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Geothermal Energy Potential in Selected Areas of Western Australia (Canning Basin)

A report prepared for the Department of Mines and Petroleum, Western Australia

Report DOIR0681008

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Executive summary

Hot Dry Rocks Pty Ltd (HDRPL) was commissioned by the Department of Mines and Petroleum (DMP; formerly Department of Infrastructure and Resources), Western Australia, to appraise the geothermal potential of the Canning Basin as part of Project DOIR0681008. A total of 274 wells were assessed in accordance with the quotation, 113 of which were assessed in detail for heat flow modelling and temperature prediction. Of these 113 wells, 101 had sufficient data to enable the modelling of heat flow.

The principle findings of this report are:-

- Measured rock thermal conductivities for 50 core samples collected from the Canning Basin range from 1.06–5.83 W/mK. These data were crucial for the development of 1D heat flow models to predict the depth to selected isotherms.

- Modelled surface heat flow in the Canning Basin ranges from 20–160 mW/m^2 with a median value of 68 mW/m^2 for all wells modelled in this report. This value is slightly higher than the Australian median value of 64.5 mW/m^2 from the global heat flow database and slightly lower than the Perth Basin median value of 76.5 mW/m^2 recorded in a previous HDRPL report issued in 2008.

- Heat flow is lowest in the northern and southern peripheral portions of the basin with values of <65 mW/m^2 encountered in the Fitzroy Trough, Lennard Shelf and Kidson Sub-basin. Heat flow values generally increase towards the central portion of the basin, reaching values >80 mW/m^2, most notably on the Broome Platform and Wallal Sub-basin.

- Broad areas in the central, northern and western portions of the basin have the 150°C isotherm modelled at <5,000 m depth and may be areas of

increased Engineered Geothermal System (EGS) prospectivity, depending on the suitability of target lithologies for fracture stimulation.

- Portions of the basin centred on the Broome Platform, Wallal Sub-basin, Jurgurra Terrace, Mowla Terrace and Barbwire Terrace have the 150°C isotherm modelled at <4,000 m and the depth to this isotherm becomes increasingly shallower (<3,000 m) on the Broome Platform. In many central and northern areas, the 150°C isotherm is coincident with Palaeozoic sedimentary units. If a suitable lithology in this area preserves natural permeability, it may be possible that Hot Sedimentary Aquifer (HSA) geothermal systems can be developed.

- In regards to the contemporary, *in-situ* stress field of the Canning Basin, there is a general lack of adequate measurements across the basin to enable any definitive statements regarding its influence on the EGS prospectivity of the region. However, it is inferred from the few stress field measurements available that the contemporary, far-field stress regime is most likely to be that of strike-slip with a mean S_H orientation of approximately NE–SW. This suggests that EGS reservoir growth and maximum permeability will favour steep to near vertical fractures that strike in an approximately NE–SW direction, which is at odds with the dominant north-westerly structural grain of the onshore portion of the basin. To improve the understanding and predictability of stress-dependent fracture permeability within the basin, it is recommended that additional stress field and rock hydraulic and bulk moduli property measurements be collected from existing boreholes and core samples from across the basin.

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1. Introduction

The Department of Mines and Petroleum (DMP; formerly Department of Infrastructure and Resources), provided Hot Dry Rocks Pty Ltd (HDRPL) with basic data for 274 wells in the Canning Basin, including scanned log headers, bottom hole temperatures (BHTs), geological and geophysical reports, and other relevant data. HDRPL was commissioned to utilise these data to address the Scope of Services (Schedule 2; Section 1.2 of the *Request For Quote DOIR0681008*) for the following topics:-

A. For all 274 wells (Attachment A) provide the following information:-

- identify basement lithology from existing geophysical data
- calculate the heat generating capacity of the basement rock

B. For 113 wells[1] that were not included in previous studies (Attachment B), provide the following information:-

- determine depth of basement at the well locations
- verify geothermal data and extrapolate temperature to the basement
- generate isotherm maps at 100°C, 150°C and 200°C

HDRPL was also requested to compile and comment on the adequacy of data on the current *in-situ* stress field in areas of potential Engineered Geothermal System (EGS) interest.

[1] The *Request For Quote DOIR0681008* was for 131 wells to be studied. However, on inspection of the datasets, only 113 wells had relevant temperature data, and of these only 101 had sufficient geological data for items under B to be addressed.

2. Canning Basin Geological Setting

The intracratonic Canning Basin is located in northern Western Australia, covering an area in excess of 595,000 km^2 of which approximately 430,000 km^2 lies onshore (Figure 1). The onshore part of the basin is bounded by three Palaeoproterozoic to Neoproterozoic terranes (the Kimberley Block to the north and the Pilbara and Musgrave blocks to the south), and to the east and south-east by the Amadeus and Officer basins.

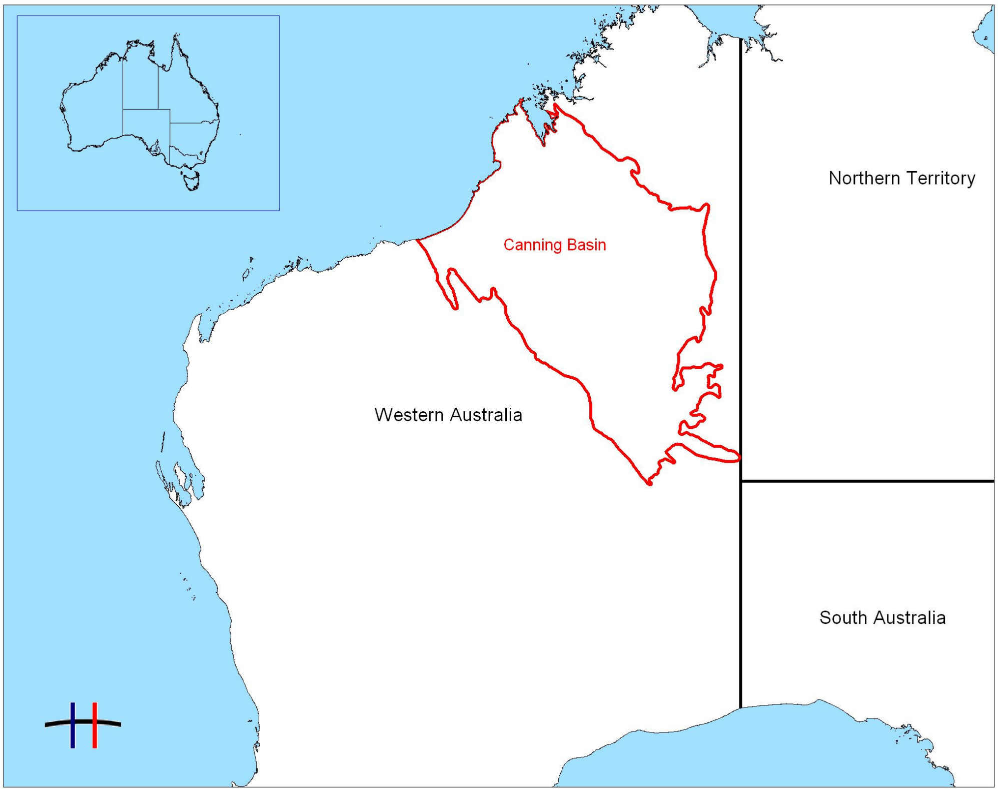

Figure 1: Location of the Canning Basin in northern Western Australia

Seismic and other geophysical data identify a north-westerly Palaeozoic structural grain in the onshore portion of the basin, and a number of tectonic elements are recognised (Hocking *et al.*, 2008; Figure 2). A fault-bounded rift dominates the northern Canning Basin and is subdivided into two depocentres—the Fitzroy Trough and the Gregory Sub-basin. A number of faulted terraces flank these depocentres [the Lennard Shelf, Betty Terrace, Balgo Terrace, Barbwire Terrace and Jurgurra Terrace]. The southern Canning Basin comprises the Crossland Platform and

Broome Platform, and two broad sag basins—the Wallal and Kidson sub-basins. The boundaries between the structural elements are typically syndepositional fault zones which have been active at various times during the Palaeozoic to Mesozoic. The Canning Basin can therefore be regarded as structurally complex.

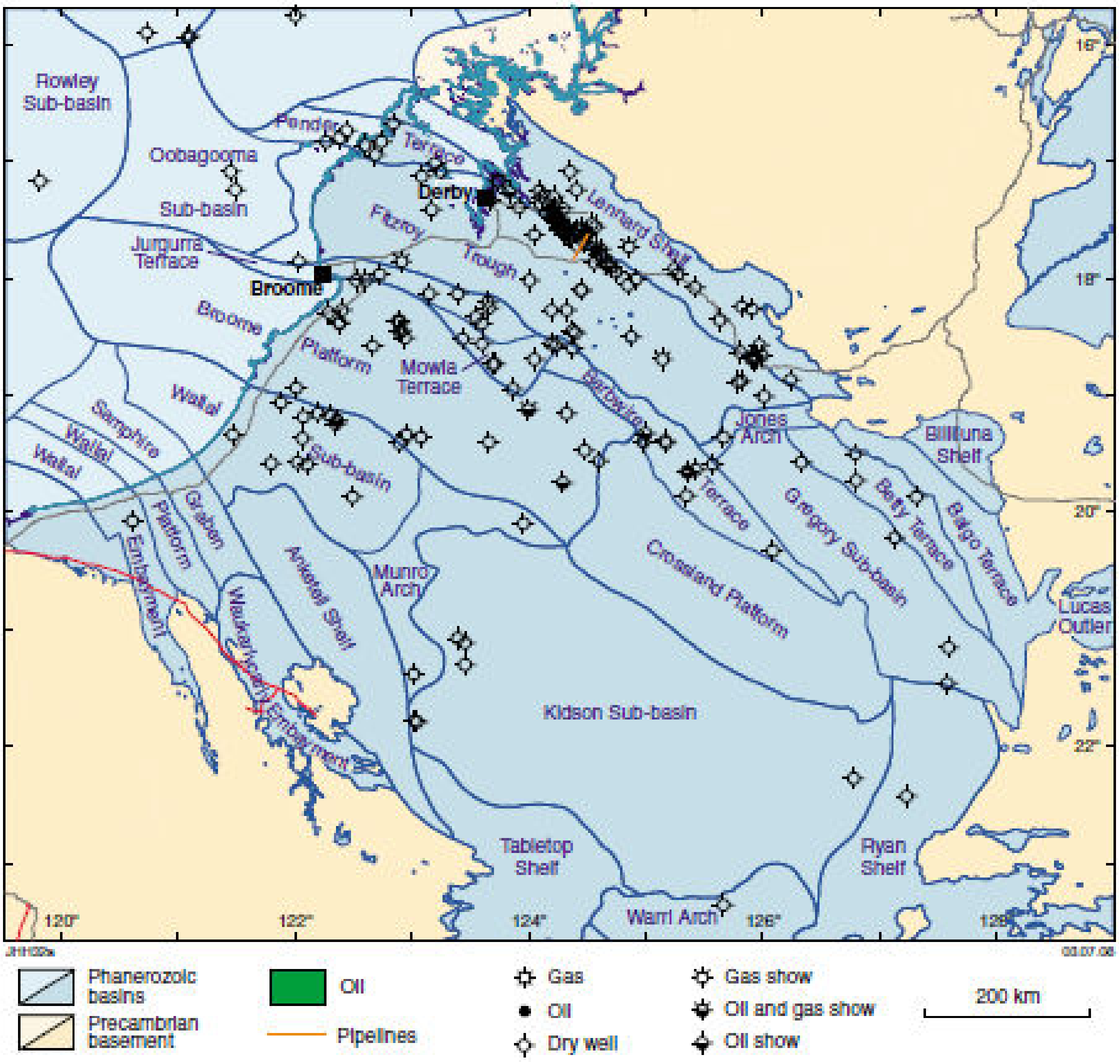

Figure 2: Basin subdivisions and tectonic elements of the Canning Basin (from Hocking *et al*., 2008)

Data derived from the OZ SEEBASEv2 project (www.frogtech.com.au) suggest in excess of 18 km of gently deformed Lower Ordovician to Lower Cretaceous sediments have accumulated in the deepest section of the Canning Basin—the Gregory Sub-basin. Sediment thickness in the main southern depocentre—the Kidson Sub-basin—is not as pronounced, typically in the range 5–6 km thick. Both the Fitzroy Trough and Kidson Sub-basin began subsiding in the Early Ordovician, however only the former continued subsiding during the Late Devonian and Early Carboniferous (Middleton, 1990).

The regional stratigraphic framework of the Canning Basin (Figure 3) is almost entirely derived from subsurface petroleum datasets as much of the basin is covered by a thin Cainozoic veneer. The Canning Basin has a multi-phase depositional history spanning the Early Ordovician to Cretaceous; thus the sedimentary architecture is complex with formations being both spatially and temporally restricted in the basin. Four major phases of deposition are recorded (Hocking *et al*., 2008): Ordovician–Silurian (marine to marginal marine, and evaporitic sequences); Devonian–Early Carboniferous (marine, reefal, and fluvio-deltaic deposition in the north, and marginal marine to terrestrial in the south); Late Carboniferous–Permian (non-marine to marine, and glacial deposition); and Jurassic–Early Cretaceous (mostly non-marine).

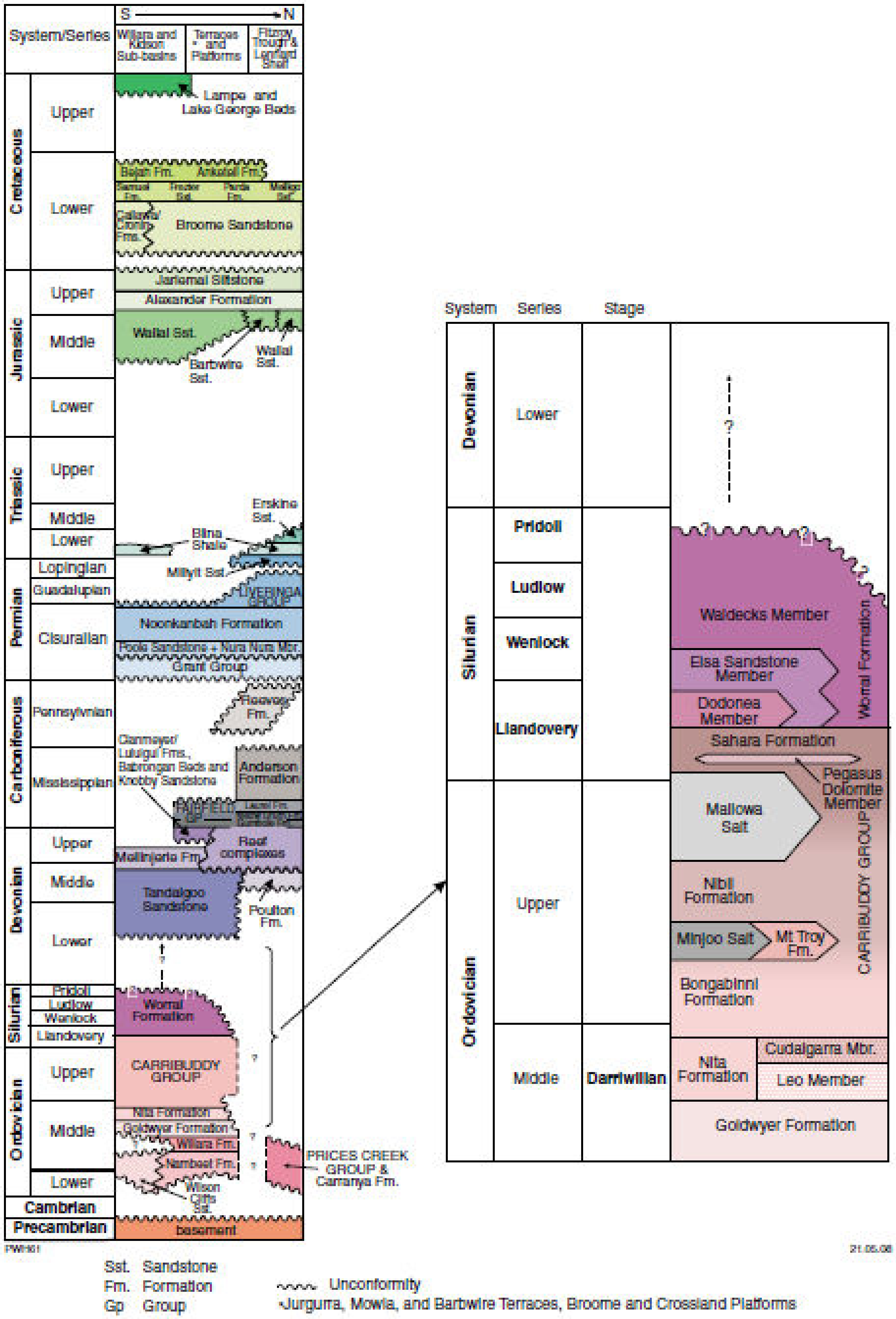

Figure 3: Stratigraphy of the onshore Canning Basin (from Hocking *et al*., 2008)

3. Basement Investigations

This section provides information for the following topics:-

For the 274 wells to be assessed:-

- determine depth of basement at the well locations
- identify basement lithology from existing geophysical data

3.1. Basement depth

Recorded actual basement intercepts in the Canning Basin have been used in conjunction with the OZ SEEBASEv2 (FrogTech, 2007) database to determine depth-to-basement[2] for the 274 wells assessed in the Canning Basin[3], and these data are detailed in Attachment C. The actual basement intercepts recorded in wells took priority over the OZ SEEBASEv2 dataset.

