</b>    | Au, Cu, U                                                                                                                                                                                                                                                                                                                                                                |
| <b>Keywords:</b>            | IOCG, gravity                                                                                                                                                                                                                                                                                                                                                            |
| <b>Prospects Drilled:</b>   | n/a                                                                                                                                                                                                                                                                                                                                                                      |
| <b>ABSTRACT:</b>            |                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Location:</b>            | Approximately 90 km southeast of Oodnadatta, SA.                                                                                                                                                                                                                                                                                                                         |
| <b>Geology:</b>             | Cretaceous shales and Quaternary sands, overlying Proterozoic rocks of the Adelaide Geosyncline.                                                                                                                                                                                                                                                                         |
| <b>Work done:</b>           | Drilling of one diamond drillhole to 144.3m, 57 samples. Successful application for PACE support.                                                                                                                                                                                                                                                                        |
| <b>Conclusions:</b>         | Whilst drill testing the gravity anomaly BC4, depth of cover was reached at a much shallower depth than expected, and the mafic rock (sg of 3.0-3.1) below that is thought to be responsible for the geophysical anomaly. No significant anomalous geochemistry was returned from the hand-held XRF and the laboratory assays. No further drilling has been recommended. |

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## 1 SUMMARY

EL5112, formerly EL3680, is held and managed by Energia Minerals Ltd (“Energia”). The tenement was previously held by Carbon Energy Ltd. EL3680 was acquired following a regional-scale generative program targeting the Gawler Craton and Stuart Shelf in the search for Cu-Au-U-REE mineralisation.

Exploration License 5112 forms the Blyth Creek project (part of the Gawler Craton Project area), and is located approximately 90 km southeast of Oodnadatta in South Australia (Figures 1 & 2).

Work covering PACE Drilling Support project DPY7-26 during 2012 included:

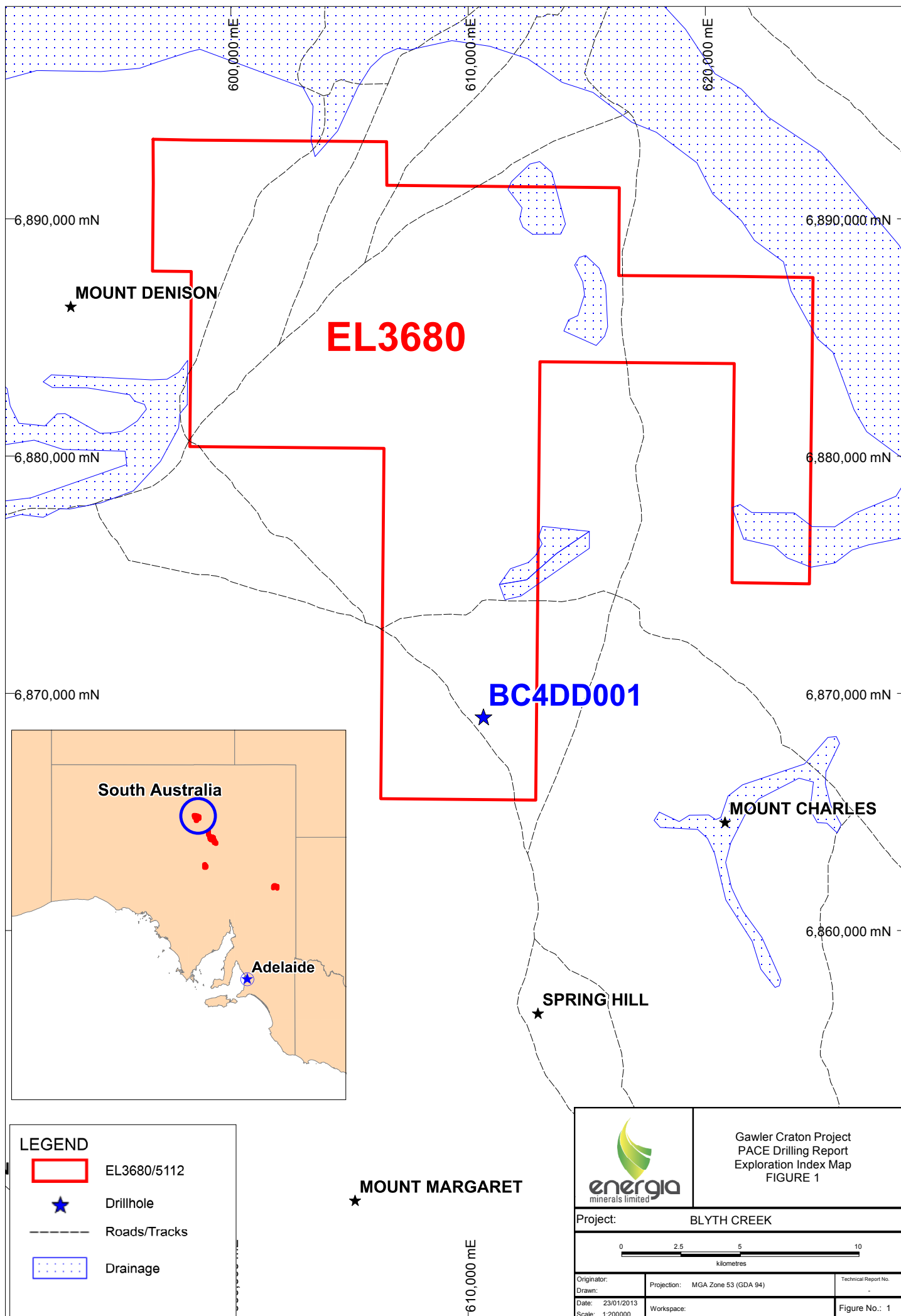
- Drilling of one vertical diamond drilling hole, BC4DD001, to a depth of 144.3m on gravity anomaly BC4, with associated logging, magsus, scintillometer, density, hand-held XRF, wet-chemical assays, and petrology;
- Successful application of PACE drilling support.

Drilling encountered depth of cover at much shallower depth (92m) than expected, and the mafic rock (sg of 3.0-3.1) below that is thought to be responsible for the geophysical anomaly. No significant anomalous geochemistry was encountered.

Table 1: Summary of Exploration

| Tenement          | Drilling                                    |
|-------------------|---------------------------------------------|
| EL3680/<br>EL5112 | 1 Diamond Drill hole, 144.3m;<br>57 samples |

Areas of exploration during the reporting period are shown on the Exploration Index Map (Figure 1).



## 2 INTRODUCTION

This report is a combined Interim and Final report, on the drilling by Energia Minerals Ltd at Blyth Creek - EL3680 (now EL5112), supported by PACE Project DPY7-26. No separate Interim report has been submitted.

## 3 LOCATION AND ACCESS

EL3680 (now known as EL5112) is situated approximately 90 km southeast of the town of Oodnadatta, South Australia, on the Warrina (SH5303) 1:250,000 scale and the Umbum (6141) and Warrina (6041) 1:100,000 scale map sheets.

Access to the tenement is via the Oodnadatta Track between Oodnadatta and Marree and then via a series of smaller unsealed tracks.

The project area location is shown in Figure 2.

## 4 TENEMENT DETAILS

EL5112 is held and managed by Energia Minerals Ltd (“Energia”). The tenement is a subsequent tenement to EL3680, which expired on 1/01/2012. EL5112 was granted on 2/01/2012, for a period of two years. Notification of the granting was received on 29 November 2012.

EL3680 was previously held by Carbon Energy Ltd from 2/01/2007, until, in December 2009, the uranium mineral assets held by Carbon were vested in new Company Energia. Tenements were officially transferred on 16/08/2010.

Tenement details are listed in Table 2 and the location is shown in Figures 1 and 2.

Table 2: Tenement Details

| Tenement No         | Tenement Name | Holder               | Grant Date | Expiry Date | Area                |
|---------------------|---------------|----------------------|------------|-------------|---------------------|
| EL5112<br>(ex-3680) | Blyth Creek   | Energia Minerals Ltd | 2/01/2012  | 1/01/2014   | 369 km <sup>2</sup> |

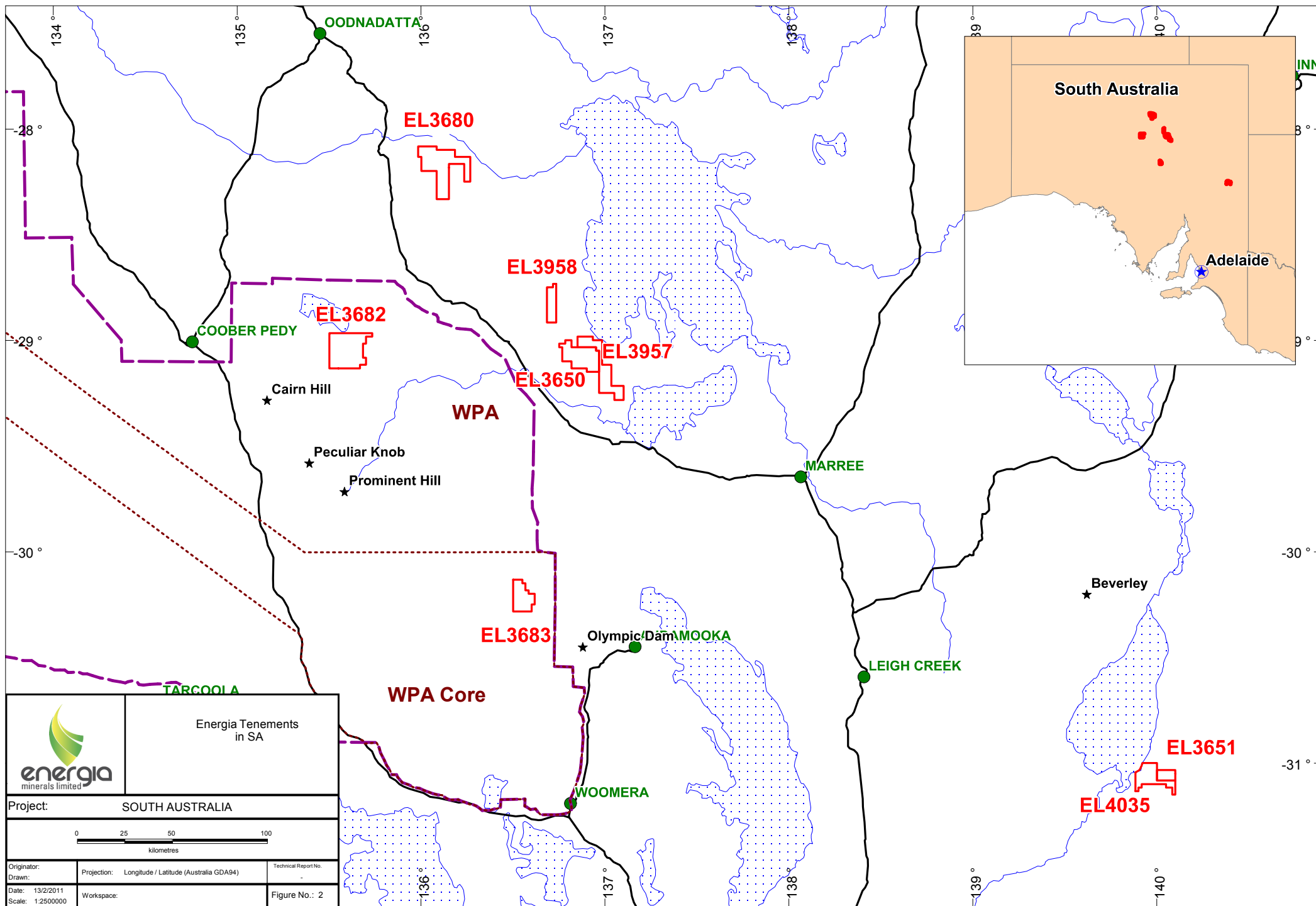
## 5 NATIVE TITLE AND ABORIGINAL HERITAGE

All tenements of the Gawler Craton Project are covered by a Native Title Claim (SAD6025/98) by the Arabunna Peoples Native Title Claim. An Indigenous Land Use agreement (ILUA) is registered between the State of South Australia and the Arabunna Native title people (Arabunna ILUA) that affects EL5112 (formerly EL3680) (from Energia Prospectus, Nov 2009).

Searches of the register maintained by AARD indicate that EL5112 is affected by the existence of known Aboriginal cultural heritage sites.

The Arabunna Heritage Agreement, covering EL5112 (formerly EL3680), was completed in November 2011 and forwarded to the South Australian Department for Manufacturing, Innovation, Trade, Resources and Energy (DMITRE) in December 2011. Due to some administrative issues, it appears DMITRE was unaware of having received the document until late March 2012. Following lengthy delays registration of the Arabunna Heritage Agreement was completed in late June 2012.

Heritage clearance was conducted with representatives of the Arabunna people for planned drilling of the BC4 target on tenement EL3680 in November 2011. No sites or areas of significance were observed during the clearance.



## **6 GEOLOGY AND MINERALISATION**

(from Beeson, 2006):

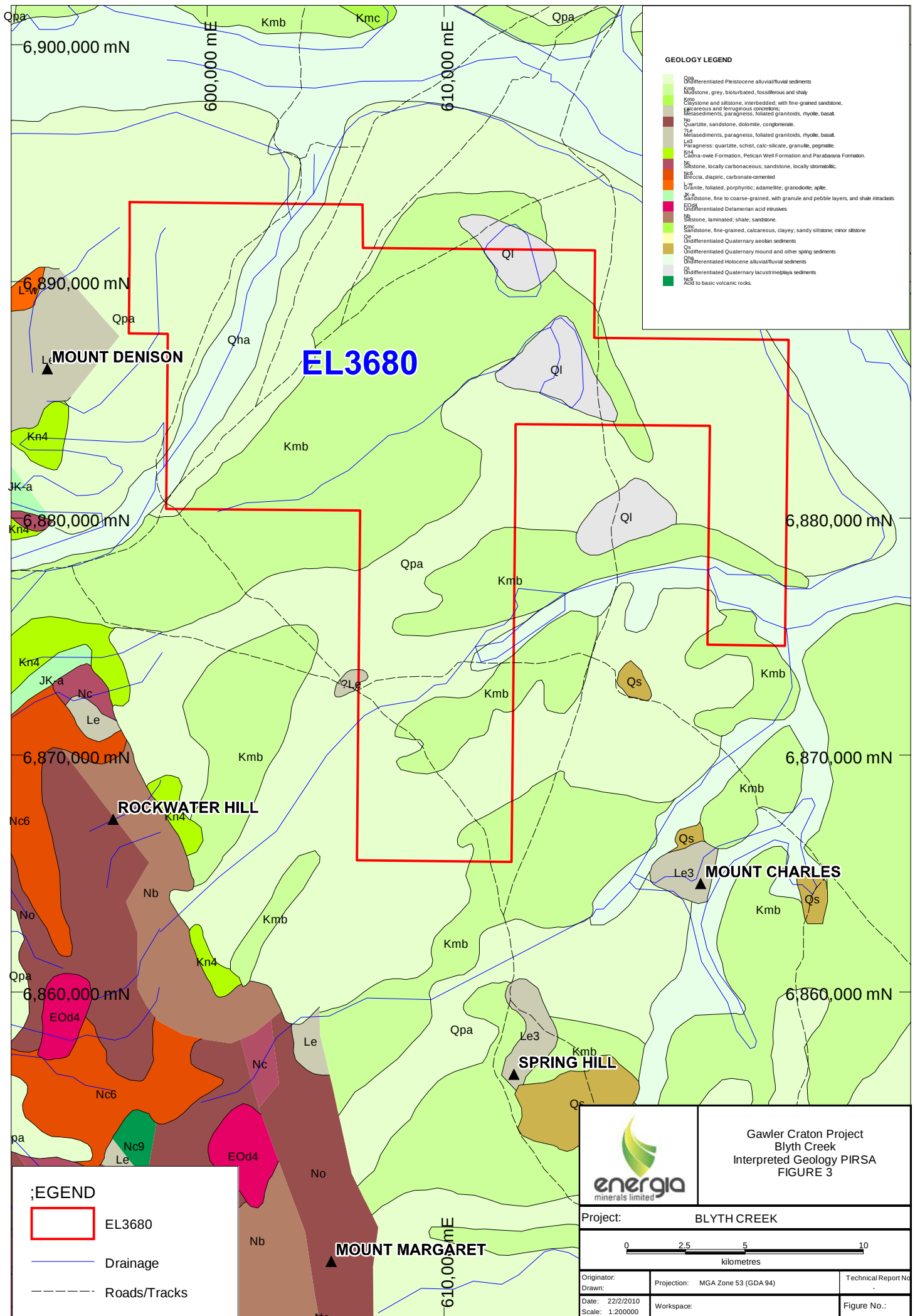
The Gawler Craton and the Stuart Shelf dominate the geology of southwestern South Australia. Both geological domains are known to host significant mineralisation in various styles and covering a diverse range of commodities. Such mineralisation includes:

- iron-oxide Cu-Au-U-REE mineralisation (including the giant Olympic Dam deposit),
- ironstone Fe deposits,
- mesothermal gold deposits (eg Tarcoola),
- coal deposits, together with
- indications of Ag-Pb-Zn deposits.
- Other commodities are also postulated but are yet to be located in potentially economic concentrations. These include nickel and mineral sands.

The Gawler Craton comprises late-Archaeon to Mesoproterozoic rocks, with overlying early Mesoproterozoic rocks of the Gawler Range Volcanics and Pandurra Sandstone. The craton comprises orthogneiss, paragneiss, granulite, amphibolite, granitoids (various suites noted), mafic-ultramafic greenstone belts (and related sedimentary basins). The sequences noted are divided into a number of domains, based on age and geological attributes.

## **7 LOCAL GEOLOGY**

EL5112 is located on Cretaceous shales and Quaternary alluvials, 20-50m deep in the west to >300m in the east, over Proterozoic rocks of the Adelaide Geosyncline (Figure 3).



## 8 EXPLORATION DURING THE REPORTING PERIOD

### 8.1 Drilling

#### 8.1.1 Targeting

3D inversion modelling and forward modelling of the BC4 target (Figures 4-6) (Morrell, 2011), undertaken by Southern Geoscience Consultants (SGC), identified a discrete ~20gu positive gravity anomaly, striking 5km N-S and 800m wide, oblique to the dominant trend of the basement geology. The BC4 gravity anomaly is coincident with a distinct non-magnetic zone visible in the regional magnetics. The source of the BC4 target was interpreted to be potentially, either a non-magnetic, dense igneous intrusion or an alteration zone such as an extensive zone of hematite. The modelling indicates a depth to the top of the source of ~225m –335m.

It was proposed to drill initially one hole (DH1) to test the BC4 basement gravity anomaly at a point where the gravity modelling indicates the shallowest depth to target (~225-335m). The drilling would utilise a combination of mud rotary drilling through the cover sequence to a depth of ~250m, followed by a diamond drill tail (NQ2) to ~380m depth.

#### 8.1.2 Programme of Works

DEF, Declared Equipment and Notice of Entry documentation was completed for the drilling programme planned for target BC4 on EL5112. Formal permission for drilling was received on 29 June 2012, after registration of the Arabunna Heritage Agreement. Heritage clearance for the drilling site had already been completed in November 2011.