All available data suggest that Palaeozoic basement reaches a maximum depth in excess of 18 km in parts of the Canning Basin.

[2] Rounded to the nearest 250 m.

[3] Basement depth has not been estimated for wells greater than 50 km from shore.

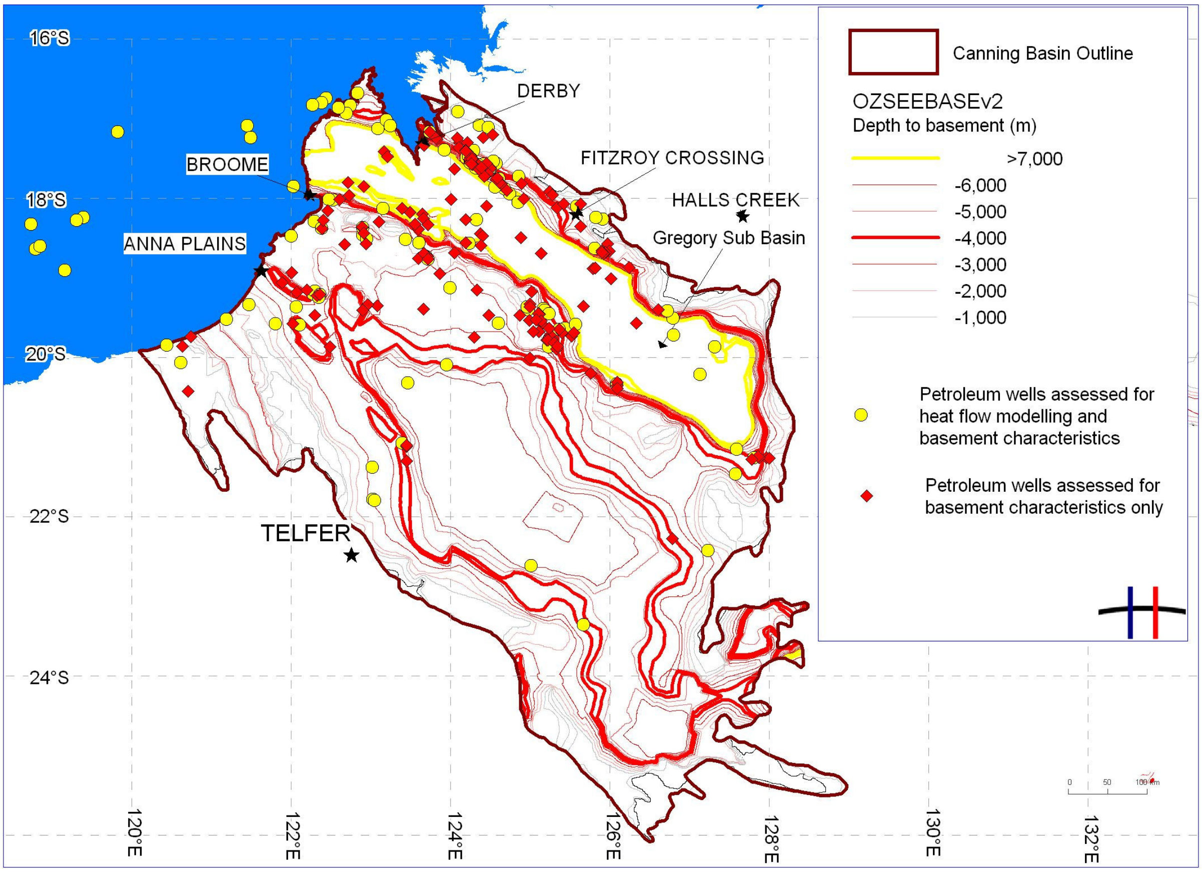

Figure 4: Depth to Basement contours for the onshore Canning Basin. Data are from OZ SEEBASEv2 and sediment thickness is estimated to exceed 18 km in the Gregory Sub-basin.

3.2. Basement lithology

Lithology estimates for basement shown in Attachment C and Figure 5 are derived from basement lithologies intersected in nearby wells, with the assumption that a similar lithology may be intersected within a 10 km radius (being the approximate size of a small pluton), or from the continuation of geophysical signatures (gravity and magnetics) from areas of known basement composition. For wells outside these radii, a determination has not been made due to a low level of certainty in determining the lithologies, thus these are denoted as having an “unknown” basement lithology. It is probable that many of these “unknown” lithologies are pre-rift metasediments. Overall, the exact nature of the basement of the Canning Basin remains poorly constrained due to the thick post-rift succession in the Fitzroy Trough and Gregory Sub-basin, and minimal basement intercepts.

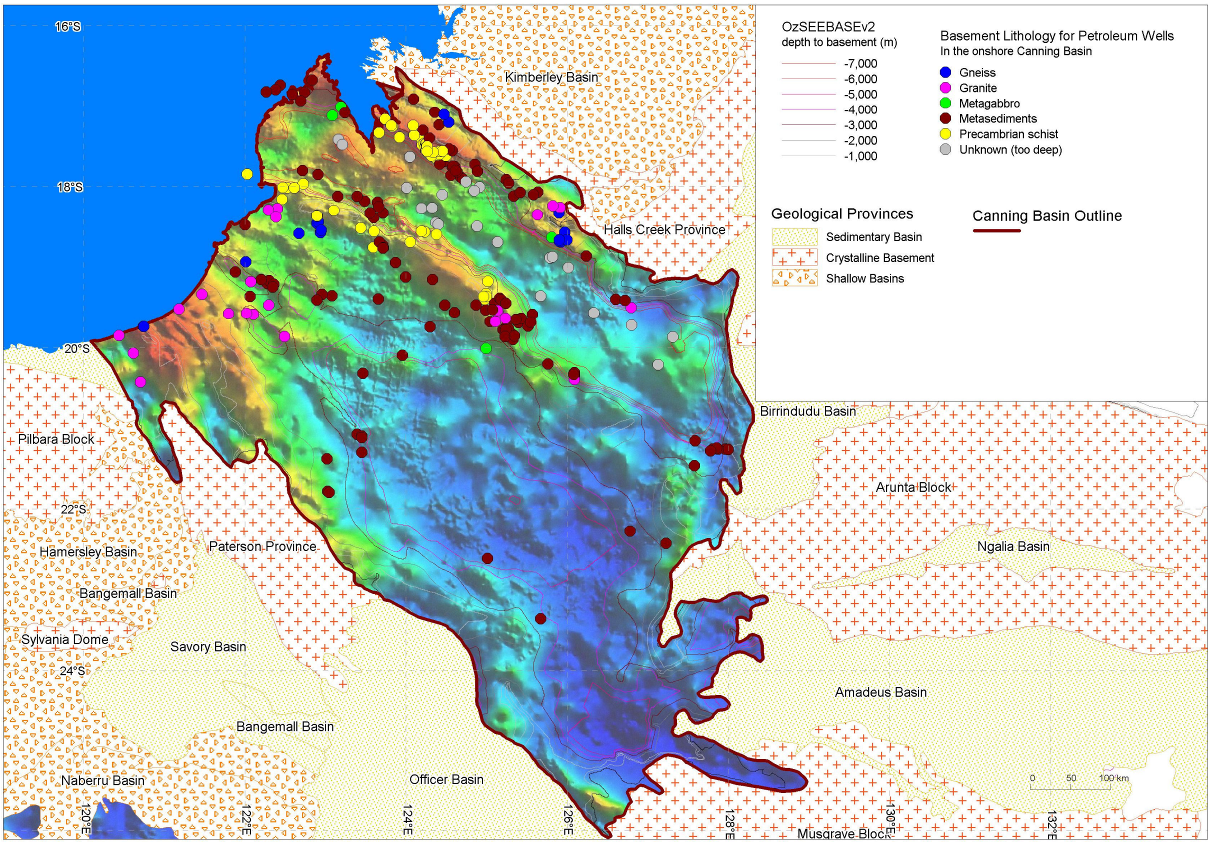

Figure 5: Predicted basement lithology in the Canning Basin for petroleum wells listed under Attachment B. A gravity image of the basin is also shown.

4. Heat flow modelling methodology

4.1. Introduction

HDRPL was commissioned to estimate thermal conditions for 113 wells (Attachment B) in the Canning Basin. HDRPL used its proprietary 1D Heat Flow Modelling Software to build heat flow models for each of these wells. Required input data include downhole temperatures (corrected to approximate equilibrated conditions where sufficient information is available) and thermal conductivity data of representative formations. Raw temperature and lithological data were provided by the DMP. Heat flow modelling provides a firm basis for accurate extrapolation of temperatures to depth, as it takes the thermodynamic principles of heat transfer into account.

4.2. Heat flow and limitations of 1D modelling

Heat flow at the Earth's surface is a power unit and is a function of heat generated within the crust plus heat conducted from the mantle.

The principle aim of geothermal exploration is to locate anomalously high temperatures at an economically and technically viable drilling depth. The thermal state of the crust can be expressed at the surface in the form of heat flow units (mW/m^2) and it is generally assumed that heat is transported to the surface by conductive means. In a conductive heat regime the temperature **T**, at depth **z** is equal to the surface temperature $\mathbf{T_0}$ plus the product of heat flow **Q** and thermal resistance **R**, such that:

$\mathbf{T=T_0+QR}$, where **R**=**z**/ (average thermal conductivity between the surface and **z**).

Equation 1

Consequently the most prospective regions for geothermal exploration are those that have geological units of sufficiently low conductivity (high thermal resistance) in the cover sequence combined with high heat flow.

Heat flow is a product of temperature gradient and rock thermal conductivity and is therefore a modelled value (not directly measured). The modelling of heat flow is a precision skill that requires a detailed understanding of physical conditions in the bore hole and the physical properties of the rocks; including advective processes that may influence bore temperature (such as ground water flow) and the temperature dependence of conductivity.

Heat flow estimates are only as accurate as the data that have been used to generate them. It is therefore important that the temperature and conductivity data used to model heat flow represent as closely as possible the actual thermal conditions.

HDRPL's 1D Heat Flow Modelling Software accounts for the temperature dependence of conductivity. However, the results of 1D heat flow modelling should be treated with caution when extrapolating data spatially over considerable distance. HDRPL recommends a later, more detailed appraisal of the Canning Basin, incorporating the data derived from this study and utilising the HDRPL 3D Heat Flow Modelling Software.

4.3. Verification of well temperatures

Temperature modelling and extrapolations undertaken solely using temperature gradients derived from the reported well temperatures measured during the drilling process can underestimate the true virgin rock temperature of the formations at depth. The reported temperature data are often of unknown quality. In order to ensure the most accurate data are used in the thermal modelling process, corrections (such as Horner Plots) can be applied to time series data recorded during logging processes.

The Horner Plot method corrects the bore hole temperature for the cooling effect of the drilling process using the parameters of recorded bore hole temperature, the time since the last fluid circulation, and the time elapsed between the end of drilling and the cessation of fluid circulation. The accuracy of the correction depends on the reliability and accuracy of the reported temperatures and times. More than one recorded temperature from the same depth is required for a Horner Plot.

Temperatures reported in the well completion reports of 113 wells in the Canning Basin were assessed and, where sufficient information was found, Horner corrections were applied using the methodology of Hermanrud *et al*. (1990). The corrected temperatures were used in the thermal models for these wells. Temperatures recorded during drill stem tests (DSTs) were also accepted as accurate representations of virgin rock temperature, and used in the thermal models. For all other temperature data it was not possible to apply corrections; however uncertainty values were ascribed to each temperature datum, as detailed in Section 5.2.

Temperature data used for each well model, and the status of those data (corrected or uncorrected), are itemised with the individual heat flow models in Appendix 2.

4.4. Surface temperatures

Ground surface temperature is an important constraint for well heat flow models. Average surface temperature for each well was determined from annual mean air temperature data derived from the Australian Bureau of Meteorology for the Canning Basin. These data were corrected upwards by 3°C to account for surface rock temperatures, following the findings of Howard and Sass, 1964. Surface temperatures for offshore wells were modelled using bottom water temperature (BWT) as a function of water depth and latitude (Beardsmore and Cull, 2001).

4.5. Temperature data issues

HDRPL undertook a cursory check of the well temperature compilation provided by the DMP and encountered several issues with the datasets. Firstly, whilst BHT temperatures were recorded, other temperature datasets such DSTs and formation tests were not recorded. These data are invaluable for constraining the temperature regime in a well. In addition, there were a number of inconsistencies with conversions from Fahrenheit to Celsius. HDRPL found it necessary to check each well and compile an internal temperature database to ensure all temperature data had been accurately extracted and recorded.

- **HDRPL recommends that the DMP undertake a quality control exercise of its well temperature database to ensure all relevant temperature data**

are captured, and to mitigate any erroneous inputs.

4.6. Rock thermal conductivity measurement

Thermal conductivity is the physical property that controls the rate at which heat energy flows through a material in a given thermal gradient. In the S.I. system of units, it is measured in watts per metre-Kelvin (W/mK). In the earth, thermal conductivity controls the rate at which temperature increases with depth for a given heat flow. The thermal conductivity distribution within a section of crust must be known in order to calculate crustal heat flow from temperature gradient data, or to predict temperature distribution from a given heat flow.

Steady-state thermal conductivity measurements were undertaken by HDRPL for 50 representative samples from lithologies of the Canning Basin using HDRPL's portable divided bar thermal conductivity apparatus. The full conductivity report is provided in Appendix 1 and a summary of measurements is provided in Attachment D.

As rock thermal conductivity is highly dependent upon lithology, some manipulation of the measured data was required to ensure that conductivity values utilised in the 1D heat flow models best represented the typical lithologies found within the basin. The 50 measurements of thermal conductivity included a number of measurements on 'pure' lithological samples such as 'shale', 'sandstone', etc. Where formation descriptions in well logs indicated mixed lithologies, a conductivity value for these formations was estimated from the weighted harmonic mean of the conductivities of the 'pure' lithological components. This process is described in Beardsmore and Cull (2001) and a summary of the calculation inputs is provided in Attachment E.

Derived thermal conductivity values for each Canning Basin formation, as used in the 1D heat flow models, are shown in Table 1.

Table 1: Summary of rock thermal conductivities by formation for the Canning Basin, as used for 1D heat flow modelling in this report. Uncertainty range derived from Antriasian, 2009 (Appendix 1 of this report).

Formation	Formation Conductivity [W/mK]
Alluvium	1.42 ± 0.14
Broome Sandstone	3.12 ± 0.07
Jarlemai Siltstone	1.57 ± 0.17
Alexander Formation	2.70 ± 0.11
Wallal Sandstone	3.12 ± 0.07
Erskine / Culvida Sandstone	3.12 ± 0.07
Blina Shale	1.28 ± 0.19
Millyit Sandstone	3.12 ± 0.07
Liveringa Group	2.70 ± 0.08
Noonkanbah Formation	1.57 ± 0.17
Poole Sandstone [Tuckfield Member]	3.12 ± 0.07
Poole Sandstone [Nura Nura Member]	3.12 ± 0.07
Grant Group Unit A [Carolyn Formation]	3.07 ± 0.28
Grant Gp Unit B [Winifred Formation]	2.61 ± 0.30
Grant Gp Unit C [Betty Formation]	4.17 ± 0.08
Lower Grant Gp [Reeves Formation]	5.83 ± 0.22
Anderson Formation [Unit A to C]	2.58 ± 0.21
Fairfield Group [Laurel Formation]	2.27 ± 0.19
Fairfield Group [Yellow Drum Formation]	2.81 ± 0.15
Fairfield Group [Gumhole Formation]	2.25 ± 0.12
Fairfield Group [Luluigui Formation]	2.27 ± 0.22
Nullara Limestone	3.33 ± 0.02
Windjana Limestone	3.13 ± 0.02
Clanmeyer Siltstone	2.23 ± 0.13
Knobby Sandstone	3.97 ± 0.33
Napier Formation	2.51 ± 0.47
Virgin Hills Formation	2.51 ± 0.47
Pillara Limestone	3.14 ± 0.14
Gogo Formation	2.51 ± 0.47
Tandalgoo Sandstone	2.23 ± 0.14
Poulton Formation	2.50 ± 0.13
Worral Formation	2.50 ± 0.13
Carribuddy Group [Unit A Sahara Formation]	2.98 ± 0.30
Carribuddy Group [Unit B Mallowa Salt]	4.89 ± 0.32
Carribuddy Group [Unit C Nibil Formation]	3.64 ± 0.63
Carribuddy Group [Unit D Mt Troy Formation]	2.07 ± 0.29
Carribuddy Group [Unit E Bongabinni Formation]	1.78 ± 0.07
Nita Formation	2.03 ± 0.35
Goldwyer Formation	2.03 ± 0.35
Willara Formation	3.24 ± 0.20
Nambeet Formation	2.03 ± 0.35
Basement [Schist]	2.76 ± 0.29
Basement [Gneiss]	3.29 ± 0.11
Basement [Metasediment]	4.01 ± 1.00
Basement [Granite]	3.36 ± 0.26

Basement [Basalt]	1.80 ± 0.18
Basement [Metabasalt]	1.80 ± 0.18
Basement [Metagabbro]	1.80 ± 0.18
Basement [Metasediment–Gabbro]	2.49 ± 0.59
Basement [Uncertain]	3.36 ± 0.42
Basalt intrusions	1.80 ± 0.18

4.7. Estimating lithologies at depth

1D heat flow models for temperature prediction at depth require detailed lithological data, and associated rock thermal conductivities, for all formations down to the modelled depth. HDRPL utilised the DMP formation top database to constrain lithologies within the drilled portion of the heat flow models.

The DMP formation top database contained a number of inconsistencies when cross-referenced to the well completion reports. In particular, there was often a lack of detailed stratigraphic nomenclature. Often just the group name or geological age was mentioned without any subdivision of the formations or members. This was especially evident in the Grant Group and Fairfield Group. There was also some uncertainty about the equivalence of formations due to inconsistent use of nomenclature systems, in particular where the nomenclature in the DMP database has been superseded.

- **HDRPL recommends that the DMP consider a quality control exercise with regards to the Canning Basin formation tops database.**

The lithologies and thicknesses of deeper formations were estimated using other available data. HDRPL utilised existing deep wells to estimate the thickness of individual formations as a ratio of the entire stratigraphic column. OZ SEEBASE depth-to-basement estimates for all wells (Attachment C) were used to constrain the overall thickness of the sedimentary section, to which the formation-specific ratios were applied.

In order to make this methodology as robust as possible, wells that reached total depth within the sedimentary sequence were tied to the nearest deep well that intersected basement. This process assumed that the sedimentary units within the sedimentary pile would continue laterally between the wells in a relatively constant ratio. Whilst simplistic, this methodology provides one of the few mechanisms to estimate the likely thickness of deep units for which there is a paucity of data.

In summary, whilst there is some uncertainty in the estimated thickness and distribution of non-intersected formations within the Canning Basin, HDRPL used all available data to make reasonable assessments on a regional scale to minimise the uncertainty.

4.8. Estimating basement heat generation

HDRPL was requested to comment on the heat generating capacity of basement for all 274 wells in the Canning Basin. Heat generation is best determined from the analytical measurement of uranium, thorium and potassium within rock samples. As it is not possible to obtain basement samples for all 274 wells for analytical measurement, HDRPL assessed the heat generation of rocks within and adjacent to the Canning Basin using data from the Geoscience Australia geochemical data base (OZCHEM). Heat generation values estimated from these data have been incorporated into the 1D heat flow models for this study.

As no geochemical data were available for the Canning Basin, samples from the Halls Creek and Kimberley regions were utilised, assuming that similar rocks may partly comprise the basement of the Canning Basin. Heat generation ($\mu W/m^3$) for each sample was estimated using an assumed rock density and the isotopic abundance method as described in Beardsmore and Cull (2001). Individual results for granites, gneiss and sedimentary rocks are listed in Attachments F, G and H, respectively.

Median heat generation results for granite, gneiss and sedimentary rock samples adjacent to the Canning Basin are shown in Table 2. The data suggest that the uranium content of granites, gneiss and sedimentary rocks around the Canning Basin is not greatly elevated. The resulting median heat generation estimate for granite is slightly below global average (Beardsmore and Cull, 2001) and well below those described underlying the Cooper Basin of South Australia (~10 μW/m^3, McLaren *et al.*, 2003).

The median value may change with further geochemical sampling of basement rocks beneath the Canning Basin.

- **HDRPL recommends that the heat generation potential of basement rocks be further investigated by the DMP.**

Table 2: Summary of heat generation estimates for selected rock types around the Canning Basin

Lithology	Number of samples	Assumed density (g/cm^3)	Heat generation (μW/m^3) Range	Heat generation (μW/m^3) Median
Granite	20	2.68	0.15–11.73	2.68
Gneiss	3	2.65	1.87–2.75	2.42
Sedimentary	6	2.5	1.84–3.71	2.48

5. Heat flow modelling

5.1. Estimated heat flow

HDRPL incorporated temperature data and measured rock thermal conductivity data to estimate heat flow in each given well (Figure 6). Data were incorporated into the model and heat flow was adjusted until the predicted temperature profile best fit the reported temperature datasets. HDRPL constructed 1D heat flow models based on data provided by the DMP for 101 wells in the Canning Basin (the individual outcomes of these thermal models are shown in Appendix 2). A summary of heat flow results, and the relative reliability ranking of these data, is shown in Attachment I.

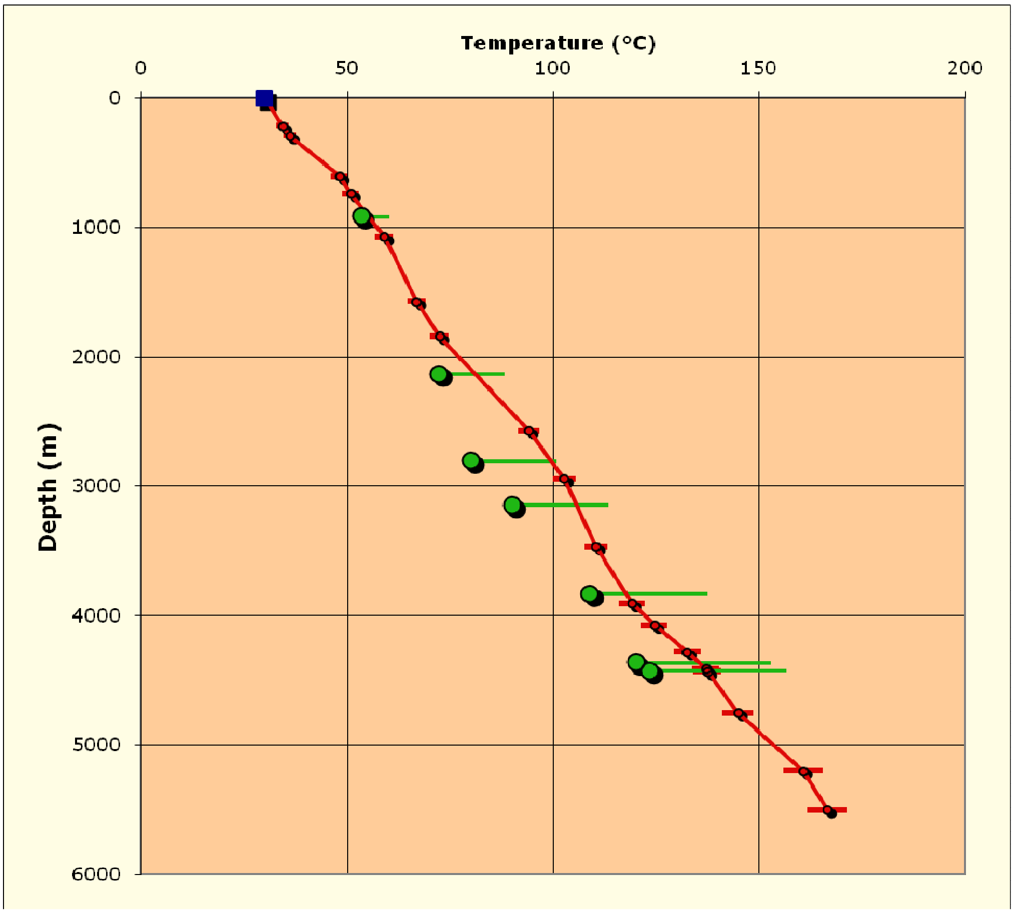

Figure 6: 1D heat flow model for the Kidson 1 petroleum well. The green circles represent individual temperature data; the green lines represent the degree of uncertainty; the red line is the predicted temperature profile for a heat flow of 60 ± 1.9 mW/m^2.

The possibility of heat flow modelling was assessed for all 113 wells in the study, however 12 of these wells were found to have insufficient temperature data or inadequate formation top data to allow accurate modelling of heat flow.

Heat flow for the Canning Basin ranges from 20 to 160 mW/m^2, with a median value of 68 mW/m^2. However, the distribution of these data is biased by local concentrations of well locations, especially in the northern portion of the basin.

5.2. Reliability of heat flow data

Modelled heat flow is highly dependent upon the quality and quantity of temperature data. For each temperature datum, an uncertainty range was estimated based on the type of datum and the information known about it. For example, a well constrained Horner corrected or DST temperature may be assigned a narrow uncertainty range centred on the corrected value. Uncorrected BHT values, however, were assigned a very low or zero uncertainty on the 'negative' side and a much larger uncertainty on the 'positive' side to reflect the fact that these data are very likely to understate the true temperature conditions. Heat flow models were constructed so that predicted temperature profiles passed as near as possible through the mid-point of the error bars on all temperature data (Figure 6 demonstrates an example of this methodology when applied to the Kidson 1 petroleum well).

Modelled heat flow values were ascribed a relative reliability ranking based on a qualitative assessment of the well temperature data (Table 3, Figure 7, and Attachment I).

Table 3: Reliability ranking scheme for the 101 wells modelled in the Canning Basin

Reliability Ranking	Temperature Data
1	One BHT datum
2	Several BHT data
3	One DST or Horner corrected temperature

4	Several DST or Horner corrected temperatures
5	Both DST and Horner corrected temperatures

Of the 101 wells modelled in this study, 20% were ascribed a reliability ranking of 1 or 2.

To ensure robustness of ensuing modelling, HDRPL excluded wells with a reliability ranking of 1 or 2 from assessments of the spatial and magnitude distribution of heat flow (Section 5.3) and temperature projections (Section 6). Thus, where data quality was poorly constrained, or where there were no well penetrations, graphical representations of the data in various figures will appear blank (Figures 8 to12). In addition, the radial distance of influence of each well was limited to 75 km.

5.3. Spatial and magnitude distribution of heat flow data

The spatial distribution of heat flow models is illustrated in Figures 7 and 8.

There is a paucity of relevant data for the Canning Basin. Large portions of the central, south and south-west of the basin (approximately 50% of the total area of the onshore basin) have not been drilled, have vintage datasets, or lack geological data that can be utilised for geothermal prospectivity assessment.

In general, those parts of the Canning Basin for which data exist show increasing surface heat flow towards the central areas. The lowest heat flow (<65 mW/m^2) is centred on the Fitzroy Trough, Gregory Sub-basin and Kidson Sub-basin (although only one well was modelled in the Kidson Sub-basin). This trend may be related to increased sediment thickness in these depocentres. Areas of lower heat flow also occur on the margins of the basin, most notably the Munro Arch and southern portion of the Anketell Shelf on the southern margin, and the Pender Terrace and Lennard Shelf on the northern margin.

Heat flow increases to >80 mW/m^2 in the central basin areas, most notably on the Broome Platform and Wallal Sub-basin. Other relatively high heat flow areas include the Mowla Terrace, Jurgurra Terrace and Barbwire Terrace.

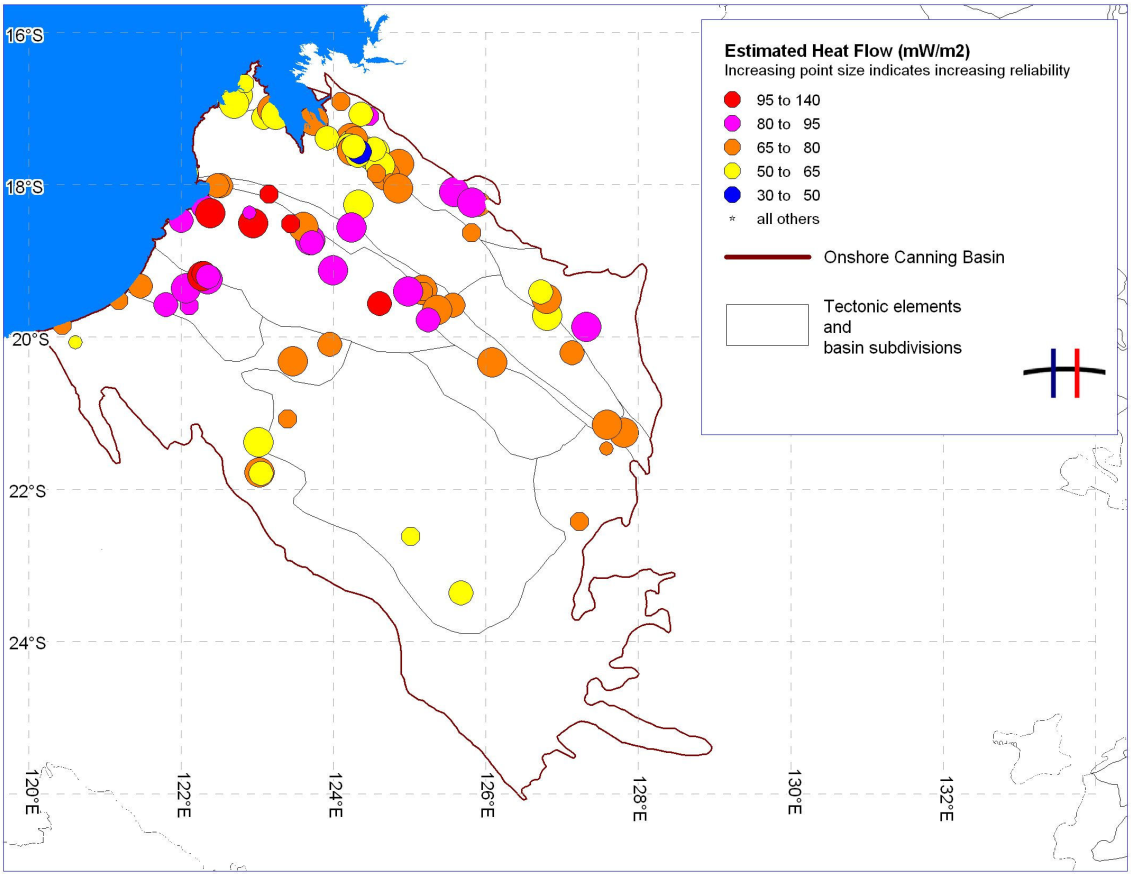

Figure 7: Estimated heat flow for 101 wells in the Canning Basin. The relative reliability of data is illustrated by point size.

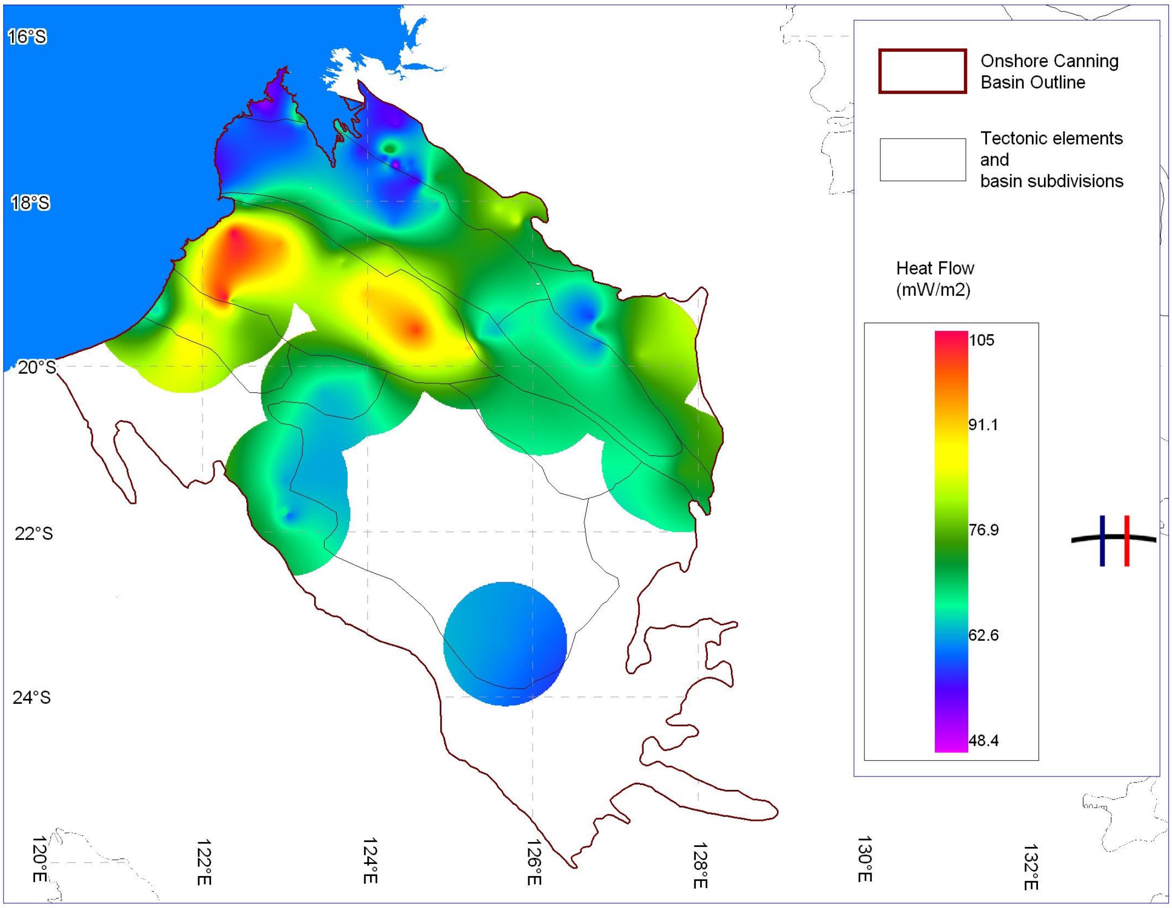

Figure 8: Gridded heat flow values for the onshore part of the Canning Basin. Each well was assumed to represent an area encompassing a radius of 75 km from the well. Those parts of the basin in which there are no wells, or where the reliability of temperature data has a ranking of 1 or 2 (Table 3) have been left blank.