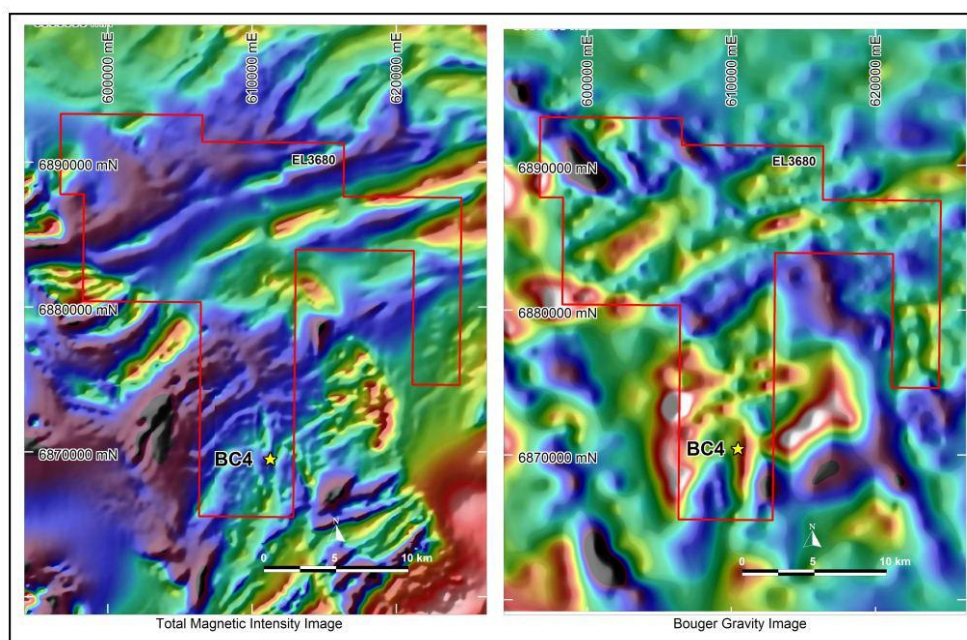
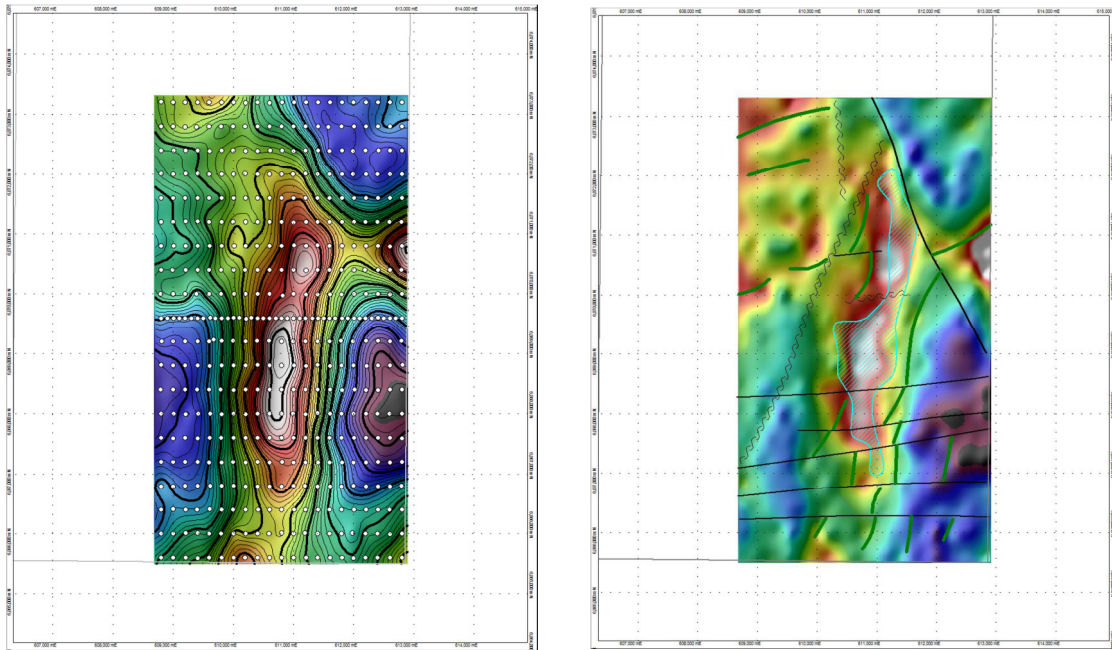


Figure 4: Blyth Creek Target BC4, Total Magnetic Intensity and Bouguer Gravity (PIRSA/Carbon).



Left: Figure 5a: BC4 residual Bouguer gravity anomaly with contours (interval = 1 gu). Gravity stations shown as white dots.

Right: Figure 5b: BC4 residual Bouguer anomaly image showing interpreted structures (black), magnetic units (green) and the extent of the magnetic low (light blue hatching).

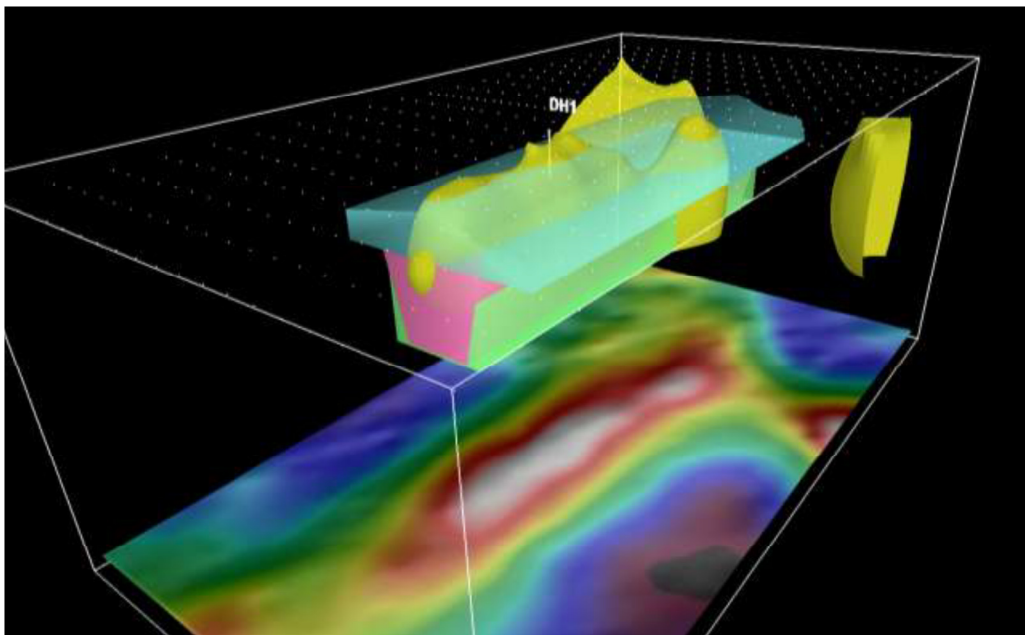


Figure 6: Summary figure showing residual Bouguer anomaly image, gravity stations (white dots), forward models (light blue, pink and green bodies), the 3.40 g/cc inversion isosurface, and a proposed vertical drillhole (DH1 in grey) targeting the shallowest part of the model.

### 8.1.3 Drilling

Vertical Diamond drillhole BC4DD001 was drilled to a depth of 144.3m, with a mud precollar of 99m. The vertical hole was drilled by Thompson Drilling, during July, 2012. Hole location is shown on Figure 1, and Table 3. All drilling data is present digitally as Appendix 2. Logging codes are shown in Appendix 5.

The hole was lithologically, structurally and geotechnically logged. A summary log is shown in Table 4. Depth of cover was reached at 92m, after which the hole intersected sheared gabbro/amphibolite, interpreted to be the source of the gravity anomaly.

Table 3: Hole Location

| Hole_ID  | East_MGA | North_MGA | RL | Grid_MGA | LEASE  | Depth | Direction | Inclination | DATE_COMP  |
|----------|----------|-----------|----|----------|--------|-------|-----------|-------------|------------|
| BC4DD001 | 610696   | 6869006   | 66 | MGA94_53 | EL3680 | 144.3 | 360       | -90         | 14/07/2012 |

Table 4: Summary Log

| Hole_id  | From | To | LITH | Description                             | Comments                                                                                                                                                                                   |
|----------|------|----|------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BC4DD001 | 0    | 2  |      | Soil                                    | Transported ferruginous soil & assorted rock fragments.                                                                                                                                    |
| BC4DD001 | 2    | 4  | Qsa  | Quaternary Alluvium                     | Gypsum rich calcrete with well rounded, transported quartz & siltstone pebbles/cobbles                                                                                                     |
| BC4DD001 | 8    | 10 | Qsa  | Quaternary Alluvium                     |                                                                                                                                                                                            |
| BC4DD001 | 10   | 12 | Ksh  | CRETACEOUS Shale                        | BULLDOG SHALE: Mixed interval, shale/calcrete                                                                                                                                              |
| BC4DD001 | 12   | 46 | Ksm  | CRETACEOUS Mudstone/Claystone           | Carbonaceous mudstone or shaley sed. V fine carbonaceous material throughout. Appears more massive than laminated                                                                          |
| BC4DD001 | 46   | 58 | Ksm  | CRETACEOUS Mudstone/Claystone           | As above, less weathered.                                                                                                                                                                  |
| BC4DD001 | 58   | 62 | Ksm  | CRETACEOUS Mudstone/Claystone           | As above, minor vein quartz                                                                                                                                                                |
| BC4DD001 | 62   | 66 | Saq  | Clastic Sed Quartzite                   | CADNA-OWIE FORMATION: Mixed interval. As previous, shale/mudstone with minor quartz pebbles to 1cm and cherty siliceous caprock or quartzite? With finely diss magnetite?                  |
| BC4DD001 | 66   | 72 | Sa   | Clastic Sed Sandstone, undifferentiated | Hard siliceous, cherty quartzite/sandstone with finely diss mt? & fine diss/fine veinlet azurite &/or malachite? The interval becomes increasingly sandy at 70-71m. Atersian Water at 71m. |
| BC4DD001 | 72   | 74 | Saq  | Clastic Sed Quartzite                   | Very fine grained sandstone/quartzite with trace blue-green sub mm azurite/malachite?                                                                                                      |
| BC4DD001 | 74   | 76 | Saq  | Clastic Sed Quartzite                   | Very fine grained sandstone/quartzite with abundant mm sized clear, well rounded quartz grains                                                                                             |
| BC4DD001 | 76   | 82 | Saq  | Clastic Sed Quartzite                   | Very fine grained sandstone/quartzite with abundant mm sized clear, sub to well rounded quartz grains. Minor blue-green malachite/azurite? 82-88m.                                         |

|          |    |       |     |                          |                                                                                                                                                       |
|----------|----|-------|-----|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| BC4DD001 | 82 | 88    | Saq | Clastic Sed Quartzite    |                                                                                                                                                       |
| BC4DD001 | 88 | 90    | Saq | Clastic Sed Quartzite    |                                                                                                                                                       |
| BC4DD001 | 90 | 92    | Saq | Clastic Sed Quartzite    | Siliceous-cherty sandstone/quartzite as previous with minor fg red rock fragments & trace amts v fine mt? Poss rhyolite component of the Mt. Anna FM? |
| BC4DD001 | 92 | 94    | Mod | Mafic Intrusive Dolerite | BASEMENT: mixed interval, vfg sandstone as per previous with amph/qtz/fd rich dolerite or gabbro showing v sl tr fine diss Py & Cpy.                  |
| BC4DD001 | 94 | 144.3 | Mog | Mafic Intrusive Gabbro   | Fresh unaltered dark green-white f-mg amph/qtz/fd rich dolerite or gabbro showing rare vfg diss Py/Cpy. END MUD ROTARY PRE-COLLAR AT 99 METRES.       |

#### 8.1.4 Magsus, Scintillometer, and Density

Energia conducted magsus measurements on core, using a KT10 in scan mode. In addition, scintillometer readings were recorded from all samples that were submitted to the assay laboratory. Results are presented in digital Appendix 2.

ALS conducted two density measurements on core from BC4DD001. Result is shown in Table 5.

Table 5: SG results

| Hole_id  | SampleID | depth(m) | sg   |
|----------|----------|----------|------|
| BC4DD001 | A165598  | 98.5     | 3.03 |
| BC4DD001 | A165599  | 144.2    | 3.10 |

#### 8.1.5 Analysis

Rotary mud drill cuttings (25 samples, 4m-composites, A165431 - A165455) and HQ sliced-core samples (32 samples, 1m or 2m samples, A165600 - A165631) were sent to Amdel Laboratories, SA for multi-element analysis by ICPMS/ICPOES in addition to fire assay for gold. No significant results were received. Maximum Cu was 765ppm from 136-137m, maximum U 4.3ppm.

Hand-held XRF analyses on 2m composites for the rotary mud precollar and 20cm intervals for the core were taken using an Innov-X-Systems Delta unit. Highest Cu value of 2024ppm was recorded at 106.8m, not corresponding with the highest wet-assay result.

The following key points from the XRF results were noted:

- Elements such as Ti, V, Rb, and Fe all show good correlation with noted changes in the mafic lithologies.

- Delineates an iron rich layer in the sandstone unit that contains exotics such as Cu, Co, Mo, and Pb at trace but anomalous levels for the unit.
- Visual copper carbonates/oxides logged in the sandstone unit did have elevated but not significant Cu ppm XRF results.
- Discrimination of perhaps unlogged subunits in mafics possible using Fe, V, Ti, Rb elements (one interpreted at 138-140m).
- Highlights a small spike in Bi, Mo, Sr, Th, Zn in a logged quartz-carbonate vein set which was logged as haematitic.

All results are presented in digital Appendix 2.

### 8.1.6 Petrology

Petrology by Roger Townsend and Associates on two samples of drill core from BC4DD001 (Table 6), identified the samples as a slightly altered Ortho-Amphibolite, and a Biotite Ortho-Amphibolite.

The Petrology Report is presented as Appendix 3.

Table 6: Petrology samples

|         |          |       |      |            |                                    |
|---------|----------|-------|------|------------|------------------------------------|
| A165595 | BC4DD001 | 98.3  | Core | Thin Slice | slightly altered ortho-amphibolite |
| A165596 | BC4DD001 | 144.3 | Core | Thin Slice | Biotite ortho-amphibolite          |

### 8.1.7 Interpretation

Depth of cover was reached at a much shallower depth than expected, and the mafic rock (sg of 3.0-3.1) is thought to be responsible for the gravity anomaly. No further drilling has been recommended.

### 8.1.8 Core Location

All core has been transferred to the DMITRE Core Library at Glenside, SA.

### 8.1.9 Rehabilitation

Rehabilitation has been arranged, but has not been completed yet, due to temporary unavailability of contractor and equipment.

## **9 PACE APPLICATION**

An application for PACE drilling support for target BC4 on EL5112 (\$75,000 requested) was submitted to DMITRE during the year, and subsequently approved (Project DPY7-26).

## **10 EXPENDITURE STATEMENT**

Total drilling costs for BC4DD001 amounted to \$131,514.90. Copy of the drilling invoice and invoices for the first and second instalments of the grant monies, for a total \$66,000 (Incl GST) are attached as Appendix 4.

## **11 CONCLUSIONS AND RECOMMENDATIONS**

Whilst drill testing the gravity anomaly BC4 with diamond drill hole BC4DD001, depth of cover was reached at a much shallower depth (92m) than expected, and the mafic rock (sg of 3.0-3.1) is thought to be responsible for the geophysical anomaly. No significant anomalous geochemistry was returned from the hand-held XRF and the laboratory assays. No further drilling has been recommended.

## **12 REFERENCES**

Beeson, J. 2006. Review of historical work and exploration potential of Metex leases and applications in the Gawler Craton, South Australia. Internal Report Metex Resources Ltd, prepared by Jigsaw Geoscience Pty Ltd.

Morrell, A. 2011. BC4 Gravity Modelling. SGC Memorandum to Energia Minerals Ltd. Report no SGC2156

**APPENDIX 1**

**VERIFICATION LISTING FORM**

also digital as

BC\_Verification\_List\_2012C.txt

| Exploration Work Type        | File Name                                                                           | Format     |
|------------------------------|-------------------------------------------------------------------------------------|------------|
| Office Studies               |                                                                                     |            |
| Literature search/review     |                                                                                     |            |
| Database compilation         |                                                                                     |            |
| Computer modelling           |                                                                                     |            |
| Reprocessing of data         |                                                                                     |            |
| Reports                      | BC_2012_PACEfinal_01_reportbody.pdf                                                 | pdf        |
| Airborne Exploration Surveys |                                                                                     |            |
| Aeromagnetics                |                                                                                     |            |
| Radiometrics                 |                                                                                     |            |
| Electromagnetics             |                                                                                     |            |
| Gravity                      |                                                                                     |            |
| Digital terrain modelling    |                                                                                     |            |
| Other (specify)              |                                                                                     |            |
| Remote Sensing               |                                                                                     |            |
| Aerial photography           |                                                                                     |            |
| LANDSAT                      |                                                                                     |            |
| SPOT                         |                                                                                     |            |
| MSS                          |                                                                                     |            |
| Ground Exploration Surveys   |                                                                                     |            |
| Geological Mapping           |                                                                                     |            |
| Regional                     |                                                                                     |            |
| Reconnaissance               |                                                                                     |            |
| Prospect                     |                                                                                     |            |
| Underground                  |                                                                                     |            |
| Costean                      |                                                                                     |            |
| Ground geophysics            |                                                                                     |            |
| Radiometrics                 |                                                                                     |            |
| Magnetics                    |                                                                                     |            |
| Gravity                      |                                                                                     |            |
| Digital terrain modelling    |                                                                                     |            |
| Electromagnetics             |                                                                                     |            |
| SP/AP/EP                     |                                                                                     |            |
| IP                           |                                                                                     |            |
| AMT                          |                                                                                     |            |
| Geophysical interpretation   |                                                                                     |            |
| Other (specify)              |                                                                                     |            |
| Geochemical Surveying        |                                                                                     |            |
| Surface Geochemistry         |                                                                                     |            |
| Stream sediment              |                                                                                     |            |
| Soil                         |                                                                                     |            |
| Rock chip                    |                                                                                     |            |
| Laterite                     |                                                                                     |            |
| Water                        |                                                                                     |            |
| Biogeochemistry              |                                                                                     |            |
| Isotope                      |                                                                                     |            |
| Whole rock                   |                                                                                     |            |
| Mineral analysis             |                                                                                     |            |
| Other (specify)              | BC_2012_PACEfinal_02_petrology.pdf                                                  | pdf        |
| Drilling                     |                                                                                     |            |
| Lithology Codes              | BC_2012_PACEfinal_03_LithoCodes.pdf                                                 | pdf        |
| Collar                       | BC_SASL4_COLL2012C                                                                  | txt        |
| Assay                        | BC_SADG4_ASS2012C<br>BC_SAQG4_DQAQC2012C<br>BC_SADL4_XRF2012C                       | txt        |
| Survey                       |                                                                                     |            |
| Lithology                    | BC_SADL4_GEO2012C                                                                   | txt        |
| Events                       | BC_SADL4_SCIN2012C<br>BC_SADL4_STRU2012C<br>BC_SADL4_GEOT2012C                      | txt        |
| Magnetic Susceptibility      | BC_SADL4_MAGN2012C                                                                  | txt        |
| Water                        |                                                                                     |            |
| Alteration                   |                                                                                     |            |
| Vein                         |                                                                                     |            |
| Drill Details                | BC_SADL4_DRIL2012C                                                                  | txt        |
| File Verification Listing    | Appendix 1 in BC_2012_PACEfinal_01_reportbody.pdf<br>BC_Verification_List_2012C.txt | pdf<br>txt |

## **APPENDIX 2**

### **DRILLING DATA**

#### **DIGITAL**

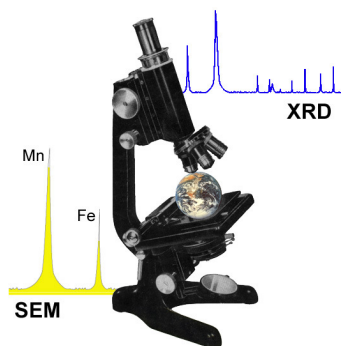
| <b>Report File Name</b> | <b>Original File Name</b> | <b>contents</b> |
|-------------------------|---------------------------|-----------------|
| BC_SASL4_COLL2012C.txt  |                           | collars         |
| BC_SADL4_DRIL2012C.txt  |                           | drill details   |
| BC_SADG4_ASS2012C.txt   |                           | assays          |
| BC_SADL4_GEO2012C.txt   |                           | lithology       |
| BC_SADL4_STRU2012C.txt  |                           | structure       |
| BC_SADL4_MAGN2012C.txt  |                           | magsus          |
| BC_SADL4_SCIN2012C.txt  |                           | scintillometer  |
| BC_SADL4_XRF2012C.txt   |                           | hand-held XRF   |
| BC_SAQG4_DQAQC2012C.txt |                           | QAQC            |
| BC_SADL4_GEOT2012C.txt  |                           | geotech         |

**APPENDIX 3**

**PETROLOGY REPORT**

**DIGITAL**

| <b>Report File Name</b>            | <b>Original File Name</b>     | <b>contents</b> |
|------------------------------------|-------------------------------|-----------------|
| BC_2012_PACEfinal_02_petrology.pdf | Petrography_23308_forBC4.docx | petrology       |



## *Roger Townend and Associates Consulting Mineralogists*

Unit 4, 40 Irvine drive, Malaga Western Australia 6062

Phone: (08) 9248 1674

email: [rogertownend@westnet.com.au](mailto:rogertownend@westnet.com.au)

Fax: (08) 9248 1502

DAVE ANDREAZZA

30-8-2012

ENERGIA MINERALS LTD ,

2/20 KINGS PARK ROW,

WEST PERTH

WESTERN AUSTRALIA

Our reference 23308

PREPARATION OF ONE POLISHED THIN SECTION OF ONE DRILL CORE AND  
PETROGRAPHIC/MINERAGRAPHIC DESCRIPTION. ONE XRD ANALYSIS.( 165594)

Roger Townend

Correspondence to Box 3129, Malaga D.C. WA 6945

ACN 069 920 476 ABN 92 076 109 663

**SAMPLE A 165595**

|         |          |      |  |      |            |
|---------|----------|------|--|------|------------|
| A165595 | BC4DD001 | 98.3 |  | Core | Thin Slice |
|---------|----------|------|--|------|------------|

DRILL CORE                      lineated non-magnetic coarse greenstone

**THIN SECTION**

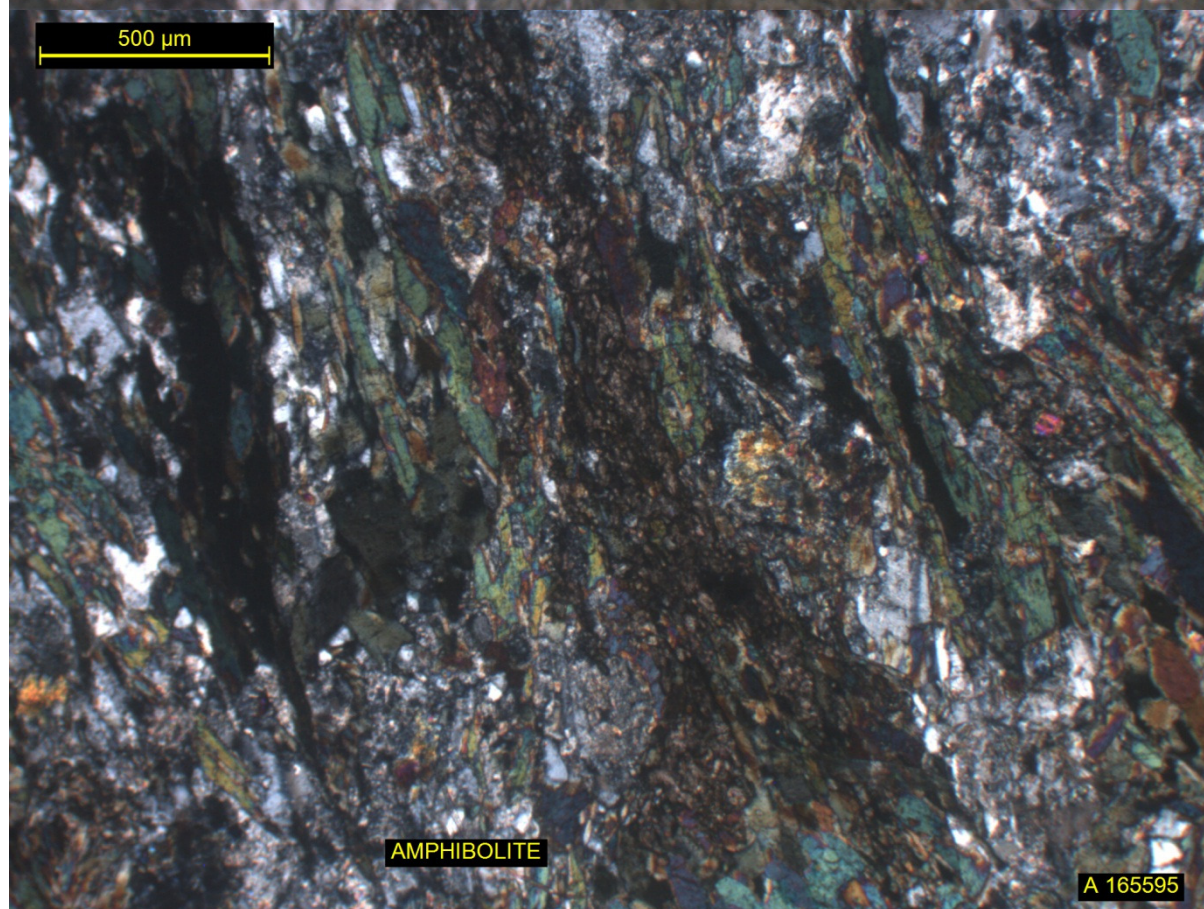
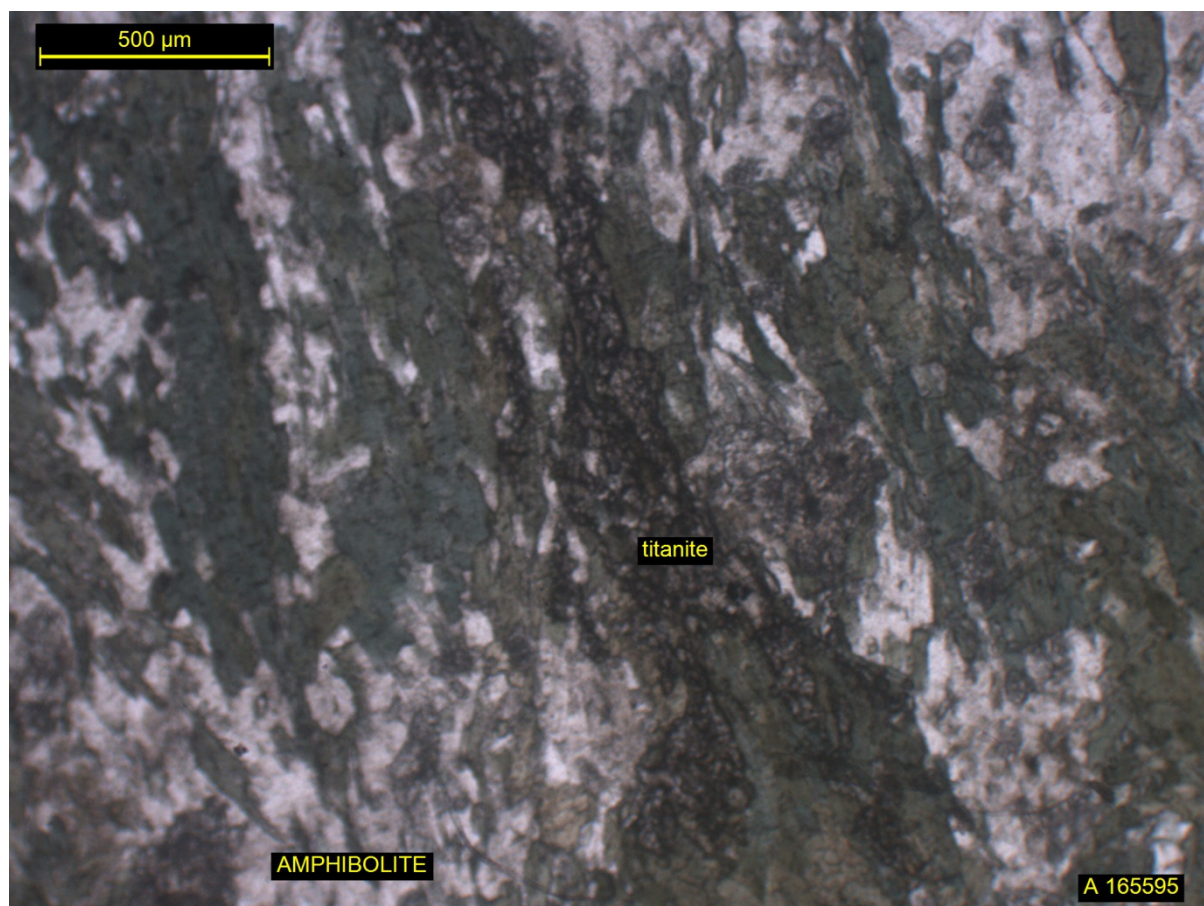
|                      |          |
|----------------------|----------|
| HORNBLENDE           | 60% plus |
| PLAGIOCLASE/SERICITE | 20-30%   |
| CLINOZOISITE         | 3-5%     |
| TITANITE             | 3-5%     |
| QUARTZ               | 1-2%     |
| ORES                 | TRACE    |
| <b>VEIN</b>          |          |
| ALKALI FELDSPAR      |          |

**CLASSIFIED AS A SLIGHTLY ALTERED ORTHOAMPHIBOLITE.**

The amphibolite has a marked lineation due to the alignment of coarse linear hornblendes frequently in excess of a millimetre. This has a yellow green to blue green pleochroism consistent with an amphibolite grade metamorphism composition. These amphiboles may occur in clusters of prismatic crystals. There is an accessory quantity as oriented acicular fines within the adjacent feldspar. The amphibole is host to sporadic sometimes linear aggregates of titanite. Ores sensu stricto are essentially absent.

The subordinate plagioclase feldspar when fresh has an intermediate composition that is commonly sericitised and also replaced by coarser clinozoisite. Quartz is negligible

The amphibolite is crossed by a narrow fresh alkali feldspar vein.



**SAMPLE A 165596**

|         |          |       |  |      |            |
|---------|----------|-------|--|------|------------|
| A165596 | BC4DD002 | 144.3 |  | Core | Thin Slice |
|---------|----------|-------|--|------|------------|

DRILL CORE                      lineated non-magnetic coarse greenstone

**POLISHED THIN SECTION**

|                        |        |
|------------------------|--------|
| HORNBLENDE             | 45-55% |
| PLAGIOCLASE/SAUSSURITE | 40-50% |
| QUARTZ                 | 3- 5%  |
| BIOTITE                | 3-5%   |
| TITANITE               | 2-3%   |
| ILMENITE               | 2-3%   |
| CHALCOPYRITE           | <1%    |
| MARCASITE              | <1%    |
| PYRITE                 | <1%    |

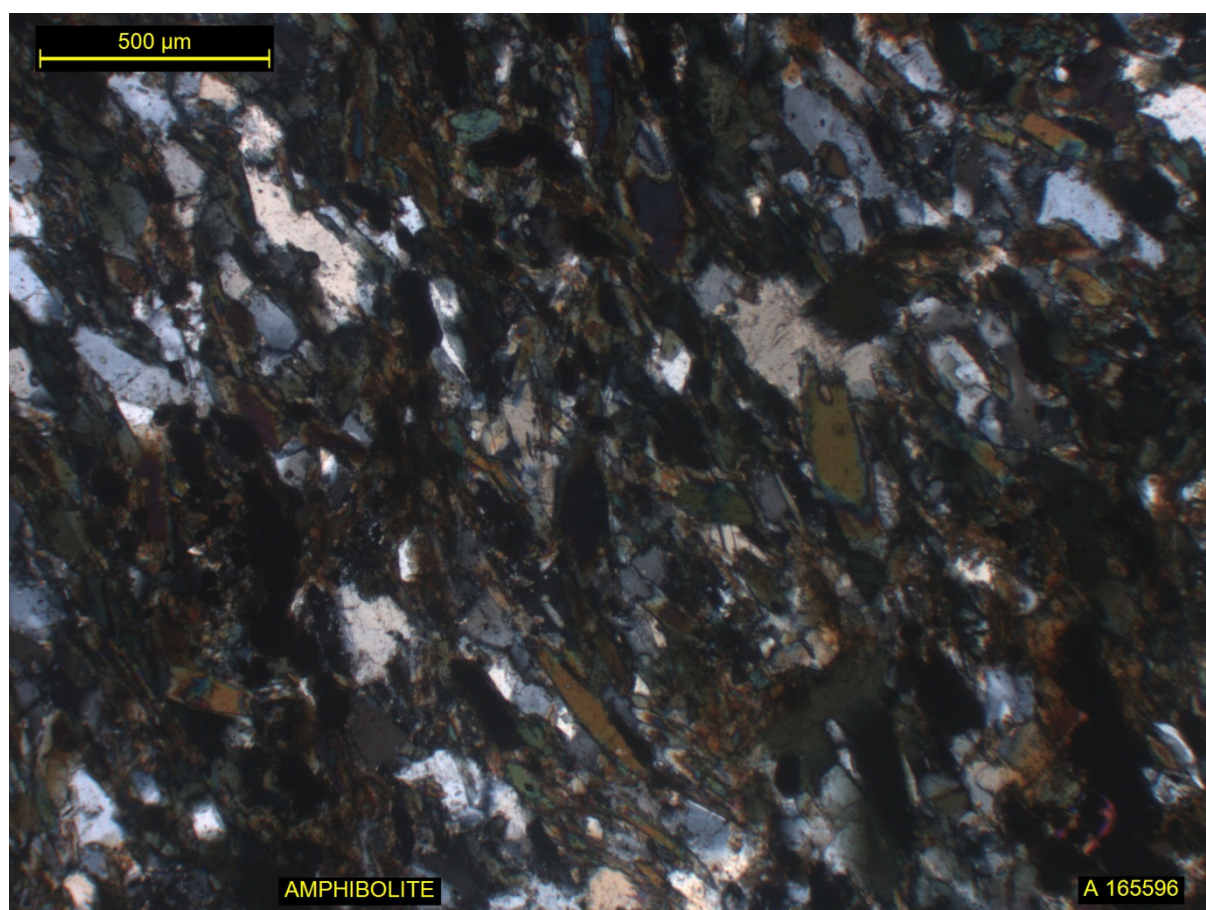
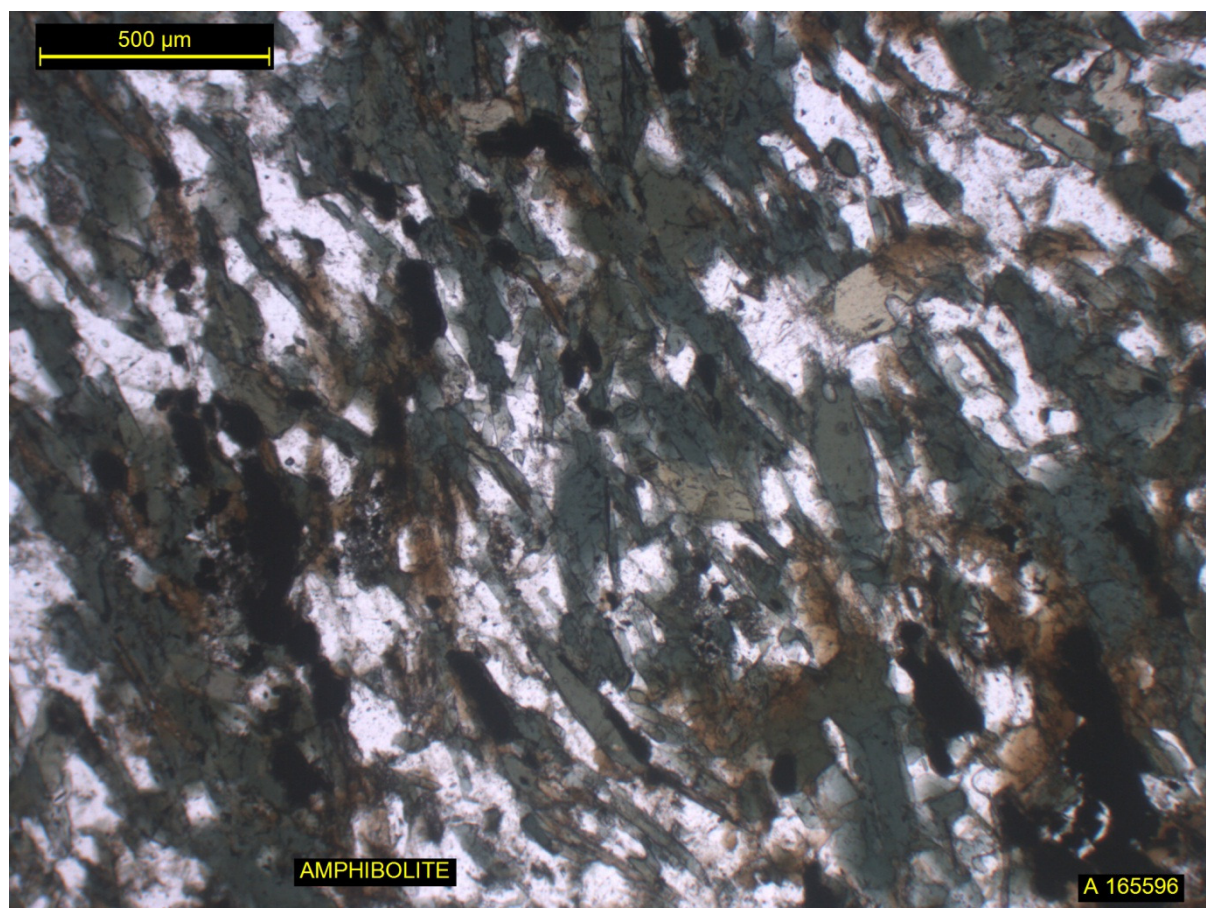
**CLASSIFIED AS A BIOTITE    ORTHOAMPHIBOLITE.**