6. Temperature projection

6.1. Depth to isotherms

Heat flow modelling allows the estimation of depth-to-isotherm targets by applying Equation 1 (Section 4.2). HDRPL was commissioned to estimate depths to the 100°C, 150°C and 200°C isotherms and a compilation of these depths for each well is shown in Attachment J. The estimated formation that may be intersected at the isotherm depth, as determined in the process described in Section 4.7, is also shown in Attachment J.

The gridded 100°C, 150°C and 200°C isothermal surfaces are shown in Figures 9 to 11.

Most of the basin has the 150°C isotherm modelled at <5,000 m depth (Figure 10) implying potential EGS prospectivity, depending on the suitability of target lithologies for fracture stimulation. Parts of the basin centred on the Broome Platform, Wallal Sub-basin, Jurgurra Terrace, Mowla Terrace and Barbwire Terrace have the 150°C isotherm modelled at <4,000 m, becoming increasingly shallow (<3,000 m) on the Broome Platform. In many central and northern areas the 150°C isotherm is coincident with Palaeozoic sedimentary units. If a lithology in this area preserves natural permeability, it may be possible that Hot Sedimentary Aquifer (HSA) geothermal systems can be developed.

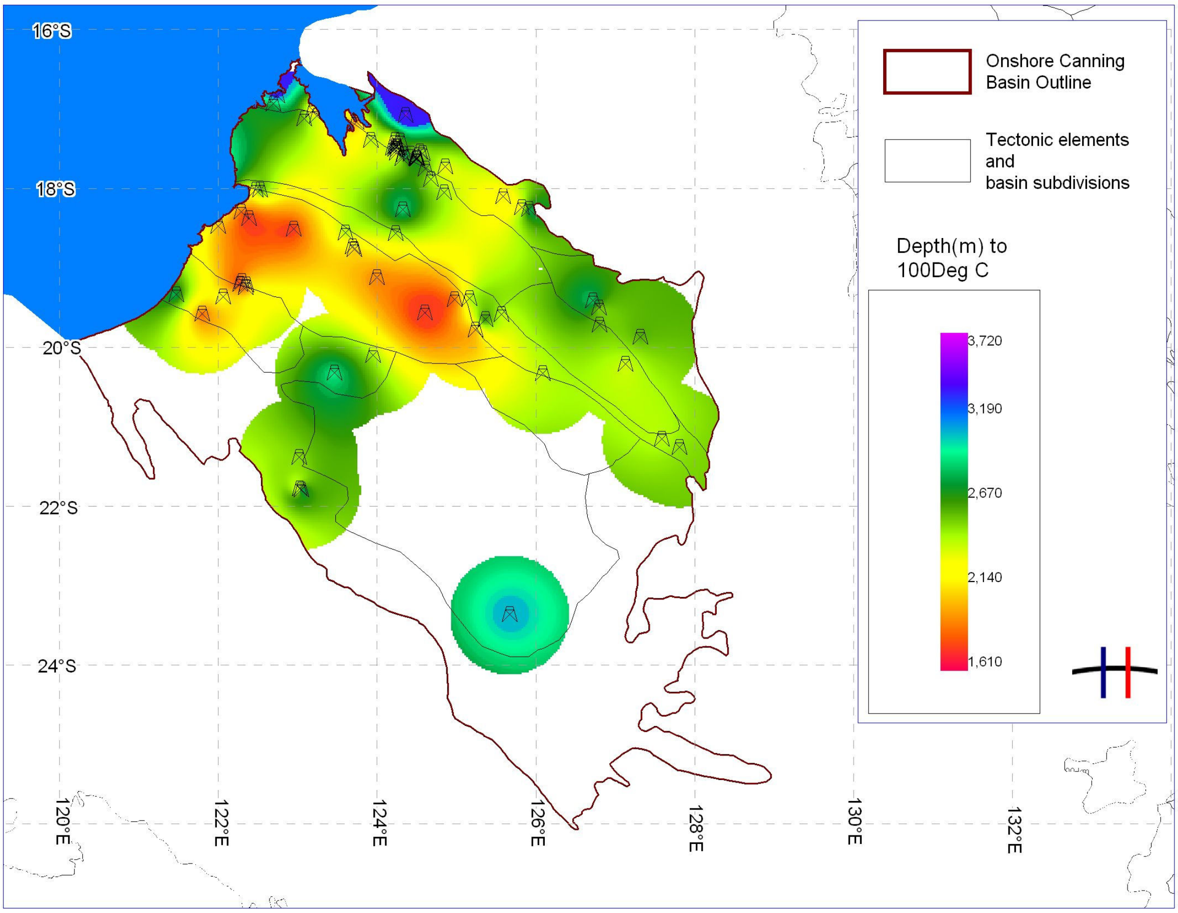

Figure 9: Estimated depth to the 100°C isotherm for the onshore Canning Basin. Each well was assumed to represent an area encompassing a radius of 75 km from the well. Those parts of the basin in which there are no wells, or where the reliability of temperature data has a ranking of 1 or 2 (Table 3) have been left blank.

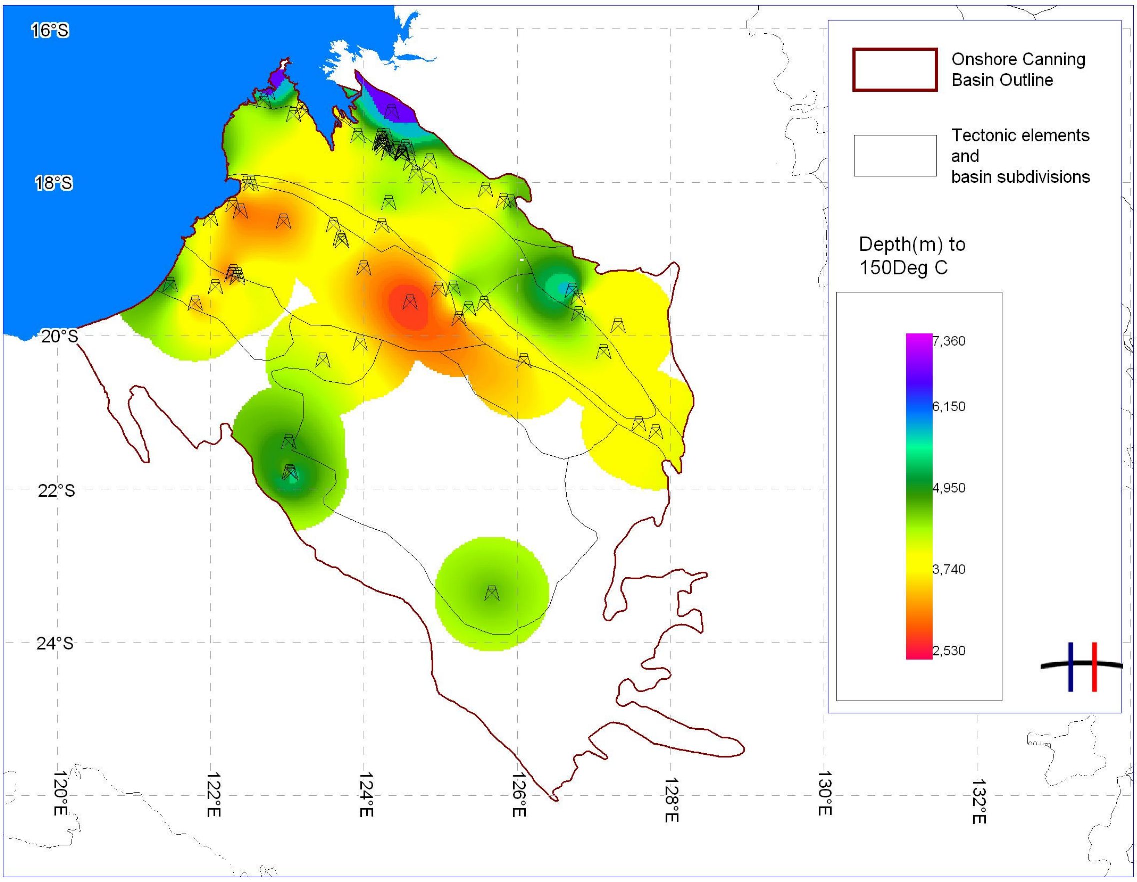

Figure 10: Estimated depth to the 150°C isotherm for the onshore Canning Basin. Each well was assumed to represent an area encompassing a radius of 75 km from the well. Those parts of the basin in which there are no wells, or where the reliability of temperature data has a ranking of 1 or 2 (Table 3) have been left blank.

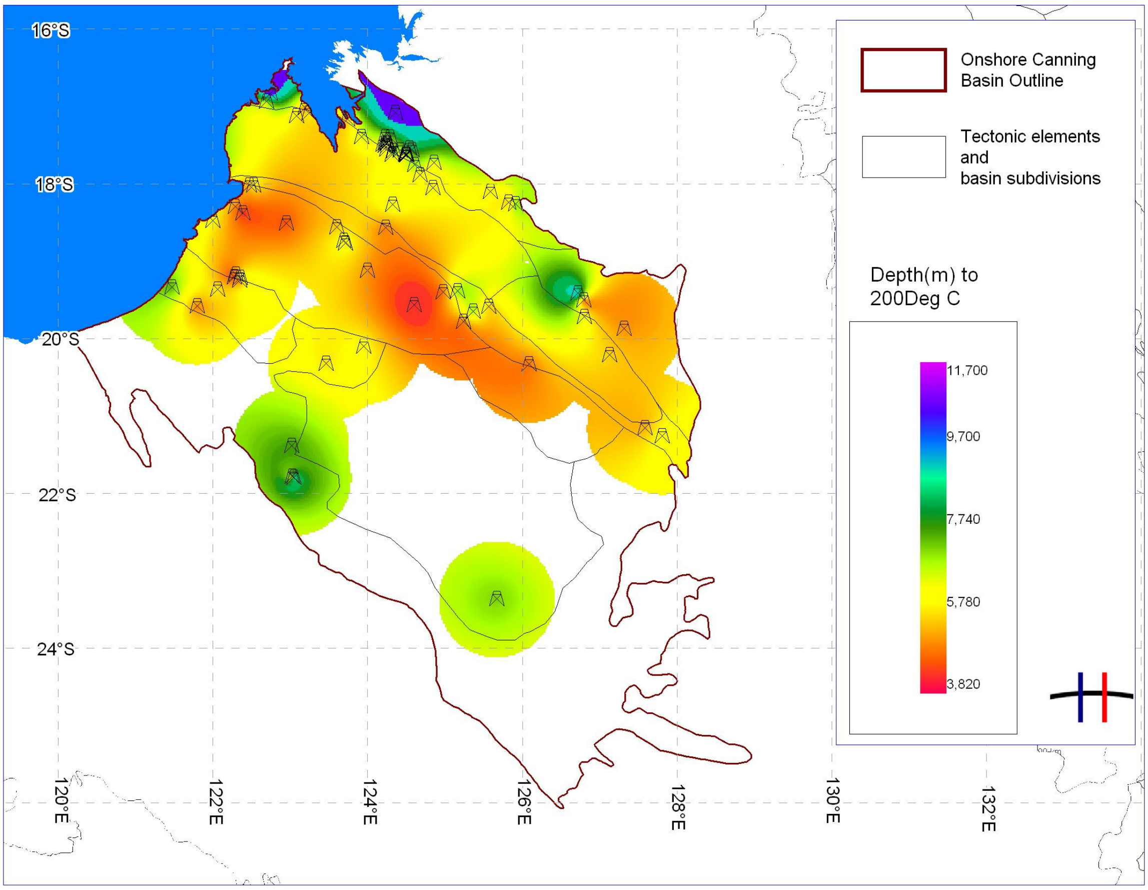

Figure 11: Estimated depth to the 200°C isotherm for the onshore Canning Basin. Each well was assumed to represent an area encompassing a radius of 75 km from the well. Those parts of the basin in which there are no wells, or where the reliability of temperature data has a ranking of 1 or 2 (Table 3) have been left blank.

6.2. Temperature at basement

HDRPL was commissioned to estimate the temperature at basement from 1D heat flow modelling. As the Canning Basin is exceptionally deep (sediment exceeding 18 km thickness), following consultation with the DMP, HDRPL restricted this request to areas where basement is <5,000 m deep, an assumed economic drilling limit.

Figure 12 shows the modelled temperature at 5,000 m depth for the Canning Basin and results for each well are tabulated in Attachment J. In general, the basement is cooler in the northern areas, centred on the Lennard Shelf, and the northern portion of the Gregory Sub-basin where estimated temperatures are <140°C. The highest estimated temperatures (>200°C) are centred on the Broome Platform and Crossland Platform.

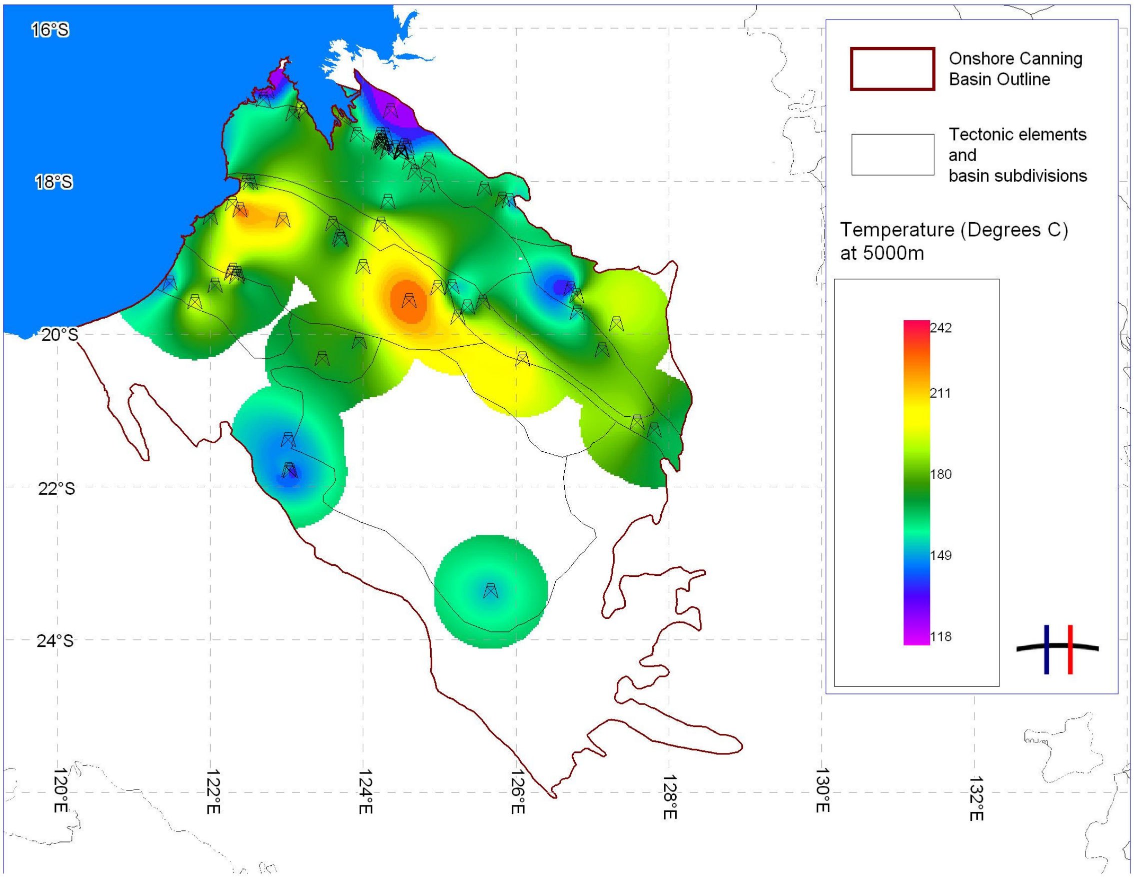

Figure 12: Estimated temperature at 5,000 m depth for the onshore Canning Basin. Each well was assumed to represent an area encompassing a radius of 75 km from the well. Those parts of the basin in which there are no wells, or where the reliability of temperature data has a ranking of 1 or 2 (Table 3) have been left blank.