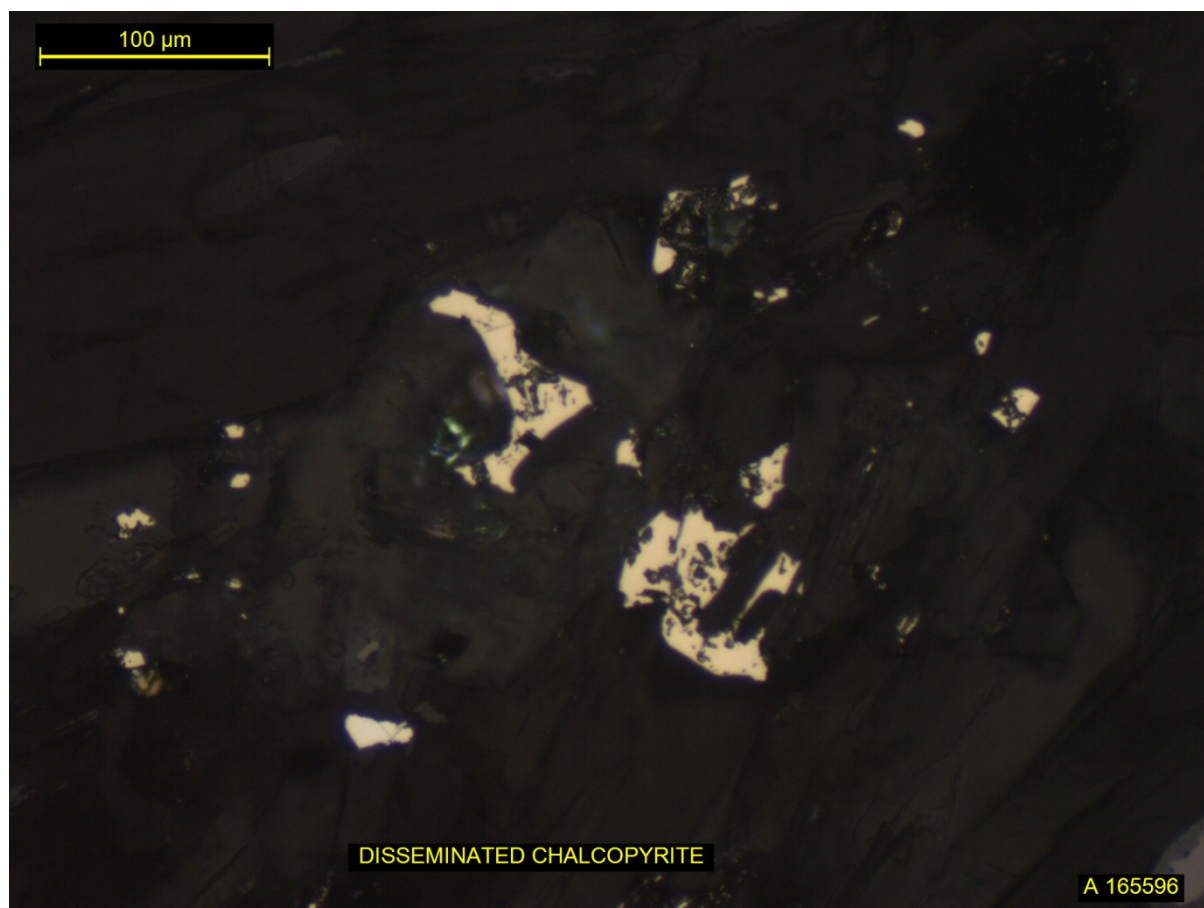
The amphibolite fabric is dominated by well oriented linear amphibole prisms. These are typically 0.5 mm length idioblastic shapes with a deep yellow green blue green pleochroism. There are occasional aggregates of these prisms with less alignment. Biotite is a common associate of rather irregular habit along amphibole strip margins.

The slightly subordinate plagioclase is finer without lineation and often shows no twinning. Its composition is intermediate. There is a little associated quartz. Rarely the feldspar shows replacement by clinozoisite.

The ores are common fresh ilmenite as a nucleus to titanite as well lineated grains following the host fabric and sulphides.

The sporadic sulphides are mainly polycrystalline marcasite ex pyrrhotite or chalcopyrite. The chalcopyrite occurs as uncommon local clusters with angular shapes to 100 µ, or as disseminated fine clusters.





**APPENDIX 4**

**EXPENDITURE STATEMENTS**

Grant Money Invoices and Drilling Invoice

# Energia Minerals Ltd

ABN: 63 078 510 988

PO Box 1785

West Perth WA 6872

Telephone: 08 9321 5000

Fax: 08 9321 7177

## Tax Invoice

| Date       | Tax Invoice # |
|------------|---------------|
| 31/12/2012 | 42            |

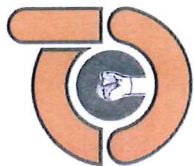
| Invoice To                                                                           |
|--------------------------------------------------------------------------------------|
| Director Mineral Resources - Dr E Tyne<br>DMITRE<br>GPO Box 1671<br>Adelaide SA 5001 |

| P.O. No. | Terms   |
|----------|---------|
| N/A      | 30 days |

| Description                                                                                                                                | GST      | Amount    |
|--------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|
| First Instalment of PACE Project DPY7-26 for Blyth Creek EL3680 in accordance with Item 3.1 of the Schedule being 50% of the Grant Monies. | 3,000.00 | 30,000.00 |

Please process EFT payments to:  
Account Name: Energia Minerals Ltd  
BSB No.: 086-006  
Account No.:15 948 6815

|                         |              |
|-------------------------|--------------|
| <b>Total</b>            | A\$33,000.00 |
| <b>Payments/Credits</b> | A\$0.00      |
| <b>Balance Due</b>      | A\$33,000.00 |



# THOMPSON DRILLING COMPANY PTY. LTD.

A.C.N. 007 934 018  
A.B.N. 97 305 837 954

RECEIVED  
30 JUL 2012  
BY: \_\_\_\_\_

Energia Minerals Limited  
PO Box 1785  
West Perth WA 6872

26.07.12

## TAX INVOICE NO. P0001

### AMOUNT

Re: Peake Station  
Rig 6

|          |          |          |
|----------|----------|----------|
| 11.07.12 | AA 03211 | 12000.00 |
| 12.07.12 | AA 03212 | 2655.00  |
| 13.07.12 | AA 03213 | 2360.00  |
| 14.07.12 | AA 03214 | 3248.00  |
| 15.07.12 | AA 03215 | 19400.00 |
| 16.07.12 | AA 03216 | 18319.00 |
| 17.07.12 | AA 03217 | 5900.00  |
| 18.07.12 | AA 03218 | 24450.00 |
| 19.07.12 | AA 03219 | 3220.50  |
| 20.07.12 | AA 03220 | 8910.00  |
| 21.07.12 | AA 03221 | 19096.50 |

|              |    |                            |
|--------------|----|----------------------------|
|              | \$ | 119,559.00                 |
| Plus GST 10% | \$ | 11,955.90                  |
|              |    | <b><u>\$131,514.90</u></b> |

PLEASE REMIT TO Thompson Drilling Company  
Westpac Bank  
Mount Gambier.  
BSB: 035-074  
ACCOUNT: 107804

Unit 3, 475 South Road, Regency Park SA 5010  
Telephone (08) 8346 5175

37 North Tce, Millicent SA 5280  
Telephone (08) 8733 2044

# Energia Minerals Ltd

ABN: 63 078 510 988

PO Box 1785

West Perth WA 6872

Telephone: 08 9321 5000

Fax: 08 9321 7177

## Tax Invoice

| Date       | Tax Invoice # |
|------------|---------------|
| 31/12/2012 | 43            |

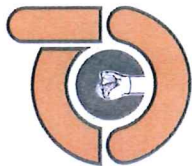
| Invoice To                                                                           |
|--------------------------------------------------------------------------------------|
| Director Mineral Resources - Dr E Tyne<br>DMITRE<br>GPO Box 1671<br>Adelaide SA 5001 |

| P.O. No. | Terms   |
|----------|---------|
| N/A      | 30 days |

| Description                                                                                                                                           | GST      | Amount    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|
| Second and Final Instalment of PACE Project DPY7-26 for Blyth Creek EL3680 in accordance with Item 3.2 of the Schedule being 50% of the Grant Monies. | 3,000.00 | 33,000.00 |

Please process EFT payments to:  
Account Name: Energia Minerals Ltd  
BSB No.: 086-006  
Account No.:15 948 6815

|                         |              |
|-------------------------|--------------|
| <b>Total</b>            | A\$33,000.00 |
| <b>Payments/Credits</b> | A\$0.00      |
| <b>Balance Due</b>      | A\$33,000.00 |



# THOMPSON DRILLING COMPANY PTY. LTD.

A.C.N. 007 934 018  
A.B.N. 97 305 837 954

RECEIVED  
30 JUL 2012  
BY: \_\_\_\_\_

Energia Minerals Limited  
PO Box 1785  
West Perth WA 6872

26.07.12

## TAX INVOICE NO. P0001

Re: Peake Station  
Rig 6

### AMOUNT

|          |          |          |
|----------|----------|----------|
| 11.07.12 | AA 03211 | 12000.00 |
| 12.07.12 | AA 03212 | 2655.00  |
| 13.07.12 | AA 03213 | 2360.00  |
| 14.07.12 | AA 03214 | 3248.00  |
| 15.07.12 | AA 03215 | 19400.00 |
| 16.07.12 | AA 03216 | 18319.00 |
| 17.07.12 | AA 03217 | 5900.00  |
| 18.07.12 | AA 03218 | 24450.00 |
| 19.07.12 | AA 03219 | 3220.50  |
| 20.07.12 | AA 03220 | 8910.00  |
| 21.07.12 | AA 03221 | 19096.50 |

|              |    |                            |
|--------------|----|----------------------------|
|              | \$ | 119,559.00                 |
| Plus GST 10% | \$ | 11,955.90                  |
|              |    | <b><u>\$131,514.90</u></b> |

PLEASE REMIT TO Thompson Drilling Company  
Westpac Bank  
Mount Gambier.  
BSB: 035-074  
ACCOUNT: 107804

Unit 3, 475 South Road, Regency Park SA 5010  
Telephone (08) 8346 5175

37 North Tce, Millicent SA 5280  
Telephone (08) 8733 2044

**APPENDIX 5**

**Lithology Codes**

**DIGITAL**

| <b>Report File Name</b>             | <b>Original File Name</b>        |
|-------------------------------------|----------------------------------|
| BC_2012_PACEfinal_03_LithoCodes.pdf | Energia_LibraryCodes_Mar2011.pdf |

## ALTINT

| CODE | DESCR    | RANKING            | P_VAL |
|------|----------|--------------------|-------|
| I    | Intense  | >95% replacement   |       |
| M    | Moderate | 30-60% replacement |       |
| S    | Strong   | 60-90% replacement |       |
| W    | Weak     | 0-30% replacement  |       |

# ALTTYPE

| CODE | DESCR                                    | RANKING | P_VAL |
|------|------------------------------------------|---------|-------|
| AK   | Ankerite                                 |         |       |
| BI   | Biotite                                  |         |       |
| CB   | Carbonate                                |         |       |
| CHL  | Chlorite                                 |         |       |
| CY   | Clay (undiff)                            |         |       |
| DO   | Dolomite                                 |         |       |
| EP   | Epidote                                  |         |       |
| FE   | Iron (undiff)                            |         |       |
| FU   | Fuchsite                                 |         |       |
| GL   | Glauconite                               |         |       |
| GO   | Goethite                                 |         |       |
| HE   | Hematite                                 |         |       |
| KA   | Kaolinite                                |         |       |
| LI   | Limonite                                 |         |       |
| LX   | Leucoxene                                |         |       |
| MG   | Magnetite                                |         |       |
| MS   | Muscovite                                |         |       |
| PHL  | Phlogopite                               |         |       |
| RCB  | Carbonate (regolith related)             |         |       |
| RCY  | Clay (regolith related)                  |         |       |
| RFE  | Iron (undiff, regolith related)          |         |       |
| RGO  | Goethite (regolith related)              |         |       |
| RHE  | Hematite (regolith related)              |         |       |
| RJA  | Jarosite (regolith related)              |         |       |
| RKA  | Kaolinite (regolith related)             |         |       |
| RMN  | Manganese (regolith related)             |         |       |
| RSI  | Silica (regolith related)                |         |       |
| SD   | Siderite                                 |         |       |
| SE   | Sericite                                 |         |       |
| SI   | Silica                                   |         |       |
| TA   | Talc                                     |         |       |
| WD   | Onslow Geology - Unknown alteration code |         |       |

## CASINGDIAM

| CODE | DESCR | RANKING | P_VAL |
|------|-------|---------|-------|
| 50   | 50 mm |         |       |

## CASINGTYPE

| CODE    | DESCR             | RANKING | P_VAL |
|---------|-------------------|---------|-------|
| PVC9_50 | PVC Case 9, 50 mm |         |       |

## COLOUR

| CODE | DESCR                    | RANKING | P_VAL |
|------|--------------------------|---------|-------|
| B    | Blue                     |         |       |
| DBB  | Dark Blue                |         |       |
| DBE  | Dark Blue Grey           |         |       |
| DBG  | Dark Blue Green          |         |       |
| DBK  | Dark Blue Pink           |         |       |
| DBN  | Dark Blue Black (Noir)   |         |       |
| DBO  | Dark Blue Orange         |         |       |
| DBP  | Dark Blue Purple         |         |       |
| DBR  | Dark Blue Red            |         |       |
| DBU  | Dark Blue Brown (Umber)  |         |       |
| DBW  | Dark Blue White          |         |       |
| DBY  | Dark Blue Yellow         |         |       |
| DEB  | Dark Grey Blue           |         |       |
| DEE  | Dark Grey                |         |       |
| DEG  | Dark Grey Green          |         |       |
| DEK  | Dark Grey Pink           |         |       |
| DEN  | Dark Grey Black (Noir)   |         |       |
| DEO  | Dark Grey Orange         |         |       |
| DEP  | Dark Grey Purple         |         |       |
| DER  | Dark Grey Red            |         |       |
| DEU  | Dark Grey Brown (Umber)  |         |       |
| DEW  | Dark Grey White          |         |       |
| DEY  | Dark Grey Yellow         |         |       |
| DGB  | Dark Green Blue          |         |       |
| DGE  | Dark Green Grey          |         |       |
| DGG  | Dark Green               |         |       |
| DGK  | Dark Green Pink          |         |       |
| DGN  | Dark Green Black (Noir)  |         |       |
| DGO  | Dark Green Orange        |         |       |
| DGP  | Dark Green Purple        |         |       |
| DGR  | Dark Green Red           |         |       |
| DGU  | Dark Green Brown (Umber) |         |       |
| DGW  | Dark Green White         |         |       |
| DGY  | Dark Green Yellow        |         |       |
| DHH  | Dark Khaki               |         |       |
| DKB  | Dark Pink Blue           |         |       |
| DKE  | Dark Pink Grey           |         |       |
| DKG  | Dark Pink Green          |         |       |
| DKK  | Dark Pink                |         |       |
| DKN  | Dark Pink Black (Noir)   |         |       |
| DKO  | Dark Pink Orange         |         |       |
| DKP  | Dark Pink Purple         |         |       |
| DKR  | Dark Pink Red            |         |       |
| DKU  | Dark Pink Brown (Umber)  |         |       |
| DKW  | Dark Pink White          |         |       |
| DKY  | Dark Pink Yellow         |         |       |
| DNB  | Dark Black (Noir) Blue   |         |       |

## COLOUR

|     |                                 |
|-----|---------------------------------|
| DNE | Dark Black (Noir) Grey          |
| DNG | Dark Black (Noir) Green         |
| DNK | Dark Black (Noir) Pink          |
| DNN | Dark Black (Noir)               |
| DNO | Dark Black (Noir) Orange        |
| DNP | Dark Black (Noir) Purple        |
| DNR | Dark Black (Noir) Red           |
| DNU | Dark Black (Noir) Brown (Umber) |
| DNW | Dark Black (Noir) White         |
| DNY | Dark Black (Noir) Yellow        |
| DOB | Dark Orange Blue                |
| DOE | Dark Orange Grey                |
| DOG | Dark Orange Green               |
| DOK | Dark Orange Pink                |
| DON | Dark Orange Black (Noir)        |
| DOO | Dark Orange                     |
| DOP | Dark Orange Purple              |
| DOR | Dark Orange Red                 |
| DOU | Dark Orange Brown (Umber)       |
| DOW | Dark Orange White               |
| DOY | Dark Orange Yellow              |
| DPB | Dark Purple Blue                |
| DPE | Dark Purple Grey                |
| DPG | Dark Purple Green               |
| DPK | Dark Purple Pink                |
| DPN | Dark Purple Black (Noir)        |
| DPO | Dark Purple Orange              |
| DPP | Dark Purple                     |
| DPR | Dark Purple Red                 |
| DPU | Dark Purple Brown (Umber)       |
| DPW | Dark Purple White               |
| DPY | Dark Purple Yellow              |
| DRB | Dark Red Blue                   |
| DRE | Dark Red Grey                   |
| DRG | Dark Red Green                  |
| DRK | Dark Red Pink                   |
| DRN | Dark Red Black (Noir)           |
| DRO | Dark Red Orange                 |
| DRP | Dark Red Purple                 |
| DRR | Dark Red                        |
| DRU | Dark Red Brown (Umber)          |
| DRW | Dark Red White                  |
| DRY | Dark Red Yellow                 |
| DUB | Dark Brown (Umber) Blue         |
| DUE | Dark Brown (Umber) Grey         |
| DUG | Dark Brown (Umber) Green        |
| DUK | Dark Brown (Umber) Pink         |
| DUN | Dark Brown (Umber) Black (Noir) |

## COLOUR

|     |                                 |
|-----|---------------------------------|
| DUO | Dark Brown (Umber) Orange       |
| DUP | Dark Brown (Umber) Purple       |
| DUR | Dark Brown (Umber) Red          |
| DUU | Dark Brown (Umber)              |
| DUW | Dark Brown (Umber) White        |
| DUY | Dark Brown (Umber) Yellow       |
| DWB | Dark White Blue                 |
| DWE | Dark White Grey                 |
| DWG | Dark White Green                |
| DWK | Dark White Pink                 |
| DWN | Dark White Black (Noir)         |
| DWO | Dark White Orange               |
| DWP | Dark White Purple               |
| DWR | Dark White Red                  |
| DWU | Dark White Brown (Umber)        |
| DWW | Dark White                      |
| DWY | Dark White Yellow               |
| DYB | Dark Yellow Blue                |
| DYE | Dark Yellow Grey                |
| DYG | Dark Yellow Green               |
| DYK | Dark Yellow Pink                |
| DYN | Dark Yellow Black (Noir)        |
| DYO | Dark Yellow Orange              |
| DYP | Dark Yellow Purple              |
| DYR | Dark Yellow Red                 |
| DYU | Dark Yellow Brown (Umber)       |
| DYW | Dark Yellow White               |
| DYY | Dark Yellow                     |
| E   | Grey                            |
| G   | Green                           |
| H   | Khaki                           |
| K   | Pink                            |
| LBB | Light (Pale) Blue               |
| LBE | Light (Pale) Blue Grey          |
| LBG | Light (Pale) Blue Green         |
| LBK | Light (Pale) Blue Pink          |
| LBN | Light (Pale) Blue Black (Noir)  |
| LBO | Light (Pale) Blue Orange        |
| LBP | Light (Pale) Blue Purple        |
| LBR | Light (Pale) Blue Red           |
| LBU | Light (Pale) Blue Brown (Umber) |
| LBW | Light (Pale) Blue White         |
| LBY | Light (Pale) Blue Yellow        |
| LEB | Light (Pale) Grey Blue          |
| LEE | Light (Pale) Grey               |
| LEG | Light (Pale) Grey Green         |
| LEK | Light (Pale) Grey Pink          |
| LEN | Light (Pale) Grey Black (Noir)  |

## COLOUR

|     |                                         |
|-----|-----------------------------------------|
| LEO | Light (Pale) Grey Orange                |
| LEP | Light (Pale) Grey Purple                |
| LER | Light (Pale) Grey Red                   |
| LEU | Light (Pale) Grey Brown (Umber)         |
| LEW | Light (Pale) Grey White                 |
| LEY | Light (Pale) Grey Yellow                |
| LGB | Light (Pale) Green Blue                 |
| LGE | Light (Pale) Green Grey                 |
| LGG | Light (Pale) Green                      |
| LGK | Light (Pale) Green Pink                 |
| LGN | Light (Pale) Green Black (Noir)         |
| LGO | Light (Pale) Green Orange               |
| LGP | Light (Pale) Green Purple               |
| LGR | Light (Pale) Green Red                  |
| LGU | Light (Pale) Green Brown (Umber)        |
| LGW | Light (Pale) Green White                |
| LGY | Light (Pale) Green Yellow               |
| LHH | Light Khaki                             |
| LKB | Light (Pale) Pink Blue                  |
| LKE | Light (Pale) Pink Grey                  |
| LKG | Light (Pale) Pink Green                 |
| LKK | Light (Pale) Pink                       |
| LKN | Light (Pale) Pink Black (Noir)          |
| LKO | Light (Pale) Pink Orange                |
| LKP | Light (Pale) Pink Purple                |
| LKR | Light (Pale) Pink Red                   |
| LKU | Light (Pale) Pink Brown (Umber)         |
| LKW | Light (Pale) Pink White                 |
| LKY | Light (Pale) Pink Yellow                |
| LNB | Light (Pale) Black (Noir) Blue          |
| LNE | Light (Pale) Black (Noir) Grey          |
| LNG | Light (Pale) Black (Noir) Green         |
| LNK | Light (Pale) Black (Noir) Pink          |
| LNN | Light (Pale) Black (Noir)               |
| LNO | Light (Pale) Black (Noir) Orange        |
| LNP | Light (Pale) Black (Noir) Purple        |
| LNR | Light (Pale) Black (Noir) Red           |
| LNU | Light (Pale) Black (Noir) Brown (Umber) |
| LNW | Light (Pale) Black (Noir) White         |
| LNy | Light (Pale) Black (Noir) Yellow        |
| LOB | Light (Pale) Orange Blue                |
| LOE | Light (Pale) Orange Grey                |
| LOG | Light (Pale) Orange Green               |
| LOK | Light (Pale) Orange Pink                |
| LON | Light (Pale) Orange Black (Noir)        |
| LOO | Light (Pale) Orange                     |
| LOP | Light (Pale) Orange Purple              |
| LOR | Light (Pale) Orange Red                 |

## COLOUR

|     |                                         |
|-----|-----------------------------------------|
| LOU | Light (Pale) Orange Brown (Umber)       |
| LOW | Light (Pale) Orange White               |
| LOY | Light (Pale) Orange Yellow              |
| LPB | Light (Pale) Purple Blue                |
| LPE | Light (Pale) Purple Grey                |
| LPG | Light (Pale) Purple Green               |
| LPK | Light (Pale) Purple Pink                |
| LPN | Light (Pale) Purple Black (Noir)        |
| LPO | Light (Pale) Purple Orange              |
| LPP | Light (Pale) Purple                     |
| LPR | Light (Pale) Purple Red                 |
| LPU | Light (Pale) Purple Brown (Umber)       |
| LPW | Light (Pale) Purple White               |
| LPY | Light (Pale) Purple Yellow              |
| LRB | Light (Pale) Red Blue                   |
| LRE | Light (Pale) Red Grey                   |
| LRG | Light (Pale) Red Green                  |
| LRK | Light (Pale) Red Pink                   |
| LRN | Light (Pale) Red Black (Noir)           |
| LRO | Light (Pale) Red Orange                 |
| LRP | Light (Pale) Red Purple                 |
| LRR | Light (Pale) Red                        |
| LRU | Light (Pale) Red Brown (Umber)          |
| LRW | Light (Pale) Red White                  |
| LRY | Light (Pale) Red Yellow                 |
| LUB | Light (Pale) Brown (Umber) Blue         |
| LUE | Light (Pale) Brown (Umber) Grey         |
| LUG | Light (Pale) Brown (Umber) Green        |
| LUK | Light (Pale) Brown (Umber) Pink         |
| LUN | Light (Pale) Brown (Umber) Black (Noir) |
| LUO | Light (Pale) Brown (Umber) Orange       |
| LUP | Light (Pale) Brown (Umber) Purple       |
| LUR | Light (Pale) Brown (Umber) Red          |
| LUU | Light (Pale) Brown (Umber)              |
| LUW | Light (Pale) Brown (Umber) White        |
| LUY | Light (Pale) Brown (Umber) Yellow       |
| LWB | Light (Pale) White Blue                 |
| LWE | Light (Pale) White Grey                 |
| LWG | Light (Pale) White Green                |
| LWK | Light (Pale) White Pink                 |
| LWN | Light (Pale) White Black (Noir)         |
| LWO | Light (Pale) White Orange               |
| LWP | Light (Pale) White Purple               |
| LWR | Light (Pale) White Red                  |
| LWU | Light (Pale) White Brown (Umber)        |
| LWW | Light (Pale) White                      |
| LWY | Light (Pale) White Yellow               |
| LYB | Light (Pale) Yellow Blue                |

## COLOUR

|     |                                   |
|-----|-----------------------------------|
| LYE | Light (Pale) Yellow Grey          |
| LYG | Light (Pale) Yellow Green         |
| LYK | Light (Pale) Yellow Pink          |
| LYN | Light (Pale) Yellow Black (Noir)  |
| LYO | Light (Pale) Yellow Orange        |
| LYP | Light (Pale) Yellow Purple        |
| LYR | Light (Pale) Yellow Red           |
| LYU | Light (Pale) Yellow Brown (Umber) |
| LYW | Light (Pale) Yellow White         |
| LYY | Light (Pale) Yellow               |
| MBB | Medium Blue                       |
| MBE | Medium Blue Grey                  |
| MBG | Medium Blue Green                 |
| MBK | Medium Blue Pink                  |
| MBN | Medium Blue Black (Noir)          |
| MBO | Medium Blue Orange                |
| MBP | Medium Blue Purple                |
| MBR | Medium Blue Red                   |
| MBU | Medium Blue Brown (Umber)         |
| MBW | Medium Blue White                 |
| MBY | Medium Blue Yellow                |
| MEB | Medium Grey Blue                  |
| MEE | Medium Grey                       |
| MEG | Medium Grey Green                 |
| MEK | Medium Grey Pink                  |
| MEN | Medium Grey Black (Noir)          |
| MEO | Medium Grey Orange                |
| MEP | Medium Grey Purple                |
| MER | Medium Grey Red                   |
| MEU | Medium Grey Brown (Umber)         |
| MEW | Medium Grey White                 |
| MEY | Medium Grey Yellow                |
| MGB | Medium Green Blue                 |
| MGE | Medium Green Grey                 |
| MGG | Medium Green                      |
| MGK | Medium Green Pink                 |
| MGN | Medium Green Black (Noir)         |
| MGO | Medium Green Orange               |
| MGP | Medium Green Purple               |
| MGR | Medium Green Red                  |
| MGU | Medium Green Brown (Umber)        |
| MGW | Medium Green White                |
| MGY | Medium Green Yellow               |
| MHH | Medium Khaki                      |
| MKB | Medium Pink Blue                  |
| MKE | Medium Pink Grey                  |
| MKG | Medium Pink Green                 |
| MKK | Medium Pink                       |

## COLOUR

|     |                                   |
|-----|-----------------------------------|
| MKN | Medium Pink Black (Noir)          |
| MKO | Medium Pink Orange                |
| MKP | Medium Pink Purple                |
| MKR | Medium Pink Red                   |
| MKU | Medium Pink Brown (Umber)         |
| MKW | Medium Pink White                 |
| MKY | Medium Pink Yellow                |
| MNB | Medium Black (Noir) Blue          |
| MNE | Medium Black (Noir) Grey          |
| MNG | Medium Black (Noir) Green         |
| MNK | Medium Black (Noir) Pink          |
| MNN | Medium Black (Noir)               |
| MNO | Medium Black (Noir) Orange        |
| MNP | Medium Black (Noir) Purple        |
| MNR | Medium Black (Noir) Red           |
| MNU | Medium Black (Noir) Brown (Umber) |
| MNW | Medium Black (Noir) White         |
| MNY | Medium Black (Noir) Yellow        |
| MOB | Medium Orange Blue                |
| MOE | Medium Orange Grey                |
| MOG | Medium Orange Green               |
| MOK | Medium Orange Pink                |
| MON | Medium Orange Black (Noir)        |
| MOO | Medium Orange                     |
| MOP | Medium Orange Purple              |
| MOR | Medium Orange Red                 |
| MOU | Medium Orange Brown (Umber)       |
| MOW | Medium Orange White               |
| MOY | Medium Orange Yellow              |
| MPB | Medium Purple Blue                |
| MPE | Medium Purple Grey                |
| MPG | Medium Purple Green               |
| MPK | Medium Purple Pink                |
| MPN | Medium Purple Black (Noir)        |
| MPO | Medium Purple Orange              |
| MPP | Medium Purple                     |
| MPR | Medium Purple Red                 |
| MPU | Medium Purple Brown (Umber)       |
| MPW | Medium Purple White               |
| MPY | Medium Purple Yellow              |
| MRB | Medium Red Blue                   |
| MRE | Medium Red Grey                   |
| MRG | Medium Red Green                  |
| MRK | Medium Red Pink                   |
| MRN | Medium Red Black (Noir)           |
| MRO | Medium Red Orange                 |
| MRP | Medium Red Purple                 |
| MRR | Medium Red                        |

## COLOUR

|     |                                   |
|-----|-----------------------------------|
| MRU | Medium Red Brown (Umber)          |
| MRW | Medium Red White                  |
| MRY | Medium Red Yellow                 |
| MUB | Medium Brown (Umber) Blue         |
| MUE | Medium Brown (Umber) Grey         |
| MUG | Medium Brown (Umber) Green        |
| MUK | Medium Brown (Umber) Pink         |
| MUN | Medium Brown (Umber) Black (Noir) |
| MUO | Medium Brown (Umber) Orange       |
| MUP | Medium Brown (Umber) Purple       |
| MUR | Medium Brown (Umber) Red          |
| MUU | Medium Brown (Umber)              |
| MUW | Medium Brown (Umber) White        |
| MUY | Medium Brown (Umber) Yellow       |
| MWB | Medium White Blue                 |
| MWE | Medium White Grey                 |
| MWG | Medium White Green                |
| MWK | Medium White Pink                 |
| MWN | Medium White Black (Noir)         |
| MWO | Medium White Orange               |
| MWP | Medium White Purple               |
| MWR | Medium White Red                  |
| MWU | Medium White Brown (Umber)        |
| MWW | Medium White                      |
| MWY | Medium White Yellow               |
| MYB | Medium Yellow Blue                |
| MYE | Medium Yellow Grey                |
| MYG | Medium Yellow Green               |
| MYK | Medium Yellow Pink                |
| MYN | Medium Yellow Black (Noir)        |
| MYO | Medium Yellow Orange              |
| MYP | Medium Yellow Purple              |
| MYR | Medium Yellow Red                 |
| MYU | Medium Yellow Brown (Umber)       |
| MYW | Medium Yellow White               |
| MYY | Medium Yellow                     |
| N   | Black                             |
| O   | Orange                            |
| P   | Purple                            |
| R   | Red                               |
| U   | Umber                             |
| W   | White                             |
| Y   | Yellow                            |

## COLOURINT

| CODE | DESCR  | RANKING | P_VAL |
|------|--------|---------|-------|
| D    | Dark   |         |       |
| L    | Light  |         |       |
| M    | Medium |         |       |

# COMPANY

| CODE      | DESCR        | RANKING | P_VAL |
|-----------|--------------|---------|-------|
| AAR       | UNKN         |         |       |
| ABEDNEGC  | ABEDNEGO     |         |       |
| ABERFOYLI | ABERFOYLE    |         |       |
| ACACIA    | ACACIA       |         |       |
| ACM       | UNKN         |         |       |
| AFMECO    | AFMECO       |         |       |
| AGL       | UNKN         |         |       |
| AGSO      | AGSO         |         |       |
| AHJV      | UNKN         |         |       |
| AHL       | UNKN         |         |       |
| AMALG     | AMALG        |         |       |
| ANGLOGOI  | ANGLOGOLD    |         |       |
| ANNACON   | ANNACONDA    |         |       |
| ASARCO    | ASARCO       |         |       |
| ASHTON    | ASHTON       |         |       |
| AUDAX     | AUDAX        |         |       |
| AURORA    | AURORA       |         |       |
| AUSTMIN   | AUSTMIN      |         |       |
| AZTEC     | AZTEC        |         |       |
| BARRICK   | BARRICK GOLD |         |       |
| BHP       | BHP          |         |       |
| BILLITON  | BILLITON     |         |       |
| BLACK MO  | BLACK MOUN   |         |       |
| BMA       | BMA          |         |       |
| CAPRICORI | CAPRICORN    |         |       |
| CARBINE   | CARBINE      |         |       |
| CARPEX    | CARPEX       |         |       |
| CONSEX    | CONSEX       |         |       |
| COVE      | COVE         |         |       |
| CRA       | CRA          |         |       |
| CRESENT   | CRESENT      |         |       |
| DELTA     | DELTA        |         |       |
| DGN       | UNKN         |         |       |
| DOMINION  | DOMINION     |         |       |
| DUKETON   | DUKETON      |         |       |
| EDJUDINA  | EDJUDINA     |         |       |
| ELMINA    | ELMINA       |         |       |
| ENERGIA   | ENERGIA      |         |       |
| ESSO      | ESSO         |         |       |
| EXODUS    | EXODUS       |         |       |
| FARCORNE  | FARCORNERS   |         |       |
| GASCOYNE  | GASCOYNE     |         |       |
| GCL       | UNKN         |         |       |
| GINDALBIE | GINDALBIE    |         |       |
| GME       | GME          |         |       |
| GOLCOND,  | GOLCONDA     |         |       |
| GOLDEN PI | GOLDEN PLA   |         |       |

# COMPANY

GOLDFIELD GOLDFIELDS  
 GOLDSTAT GOLDSTATE  
 GRANNYS GRANNYS  
 GRIMWOC GRIMWOOD  
 GSM GSM  
 HAMPTON HAMPTON HILL  
 HAOMA HAOMA  
 HGM UNKN  
 HILL HILL  
 HILLMIN HILLMIN  
 HOMESTAI HOMESTAKE  
 JACKSON JACKSON  
 JOHNSWEI JOHNSWELL  
 JUBILEE JUBILEE  
 KEL UNKN  
 LJV UNKN  
 MAGMA Magma Metals  
 METANA METANA  
 METEX METEX  
 MIDAS MIDAS  
 MILLENNIL MILLENNIUM  
 MIM MIM  
 MINATONI Minatone Australia  
 MPI MPI  
 MT BURGE MT BURGESS  
 MT EDON MT EDON  
 MT KERSEY MT KERSEY  
 NEWCREST NEWCREST  
 NEWMONT NEWMONT  
 NORMANDY NORMANDY  
 OXIANA OXIANA  
 PANCONTI PANCONTINENTAL  
 PARAGON PARAGON  
 PDAP PDAP  
 PEAK PEAK  
 PEL PEL  
 PGS PGS  
 PLENTY PLENTY  
 PLUTONIC PLUTONIC  
 POSEIDON POSEIDON  
 POSGOLD POSGOLD  
 PPL UNKN  
 PREG Placer Regional  
 RGC RGC  
 SOG SOG  
 SOO UNKN  
 SVENTURE SVENTURES  
 SWAN SWAN

## COMPANY

|          |           |
|----------|-----------|
| TAURUS   | TAURUS    |
| THAM     | UNKN      |
| TMN      | UNKN      |
| TRINTO   | TRINTO    |
| TROY     | TROY      |
| UDAPS    | UNKN      |
| UNKN     | UNKN      |
| WAMEX    | WAMEX     |
| WCC      | UNKN      |
| WELLSGOL | WELLSGOLD |
| WESTMIN  | WESTMIN   |
| WMC      | WMC       |
| YARDARIN | YARDARINO |

## DHSURVMETH

| CODE | DESCR       | RANKING | P_VAL |
|------|-------------|---------|-------|
| COLL | Rig Setup - | 5       |       |
| EMS  | Electronic  | 3       |       |
| ESS  | Eastman si  | 3       |       |
| GYRO | North seek  | 1       |       |
| PROP | Proposed a  | 6       |       |
| REFL | Reflex EYZ  | 2       |       |
| RODS | Mag tool, i | 4       |       |
| UNKN | Unknown     | 6       |       |

## DRILLEQUIP

| CODE | DESCR                 | RANKING | P_VAL |
|------|-----------------------|---------|-------|
| ACB  | Air Core Blade        |         |       |
| DBT  | Double Tube - Diamond |         |       |
| DRG  | Drag Bit              |         |       |
| HMC  | Hammer - Crossover    |         |       |
| HMF  | Hammer - Face         |         |       |
| OPH  | Open Hole             |         |       |
| SIT  | Single Tube - Diamond |         |       |
| TRT  | Triple Tube - Diamond |         |       |