7. Stress field in the Canning Basin

The successful development of an EGS is dependent upon several factors, but one of the most critical factors is the response of the fractured rock mass to the influence of the *in-situ* stress field. Stress-dependant permeability of deep-seated, fractured rocks is well documented in studies relating to both hydrocarbon and geothermal reservoirs as well as nuclear repositories (e.g. Gentier *et al*., 2000; Hillis *et al*., 1997; Hudson *et al*., 2005). In particular, *in-situ* stress fields are known to exert a significant control on fluid flow patterns in fractured rocks with a low matrix permeability. For example, in a key study of deep (>1.7 km) boreholes, Barton *et al*. (1995) found that permeability manifests itself as fluid flow focussed along fractures favourably aligned within the *in-situ* stress field, and that if fractures are critically stressed this can impart a significant anisotropy to the permeability of a fractured rock mass. Preferential flow occurs along fractures that are oriented orthogonal to the minimum principal stress direction (due to low normal stress), or inclined ~30° to the maximum principal stress direction (due to dilation).

Knowledge of both the local- and regional-scale stress regime is important for EGS projects in order to understand and predict potential reservoir growth and flooding directions. In general, stress fields are anisotropic and inhomogeneous. They are defined in simplified terms by three mutually orthogonal principal axes of stress, being the maximum (S_1), intermediate (S_2) and minimum (S_3) stress axes. In practice, the classification of far-field stress regimes is based upon the Andersonian scheme, which relates the three major styles of faulting in the crust to the three major arrangements of the principal axes of stress i.e. the vertical principal stress (S_V) and the maximum and minimum horizontal principal stresses (S_H and S_h, respectively) (Anderson, 1951). These three major stress regimes are: (a) the normal faulting stress regime where $S_V > S_H > S_h$; (b) the strike-slip faulting stress regime where $S_H > S_V > S_h$; and (c) the reverse (or thrust) faulting stress regime where $S_H > S_h > S_V$ (Figure 13).

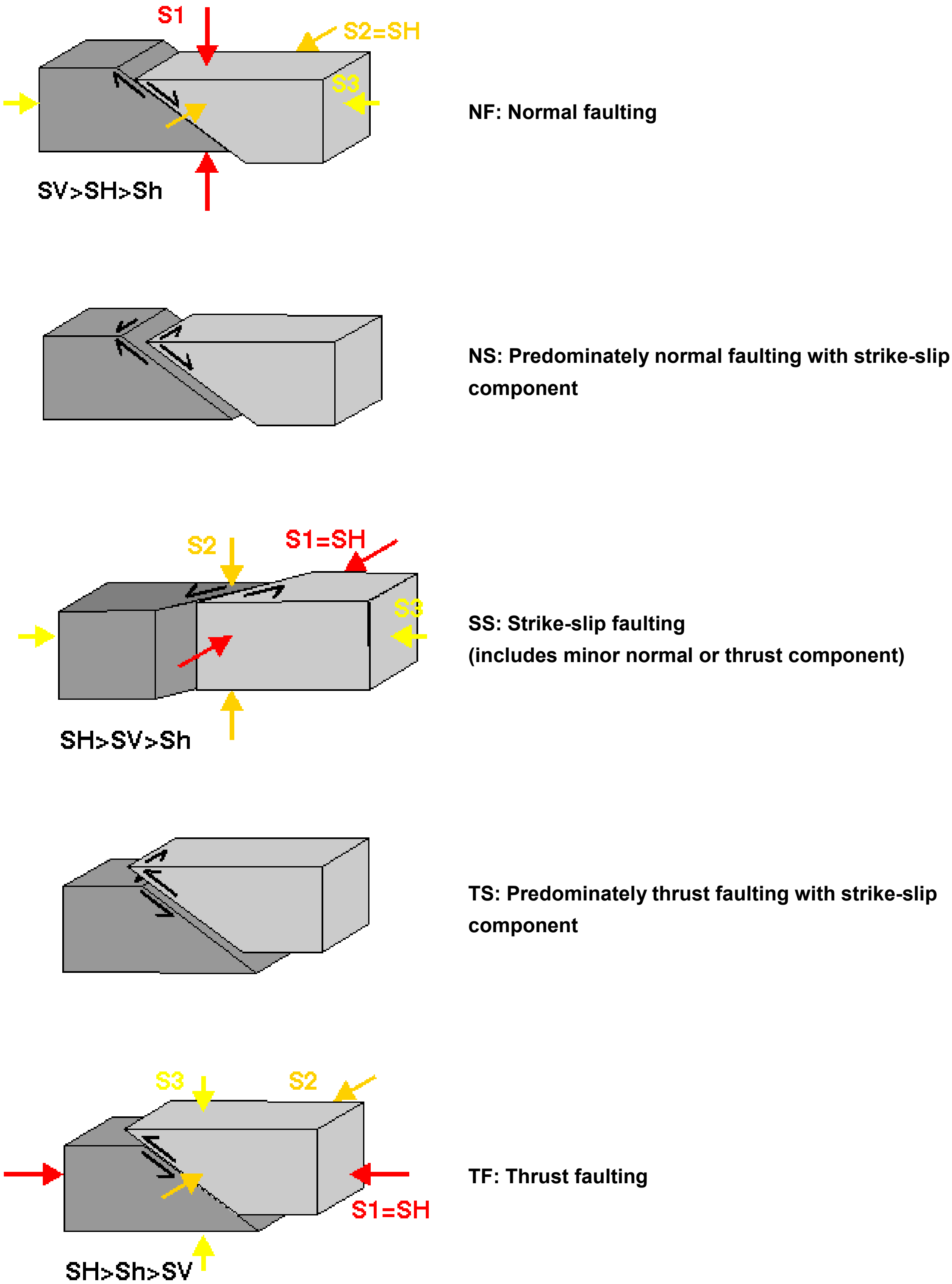

Figure 13: The World Stress Map stress regime classifications (NF, NS, SS, TS, TF) and their associated styles of faulting (from Heidbach *et al.*, 2008)

7.1. Canning basin stress measurement data

A compilation of all currently available *in-situ* stress field data for the Canning Basin contains only twelve recorded measurements (Table 4; Figure 14). These stress data, sourced from the World Stress Map (WSM), are mainly derived from borehole breakouts and earthquake focal mechanisms, with one shallow hydraulic fracturing measurement (Heidbach *et al*., 2008). The stress data range in WSM quality ranking from A–D (i.e. high–low), with borehole breakouts and earthquake focal mechanisms generally considered better quality indicators of the in-situ stress field (Heidbach *et al*., 2008). However, as there are so few data points spread across the entire basin and they are of variable quality rankings this information can only be used to describe the far-field, regional-scale stress field orientations and style (no magnitudes). The single hydraulic fracturing measurement is probably too shallow to be truly representative of the far-field, tectonic regime and is considered irrelevant to this discussion.

Table 4: Published stress field measurements for the Canning Basin (from Heidbach *et al*., 2008) (where BO=borehole breakout orientation, BOC=borehole cross-sectional analysis, FMS=single earthquake focal mechanism, HF=hydraulic fracturing measurement with no magnitude).

Latitude	Longitude	Site	Type	Quality	Regime	Depth (km)	S_H azimuth (°)
-18.017	122.608	AUS8	BOC	A	Unknown	1.913	56
-17.758	124.572	AUS10	BOC	A	Unknown	2.799	40
-17.26	123.829	AUS9	BOC	B	Unknown	2.238	48
-15.314	121.491	SEA3366	BO	B	Unknown	2.611	146
-18.711	125.965	AUS319	HF	B	Unknown	0.184	64
-17.969	122.724	AUS7	BOC	C	Unknown	1.588	28
-17.624	124.501	AUS92	BO	C	Unknown	0.32	55
-18.277	122.401	AUS101	BOC	C	Unknown	1.025	55
-17.626	124.463	AUS102	BOC	C	Unknown	1.095	60

-16.517	123.578	AUS138	FMS	C	Strike-Slip	10	66
-16.68	124.66	AUS139	FMS	C	Strike-Slip	10	68
-16.18	124.51	AUS72	FMS	D	Strike-Slip	5	168

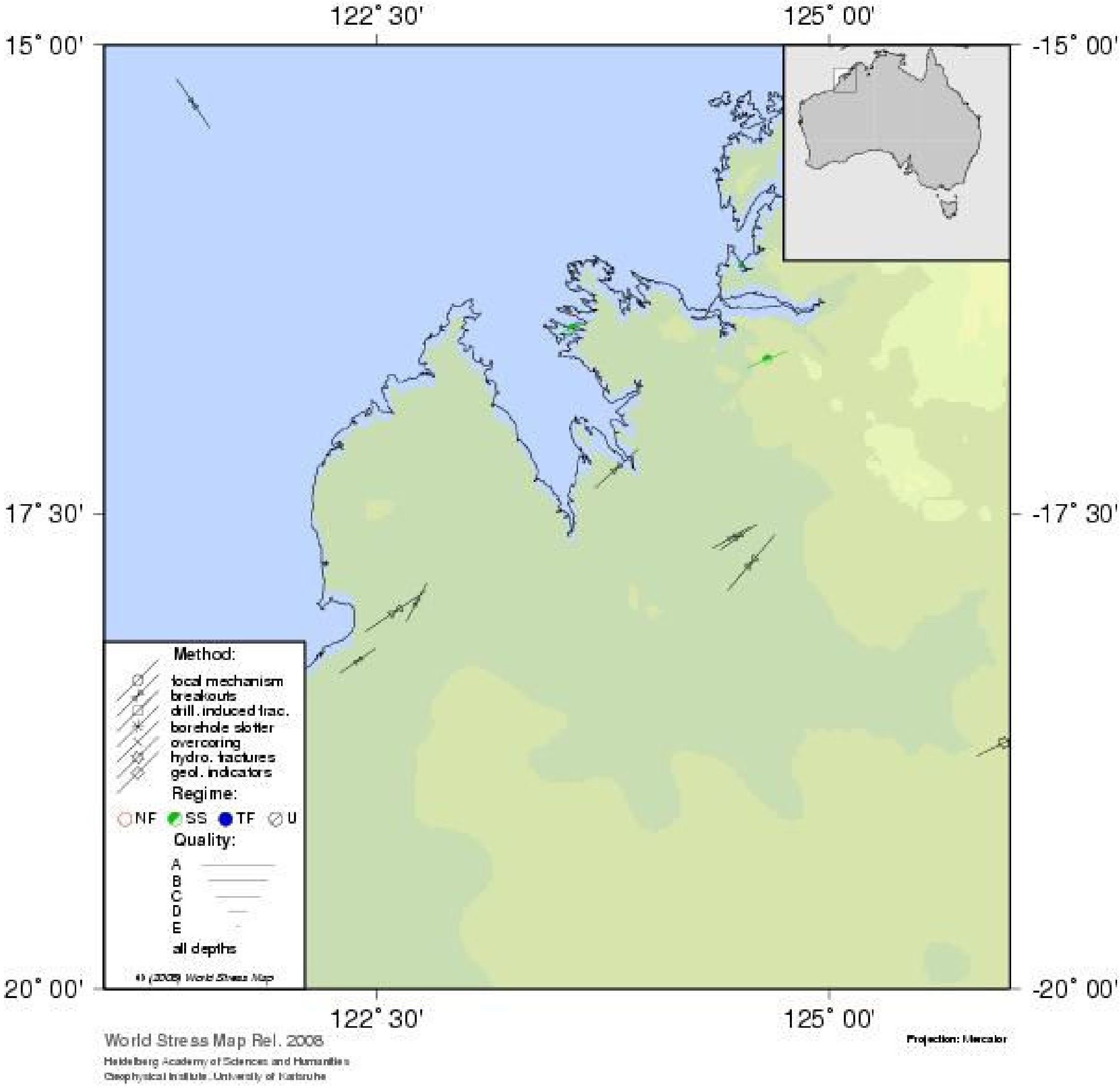

Figure 14: In-situ stress field measurements in the Canning Basin, including the method, quality ranking, stress regime and orientations of the principle horizontal stress axis (S_H) (from Heidbach *et al.*, 2008)

7.2. Relevance of the regional stress field data

In the absence of more substantial stress field data, HDRPL is unable to make definitive statements regarding the influence of the in-situ stress field on the geothermal prospectivity of the Canning Basin. However, the existing data indicate that the contemporary, far-field stress regime currently affecting the onshore Canning Basin is most likely strike-slip, where $S_H > S_V > S_h$. Under a strike-slip stress regime, EGS reservoir growth and permeability orientation is predicted to favour steep to vertical dipping fractures that strike <45° (commonly 30°) to the direction of S_H. The mean S_H orientation for all onshore data of quality ranking A–C is approximately 54°, with a standard deviation of 12° (n=10). This implies that maximum fracture permeability will occur in steep to near vertical fractures that strike in an approximately NE–SW direction. This is roughly orthogonal to the apparent north-westerly structural grain of the onshore portion of the basin (see Section 2).

There are no stress magnitude or pore pressure estimates available to make any observations regarding the state of differential and effective stress at depth.

8. Conclusions and Recommendations

The 101 wells modelled in this study suggest that the Canning Basin has a median heat flow 68 mW/m^2. Whilst this is only marginally higher than the Australian median of 64.5 mW/m^2, there are portions of the basin where the heat flow is considerably higher. Heat flow is lowest in the northern and southern peripheral portions of the basin and increases towards the central parts of the basin, reaching maximum values >80 mW/m^2 on the Broome Platform and Wallal Sub-basin.

Across most of the Canning Basin, the 150°C isotherm is modelled to lie shallower than 5,000 m. From a technical perspective these areas may all be prospective for EGS development (subject to other risks being mitigated). The increasing heat flow towards the central parts of the basin results in the modelled 150°C isotherm becoming increasingly shallower (<3,000 m) on the Broome Platform, which may indicate the possibility of developing HSA geothermal systems if suitably permeable sedimentary rocks are present.

HDRPL makes the following recommendations with regards to future studies:-

- Increase the spatial distribution of heat flow values by incorporating wells previously studied by the DMP within a similar conductivity-heat flow study.

- The data derived from this report should be incorporated into a 3D heat flow model to better understand possible isotherm surfaces away from control points.

- The DMP should investigate a quality assurance program for well temperatures and basin stratigraphy databases. Likewise, in the absence of suitable temperature data for many wells, the DMP may wish to obtain new data via Precision Temperature Logging (PTL) of existing petroleum wells or water bores. Water bores in areas where no petroleum wells exist may provide crucial data to delineate heat flow in parts of the Canning Basin that are presently unexplored.

- In order to make any reliable stress field prediction and models a substantial amount of additional stress field measurements are required across the entire Canning Basin. This may be facilitated by a field program, which involves obtaining stress field estimates via hydraulic fracturing or borehole imaging of existing wells across the region. With robust stress field data, 2D or 3D numerical hydro-mechanical modelling could be undertaken to constrain expected geothermal reservoir growth and flooding directions. This proposed numerical modelling exercise would also require: (1) estimates of pore fluid pressures from either well drill stem (DST) or leak off (LOT) tests; (2) laboratory estimates of the hydraulic and bulk moduli properties of key rock types as collected from selected core samples; and (3) detailed structural interpretations at both the regional and prospect scale.

- More extensive database of rock thermal conductivity measurements would greatly improve the reliability of heat flow estimates and temperature projections.

9. References

ANDERSON, E. M., 1951, The dynamics of faulting and dyke formation with application to Britain, Edinburgh, Oliver and Boyd.

BARTON, C. A., ZOBACK, M. D., AND MOOS, D., 1995, Fluid flow along potentially active faults in crystalline rock, Geology, 23, 683–686.

BEARDSMORE, G.R., AND CULL, J.P., 2001. Crustal Heat Flow: A Guide to Measurement and Modelling. Cambridge University Press, Cambridge, UK, 321 pp.

GENTIER, S., HOPKINS, D., AND RISS, J., 2000, Role of Fracture Geometry in the Evolution of Flow Paths under Stress. In B. Faybishenko, P.A. Witherspoon and S.M Benson (eds) Dynamics of Fluids in Fractured Rocks, Washington, D.C., AGU Geophysical Monograph 122, 169–184.

HEIDBACH, O., TINGAY, M., BARTH, A., REINECKER, J., KURFEß, D., AND MÜLLER, B. (2008): The release 2008 of the World Stress Map (available online at www.world-stress-map.org).

HERMANRUD, C., CAO, S. AND LERCHE, I., 1990. Estimates of virgin rock temperature derived from BHT measurements: Bias and error. Geophysics **55**(7), 924–931.

HILLIS, R. R., COBLENTZ, D. D., SANDIFORD, M., AND ZHOU, S., 1997, Modelling the Contemporary Stress Field and its Implications for Hydrocarbon Exploration: Exploration Geophysics, 28, 88–93.

HOCKING, R.M., PLAYFORD, P.E., HAINES, P.W. AND MORY, A.J., 2008. Palaeozoic geology of the Canning Basin—a field guide. Geological Survey of Western Australia, Record **2008/18**.

HOWARD, L.E. AND SASS, J.H., 1964. Terrestrial heat flow in Australia. *Journal of Geophysical Research*, **69**, 1617–26.

HUDSON, J. A., STEPHANSSON, O., AND ANDERSSON, J., 2005, Guidance on numerical modelling of thermo-hydro-mechanical coupled processes for performance assessment of radioactive waste repositories, Int. J. Rock Mech. Min. Sci., 42, 850–870.

MCLAREN, S., SANDIFORD, M., HAND, M., NEUMANN, N, WYBORN, L. AND BASTRAKOVA, I., 2003. The hot southern continent: heat flow and heat production in Australian Proterozoic terranes. Geological Society of Australia Special Publication **22**, 151–161.

MIDDLETON, M.F., 1990. Canning Basin. *In* Geology and Mineral Resources of Western Australia. Western Australia Geological Survey, Memoir **3**, 425–457.

Attachment A: All 274 wells in the DMP's Canning Basin database.

Number	Well Name	Classification	Total Depth (m)	Onshore/ Offshore	Age at Total Depth	Datum	Latitude	Longitude
1	Abutilon 1	STR	850	ON	Devonian	GDA94	-19.4535972	125.1179605
2	Acacia 1	STR	1209	ON	Ordovician	GDA94	-19.3292294	124.9955825
3	Acacia 2	NFW	1575	ON	Precambrian	GDA94	-19.3297087	124.9954607
4	Anna Plains 1	NFW	1161	ON	Ordovician	GDA94	-19.3370921	121.468007
5	Antares 1	NFW	1299	ON	Ordovician	GDA94	-18.7326648	123.6951695
6	Aquanita 1	NFW	3000	ON	Devonian	GDA94	-17.6275184	124.358665
7	Aquila 1	NFW	1735	ON	Ordovician	GDA94	-18.5813931	122.670469
8	Aristida 1/1A	STR	734	ON	Devonian	GDA94	-19.8972084	125.3279648
9	Atrax 1	STR	786	ON	Devonian	GDA94	-19.4015163	126.6050993
10	Auld 1	NFW	817	ON	Devonian	GDA94	-21.7802909	123.026047
11	Babrongan 1	NFW	1949	ON	Devonian	GDA94	-18.388887	123.5961855
12	Barbwire 1	STR	1071	ON	Ordovician	GDA94	-19.1759217	125.0177814
13	Barlee 1	NFW	2469	ON	Carboniferous	GDA94	-17.8053165	122.7139281
14	Bedout 1	NFW	3073	OFF	Triassic	GDA94	-18.2430937	119.3909332
15	Bindi 1	NFW	2507	ON	Carboniferous	GDA94	-19.7207737	126.8006165
16	Blackstone 1	NFW	3050	ON	Ordovician	GDA94	-17.5855335	124.3530489
17	Blina 1	NFW	2498	ON	Devonian	GDA94	-17.6226214	124.5016947
18	Blina 2	EXT	1588	ON	Devonian	GDA94	-17.6179454	124.4974943
19	Blina 3	EXT	1580	ON	Devonian	GDA94	-17.6216034	124.4978381
20	Blina 4	EXT	1526	ON	Devonian	GDA94	-17.6202789	124.5003302
21	Blina 4 Deepening	DEV	1526	ON	Devonian	GDA94	-17.6202789	124.5003302
22	Blina 5	EXT	1600	ON	Devonian	GDA94	-17.6248587	124.5041799
23	Blina 6	EXT	1260	ON	Devonian	GDA94	-17.6231875	124.5020851
24	Blina 7	DEV	1551	ON	Devonian	GDA94	-17.6269418	124.5010778
25	Blina 8	DEV	1550	ON	Devonian	GDA94	-17.6183465	124.4927978
26	BMR 01 Mt Anderson	STR	512	ON	Permian	GDA94	-18.33	123.7156
27	BMR 02 Noonkanbah	STR	1219	ON	Devonian	GDA94	-18.1183	125.3347
28	BMR 03 Noonkanbah	STR	212	ON	Precambrian	GDA94	-18.6602778	125.9026389
29	BMR 04 Mandora	STR	430	ON	Jurassic	GDA94	-19.7367	120.7411
30	BMR 04A Mandora	STR	679	ON	Precambrian	GDA94	-19.7383	120.7433

31	BMR Lennard River 1	STR	63	ON	Devonian	GDA94	-17.9152564	125.2429513
32	BMR Lennard River 2	STR	69	ON	Devonian	GDA94	-17.96109	125.2762841
33	BMR Noonkanbah 1	STR	155	ON	Devonian	GDA94	-18.5706	125.9711
34	BMR Noonkanbah 4	STR	69	ON	Devonian	GDA94	-18.0735897	125.4179501
35	BMR Noonkanbah 5	STR	69	ON	Devonian	GDA94	-18.6652558	125.9957267
36	Boab 1	STR	1033	ON	Silurian	GDA94	-19.5769308	125.147128
37	Booran 1	NFW	2800	ON	Permian	GDA94	-17.3342567	123.6648538
38	Boronia 1	NFW	3391	ON	Devonian	GDA94	-17.7568434	124.572896
39	Boundary 1	NFW	1670	ON	Carboniferous	GDA94	-17.4858727	124.245199
40	Boundary Southeast 1	NFW	1710	ON	Not known	GDA94	-17.4892167	124.2464333
41	Brooking Springs 1	STR	162	ON	Devonian	GDA94	-18.0688656	125.6346162
42	Caladenia 1	STR	297	ON	Devonian	GDA94	-19.6780426	125.1085196
43	Calamia 1	NFW	1700	ON	Precambrian	GDA94	-19.5789999	121.7977225
44	Calytrix 1	STR	450	ON	Devonian	GDA94	-20.3547893	126.0894915
45	Canegrass 1	NFW	2007	ON	Ordovician	GDA94	-17.3902633	124.2268398
46	Canopus 1	NFW	1779	ON	Ordovician	GDA94	-18.9466601	123.8683009
47	Capparis 1	STR	521	ON	Devonian	GDA94	-19.4505417	125.1024049
48	Carina 1	NFW	1603	ON	Ordovician	GDA94	-19.3533833	123.0802139
49	Cassia 1	STR	1577	ON	Devonian	GDA94	-19.7346232	125.5162949
50	Chestnut 1	NFW	2669	ON	Devonian	GDA94	-17.7281322	124.8571035
51	Chirup 1	STR	763	ON	Permian	GDA94	-19.8484756	120.4360336
52	Clianthus 1	STR	450	ON	Permian	GDA94	-20.3085391	126.0899075
53	Contention Heights 1	NFW	1791	ON	Ordovician	GDA94	-22.4252577	127.2265882
54	Corbett 1	NFW	800	ON	Permian	GDA94	-20.0677917	120.6127056
55	Cow Bore 1	NFW	2940	ON	Devonian	GDA94	-17.9679828	122.7251397
56	Crab Creek 1	NFW	1790	ON	Devonian	GDA94	-18.0182882	122.5241876
57	Crimson Lake 1	NFW	1981	ON	Carboniferous	GDA94	-17.8833811	124.6778279
58	Crossland 1	STR	913	ON	Devonian	GDA94	-19.7159262	125.2517461
59	Crossland 2	STR	914	ON	Permian	GDA94	-20.0084533	124.9931031
60	Crossland 3	STR	915	ON	Devonian	GDA94	-20.2010453	125.7609592
61	Crystal Creek 1	NFW	2504	ON	Ordovician	GDA94	-18.5561838	123.6022207
62	Cudalgarra 1	NFW	1703	ON	Ordovician	GDA94	-19.2203204	122.3222919
63	Cudalgarra 2	NFW	1550	ON	Ordovician	GDA94	-19.2041729	122.2760965
64	Cudalgarra North 1	NFW	1220	ON	Ordovician	GDA94	-19.1694698	122.298612

65	Curringa 1	NFW	2335	ON	Devonian	GDA94	-16.8315224	122.7429214
66	Cycas 1	NFW	3019	ON	Carboniferous	GDA94	-19.0082174	126.0161218
67	Dampier Downs 1	STR	923	ON	Ordovician	GDA94	-18.2989194	123.102585
68	Dampiera 1A	STR	1857	ON	Devonian	GDA94	-19.7669306	125.2696306
69	Darriwell 1	NFW	1600	ON	Ordovician	GDA94	-19.5884827	122.1053175
70	Dodonea 1	NFW	2215	ON	Ordovician	GDA94	-19.3850409	125.162043
71	Dodonea 2	NFW	1688	ON	Ordovician	GDA94	-19.4035965	125.1793487
72	Doran 1	STR	763	ON	Devonian	GDA94	-18.1803054	123.4878297
73	Drosera 1	STR	450	ON	Silurian	GDA94	-19.6780431	125.0407421
74	East Crab Creek 1	NFW	2813	ON	Devonian	GDA94	-18.0169453	122.6101851
75	East Mermaid 1	NFW	4068	OFF	Triassic	GDA94	-17.1655716	119.8238539
76	East Yeeda 1	NFW	3556	ON	Devonian	GDA94	-17.631713	124.0484974
77	Edgar Range 1	STR	1968	ON	Ordovician	GDA94	-18.75554	123.5953405
78	Ellendale 1	NFW	3191	ON	Devonian	GDA94	-17.9035944	124.7054511
79	Eremophila 1	STR	1252	ON	Devonian	GDA94	-19.7791492	125.2048283
80	Eremophila 2	STR	360	ON	Devonian	GDA94	-19.7788755	125.2193532
81	Eremophila 3	STR	464	ON	Devonian	GDA94	-19.7780419	125.2382419
82	Ficus 1	STR	1084	ON	Devonian	GDA94	-19.8174861	125.2993532
83	Fitzroy River 1	NFW	3134	ON	Carboniferous	GDA94	-18.4927595	124.8818419
84	Frankenia 1	STR	479	ON	Devonian	GDA94	-19.4483185	125.2393488
85	Frankenstein 1	NFW	2803	ON	Proterozoic	GDA94	-21.3807149	123.0171216
86	Fraser River 1	NFW	3092	ON	Carboniferous	GDA94	-17.416157	123.1636169
87	Fraser River No. S-1 Structure Hole	STR	366	ON	Not known	GDA94	-17.4805556	123.2083333
88	Freney 1	NFW	1116	ON	Carboniferous	GDA94	-18.0148973	122.4716667
89	Frome Rocks 1	NFW	1220	ON	Devonian	GDA94	-18.1963792	123.6465306
90	Frome Rocks 2	NFW	2287	ON	Devonian	GDA94	-18.2538786	123.6612528
91	Fruitcake 1	NFW	1696	ON	Ordovician	GDA94	-19.4722139	124.4810472
92	Gap Creek 1	NFW	1541	ON	Precambrian	GDA94	-18.6309173	125.811159
93	Goldwyer 1	NFW	1439	ON	Precambrian	GDA94	-18.3794725	122.3843364
94	Goodenia 1	STR	163	ON	Devonian	GDA94	-19.8630423	125.2301872
95	Goorda 1	STR	152	ON	Jurassic	GDA94	-18.5725	122.94
96	Grant Range 1	NFW	3936	ON	Carboniferous	GDA94	-18.0149211	124.0091964
97	Great Sandy 1	NFW	1771	ON	Ordovician	GDA94	-19.2118699	122.3561172
98	Great Sandy 2	DEV	1576	ON	Ordovician	GDA94	-19.2118699	122.3560644

99	Grevillea 1	NFW	2581	ON	Precambrian	GDA94	-18.350921	125.632631
100	Hakea 1	NFW	1703	ON	Carboniferous	GDA94	-17.6922972	124.465304
101	Halgania 1	STR	500	ON	Devonian	GDA94	-19.689707	125.3968501
102	Hangover 1	NFW	1655	ON	Carboniferous	GDA94	-17.5761368	124.2767974
103	Harold 1	NFW	1550	ON	Devonian	GDA94	-17.5598423	124.5729639
104	Hawkstone Peak 1	NFW	1188	ON	Precambrian	GDA94	-17.2386026	124.4099965
105	Hedonia 1	NFW	1543	ON	Precambrian	GDA94	-18.2752822	122.4026906
106	Hibiscus 1	NFW	2394	ON	Devonian	GDA94	-19.636651	125.4315715
107	Hilltop 1	NFW	1770	ON	Precambrian	GDA94	-18.2921991	122.290036
108	Hoya 1	STR	450	ON	Devonian	GDA94	-20.3922629	126.0897977
109	Janpam 1	NFW	2263	ON	Devonian	GDA94	-17.6008157	124.415729
110	Janpam North 1	NFW	2202	ON	Devonian	GDA94	-17.5671639	124.4179436
111	Jones Range 1	NFW	2541	ON	Devonian	GDA94	-19.3606013	125.6704235
112	Jum Jum 1	NFW	2600	ON	Carboniferous	GDA94	-17.1210264	123.083903
113	Juno 1	NFW	1750	ON	Ordovician	GDA94	-19.3638426	122.0632796
114	Justago 1	NFW	3150	ON	Ordovician	GDA94	-18.8664929	126.2369631
115	Kambara 1	NFW	3147	OFF	Devonian	GDA94	-16.741618	122.4388677
116	Kanak 1	NFW	1365	ON	Ordovician	GDA94	-18.3767547	122.3839978
117	Katy 1	NFW	1952	ON	Carboniferous	GDA94	-17.643033	124.359435
118	Kemp Field 1	STR	1181	ON	Silurian	GDA94	-20.3179961	123.4645724
119	Kennedia 1	NFW	3388	ON	Devonian	GDA94	-17.7528712	124.6066463
120	Keraudren 1	NFW	3844	OFF	Triassic	GDA94	-18.9062322	119.155545
121	Kidson 1	STR	4431	ON	Ordovician	GDA94	-22.6165326	125.0097017
122	Kilang Kilang 1	NFW	2300	ON	Carboniferous	GDA94	-20.2116411	127.1282333
123	Kora 1	NFW	3100	ON	Devonian	GDA94	-17.2592683	123.8297622
124	Kunzea 1	STR	450	ON	Ordovician	GDA94	-19.5337096	124.9909895
125	La Grange 1	NFW	3260	OFF	Permian	GDA94	-18.2729029	119.3033087
126	Lacepede 1A	NFW	2286	OFF	Permian	GDA94	-17.0870543	121.4461146
127	Lake Betty 1	NFW	3146	ON	Devonian	GDA94	-19.5682999	126.3325945
128	Lake Hevern 1	NFW	2296	ON	Ordovician	GDA94	-21.4644546	127.5789464
129	Langoora 1	NFW	1617	ON	Precambrian	GDA94	-17.3016667	124.1147222
130	Leo 1	NFW	2411	ON	Ordovician	GDA94	-19.2472686	122.3456409
131	Lloyd 1	NFW	2001	ON	Devonian	GDA94	-17.4661593	124.2502963
132	Lloyd 2	EXT	1580	ON	Carboniferous	GDA94	-17.4683937	124.2530488

133	Lloyd 3	EXT	1590	ON	Carboniferous	GDA94	-17.4683937	124.2530488
134	Logue 1	NFW	2699	ON	Devonian	GDA94	-18.1244939	123.3914086
135	Looma 1	NFW	2535	ON	Precambrian	GDA94	-19.1235728	123.994283
136	Loris 1	NFW	1897	ON	Permian	GDA94	-17.5068059	124.2281063
137	Lovells Pocket 1	NFW	1924	ON	Ordovician	GDA94	-18.5144825	123.4372179
138	Lukins 1	NFW	1675	ON	Devonian	GDA94	-17.535995	124.535817
139	Mahe 1	NFW	1098	ON	Carboniferous	GDA94	-18.1260355	123.1530912
140	Mangaloo 1	NFW	3100	ON	Devonian	GDA94	-19.5867611	125.568376
141	Margaret 1	NFW	955	ON	Devonian	GDA94	-18.2613873	125.910681
142	Mariana 1	NFW	1700	ON	Devonian	GDA94	-17.5643332	124.4537416
143	Matches Spring 1	NFW	2835	ON	Ordovician	GDA94	-18.6891978	124.0518919
144	May River 1	NFW	1678	ON	Precambrian	GDA94	-17.2455605	124.0863723
145	McLarty 1	NFW	2591	ON	Ordovician	GDA94	-19.3941295	123.6567788
146	Meda 1	NFW	2685	ON	Precambrian	GDA94	-17.397533	124.1935871
147	Meda 2	NFW	2325	ON	Devonian	GDA94	-17.4083556	124.1913361
148	Melaleuca 1	STR	450	ON	Permian	GDA94	-19.686895	125.5469936
149	Mellany 1	NFW	1476	ON	Precambrian	GDA94	-17.400423	124.2895592
150	Metters 1	NFW	1505	ON	Carboniferous	GDA94	-17.9434496	124.7433435
151	Millard 1	NFW	1680	ON	Permian	GDA94	-17.3922269	123.9193525
152	Mimosa 1	NFW	4117	ON	Devonian	GDA94	-17.7479377	124.5847183
153	Minilya 1	NFW	2400	OFF	Jurassic	GDA94	-18.3232907	118.7337274
154	Minjin 1	NFW	1850	OFF	Devonian	GDA94	-16.8007609	122.3803822
155	Mirbelia 1	NFW	2670	ON	Silurian	GDA94	-19.6507349	125.3614332
156	Mirbelia 2	EXT	2819	ON	Ordovician	GDA94	-19.6489766	125.362197
157	Missing 1	NFW	1810	ON	Ordovician	GDA94	-19.5661017	124.6029647
158	Moogana 1	NFW	2213	ON	Precambrian	GDA94	-16.9366611	122.6921351
159	Mowla 1	NFW	763	ON	Ordovician	GDA94	-18.7291647	123.7110221
160	Mt Alexander 1	STR	62	ON	Jurassic	GDA94	-18.6908	123.6677778
161	Mt Hardman 1	NFW	3360	ON	Devonian	GDA94	-18.0091272	124.9147327
162	Mt Wynne 1	NFW	273	ON	Permian	GDA94	-18.1	124.45
163	Mt Wynne 3	NFW	657	ON	Permian	GDA94	-18.1	124.45
164	Munda 1	STR	1067	ON	Silurian	GDA94	-19.4726726	122.2940599
165	Munro 1	NFW	2116	ON	Precambrian	GDA94	-19.8639297	122.4897951
166	Musca 1	NFW	1535	ON	Ordovician	GDA94	-19.337313	122.9569366