# DRILLTYPE

| CODE    | DESCR               | RANKING | P_VAL |
|---------|---------------------|---------|-------|
| AC      | Air Core            |         |       |
| AT      | Air Track           |         |       |
| AU      | Auger               |         |       |
| DD      | Diamond Drilling    |         |       |
| GR      | Grade Control       |         |       |
| HQ      | HQ - Doubl          | 1       |       |
| HQ3     | HQ - Triple         | 1       |       |
| HQBLADE | HQ Blade            |         |       |
| NQ      | NQ - Doub           | 1       |       |
| NQ3     | NQ - Triple         | 1       |       |
| OH      | Open Hole           |         |       |
| OH3     | Open Hole           | 1       |       |
| OH35    | Open Hole           | 1       |       |
| OH375   | Open Hole           | 1       |       |
| OH4     | Open Hole           | 1       |       |
| PQ      | PQ - Doubl          | 1       |       |
| PQ3     | PQ - Triple         | 1       |       |
| PQROL   | PQ3 Mud Roller      |         |       |
| RB      | Rab Drilling        |         |       |
| RC      | Reverse Circulation |         |       |
| RC425   | Reverse Cii         | 1       |       |
| RC45    | Reverse Cii         | 1       |       |
| RC5     | Reverse Cii         | 1       |       |
| RC525   | Reverse Cii         | 1       |       |
| RC550   | Reverse Cii         | 1       |       |
| RK      | Rock chip           |         |       |
| RM      | Rotary Mud          |         |       |
| SL      | Soil Sample         |         |       |
| ST      | Stream Sediment     |         |       |
| TR      | Trench              |         |       |
| UG      | Underground         |         |       |
| UN      | Unknown             |         |       |
| VM      | Vacuum Drilling     |         |       |
| WR      | Water Sample        |         |       |

# FABINT

| CODE | DESCR                           | RANKING                   | P_VAL |
|------|---------------------------------|---------------------------|-------|
| -    | Not recorded                    |                           |       |
| I    | Intense                         | >90% recrystallisation    |       |
| M    | Moderate                        | 30- 60% recrystallisation |       |
| MAS  | Massive                         |                           |       |
| R    | Relict fabric, strength unknown |                           |       |
| S    | Strong                          | 60- 90% recrystallisation |       |
| VW   | Very weak                       | <10% recrystallisation    |       |
| W    | Weak                            | 10- 30% recrystallisation |       |

# FABTYPE

| CODE | DESCR                                        | RANKING | P_VAL |
|------|----------------------------------------------|---------|-------|
| -    | Not recorded                                 |         |       |
| BRX  | Brecciated                                   |         |       |
| FOL  | Foliation (simple shear fabric- rotation)    |         |       |
| JT   | Joint                                        |         |       |
| LAM  | Laminated                                    |         |       |
| LIN  | Lineated                                     |         |       |
| MAS  | Massive                                      |         |       |
| MYL  | Mylonitised                                  |         |       |
| RCX  | Recrystallised                               |         |       |
| SCH  | Schistosity (pure shear fabric - flattening) |         |       |

## FRACTION

| CODE     | DESCR                                | RANKING | P_VAL |
|----------|--------------------------------------|---------|-------|
| +10M     | Greater than 10 mesh size            |         |       |
| +20M     | Greater than 20 mesh size            |         |       |
| +6.4MM   | Greater than 6.4mm                   |         |       |
| +80M     | Greater than 80 mesh size            |         |       |
| -0.8MM+1 | Between 0.8 and 12.8 mm              |         |       |
| -10+20M  | Between 10 and 20 mesh in size       |         |       |
| -10M     | Less than 10 mesh size               |         |       |
| -200M    | Less than 200 mesh size              |         |       |
| -20M     | Less than 20 mesh size               |         |       |
| -2mm     | Less than 2 mm in size               |         |       |
| -2mm+400 | Between 2 mm and 400 microns in size |         |       |
| -4mm     | Less tha 4 mm in size                |         |       |
| -4mm+10M | Between 4 mm and 10 mesh in size     |         |       |
| -4mm+20M | Between 4 mm and 20 mesh in size     |         |       |
| -5mm     | Less than 5 mm in size               |         |       |
| -6mm+2mm | Between 6 mm and 2 mm in size        |         |       |
| -80M     | Less than 80 mesh size               |         |       |
| A_HORIZ  | Soil horizon A                       |         |       |
| ALL      | No sieving, all of sample taken      |         |       |
| B_HORIZ  | Soil horizon B                       |         |       |
| BARK     | Bark geochem sample                  |         |       |
| C_HORIZ  | Soil horizon C                       |         |       |
| D_HORIZ  | Soil horizon D                       |         |       |
| E_HORIZ  | Soil horizon E                       |         |       |
| LAG      | Lag                                  |         |       |
| LATERITE | Laterite fraction (used by Exodus)   |         |       |
| LEAF     | Leaf geochem sample                  |         |       |
| MAG      | Magnetic                             |         |       |
| NON_MAG  | Non magnetic lag sample              |         |       |
| PISO     | Plisoliths sampled                   |         |       |
| ROOT     | Root geochem sample                  |         |       |
| STEM     | Stem geochem sample                  |         |       |
| TWIG     | Twig geochem sample                  |         |       |
| UNKN     | Unknown size fraction sampled        |         |       |
| X        | Old code - needs translating !       |         |       |

# GEOLOGIST

| CODE   | DESCR         | RANKING | P_VAL |
|--------|---------------|---------|-------|
| AA     | Alex Aaltonen |         |       |
| BDS    | BDS           |         |       |
| BT     | Boris Tavcar  |         |       |
| CCC    | CCC           |         |       |
| ET     | ET            |         |       |
| IM     | IM            |         |       |
| JLH    | JLH           |         |       |
| JRD    | JRD           |         |       |
| MAM    | MAM           |         |       |
| OH     | Oliver Hirst  |         |       |
| PC     | PC            |         |       |
| RP     | RP            |         |       |
| SOC    | SOC           |         |       |
| SOC/PC | SOC/PC        |         |       |
| TE     | TE            |         |       |
| UNKN   | UNKN          |         |       |

## GRAINSIZE

| CODE | DESCR                    | RANKING | P_VAL |
|------|--------------------------|---------|-------|
| -    | Not recorded             |         |       |
| A    | not visible in 10x lense |         |       |
| C    | 2.0- 4.0 mm              |         |       |
| F    | 0.2- 0.1.0 mm            |         |       |
| M    | 1.0- 2.0mm               |         |       |
| VC   | >4.0 mm                  |         |       |
| VF   | <0.2 mm                  |         |       |

# HOLEDIAMETER

| CODE  | DESCR                  | RANKING     | P_VAL |
|-------|------------------------|-------------|-------|
| 102.4 | RAB 4" and AC 4" Hol   | RAB4 ,AC4   |       |
| 115.2 | RC 4.5" Hole diameter  | RC4_5       |       |
| 122.6 | PQ ROLLER Hole diam    | PQROL, PQ   |       |
| 128   | RC 5" Hole diameter    | RC5         |       |
| 134.4 | RC 5.25" Hole diameter | RC5_25      |       |
| 140.8 | RC 5.5" Hole diameter  | RC5_5       |       |
| 4.5"  | 4.5"                   |             |       |
| 59.9  | BQ Hole diameter       | BQ          |       |
| 75.7  | NQ Hole diameter       | NQ          |       |
| 88.9  | AC 3.5" Hole diameter  | AC          |       |
| 96.1  | HQBLADE, HQ Hole di    | HQBLADE, HQ |       |

## LANDFORM

| CODE    | DESCR                                     | RANKING | P_VAL |
|---------|-------------------------------------------|---------|-------|
| B_SLOPE | Back slope. On side of breakaway.         |         |       |
| CAP     | Breakaway or laterite cap                 |         |       |
| CREEK   | Alluvial drainage area                    |         |       |
| DUNE    | Eolian sands or dune deposits             |         |       |
| MULLOCK | Sample from old workings                  |         |       |
| OUTCROP | Area of outcrop                           |         |       |
| PAN     | Salt pan                                  |         |       |
| PLAIN   | Flat area. No alluvial / surface movement |         |       |
| RIDGE   | Breakaway face / hill / ridge             |         |       |
| SHEET   | Plain with evidence of sediment movement  |         |       |
| SLOPE   | Slope marginal to ridge or breakaway face |         |       |
| UNKN    | Unknown                                   |         |       |

# LITHOLOGY

| CODE   | DESCR                                              | RANKING | P_VAL |
|--------|----------------------------------------------------|---------|-------|
| Ap     | Felsic Intrusive Undifferentiated                  |         |       |
| Apf    | Felsic Intrusive Feldspar porphyry                 |         |       |
| Apg    | Felsic Intrusive Pegmatite                         |         |       |
| Apl    | Felsic Intrusive Aplite                            |         |       |
| Apq    | Felsic Intrusive Quartz porphyry                   |         |       |
| Apqf   | Felsic Intrusive Quartz feldspar porphyry          |         |       |
| Av     | Felsic Felsic volcanic, undifferentiated           |         |       |
| Ava    | Felsic Agglomerate, pyroclastic breccia            |         |       |
| Avl    | Felsic Lava, undifferentiated                      |         |       |
| Avla   | Felsic Lava, porphyritic_sodic phenocrysts         |         |       |
| Avlb   | Felsic Lava, porphyritic_biotite phenocrysts       |         |       |
| Avlf   | Felsic Lava, porphyritic_feldspar phenocrysts      |         |       |
| Avlh   | Felsic Lava, porphyritic_hornblende phenocrysts    |         |       |
| Avlk   | Felsic Lava, porphyritic_potassic phenocrysts      |         |       |
| Avlp   | Felsic Lava, porphyritic_plagioclase phenocrysts   |         |       |
| Avlq   | Felsic Lava, porphyritic_quartz phenocrysts        |         |       |
| Avlx   | Felsic Lava, porphyritic_pyroxene phenocrysts      |         |       |
| Avt    | Felsic Tuff, undifferentiated                      |         |       |
| Avta   | Felsic Tuff, crystal_sodic phenocrysts             |         |       |
| Avtb   | Felsic Tuff, crystal biotite phenocrysts           |         |       |
| Avtc   | Felsic Tuff, cherty                                |         |       |
| Avtf   | Felsic Tuff, crystal porphyritic_feldspar phenocry |         |       |
| Avth   | Felsic Tuff, crystal_hornblende phenocrysts        |         |       |
| Avti   | Felsic Ignimbrite, composite pyroclastic flow      |         |       |
| Avtk   | Felsic Tuff, crystal_potassic phenocrysts          |         |       |
| Avtl   | Felsic Tuff, lapilli                               |         |       |
| Avtp   | Felsic Tuff, crystal_plagioclase phenocrysts       |         |       |
| Avtq   | Felsic Tuff, crystal_quartz phenocrysts            |         |       |
| Avtw   | Felsic Tuff, ash fall                              |         |       |
| Avtwa  | Felsic Tuff, ash flow_sodic phenocrysts            |         |       |
| Avtwb  | Felsic Tuff, ash flow_biotite phenocrysts          |         |       |
| Avtwf  | Felsic Tuff, ash flow_porphyritic feldspar phenocr |         |       |
| Avtwh  | Felsic Tuff, ash flow_hornblende phenocrysts       |         |       |
| Avtwk  | Felsic Tuff, ash flow_potassic phenocrysts         |         |       |
| Avtwp  | Felsic Tuff, ash flow_plagioclase phenocrysts      |         |       |
| Avtwq  | Felsic Tuff, ash flow_quartz phenocrysts           |         |       |
| Avtwx  | Felsic Tuff, ash flow_pyroxene phenocrysts         |         |       |
| Avtx   | Felsic Tuff, crystal_pyroxene phenocrysts          |         |       |
| CAVITY | Misc Cavity                                        |         |       |
| CL     | Misc Core loss                                     |         |       |
| CO     | Misc                                               |         |       |
| Crb    | Carbonates; Carbonate rock (marble)                |         |       |
| Crbmg  | Carbonates; Carbonate-magnetite rock (marble)      |         |       |
| Dc     | DEVONIAN Clay                                      |         |       |
| Dcbc   | DEVONIAN Calcareous clays                          |         |       |
| Dcbl   | DEVONIAN Limestone                                 |         |       |
| Dcbsa  | DEVONIAN Calcareous sandstone                      |         |       |

## LITHOLOGY

|       |                                                    |
|-------|----------------------------------------------------|
| Dcbsh | DEVONIAN Calcareous black shale                    |
| Dcbst | DEVONIAN Calcareous siltstone                      |
| Dcg   | DEVONIAN Green clays                               |
| Dgv   | DEVONIAN Gravel                                    |
| Dlg   | DEVONIAN Lignite                                   |
| Ds    | Onslow Geology - Unknown Lithology Code            |
| Dsa   | DEVONIAN Sandstone                                 |
| Dsad  | DEVONIAN - Dolomite bearing                        |
| Dsh   | DEVONIAN Shale                                     |
| Dshb  | DEVONIAN Black Shale                               |
| Dshsy | DEVONIAN Pyritic/Sulphritic Shale                  |
| Dsm   | DEVONIAN Claystone/Mudstone                        |
| Dso   | DEVONIAN Conglomerate                              |
| Dst   | DEVONIAN Siltstone                                 |
| Fill  | Misc Fill                                          |
| Gr    | Granitoids Undifferentiated                        |
| Grd   | Granitoids Granodiorite                            |
| Grm   | Granitoids Monzonite                               |
| Grn   | Granitoids Tonalite                                |
| Grr   | Granitoids Diorite                                 |
| Grs   | Granitoids Syenite                                 |
| Grt   | Granitoids Granite                                 |
| Grz   | Granitoids Monzodiorite                            |
| Ip    | Intermediate Intrusive Undifferentiated            |
| Ipa   | Intermediate Intrusive Anorthosite                 |
| Iph   | Intermediate Intrusive Hornblende porphyry         |
| Ipi   | Intermediate Intrusive Andesite porphyry           |
| Ipia  | Intermediate Intrusive Andesite porphyry_sodic phe |
| Ipiib | Intermediate Intrusive Andesite porphyry_biotite p |
| Ipiik | Intermediate Intrusive Andesite porphyry_potassic  |
| Ipim  | Intermediate Intrusive Andesite porphyry_amphibole |
| Ipip  | Intermediate Intrusive Andesite porphyry_plagiocla |
| Ipiq  | Intermediate Intrusive Andesite porphyry_quartz ph |
| Iv    | Andesite Undifferentiated                          |
| Iva   | Andesite Agglomerate, pyroclastic breccia          |
| Ivl   | Andesite Lava, undifferentiated                    |
| Ivla  | Andesite Lava, porphyritic_sodic phenocrysts       |
| Ivlb  | Andesite Lava, porphyritic_biotite phenocrysts     |
| Ivlf  | Andesite Lava, porphyritic_feldspar phenocrysts    |
| Ivlh  | Andesite Lava, porphyritic_hornblende phenocrysts  |
| Ivlk  | Andesite Lava, porphyritic_potassic phenocrysts    |
| Ivlp  | Andesite Lava, porphyritic_plagioclase phenocrysts |
| Ivlq  | Andesite Lava, porphyritic_quartz phenocrysts      |
| Ivlx  | Andesite Lava, porphyritic_pyroxene phenocrysts    |
| Ivt   | Andesite Tuff, undifferentiated                    |
| Ivta  | Andesite Tuff, crystal_sodic phenocrysts           |
| Ivtb  | Andesite Tuff, crystal biotite phenocrysts         |
| Ivtc  | Andesite Tuff, cherty                              |

## LITHOLOGY

|       |                                                               |
|-------|---------------------------------------------------------------|
| Ivtf  | Andesite Tuff, crystal porphyritic_feldspar phenoc            |
| Ivth  | Andesite Tuff, crystal_hornblende phenocrysts                 |
| Ivti  | Andesite Ignimbrite, composite pyroclastic flow               |
| Ivtk  | Andesite Tuff, crystal_potassic phenocrysts                   |
| Ivtl  | Andesite Tuff, lapilli                                        |
| Ivtp  | Andesite Tuff, crystal_plagioclase phenocrysts                |
| Ivtq  | Andesite Tuff, crystal_quartz phenocrysts                     |
| Ivtw  | Andesite Tuff, ash fall                                       |
| Ivtwa | Andesite Tuff, ash flow_sodic phenocrysts                     |
| Ivtwb | Andesite Tuff, ash flow_biotite phenocrysts                   |
| Ivtwf | Andesite Tuff, ash flow_porphyritic feldspar pheno            |
| Ivtwh | Andesite Tuff, ash flow_hornblende phenocrysts                |
| Ivtwk | Andesite Tuff, ash flow_potassic phenocrysts                  |
| Ivtwp | Andesite Tuff, ash flow_plagioclase phenocrysts               |
| Ivtwq | Andesite Tuff, ash flow_quartz phenocrysts                    |
| Ivtwx | Andesite Tuff, ash flow_pyroxene phenocrysts                  |
| Ivtx  | Andesite Tuff, crystal_pyroxene phenocrysts                   |
| Kc    | Alkaline Carbonatite                                          |
| Kcb   | CRETACEOUS Calcareous - undiff                                |
| Kcbl  | CRETACEOUS Limestone/Dolomite                                 |
| KCpr  | CRETACEOUS Carbonised plant remains/carbonaceous              |
| Kgv   | CRETACEOUS Gravel                                             |
| Kk    | Alkaline Kimberlite                                           |
| Kl    | Alkaline Lamprophyre                                          |
| Klg   | CRETACEOUS Lignite                                            |
| Ks    | CRETACEOUS Sands                                              |
| Ksa   | CRETACEOUS Sandstone                                          |
| Ksct  | CRETACEOUS Chert                                              |
| Ksh   | CRETACEOUS Shale                                              |
| Kshb  | CRETACEOUS Black Shale                                        |
| Kshsy | CRETACEOUS Pyritic/Sulphritic Shale                           |
| Ksm   | CRETACEOUS Mudstone/Claystone                                 |
| Kso   | CRETACEOUS Conglomerate                                       |
| Kst   | CRETACEOUS Siltstone                                          |
| Kwr   | CRETACEOUS Windalia Radiolarite                               |
| Lc    | Tertiary Regolith Regolith:Saprolitic Clays, undifferentiated |
| Lcm   | Regolith-Mottled Clay                                         |
| Lcp   | Regolith-Pallid Clay                                          |
| Lf    | Laterite, ironstone undifferentiated                          |
| M     | Tholeiite Mafic undifferentiated                              |
| MI    | Missing Interval                                              |
| Mktc  | Tholeiite                                                     |
| Mo    | Mafic Intrusive Undifferentiated                              |
| Mod   | Mafic Intrusive Dolerite                                      |
| Mog   | Mafic Intrusive Gabbro                                        |
| Mogn  | Mafic Intrusive Gabbro Norite                                 |
| Mogq  | Mafic Intrusive Quartz Gabbro                                 |
| Mogz  | Mafic Intrusive Monzo Gabbro                                  |