167	Myroodah 1	NFW	1829	ON	Carboniferous	GDA94	-18.2694333	124.1921256
168	Napier 1	STR	1801	ON	Precambrian	GDA94	-17.2041494	124.5279484
169	Napier 2	NFW	1607	ON	Precambrian	GDA94	-17.0805379	124.3568354
170	Napier 4	STR	965	ON	Precambrian	GDA94	-16.9152607	124.0943336
171	Napier 5	STR	1658	ON	Precambrian	GDA94	-17.1069266	124.4696134
172	Needle Eye Rocks 1	NFW	1665	ON	Precambrian	GDA94	-18.2398092	125.8208924
173	Nemile 1	NFW	1601	ON	Carboniferous	GDA94	-17.8589037	124.5583179
174	Nerrima 1 (AFO)	NFW	2765	ON	Carboniferous	GDA94	-18.4486111	124.3713889
175	Nerrima 1 (FKO)	NFW	1302	ON	Permian	GDA94	-18.4711	124.4005556
176	Ngalti 1	NFW	2758	ON	Devonian	GDA94	-19.8674714	127.3140632
177	Nita Downs 1	NFW	1849	ON	Ordovician	GDA94	-19.1542029	122.1998813
178	Nollamara 1	NFW	1719	ON	Devonian	GDA94	-18.5660328	124.2324575
179	Notabilis 1	NFW	2812	ON	Devonian	GDA94	-18.3287031	123.5514461
180	Nuytsia 1	NFW	1350	ON	Devonian	GDA94	-18.5564066	124.1929629
181	Olios 1	NFW	1964	ON	Devonian	GDA94	-19.5042124	126.7930235
182	Orange Pool 1	NFW	1172	ON	Precambrian	GDA94	-17.3035462	124.2106471
183	Oscar Hill 1	NFW	1854	ON	Devonian	GDA94	-18.1003106	125.5840604
184	Padilpa 1	NFW	2184	ON	Carboniferous	GDA94	-17.0160206	123.1942169
185	Palm Spring 1	STR	1067	ON	Devonian	GDA94	-17.8141487	124.8867663
186	Pandanus 1	STR	880	ON	Precambrian	GDA94	-20.4269255	120.7035195
187	Pandorea 1	NFW	2275	ON	Devonian	GDA94	-19.8562081	125.3449088
188	Panicum 1	STR	278	ON	Devonian	GDA94	-19.5397085	125.1343499
189	Parda 1	NFW	1909	ON	Precambrian	GDA94	-18.9339559	122.0091703
190	Patience 1	NFW	1869	ON	Silurian	GDA94	-23.3613795	125.6699555
191	Patience 2	NFW	4184	ON	Confidential	GDA94	-23.3613812	125.6699808
192	Pearl 1	NFW	2203	OFF	Permian	GDA94	-17.8497556	122.0291
193	Pegasus 1	NFW	2995	ON	Ordovician	GDA94	-20.096001	123.952452
194	Pender 1	NFW	912	ON	Precambrian	GDA94	-16.6786655	122.8361667
195	Percival 1	NFW	2448	ON	Ordovician	GDA94	-20.3307333	126.0833247
196	Perindi 1	NFW	1867	OFF	Devonian	GDA94	-16.8269949	122.26444
197	Petaluma 1	NFW	2086	ON	Carboniferous	GDA94	-18.2668296	124.3263409
198	Philydrum 1	NFW	1608	ON	Devonian	GDA94	-17.8151355	124.6335822
199	Phoenix 1	NFW	4880	OFF	Triassic	GDA94	-18.6339336	118.7867131
200	Phoenix 2	NFW	4970	OFF	Triassic	GDA94	-18.6008357	118.8438405

201	Pictor 1	NFW	2146	ON	Precambrian	GDA94	-18.7630087	123.7160224
202	Pictor 2	EXT	1085	ON	Ordovician	GDA94	-18.7644865	123.7144642
203	Placer Camelgooda 1	MIN	1170	ON	Devonian	GDA94	-18.5966532	124.3801838
204	Point Moody 1	STR	2441	ON	Carboniferous	GDA94	-21.2594444	127.8061111
205	Point Torment 1	NFW	2130	ON	Devonian	GDA94	-17.1646576	123.7387512
206	Point Torment 1 Deepening	NFW	2604	ON	Devonian	GDA94	-17.1646576	123.7387507
207	Poole Range 3	NFW	995	ON	Permian	GDA94	-18.885	125.7888889
208	Poole Range 5	NFW	471	ON	Permian	GDA94	-18.8742	125.8172222
209	Pratia 1	STR	464	ON	Devonian	GDA94	-19.3638755	124.9960164
210	Prices Creek 1	NFW	307	ON	Ordovician	GDA94	-18.675	125.9166667
211	Prices Creek 2	NFW	104	ON	Ordovician	GDA94	-18.6758531	125.9431843
212	Prices Creek 3	NFW	247	ON	Ordovician	GDA94	-18.6903	125.9208333
213	Prices Creek 4	NFW	135	ON	Permian	GDA94	-18.6819	125.9013889
214	Puratte 1	NFW	3750	ON	Devonian	GDA94	-17.0864154	123.239457
215	Robert 1	NFW	1628	ON	Ordovician	GDA94	-19.1561	124.3299083
216	Roebuck Bay 1	STR	1222	ON	Ordovician	GDA94	-18.1591806	122.4592592
217	Runthrough 1	NFW	1380	ON	Permian	GDA94	-17.4882804	124.2002548
218	Sahara 1	NFW	2120	ON	Silurian	GDA94	-21.0767308	123.3944356
219	Sally May 1	NFW	1700	ON	Not known	GDA94	-19.7441667	124.2962889
220	Samphire Marsh 1	NFW	2031	ON	Precambrian	GDA94	-19.5203167	121.1830364
221	Santalum 1A	STR	629	ON	Ordovician	GDA94	-19.4716991	124.8696292
222	Scarpia 1	NFW	1600	ON	Carboniferous	GDA94	-18.0521414	124.8446241
223	Scrubby 1	NFW	1250	ON	Not known	GDA94	-17.5099167	124.2415278
224	Selenops 1	STR	1263	ON	Devonian	GDA94	-19.4139187	126.7182377
225	Setaria 1	NFW	956	ON	Ordovician	GDA94	-19.4008203	124.9757389
226	Sharon Ann 1	NFW	1830	ON	Ordovician	GDA94	-18.4762833	122.0018028
227	Solanum 1	STR	834	ON	Ordovician	GDA94	-19.3649872	124.9629615
228	South Auld 1	NFW	857	ON	Permian	GDA94	-21.7927908	123.0449359
229	St George Range 1	NFW	4437	ON	Carboniferous	GDA94	-18.6914	125.1380556
230	Stansmore Range 1	STR	107	ON	Permian	GDA94	-21.2597222	127.9652778
231	Stansmore Range 2	STR	102	ON	Permian	GDA94	-21.2638889	128
232	Stansmore Range 3	STR	105	ON	Permian	GDA94	-21.2611111	127.8722222
233	Stansmore Range 4	STR	32	ON	Permian	GDA94	-21.2444444	127.8583333
234	Stansmore Range 5	STR	53	ON	Permian	GDA94	-21.2791667	127.7805556

235	Sundown 1	NFW	2736	ON	Devonian	GDA94	-17.5513825	124.2431881
236	Sundown 2	EXT	1965	ON	Carboniferous	GDA94	-17.5535907	124.2461578
237	Sundown 3	DEV	1220	ON	Permian	GDA94	-17.5567049	124.2481784
238	Sundown 3H	DEV	1645	ON	Permian	GDA94	-17.5567049	124.2481784
239	Sundown 4	EXT	1800	ON	Permian	GDA94	-17.5519123	124.2450325
240	Sundown 5	DEV	1152	ON	Carboniferous	GDA94	-17.5552546	124.2449439
241	Sunshine 1	NFW	738	ON	Carboniferous	GDA94	-18.4572323	122.8947433
242	Sunup 1	NFW	1500	ON	Permian	GDA94	-17.618928	124.317334
243	Tandalgoo 1	NFW	34	ON	Permian	GDA94	-21.1	123.45
244	Tandalgoo 2	NFW	152	ON	Permian	GDA94	-21.1166667	123.45
245	Tandalgoo 3	NFW	125	ON	Permian	GDA94	-21.3	123.45
246	Tappers Inlet 1	NFW	2856	ON	Precambrian	GDA94	-16.8591089	122.5907738
247	Terrace 1	NFW	2389	ON	Devonian	GDA94	-17.5050833	124.2652778
248	Thangoo 1	NFW	1059	ON	Ordovician	GDA94	-18.3667501	122.8922904
249	Thangoo 1A	NFW	1655	ON	Ordovician	GDA94	-18.3621897	122.8866504
250	Thangoo 2	NFW	1472	ON	Precambrian	GDA94	-18.4409071	122.9103364
251	The Sisters 1	NFW	2996	ON	Devonian	GDA94	-17.7238732	124.420452
252	Thompsons 1	NFW	2009	ON	Devonian	GDA94	-17.6101106	124.3874919
253	Triodia 1	STR	631	ON	Devonian	GDA94	-19.6366527	125.233796
254	Twin Buttes 1	NFW	1600	ON	Ordovician	GDA94	-18.510313	122.9462983
255	Typha 1	STR	395	ON	Devonian	GDA94	-19.5280422	125.0729613
256	Vela 1	NFW	1909	ON	Ordovician	GDA94	-19.4104744	122.8946649
257	Wallal Corehole 1	STR	309	ON	Jurassic	GDA94	-19.8627778	120.6330611
258	Wamac 1	NFW	2764	OFF	Devonian	GDA94	-17.2392157	121.4929601
259	Wattle 1	NFW	3056	ON	Devonian	GDA94	-17.4691135	124.2276545
260	West Blackstone 1	NFW	1943	ON	Devonian	GDA94	-17.5740575	124.3380237
261	West Kora 1	NFW	2606	ON	Devonian	GDA94	-17.2451378	123.8179843
262	West Philydrum 1	NFW	1109	ON	Permian	GDA94	-17.8042882	124.6160629
263	West Terrace 1	NFW	1250	ON	Carboniferous	GDA94	-17.5059269	124.2599519
264	West Terrace 2	EXT	1200	ON	Carboniferous	GDA94	-17.5026752	124.2609471
265	Whistler 1	NFW	884	ON	Devonian	GDA94	-18.3709696	122.8969692
266	White Hills 1	NFW	4148	ON	Devonian	GDA94	-21.1542368	127.5887907
267	Whitetail 1	NFW	2504	OFF	Confidential	GDA94	-17.6521797	118.2516611
268	Whitewell 1	NFW	1754	ON	Carboniferous	GDA94	-17.5657849	124.2623999

269	Willara 1	NFW	3903	ON	Ordovician	GDA94	-19.1815556	122.0727222
270	Willara Hill 1	NFW	858	ON	Permian	GDA94	-19.0588051	121.8826389
271	Wilson Cliffs 1	NFW	3722	ON	Proterozoic	GDA94	-22.2760948	126.7832561
272	Wood Hills 1	NFW	1978	ON	Ordovician	GDA94	-19.5747043	122.0203641
273	Yarrada 1	NFW	3295	ON	Devonian	GDA94	-17.3651334	124.1037924
274	Yulleroo 1	NFW	4572	ON	Devonian	GDA94	-17.8530635	122.9082434

Attachment B: 113 wells in the Canning Basin not previously studied and with sufficient data to carry out required work program

Number	Well Name	Classification	Total Depth (m)	Onshore/ Offshore	Age at Total Depth	Datum	Latitude	Longitude
1	Anna Plains 1	NFW	1161	ON	Ordovician	GDA94	-19.3370921	121.468007
2	Antares 1	NFW	1299	ON	Ordovician	GDA94	-18.7326648	123.6951695
3	Auld 1	NFW	817	ON	Devonian	GDA94	-21.7802909	123.026047
4	Bedout 1	NFW	3073	OFF	Triassic	GDA94	-18.2430937	119.3909332
5	Bindi 1	NFW	2507	ON	Carboniferous	GDA94	-19.7207737	126.8006165
6	Blina 4 Deepening	DEV	1526	ON	Devonian	GDA94	-17.6202789	124.5003302
7	Blina 6	EXT	1260	ON	Devonian	GDA94	-17.6231875	124.5020851
8	Blina 7	DEV	1551	ON	Devonian	GDA94	-17.6269418	124.5010778
9	Blina 8	DEV	1550	ON	Devonian	GDA94	-17.6183465	124.4927978
10	Boundary 1	NFW	1670	ON	Carboniferous	GDA94	-17.4858727	124.245199
11	Calamia 1	NFW	1700	ON	Precambrian	GDA94	-19.5789999	121.7977225
12	Canegrass 1	NFW	2007	ON	Ordovician	GDA94	-17.3902633	124.2268398
13	Chestnut 1	NFW	2669	ON	Devonian	GDA94	-17.7281322	124.8571035
14	Chirup 1	STR	763	ON	Permian	GDA94	-19.8484756	120.4360336
15	Contention Heights 1	NFW	1791	ON	Ordovician	GDA94	-22.4252577	127.2265882
16	Corbett 1	NFW	800	ON	Permian	GDA94	-20.0677917	120.6127056
17	Crab Creek 1	NFW	1790	ON	Devonian	GDA94	-18.0182882	122.5241876
18	Crimson Lake 1	NFW	1981	ON	Carboniferous	GDA94	-17.8833811	124.6778279
19	Crystal Creek 1	NFW	2504	ON	Ordovician	GDA94	-18.5561838	123.6022207
20	Cudalgarra 2	NFW	1550	ON	Ordovician	GDA94	-19.2041729	122.2760965
21	Cudalgarra North 1	NFW	1220	ON	Ordovician	GDA94	-19.1694698	122.298612
22	Curringa 1	NFW	2335	ON	Devonian	GDA94	-16.8315224	122.7429214
23	Darriwell 1	NFW	1600	ON	Ordovician	GDA94	-19.5884827	122.1053175
24	Dodonea 1	NFW	2215	ON	Ordovician	GDA94	-19.3850409	125.162043
25	Dodonea 2	NFW	1688	ON	Ordovician	GDA94	-19.4035965	125.1793487
26	East Mermaid 1	NFW	4068	OFF	Triassic	GDA94	-17.1655716	119.8238539
27	Eremophila 3	STR	464	ON	Devonian	GDA94	-19.7780419	125.2382419
28	Frankenia 1	STR	479	ON	Devonian	GDA94	-19.4483185	125.2393488
29	Frankenstein 1	NFW	2803	ON	Proterozoic	GDA94	-21.3807149	123.0171216
30	Freney 1	NFW	1116	ON	Carboniferous	GDA94	-18.0148973	122.4716667

31	Gap Creek 1	NFW	1541	ON	Precambrian	GDA94	-18.6309173	125.811159
32	Goodenia 1	STR	163	ON	Devonian	GDA94	-19.8630423	125.2301872
33	Great Sandy 2	DEV	1576	ON	Ordovician	GDA94	-19.2118699	122.3560644
34	Harold 1	NFW	1550	ON	Devonian	GDA94	-17.5598423	124.5729639
35	Hibiscus 1	NFW	2394	ON	Devonian	GDA94	-19.636651	125.4315715
36	Hilltop 1	NFW	1770	ON	Precambrian	GDA94	-18.2921991	122.290036
37	Janpam North 1	NFW	2202	ON	Devonian	GDA94	-17.5671639	124.4179436
38	Jum Jum 1	NFW	2600	ON	Carboniferous	GDA94	-17.1210264	123.083903
39	Juno 1	NFW	1750	ON	Ordovician	GDA94	-19.3638426	122.0632796
40	Kambara 1	NFW	3147	OFF	Devonian	GDA94	-16.741618	122.4388677
41	Kanak 1	NFW	1365	ON	Ordovician	GDA94	-18.3767547	122.3839978
42	Kemp Field 1	STR	1181	ON	Silurian	GDA94	-20.3179961	123.4645724
43	Kennedia 1	NFW	3388	ON	Devonian	GDA94	-17.7528712	124.6066463
44	Keraudren 1	NFW	3844	OFF	Triassic	GDA94	-18.9062322	119.155545
45	Kidson 1	STR	4431	ON	Ordovician	GDA94	-22.6165326	125.0097017
46	Kilang Kilang 1	NFW	2300	ON	Carboniferous	GDA94	-20.2116411	127.1282333
47	La Grange 1	NFW	3260	OFF	Permian	GDA94	-18.2729029	119.3033087
48	Lacepede 1A	NFW	2286	OFF	Permian	GDA94	-17.0870543	121.4461146
49	Lake Hevern 1	NFW	2296	ON	Ordovician	GDA94	-21.4644546	127.5789464
50	Leo 1	NFW	2411	ON	Ordovician	GDA94	-19.2472686	122.3456409
51	Lloyd 1	NFW	2001	ON	Devonian	GDA94	-17.4661593	124.2502963
52	Lloyd 2	EXT	1580	ON	Carboniferous	GDA94	-17.4683937	124.2530488
53	Looma 1	NFW	2535	ON	Precambrian	GDA94	-19.1235728	123.994283
54	Loris 1	NFW	1897	ON	Permian	GDA94	-17.5068059	124.2281063
55	Lovells Pocket 1	NFW	1924	ON	Ordovician	GDA94	-18.5144825	123.4372179
56	Lukins 1	NFW	1675	ON	Devonian	GDA94	-17.535995	124.535817
57	Mahe 1	NFW	1098	ON	Carboniferous	GDA94	-18.1260355	123.1530912
58	Mangaloo 1	NFW	3100	ON	Devonian	GDA94	-19.5867611	125.568376
59	Margaret 1	NFW	955	ON	Devonian	GDA94	-18.2613873	125.910681
60	Mellany 1	NFW	1476	ON	Precambrian	GDA94	-17.400423	124.2895592
61	Metters 1	NFW	1505	ON	Carboniferous	GDA94	-17.9434496	124.7433435
62	Millard 1	NFW	1680	ON	Permian	GDA94	-17.3922269	123.9193525
63	Minilya 1	NFW	2400	OFF	Jurassic	GDA94	-18.3232907	118.7337274
64	Minjin 1	NFW	1850	OFF	Devonian	GDA94	-16.8007609	122.3803822