## LITHOLOGY

|      |                                                    |
|------|----------------------------------------------------|
| Mon  | Mafic Intrusive Norite                             |
| Mot  | Mafic Intrusive Troctolite                         |
| Mtkc | High Mg Tremolite Chlorite Schist                  |
| Mv   | Tholeiite Mafic volcanic, undifferentiated         |
| Mva  | Tholeiite Vent breccia, flow top or pillow breccia |
| Mvac | Actinolite Chlorite Schist                         |
| Mvhp | Tholeiite Amphibole-plagioclase schist             |
| Mvk  | High Mg Komatiitic basalt undiff.                  |
| Mvkv | High Mg Komatiitic basalt, variolitic textured     |
| Mvkv | High Mg Komatiitic basalt, pyroxene spinifex       |
| Mvl  | Tholeiite Lava, tholeiitic                         |
| Mvlp | Tholeiite Lava, tholeiitic, pillowed               |
| Mvlv | Tholeiite Lava, tholeiitic, vesicular              |
| Mvt  | Tholeiite Tuff, ash fall                           |
| ns   | Misc No Sample                                     |
| P    | Permian Permian, undifferentiated                  |
| Pc   | Permian Lacustrine clays, shales, siltstones       |
| Pgv  | Permian Gravel                                     |
| Ps   | Permian Arkose                                     |
| Pt   | Permian Tillite/Erratics                           |
| Qcal | Quaternary Calcrete (only if 100% destruction of   |
| Qcp  | Claypan - Playa Lake                               |
| Qgp  | Quaternary Gravel, pisolithic with clay, silt and  |
| Qgq  | Quaternary Gravels, predominantly quartz grit      |
| Qgv  | Quaternary Gravels, undifferentiated               |
| Qrs  | Quaternary Sands, soils undifferentiated - residu  |
| Qrsg | Quaternary Residual soil developed over granite r  |
| Qrsm | Quaternary Residual soil developed over mafic roc  |
| Qrsu | Quaternary residual soil developed over ultramafi  |
| Qs   | Quaternary Sediments, transported                  |
| Qsa  | Quaternary Alluvium                                |
| Qsc  | Quaternary Colluvium - local                       |
| Qsd  | Quaternary Sand                                    |
| Qse  | Quaternary Eolian sands                            |
| Qsh  | Quaternary Sheetwash                               |
| Qsil | Quaternary Silcrete (only if 100% destruction of   |
| Qsl  | Quaternary Lacustrine sediments                    |
| Qss  | Quaternary Colluvium - distal                      |
| Qst  | Quaternary Silt                                    |
| Qt   | Quaternary Sands, soils undifferentiated - transp  |
| Qtd  | Quaternary Soils - depositional regime             |
| Qte  | Quaternary Soils - erosional regime                |
| S    | Clastic Sed Undifferentiated                       |
| Sa   | Clastic Sed Sandstone, undifferentiated            |
| Sac  | Clastic Sed Calcite Bearing                        |
| Sad  | Clastic Sed Dolomite Bearing                       |
| Sag  | Clastic Sed Greywacke                              |
| Sak  | Clastic Sed Arkose                                 |

## LITHOLOGY

|       |                                                                  |
|-------|------------------------------------------------------------------|
| Sal   | Clastic Sed Lithic                                               |
| Saq   | Clastic Sed Quartzite                                            |
| Sat   | Clastic Sed Composite turbidite succession                       |
| Sav   | Clastic Sed Reworked Tuff                                        |
| Sbx   | Clastic Sed Sedimentary breccia                                  |
| Sc    | Onslow Geology - Unknown Lithology Code                          |
| Scb   | Chemical Sed Calcareous Rocks (50% Carb), undiffer               |
| Scbd  | Chemical Sed Dolomite                                            |
| Scbl  | Limestone                                                        |
| Scbm  | Chemical Sed Marl                                                |
| Scg   | Chemical Sed                                                     |
| Sct   | Chemical Sed Chert                                               |
| sd    | Onslow Geology - Unknown Lithology Code                          |
| Sh    | Chemical Sed Silts and Shales, undifferentiated                  |
| Shb   | Clastic Sed Black Shale                                          |
| Shc   | Clastic Sed Calcite Bearing Shale                                |
| Shd   | Clastic Sed Dolomite Bearing Shale                               |
| Shs   | Clastic Sed Sulphidic Shale                                      |
| Shso  | Clastic Sed Pyrrhotitic Black Shale                              |
| Shsy  | Clastic Sed Pyritic Sulphidic Shale                              |
| Sif   | Chemical Sed Banded iron formation, undiff.                      |
| Sifa  | Chemical Sed Amphibole iron formation                            |
| Sifc  | Chemical Sed Carbonate iron formation                            |
| Sifj  | Chemical Sed Jasperlite iron formation                           |
| Sifm  | Chemical Sed Magnetic iron formation                             |
| Sifs  | Chemical Sed Sulphide iron formation                             |
| Sm    | Mudstone/claystone                                               |
| So    | Clastic Sed Conglomerate, undifferentiated                       |
| Sob   | Clastic Sed Conglomerate, Sif cobble dominated                   |
| Soo   | Clastic Sed Oligomictic, clasts Undifferentiated                 |
| Sooap | Clastic Sed Oligomictic, clasts Felsic Intrusive                 |
| Sooav | Clastic Sed Oligomictic, clasts Felsic volcanic, undifferentiate |
| Soogr | Clastic Sed Oligomictic, clasts Granitic_Granitic Gneiss         |
| Sooip | Clastic Sed Oligomictic, clasts Intermediate Intrusive Undiffere |
| Sooiv | Clastic Sed Oligomictic, clasts Felsic Intrusive Undifferentiate |
| Soomo | Clastic Sed Oligomictic, clasts Mafic Intrusive Undifferentiated |
| Soomv | Clastic Sed Oligomictic, clasts Tholeiite Mafic volcanic, undiff |
| Sooq  | Clastic Sed Oligomictic, clasts Quartz                           |
| Soos  | Clastic Sed Oligomictic, clasts Undifferentiated                 |
| Soouk | Clastic Sed Oligomictic, clasts Ultramafic volcanic, undifferent |
| Sooup | Clastic Sed Oligomictic, clasts Ultramafic Intrusive Undifferent |
| Sop   | Clastic Sed Conglomerate, polymictic                             |
| Tc    | Tertiary Clay                                                    |
| TCAL  | Tertiary Calcrete                                                |
| Tcf   | Tertiary Chemical Ferricrete                                     |
| TCP   | Tertiary Claypan-Playa lake                                      |
| Tgv   | Tertiary Gravel                                                  |
| Tlg   | Tertiary Lignite                                                 |

## LITHOLOGY

|       |                                                    |
|-------|----------------------------------------------------|
| TRS   | Tertiary Sands, soils Undifferentiated             |
| Ts    | Tertiary Sand                                      |
| Tsa   | TERTIARY Sandstone                                 |
| TSc   | Tertiary Colluvium-local                           |
| TSd   | Tertiary Siderite                                  |
| TSe   | Tertiary Sericite                                  |
| TSIL  | Tertiary Silcrete                                  |
| TSM   | Tertiary Mud/claystone                             |
| Tso   | TERTIARY Conglomerate                              |
| TSs   | Tertiary Colluvium-distal                          |
| Tst   | TERTIARY Siltstone                                 |
| TT    | Tertiary Sands, soils undifferentiated             |
| TTe   | Tertiary soils erosional regime                    |
| Uk    | Ultramafic Ultramafic volcanic, undifferentiated   |
| Ukac  | Ultramafic Tremolite-Chlorite rock                 |
| Ukatc | Ultramafic Trem-Talc-Chlorite(+/- Carb) rock       |
| Ukc   | Ultramafic Cumulate, undifferentiated              |
| Ukca  | Ultramafic Adcumulate olivine                      |
| Ukcm  | Ultramafic Mesocumulate olivine                    |
| Ukco  | Ultramafic Orthocumulate olivine                   |
| Ukcos | Ultramafic Olivine-sulphide cumulate               |
| Ukcs  | Ultramafic Sulphide cumulate                       |
| Uks   | Ultramafic Serpentine                              |
| Uksac | Ultramafic Serp-trem-Chlorite rock                 |
| Ukst  | Ultramafic Serp-Talc rock                          |
| Uktc  | Ultramafic Talc Chlorite                           |
| Uktd  | Ultramafic Talc-Dolomite rock                      |
| Uktm  | Ultramafic Talc-Magnesite rock                     |
| Ukx   | Ultramafic Spinifex Textured, undifferentiated     |
| Ukxb  | Ultramafic Coarse grained bladed texture (A3 zone) |
| Ukxc  | Ultramafic Chilled flow top breccia (A1 zone)      |
| Ukxf  | Ultramafic Fine grained feathery texture (A2 zone) |
| UNKN  | Misc Unknown                                       |
| Up    | Ultramafic Intrusive Undifferentiated              |
| Upd   | Ultramafic Intrusive Peridotite                    |
| Upb   | Ultramafic Intrusive Hornblende                    |
| Upn   | Ultramafic Intrusive Dunite                        |
| Upx   | Ultramafic Intrusive Pyroxenite                    |
| Upxc  | Ultramafic Intrusive Pyroxenite_cpx                |
| Upxn  | Ultramafic Intrusive Olivine Pyroxenite            |
| Upxo  | Ultramafic Intrusive Pyroxenite_opx                |
| Upxw  | Ultramafic Intrusive Pyroxenite_websterite         |
| Uxs   | Ultramafic Adcumulate                              |
| VEIN  | MinAlt Veining                                     |
| Wcy   | Onslow Geology - Unknown Geology Code              |
| Xcs   | MinAlt Calc silicate rocks                         |
| Xgn   | Gneiss Undifferentiated                            |
| Xgnf  | Gneiss Felsic                                      |

## LITHOLOGY

|        |                                   |
|--------|-----------------------------------|
| Xgnfa  | Gneiss Felsic_augen               |
| Xgnfb  | Gneiss Felsic_biotite             |
| Xgnfgn | Gneiss Felsic_garnet              |
| Xgnfh  | Gneiss Felsic_hornblende          |
| Xgng   | Gneiss Granitic_Granitic Gneiss   |
| Xgnga  | Gneiss Granitic_augen             |
| Xgn gb | Gneiss Granitic_biotite           |
| Xgnggn | Gneiss Granitic_garnet            |
| Xgngh  | Gneiss Granitic_hornblende        |
| Xgnm   | Gneiss Mafic                      |
| Xgnma  | Gneiss Mafic_augen                |
| Xgnmb  | Gneiss Mafic_biotite              |
| Xgnmgn | Gneiss Mafic_garnet               |
| Xgnmh  | Gneiss Mafic_hornblende           |
| Xgnr   | Gneiss Granodioritic              |
| Xgnra  | Gneiss Granodioritic_augen        |
| Xgnrb  | Gneiss Granodioritic_biotite      |
| Xgnrgn | Gneiss Granodioritic_garnet       |
| Xgnrh  | Gneiss Granodioritic_hornblende   |
| Xgnt   | Gneiss Tonalitic                  |
| Xgnta  | Gneiss Tonalitic_augen            |
| Xgntb  | Gneiss Tonalitic_biotite          |
| Xgntgn | Gneiss Tonalitic_garnet           |
| Xgnth  | Gneiss Tonalitic_hornblende       |
| Xgr    | Granulite Undifferentiated        |
| Xgrc   | Granulite Undifferentiated_cpx    |
| Xgrca  | Charnokite augen                  |
| Xgrcb  | Charnokite biotite                |
| Xgrcgn | Charnokite garnet                 |
| Xgrch  | Charnokite hornblende             |
| Xgrcp  | Charnokite plagioclase            |
| Xgrf   | Granulite Felsic                  |
| Xgrfa  | Granulite Felsic_augen            |
| Xgrfb  | Granulite Felsic_biotite          |
| Xgrfgn | Granulite Felsic_garnet           |
| Xgrfh  | Granulite Felsic_hornblende       |
| Xgrgn  | Granulite Undifferentiated_garnet |
| Xgrm   | Granulite Mafic                   |
| Xgrma  | Granulite Mafic_augen             |
| Xgrmb  | Granulite Mafic_biotite           |
| Xgrmgn | Granulite Mafic_garnet            |
| Xgrmh  | Granulite Mafic_hornblende        |
| Xgro   | Granulite Undifferentiated_opx    |
| Xk     | Skarn Undifferentiated            |
| Xkg    | Skarn Garnet Skarn                |
| Xkh    | Skarn Hornfels                    |
| Xkha   | Skarn Hornfelsed Arenite          |
| Xkhg   | Skarn Horneblende Garnet          |

## LITHOLOGY

|         |                                      |
|---------|--------------------------------------|
| Xkhh    | Skarn Hornfelses Argillite           |
| Xkhm    | Skarn Hornfelses Mafic               |
| Xkpg    | Skarn Pyroxene Garnet                |
| Xm      | Amphibolite Undifferentiated         |
| Xma     | Amphibolite hb-fs rock               |
| Xmg     | Amphibolite hb-fs-gn rock            |
| Xmh     | Amphibolite Horneblendite            |
| Xmhg    | Amphibolite hb-gn rock               |
| Xs      | Schists Undifferentiated             |
| Xsac    | Schists trem/act-chlorite            |
| Xsaccd  | Schists trem/act-chlorite_corderite  |
| Xsacgn  | Schists trem/act-chlorite_garnet     |
| Xsachn  | Schists trem/act-chlorite_hornblende |
| Xsacst  | Schists trem/act-chlorite_staurolite |
| Xsb     | Schists biotite                      |
| Xsbcd   | Schists biotite_corderite            |
| Xsbgn   | Schists biotite_garnet               |
| Xsbhn   | Schists biotite_hornblende           |
| Xsbst   | Schists biotite_staurolite           |
| Xsc     | Schists chlorite                     |
| Xscb    | Schists chlorite-biotite             |
| Xscbcd  | Schists chlorite-biotite_corderite   |
| Xscbgn  | Schists chlorite-biotite_garnet      |
| Xscbhn  | Schists chlorite-biotite_hornblende  |
| Xscbst  | Schists chlorite-biotite_staurolite  |
| Xsccd   | Schists chlorite_corderite           |
| Xscgn   | Schists chlorite_garnet              |
| Xschn   | Schists chlorite_hornblende          |
| Xscst   | Schists chlorite_staurolite          |
| Xsfc    | Schists fs-chlorite                  |
| Xsfccd  | Schists fs-chlorite_corderite        |
| Xsfagn  | Schists fs-chlorite_garnet           |
| Xsfchn  | Schists fs-chlorite_hornblende       |
| Xsfbst  | Schists fs-chlorite_staurolite       |
| Xsfs    | Schists fs-sericite                  |
| Xsfscd  | Schists fs-sericite_corderite        |
| Xsfagn  | Schists fs-sericite_garnet           |
| Xsfshn  | Schists fs-sericite_hornblende       |
| Xsfbst  | Schists fs-sericite_staurolite       |
| Xsqc    | Schists qtz-mu-chlorite              |
| Xsqccd  | Schists qtz-mu-chlorite_corderite    |
| Xsqagn  | Schists qtz-mu-chlorite_garnet       |
| Xsqchn  | Schists qtz-mu-chlorite_hornblende   |
| Xsqbst  | Schists qtz-mu-chlorite_staurolite   |
| Xsqf    | Schists qtz-fs                       |
| Xsqfb   | Schists qtz-fs-biotite               |
| Xsqfbcd | Schists qtz-fs-biotite_corderite     |
| Xsqfbgn | Schists qtz-fs-biotite_garnet        |

## LITHOLOGY

|         |                                                  |
|---------|--------------------------------------------------|
| Xsqfbhn | Schists qtz-fs-biotite_hornblende                |
| Xsqfbst | Schists qtz-fs-biotite_staurolite                |
| Xsqfc   | Schists qtz-fs-chlorite                          |
| Xsqfccd | Schists qtz-fs-chlorite_corderite                |
| Xsqfcgn | Schists qtz-fs-chlorite_garnet                   |
| Xsqfchn | Schists qtz-fs-chlorite_hornblende               |
| Xsqfcst | Schists qtz-fs-chlorite_staurolite               |
| Xsqfm   | Schists qtz-fs-muscovite                         |
| Xsqfmcd | Schists qtz-fs-muscovite_corderite               |
| Xsqfmgn | Schists qtz-fs-muscovite_garnet                  |
| Xsqfmhn | Schists qtz-fs-muscovite_hornblende              |
| Xsqfmst | Schists qtz-fs-muscovite_staurolite              |
| Xsqm    | Schists qtz-muscovite                            |
| Xsqma   | Schists qtz-muscovite-aluminosilicate            |
| Xsqmacd | Schists qtz-muscovite-aluminosilicate_corderite  |
| Xsqmagn | Schists qtz-muscovite-aluminosilicate_garnet     |
| Xsqmahn | Schists qtz-muscovite-aluminosilicate_hornblende |
| Xsqmast | Schists qtz-muscovite-aluminosilicate_staurolite |
| Xsqmcd  | Schists qtz-muscovite_corderite                  |
| Xsqmgn  | Schists qtz-muscovite_garnet                     |
| Xsqmhn  | Schists qtz-muscovite_hornblende                 |
| Xsqmst  | Schists qtz-muscovite_staurolite                 |
| Xsq     | Schists qtz-mu-sericite                          |
| Xsqscd  | Schists qtz-mu-sericite_corderite                |
| Xsqsgn  | Schists qtz-mu-sericite_garnet                   |
| Xsqshn  | Schists qtz-mu-sericite_hornblende               |
| Xsqsst  | Schists qtz-mu-sericite_staurolite               |
| Ybrx    | Tectonite Breccia                                |
| Ym      | Tectonite Mylonite                               |
| Ymq     | Tectonite Quartz Mylonite                        |
| Ymqf    | Tectonite Quartz Feldspar Mylonite               |
| Yms     | Tectonite Sericite Mylonite                      |
| Zcg     | MinAlt Galena                                    |
| Zs      | MinAlt Massive Sulphide                          |
| Zsc     | MinAlt Chalcocite                                |
| Zsh     | MinAlt Sphalerite                                |
| Zso     | MinAlt Pyrrhotite                                |
| Zsy     | MinAlt Pyrite                                    |

# MINZN

| CODE | DESCR                               | RANKING | P_VAL |
|------|-------------------------------------|---------|-------|
| ASPY | Arsenopyrite                        |         |       |
| AU   | Gold                                |         |       |
| CA   | Calcium                             |         |       |
| CPY  | Chalcopyrite                        |         |       |
| FE   | Undifferentiated Iron               |         |       |
| GN   | Galena                              |         |       |
| GO   | Goethite                            |         |       |
| HM   | Haematite                           |         |       |
| JA   | Jarosite                            |         |       |
| MG   | Magnetite                           |         |       |
| MI   | Mica                                |         |       |
| MO   | Molybdenite                         |         |       |
| MU   | Muscovite                           |         |       |
| PO   | Pyrrhotite                          |         |       |
| PY   | Pyrite                              |         |       |
| S    | Sulfur                              |         |       |
| SI   | Silica                              |         |       |
| SPH  | Sphalerite                          |         |       |
| SX   | Oxidised sulphide, undifferentiated |         |       |
| USU  | Undifferentiated Sulphides          |         |       |

# MINZNSTYLE

| CODE | DESCR            | RANKING | P_VAL |
|------|------------------|---------|-------|
| AGG  | Aggregates       |         |       |
| BND  | Banded           |         |       |
| DISS | Disseminated     |         |       |
| FRAC | Fracture         |         |       |
| GOS  | Gossanous        |         |       |
| LAM  | Laminated/banded |         |       |
| MAS  | Massive          |         |       |
| NOD  | Nodular          |         |       |
| PV   | Pervasive        |         |       |
| RM   | Remobilised      |         |       |
| STN  | Staining         |         |       |
| STR  | Stringer         |         |       |
| VN   | Vein             |         |       |

# PEDCARB

| CODE | DESCR                                             | RANKING | P_VAL |
|------|---------------------------------------------------|---------|-------|
| M    | Moderate carbonate. moderate reaction with acid   |         |       |
| N    | No carbonate. No reaction.                        |         |       |
| S    | Abundant carbonate. Strong Crb reaction with acid |         |       |
| U    | Unknown                                           |         |       |
| W    | Weak carbonate. weak reaction with acid           |         |       |

## PERCENTAGE

| CODE | DESCR      | RANKING | P_VAL |
|------|------------|---------|-------|
| -1   | = <0.5%    |         |       |
| 10   | = 5 - 10%  |         |       |
| 100  | = >75%     |         |       |
| 2    | = 0.5 - 2% |         |       |
| 25   | = 10 - 25% |         |       |
| 5    | = 2 - 5%   |         |       |
| 50   | = 25 - 50% |         |       |
| 75   | = 50 - 75% |         |       |
| U    | Unknown    |         |       |

# PRIORITY\_S

| CODE | DESCR                                                   | RANKING | P_VAL |
|------|---------------------------------------------------------|---------|-------|
| 1    | Routine sample                                          |         |       |
| 2    | Resplit                                                 |         |       |
| 3    | QC sample, Duplicate, FieldCheck, LabCheck, or Standard |         |       |
| 4    | Overlap - Parital resplit, BOH sample                   |         |       |
| 9    | Dodgy sample - ignore                                   |         |       |

## REDOX

| CODE  | DESCR | RANKING | P_VAL |
|-------|-------|---------|-------|
| MOX   |       |         |       |
| MRED  |       |         |       |
| NEUT  |       |         |       |
| SRED  |       |         |       |
| STOX  |       |         |       |
| STRED |       |         |       |
| WOX   |       |         |       |
| WRED  |       |         |       |

# REGOLITH

| CODE   | DESCR                                  | RANKING | P_VAL |
|--------|----------------------------------------|---------|-------|
| CAVITY | Cavity                                 |         |       |
| CL     | Core loss                              |         |       |
| Gos    | Gossan                                 |         |       |
| Lc     | Undifferentiated Saprolitic Clay       |         |       |
| Lcl    | Lower saprolite, moderately weather    |         |       |
| Lcm    | Mottled zone                           |         |       |
| Lcp    | Pallid zone                            |         |       |
| Lcr    | Saprock weakly weathered               |         |       |
| Lcu    | Upper saprolite, strongly weathered    |         |       |
| Lcv    | Very weakly weathered rock             |         |       |
| Lf     | Ironstone, undifferentiated            |         |       |
| Lnc    | Laterite, nodular - consolidated       |         |       |
| LnI    | Laterite, nodular - loose              |         |       |
| Lpc    | Laterite, pisolitic - consolidated     |         |       |
| Lpl    | Laterite, pisolitic - loose            |         |       |
| Ltc    | Laterite, transported - consolidate    |         |       |
| Ltl    | Laterite, transported - loose          |         |       |
| NS     | No Sample                              |         |       |
| Qcal   | Calcrete                               |         |       |
| Qh     | Hardpan                                |         |       |
| Qr     | Residual                               |         |       |
| Qsil   | Silcrete                               |         |       |
| Qt     | Transported                            |         |       |
| TSIL   | Tertiary Silcrete                      |         |       |
| TT     | Tertiary Sands, soils undifferentiated |         |       |
| UNKN   | Unknown Regolith Descriptor            |         |       |
| UNW    | Unweathered                            |         |       |

## RELIABLE

| CODE | DESCR              | RANKING | P_VAL |
|------|--------------------|---------|-------|
| H    | High Confidence    |         |       |
| L    | Low Confidence     |         |       |
| U    | Unknown Confidence |         |       |

# RESPLIT

| CODE | DESCR | RANKING | P_VAL |
|------|-------|---------|-------|
| N    | No    |         |       |
| Y    | Yes   |         |       |

## SAMPLER

| CODE | DESCR | RANKING | P_VAL |
|------|-------|---------|-------|
| BDS  | BDS   |         |       |
| CR   | CR    |         |       |
| GB   | GB    |         |       |
| RON  | RON   |         |       |
| RS   | RS    |         |       |
| TE   | TE    |         |       |
| UNKN | UNKN  |         |       |

# SAMPMETH

| CODE       | DESCR                           | RANKING | P_VAL |
|------------|---------------------------------|---------|-------|
| CONESPLIT  | Cone split                      |         |       |
| GNS        | Geologically not sampled        |         |       |
| GRAB       | Grab                            |         |       |
| HALF_COR   | Half core                       |         |       |
| HAMMER     | Hammer                          |         |       |
| MAT&SLIC   | Mix sample on mat and pie slice |         |       |
| ML         | ML                              |         |       |
| PULP       | Pulp                            |         |       |
| QTR_CORE   | Quarter core                    |         |       |
| RIFFLESPLI | Riffle split                    |         |       |
| SCOOP      | Scoop                           |         |       |
| SIEVE      | Sieve                           |         |       |
| SLICE_COR  | Slice core                      |         |       |
| SPADE      | Spade                           |         |       |
| SPEAR      | Spear                           |         |       |
| UNKN       | Unknown                         |         |       |
| WHOLE_C    | Whole core                      |         |       |

## SAMPMOIST

| CODE | DESCR | RANKING | P_VAL |
|------|-------|---------|-------|
| D    | Dry   |         |       |
| M    | Moist |         |       |
| W    | Wet   |         |       |

# SAMPPURP

| CODE       | DESCR                                      | RANKING | P_VAL |
|------------|--------------------------------------------|---------|-------|
| BLANK      | BLANK sample                               |         |       |
| FIELDCHK_  | Field Check - Duplicate sample             |         |       |
| FIELDCHK_  | Field Check - Resample                     |         |       |
| LABCHK     | Lab Check                                  |         |       |
| NOSAMPLI   | No Sample                                  |         |       |
| ORIG_1M    | Original 1m sample                         | 1       |       |
| ORIG_2MC   | Original 2m composite                      | 2       |       |
| ORIG_3MC   | Original 3m composite                      | 3       |       |
| ORIG_4MC   | Original 4m composite                      | 4       |       |
| ORIG_5MC   | Original 5m composite                      | 5       |       |
| ORIG_GSA   | Original geology sample interval <= 1m     |         |       |
| ORIG_GSA   | Original geology selected composite sample |         |       |
| ORIG_POIN  | Point sample                               |         |       |
| RESPL_GSA  | Resplit Geology sample                     |         |       |
| RESPLIT_1I | 1m resplit of composite                    | 1       |       |
| STANDARD   | Standard sample                            |         |       |
| UNKN       | Unknown sample                             |         |       |

## SAMPQUAL

| CODE | DESCR                         | RANKING | P_VAL |
|------|-------------------------------|---------|-------|
| 1    | Wet Sample - <40% Recovery    |         |       |
| 2    | Damp Sample - <40% Recovery   |         |       |
| 3    | Dry Sample - <40% Recovery    |         |       |
| 4    | Wet Sample - 40-80% Recovery  |         |       |
| 5    | Damp Sample - 40-80% Recovery |         |       |
| 6    | Dry Sample - 40-80% Recovery  |         |       |
| 7    | Wet Sample - >80% Recovery    |         |       |
| 8    | Damp Sample - >80% Recovery   |         |       |
| 9    | Dry Sample - >80% Recovery    |         |       |

# SAMPTYPE

| CODE      | DESCR                                             | RANKING | P_VAL |
|-----------|---------------------------------------------------|---------|-------|
| AC_CHIPS  | AC chips                                          |         |       |
| AU_CHIPS  | Auger Chips                                       |         |       |
| BIO_GCHEI | Biological Geochem sample                         |         |       |
| BLEG      | Bulk cyanide leachable extractable stream samples |         |       |
| BQ        | BQ core                                           |         |       |
| BQ2       | BQ2 core                                          |         |       |
| BQ3       | BQ3 core                                          |         |       |
| CHANNEL   | Channel sample                                    |         |       |
| CORELOSS  | Core loss                                         |         |       |
| DD        | Diamond core unkn                                 |         |       |
| FLOAT     | Float                                             |         |       |
| GNS       | Geologically not sampled                          |         |       |
| HQ        | HQ core                                           |         |       |
| HQ2       | HQ2 core                                          |         |       |
| HQ3       | HQ3 core                                          |         |       |
| LAG       | LAG                                               |         |       |
| MAGLAG    | Magnetic LAG sample                               |         |       |
| MULLOCK   | Mullock                                           |         |       |
| NAVI      | NAVI bit - rotary mud                             |         |       |
| NQ        | NQ core                                           |         |       |
| NQ2       | NQ2 core                                          |         |       |
| NQ3       | NQ3 core                                          |         |       |
| PQ        | PQ core                                           |         |       |
| PQ2       | PQ2 core                                          |         |       |
| PQ3       | PQ3 core                                          |         |       |
| PULP      | PULP                                              |         |       |
| RAB_CHIPS | RAB chips                                         |         |       |
| RC_CHIPS  | RC chips                                          |         |       |
| ROCK      | Rock chips                                        |         |       |
| ROTARYMI  | Rotary mud sample                                 |         |       |
| SOIL      | Soil sample                                       |         |       |
| UN_CHIPS  | Unknown Chips - needs to be translated !          |         |       |
| VM_CHIPS  | Vacuum chips                                      |         |       |
| WATER     | Water sample                                      |         |       |

## SCINTINSTRUM

| CODE     | DESCR                                              | RANKING | P_VAL |
|----------|----------------------------------------------------|---------|-------|
| GR_110G_ | Saic Exploranium portable gamma ray scintillometer |         |       |

# SITESUBTYPE

| CODE | DESCR       | RANKING | P_VAL |
|------|-------------|---------|-------|
| AC   | Air Core    | 1       |       |
| AT   | Airtrack    |         |       |
| AU   | Auger       | 1       |       |
| DD   | Diamond C   | 1       |       |
| GR   | Grade Con   | 1       |       |
| OH   | Open Hole   | 1       |       |
| RB   | RAB Drillin | 1       |       |
| RC   | Reverse Cii | 1       |       |
| RK   | Rockchip    | 2       |       |
| RM   | Rotary Mud  |         |       |
| SL   | Soil        | 2       |       |
| ST   | Stream Sec  | 2       |       |
| TR   | Trench      |         |       |
| UG   | Undergrou   | 1       |       |
| UN   | Unknown     |         |       |
| VM   | Vacuum Dr   | 1       |       |
| WR   | Water Samr  | 2       |       |

# SITETYPE

| CODE | DESCR      | RANKING | P_VAL |
|------|------------|---------|-------|
| DH   | Drill Hole | 1       |       |
| SU   | Surface Ge | 1       |       |
| TR   | Trench     | 1       |       |

## SOILTYPE

| CODE      | DESCR                                       | RANKING | P_VAL |
|-----------|---------------------------------------------|---------|-------|
| CALCRETE  | Areas with strong ca                        |         |       |
| CALCRETEC | Areas with strong ca Fine Pisoliths         |         |       |
| CALCRETEC | Areas with strong ca Fine Pisoliths Hardpan |         |       |
| CALCRETEH | Areas with strong ca Hardpan                |         |       |
| CALCRETEH | Areas with strong ca Hardpan Fine Pisoliths |         |       |
| CLAY      | Clay and silt, very                         |         |       |
| CLAYG     | Clay and silt, very Fine Pisoliths          |         |       |
| CLAYGH    | Clay and silt, very Fine Pisoliths Hardpan  |         |       |
| CLAYH     | Clay and silt, very Hardpan                 |         |       |
| CLAYHG    | Clay and silt, very Hardpan Fine Pisoliths  |         |       |
| GRAVEL    | Particles > 4mm                             |         |       |
| GRAVELG   | Particles > 4mm Fine Pisoliths              |         |       |
| GRAVELGH  | Particles > 4mm Fine Pisoliths Hardpan      |         |       |
| GRAVELH   | Particles > 4mm Hardpan                     |         |       |
| GRAVELHG  | Particles > 4mm Hardpan Fine Pisoliths      |         |       |
| LATNOD    | Nodular laterite                            |         |       |
| LATNODG   | Nodular laterite Fine Pisoliths             |         |       |
| LATNODGH  | Nodular laterite Fine Pisoliths Hardpan     |         |       |
| LATNODH   | Nodular laterite Hardpan                    |         |       |
| LATNODHC  | Nodular laterite Hardpan Fine Pisoliths     |         |       |
| LATPIS    | Pisolithic laterite                         |         |       |
| LATPISG   | Pisolithic laterite Fine Pisoliths          |         |       |
| LATPISGH  | Pisolithic laterite Fine Pisoliths Hardpan  |         |       |
| LATPISH   | Pisolithic laterite Hardpan                 |         |       |
| LATPISHG  | Pisolithic laterite Hardpan Fine Pisoliths  |         |       |
| LOAM      | Clay, silt and sand                         |         |       |
| LOAMG     | Clay, silt and sand Fine Pisoliths          |         |       |
| LOAMGH    | Clay, silt and sand Fine Pisoliths Hardpan  |         |       |
| LOAMH     | Clay, silt and sand Hardpan                 |         |       |
| LOAMHG    | Clay, silt and sand Hardpan Fine Pisoliths  |         |       |
| SAND      | Sand (0.2 - 4mm)                            |         |       |
| SANDG     | Sand (0.2 - 4mm) Fine Pisoliths             |         |       |
| SANDGH    | Sand (0.2 - 4mm) Fine Pisoliths Hardpan     |         |       |
| SANDH     | Sand (0.2 - 4mm) Hardpan                    |         |       |
| SANDHG    | Sand (0.2 - 4mm) Hardpan Fine Pisoliths     |         |       |
| SILCRETE  | Areas with strong si                        |         |       |
| SILCRETEG | Areas with strong si Fine Pisoliths         |         |       |
| SILCRETEG | Areas with strong si Fine Pisoliths Hardpan |         |       |
| SILCRETEH | Areas with strong si Hardpan                |         |       |
| SILCRETEH | Areas with strong si Hardpan Fine Pisoliths |         |       |
| STONY     | Very abundant rock f                        |         |       |
| STONYG    | Very abundant rock f Fine Pisoliths         |         |       |
| STONYGH   | Very abundant rock f Fine Pisoliths Hardpan |         |       |
| STONYH    | Very abundant rock f Hardpan                |         |       |
| STONYHG   | Very abundant rock f Hardpan Fine Pisoliths |         |       |
| UNKN      | Unknown                                     |         |       |

## STRATIGRAPHY

| CODE   | DESCR                             | RANKING | P_VAL |
|--------|-----------------------------------|---------|-------|
| BSS    | Birdrong Sandstone                |         |       |
| DEV    | Devonian                          |         |       |
| GAP    | Gascoyne Province                 |         |       |
| GAS    | Gascoyne Province and Proterozoic |         |       |
| GCU    | Green Clay Unit                   |         |       |
| KWRQUA | Windalia Radiolarite              |         |       |
| MUC    | Muderong Channel Unit             |         |       |
| MUD    | Muderong                          |         |       |
| QUAQUA | Quaternary                        |         |       |
| TER    | Tertiary                          |         |       |

# STRUCTTYPE

| CODE | DESCR                  | RANKING | P_VAL |
|------|------------------------|---------|-------|
| CA   | Alteration Contact     |         |       |
| CB   | Breccia Contact        |         |       |
| CI   | Intrusive Contact      |         |       |
| CL   | Lithological Contact   |         |       |
| CW   | Weathering Contact     |         |       |
| F    | Faults                 |         |       |
| FO   | Foliation              |         |       |
| J    | Joint                  |         |       |
| LH   | Fold Hinge Lineation   |         |       |
| LS   | Slickenside on joint   |         |       |
| LX   | Intersection Lineation |         |       |
| S    | Schistosity            |         |       |
| SB   | Banding, lamination    |         |       |
| SC   | cleavage               |         |       |
| SO   | Bedding                |         |       |
| SZ   | Shear Zone             |         |       |
| VC   | Carbonate veins        |         |       |
| VCQ  | Carbonate Quartz Veins |         |       |
| VF   | Ferruginous Veins      |         |       |
| VQ   | Quartz Veins           |         |       |
| VS   | Sulphide Veins         |         |       |

# SURVMETH

| CODE     | DESCR                              | RANKING | P_VAL |
|----------|------------------------------------|---------|-------|
| CC       | Compass & Chain                    |         |       |
| CT       | Compass and Tape                   |         |       |
| DGPS1    | Differential GPS <1m               |         |       |
| DGPS5    | Differential GPS <5m               |         |       |
| DIG      | Digitised off a map                |         |       |
| GPS      | GPS Located                        |         |       |
| GPS_SA   | GPS Selective Availability On      |         |       |
| GT       | Grid and Tape                      |         |       |
| PHOTO    | Estimate off Photo                 |         |       |
| PROP     | Proposed coordinates               |         |       |
| REFL     | REFLEX EZY SHOT SURVEY RANGER      |         |       |
| RTK_DGPS | Real time kinetic DGPS <25mm       |         |       |
| SBLCC    | Surveyed Baseline, Compass & Chain |         |       |
| SGRID    | Surveyed Grid                      |         |       |
| SURV     | Surveyed                           |         |       |
| TOPO10K  | Scaled from 1:25 000 Topo Map      |         |       |
| TOPO25K  | Scaled from 1:10 000 Topo Map      |         |       |
| TOPO2K   | Scaled from 1:2 000 Topo Map       |         |       |
| TOPO5K   | Scaled from 1:2 000 Topo Map       |         |       |
| UNKN     | Unspecified Accuracy               |         |       |

# SURVMETHRL

| CODE      | DESCR       | RANKING | P_VAL |
|-----------|-------------|---------|-------|
| 2008GRAV  | 2008 Gravi  | 3       |       |
| DGPS      | DGPS Erro   | 2       |       |
| ESTIMATEI | Estimated   | 5       |       |
| RTK_DGPS  | Real Time I | 1       |       |
| SRTM_DEN  | Shuttle Rac | 4       |       |

## TASK

| CODE  | DESCR                        | RANKING | P_VAL |
|-------|------------------------------|---------|-------|
| DHSUR | Down hole directional survey |         |       |
| DRILL | Drilled                      |         |       |
| FARM  | Bag Farmed                   |         |       |
| GEOP  | Down hole geophysical survey |         |       |
| LOG   | Geological logging           |         |       |
| PHOTO | Photographed                 |         |       |
| REHAB | Rehabilitated                |         |       |
| SAMP  | Sampled                      |         |       |

## VEINING

| CODE | DESCR                            | RANKING | P_VAL |
|------|----------------------------------|---------|-------|
| *S/V | Other Mineral Stringers or Veins |         |       |
| CS   | Carbonate Stringer               |         |       |
| CV   | Carbonate Vein                   |         |       |
| QCS  | Quartz Carbonate Stringer        |         |       |
| QCV  | Quartz Carbonate Vein            |         |       |
| QS   | Quartz Stringer                  |         |       |
| QV   | Quartz Vein                      |         |       |

# WTHGINTENS

| CODE | DESCR                | RANKING | P_VAL |
|------|----------------------|---------|-------|
| MX   | Moderately Oxidised  |         |       |
| OX   | Oxidised             |         |       |
| SX   | Slightly Oxidised    |         |       |
| UX   | Unoxidised           |         |       |
| VX   | Very slightly Oxidis |         |       |

YESNO

| CODE | DESCR | RANKING | P_VAL |
|------|-------|---------|-------|
| N    | No    |         |       |
| Y    | Yes   |         |       |