65	Mirbelia 2	EXT	2819	ON	Ordovician	GDA94	-19.6489766	125.362197
66	Missing 1	NFW	1810	ON	Ordovician	GDA94	-19.5661017	124.6029647
67	Moogana 1	NFW	2213	ON	Precambrian	GDA94	-16.9366611	122.6921351
68	Napier 2	NFW	1607	ON	Precambrian	GDA94	-17.0805379	124.3568354
69	Napier 4	STR	965	ON	Precambrian	GDA94	-16.9152607	124.0943336
70	Napier 5	STR	1658	ON	Precambrian	GDA94	-17.1069266	124.4696134
71	Needle Eye Rocks 1	NFW	1665	ON	Precambrian	GDA94	-18.2398092	125.8208924
72	Nemile 1	NFW	1601	ON	Carboniferous	GDA94	-17.8589037	124.5583179
73	Ngalti 1	NFW	2758	ON	Devonian	GDA94	-19.8674714	127.3140632
74	Nollamara 1	NFW	1719	ON	Devonian	GDA94	-18.5660328	124.2324575
75	Olios 1	NFW	1964	ON	Devonian	GDA94	-19.5042124	126.7930235
76	Oscar Hill 1	NFW	1854	ON	Devonian	GDA94	-18.1003106	125.5840604
77	Padilpa 1	NFW	2184	ON	Carboniferous	GDA94	-17.0160206	123.1942169
78	Patience 1	NFW	1869	ON	Silurian	GDA94	-23.3613795	125.6699555
79	Patience 2	NFW	4184	ON	Confidential	GDA94	-23.3613812	125.6699808
80	Pearl 1	NFW	2203	OFF	Permian	GDA94	-17.8497556	122.0291
81	Pegasus 1	NFW	2995	ON	Ordovician	GDA94	-20.096001	123.952452
82	Pender 1	NFW	912	ON	Precambrian	GDA94	-16.6786655	122.8361667
83	Percival 1	NFW	2448	ON	Ordovician	GDA94	-20.3307333	126.0833247
84	Perindi 1	NFW	1867	OFF	Devonian	GDA94	-16.8269949	122.26444
85	Petaluma 1	NFW	2086	ON	Carboniferous	GDA94	-18.2668296	124.3263409
86	Phoenix 1	NFW	4880	OFF	Triassic	GDA94	-18.6339336	118.7867131
87	Phoenix 2	NFW	4970	OFF	Triassic	GDA94	-18.6008357	118.8438405
88	Pictor 2	EXT	1085	ON	Ordovician	GDA94	-18.7644865	123.7144642
89	Point Moody 1	STR	2441	ON	Carboniferous	GDA94	-21.2594444	127.8061111
90	Point Torment 1 Deepening	NFW	2604	ON	Devonian	GDA94	-17.1646576	123.7387507
91	Puratte 1	NFW	3750	ON	Devonian	GDA94	-17.0864154	123.239457
92	Runthrough 1	NFW	1380	ON	Permian	GDA94	-17.4882804	124.2002548
93	Sahara 1	NFW	2120	ON	Silurian	GDA94	-21.0767308	123.3944356
94	Samphire Marsh 1	NFW	2031	ON	Precambrian	GDA94	-19.5203167	121.1830364
95	Scarpia 1	NFW	1600	ON	Carboniferous	GDA94	-18.0521414	124.8446241
96	Selenops 1	STR	1263	ON	Devonian	GDA94	-19.4139187	126.7182377
97	Setaria 1	NFW	956	ON	Ordovician	GDA94	-19.4008203	124.9757389
98	Sharon Ann 1	NFW	1830	ON	Ordovician	GDA94	-18.4762833	122.0018028

99	Solanum 1	STR	834	ON	Ordovician	GDA94	-19.3649872	124.9629615
100	South Auld 1	NFW	857	ON	Permian	GDA94	-21.7927908	123.0449359
101	Sundown 4	EXT	1800	ON	Permian	GDA94	-17.5519123	124.2450325
102	Sundown 5	DEV	1152	ON	Carboniferous	GDA94	-17.5552546	124.2449439
103	Sunshine 1	NFW	738	ON	Carboniferous	GDA94	-18.4572323	122.8947433
104	Sunup 1	NFW	1500	ON	Permian	GDA94	-17.618928	124.317334
105	Tappers Inlet 1	NFW	2856	ON	Precambrian	GDA94	-16.8591089	122.5907738
106	Twin Buttes 1	NFW	1600	ON	Ordovician	GDA94	-18.510313	122.9462983
107	Wamac 1	NFW	2764	OFF	Devonian	GDA94	-17.2392157	121.4929601
108	Wattle 1	NFW	3056	ON	Devonian	GDA94	-17.4691135	124.2276545
109	West Blackstone 1	NFW	1943	ON	Devonian	GDA94	-17.5740575	124.3380237
110	West Terrace 2	EXT	1200	ON	Carboniferous	GDA94	-17.5026752	124.2609471
111	Whistler 1	NFW	884	ON	Devonian	GDA94	-18.3709696	122.8969692
112	White Hills 1	NFW	4148	ON	Devonian	GDA94	-21.1542368	127.5887907
113	Whitetail 1	NFW	2504	OFF	Confidential	GDA94	-17.6521797	118.2516611

Attachment C: Basement Lithology and Depths for all wells in Attachment A [excluding wells >50 km offshore]

Well ID	Well Name	Total Depth (m)	Probable Basement Lithology	Basement Depth (m)	Depth to Basement from Total Depth (m)	Datum	Latitude	Longitude
W001070	Abutilon 1	850.3	Metasediment	2400	1549.7	GDA94	-19.4536	125.118
W001071	Acacia 1	1208.7	Precambrian schist	1500	291.3	GDA94	-19.3292	124.995
W001177	Acacia 2	1575.0	Precambrian schist	1502	-73.0	GDA94	-19.3297	124.995
W001532	Anna Plains 1	1161.0	Granite	1650	489.0	GDA94	-19.3371	121.468
W001534	Antares 1	1298.5	Metasediment	2000	701.5	GDA94	-18.7327	123.695
W001190	Aquanita 1	3000.0	Precambrian schist	3900	900.0	GDA94	-17.6275	124.359
W001196	Aquila 1	1735.0	Gneiss	1900	165.0	GDA94	-18.5814	122.67
W001271	Aristida 1/1A	734.0	Metasediment	3500	2766.0	GDA94	-19.8972	125.328
W001351	Atrax 1	786.0	Metasediment	2000	1214.0	GDA94	-19.4015	126.605
W001391	Auld 1	817.0	Metasediment	2500	1683.0	GDA94	-21.7803	123.026
W000011	Babrongan 1	1949.2	Metasediment	6000	4050.8	GDA94	-18.3889	123.596
W000832	Barbwire 1	1071.4	Precambrian schist	1500	428.6	GDA94	-19.1759	125.018
W000063	Barlee 1	2469.2	Metasediment	6800	4330.8	GDA94	-17.8053	122.714
W001347	Bindi 1	2507.0	uncertain	10000	7493.0	GDA94	-19.7208	126.801
W000674	Blackstone 1	3049.5	Precambrian schist	3500	450.5	GDA94	-17.5855	124.353
W001064	Blina 1	2498.1	Precambrian schist	3500	1001.9	GDA94	-17.6226	124.502
W001088	Blina 2	1588.0	Precambrian schist	3500	1912.0	GDA94	-17.6179	124.497
W001107	Blina 3	1580.0	Precambrian schist	3500	1920.0	GDA94	-17.6216	124.498
W001140	Blina 4	1526.0	Precambrian schist	3500	1974.0	GDA94	-17.6203	124.5
W002155	Blina 4 Deepening	1526.2	Precambrian schist	3500	1973.8	GDA94	-17.6203	124.5
W001446	Blina 5	1600.0	Precambrian schist	3500	1900.0	GDA94	-17.6249	124.504
W001459	Blina 6	1260.0	Precambrian schist	3500	2240.0	GDA94	-17.6232	124.502
W001535	Blina 7	1551.0	Precambrian schist	3500	1949.0	GDA94	-17.6269	124.501
W001680	Blina 8	1550.0	Precambrian schist	3500	1950.0	GDA94	-17.6183	124.493
W001493	BMR 01 Mt Anderson	512.0	Metasediment	6800	6288.0	GDA94	-18.33	123.716
W001494	BMR 02 Noonkanbah	1219.0	Metasediment	3500	2281.0	GDA94	-18.1183	125.335
W001495	BMR 03 Noonkanbah	212.0	Gneiss	211	-1.0	GDA94	-18.3289	125.9
W001496	BMR 04 Mandora	430.0	Gneiss	680	250.0	GDA94	-19.7367	120.741
W001497	BMR 04A Mandora	679.0	Gneiss	678	-1.0	GDA94	-19.7383	120.743
	BMR Lennard River 1	63.0	Metasediment	1100	1037.0	GDA94	-17.9153	125.243

	BMR Lennard River 2	69.0	Metasediment	1500	1431.0	GDA94	-17.9611	125.276
	BMR Noonkanbah 1	155.0	Gneiss	1100	945.0	GDA94	-18.5706	125.971
	BMR Noonkanbah 4	69.0	Metasediment	2000	1931.0	GDA94	-18.0736	125.418
	BMR Noonkanbah 5	69.0	Gneiss	750	681.0	GDA94	-18.6653	125.996
W001072	Boab 1	1033.4	Granite	2900	1866.6	GDA94	-19.5769	125.147
W001191	Booran 1	2800.0	Precambrian schist	7000	4200.0	GDA94	-17.3343	123.665
W001123	Boronia 1	3391.0	Metasediment	4600	1209.0	GDA94	-17.7568	124.573
W001682	Boundary 1	1670.0	Precambrian schist	3500	1830.0	GDA94	-17.4859	124.245
	Boundary Southeast 1	1710.0	Precambrian schist	3500	1790.0	GDA94	-17.4892	124.246
W000080	Brooking Springs 1	161.5	Metasediment	1800	1638.5	GDA94	-18.0689	125.635
W001282	Caladenia 1	296.5	Granite	2200	1903.5	GDA94	-19.678	125.109
W001537	Calamia 1	1700.0	Granite	1671	-29.0	GDA94	-19.579	121.798
W001331	Calytrix 1	450.0	Metasediment	6400	5950.0	GDA94	-20.3548	126.089
W001868	Canegrass 1	2006.5	Metasediment	1866	-140.5	GDA94	-17.3903	124.227
W001179	Canopus 1	1779.0	Metasediment	2100	321.0	GDA94	-18.9467	123.868
W001270	Capparis 1	521.0	Metasediment	2400	1879.0	GDA94	-19.4505	125.102
W001178	Carina 1	1603.0	Metasediment	2200	597.0	GDA94	-19.3534	123.08
W001073	Cassia 1	1576.6	Metasediment	4800	3223.4	GDA94	-19.7346	125.516
W001907	Chestnut 1	2669.0	Metasediment	3400	731.0	GDA94	-17.7281	124.857
W000713	Chirup 1	762.6	Granite	900	137.4	GDA94	-19.8485	120.436
W001332	Clianthus 1	450.0	Metasediment	6500	6050.0	GDA94	-20.3085	126.09
W000875	Contention Heights 1	1790.7	Metasediment	2400	609.3	GDA94	-22.4253	127.227
W001892	Corbett 1	800.0	Granite	900	100.0	GDA94	-20.0678	120.613
W001307	Cow Bore 1	2940.0	Precambrian schist	6000	3060.0	GDA94	-17.968	122.725
W001541	Crab Creek 1	1790.0	Precambrian schist	3100	1310.0	GDA94	-18.0183	122.524
W001578	Crimson Lake 1	1980.9	Metasediment	6100	4119.1	GDA94	-17.8834	124.678
W000805	Crossland 1	913.2	Metasediment	2900	1986.8	GDA94	-19.7159	125.252
W000806	Crossland 2	914.4	Metagabbro	3500	2585.6	GDA94	-20.0113	124.995
W000807	Crossland 3	915.3	Metasediment	2300	1384.7	GDA94	-20.201	125.761
W001585	Crystal Creek 1	2504.0	Precambrian schist	2800	296.0	GDA94	-18.5562	123.602
W001359	Cudalgarra 1	1703.0	Metasediment	2300	597.0	GDA94	-19.2203	122.322
W001467	Cudalgarra 2	1550.0	Metasediment	2500	950.0	GDA94	-19.2042	122.276
W001629	Cudalgarra North 1	1220.0	Metasediment	2100	880.0	GDA94	-19.1695	122.299
W001173	Curringa 1	2335.0	Metasediment	2800	465.0	GDA94	-16.8315	122.743

W001268	Cycas 1	3019.0	uncertain	9500	6481.0	GDA94	-19.0082	126.016
W000056	Dampier Downs 1	922.9	Precambrian schist	1500	577.1	GDA94	-18.2989	123.103
W001074	Dampiera 1A	1856.9	Metasediment	2900	1043.1	GDA94	-19.7669	125.27
W001569	Darriwell 1	1600.0	Granite	4100	2500.0	GDA94	-19.5885	122.105
W001469	Dodonea 1	2215.0	Metasediment	2185	-30.0	GDA94	-19.385	125.162
W001519	Dodonea 2	1688.0	Metasediment	2200	512.0	GDA94	-19.4036	125.179
W000704	Doran 1	763.2	Metasediment	6900	6136.8	GDA94	-18.1803	123.488
W001281	Drosera 1	450.0	Metasediment	1800	1350.0	GDA94	-19.678	125.041
W001312	East Crab Creek 1	2813.0	Precambrian schist	3300	487.0	GDA94	-18.0169	122.61
W001445	East Yeeda 1	3556.0	uncertain	9500	5944.0	GDA94	-17.6317	124.048
W000708	Edgar Range 1	1968.1	Precambrian schist	1915	-53.1	GDA94	-18.7555	123.595
W001009	Ellendale 1	3190.0	Metasediment	6900	3710.0	GDA94	-17.9036	124.705
W001138	Eremophila 1	1252.0	Metasediment	2400	1148.0	GDA94	-19.7791	125.205
W001279	Eremophila 2	360.0	Metasediment	2500	2140.0	GDA94	-19.7789	125.219
W001280	Eremophila 3	464.0	Metasediment	2700	2236.0	GDA94	-19.778	125.238
W001075	Ficus 1	1083.7	Metasediment	3100	2016.3	GDA94	-19.8175	125.299
W001001	Fitzroy River 1	3133.8	uncertain	9500	6366.2	GDA94	-18.4928	124.882
W001275	Frankenia 1	479.0	Metasediment	2500	2021.0	GDA94	-19.4483	125.239
W001594	Frankenstein 1	2803.0	Metasediment	2666	-137.0	GDA94	-21.3807	123.017
W000060	Fraser River 1	3091.9	uncertain	5000	1908.1	GDA94	-17.4175	123.162
W000775	Fraser River No. S-1 Structure Hole	366.4	uncertain	5500	5133.6	GDA94	-17.4806	123.208
W001601	Freney 1	1116.0	Precambrian schist	3100	1984.0	GDA94	-18.0149	122.472
W000062	Frome Rocks 1	1220.1	Metasediment	8000	6779.9	GDA94	-18.1964	123.647
W000061	Frome Rocks 2	2287.2	Metasediment	7100	4812.8	GDA94	-18.2539	123.661
W002508	Fruitcake 1	1696.0	Metasediment	2600	904.0	GDA94	-19.4722	124.481
W001577	Gap Creek 1	1541.2	Metagabbro	1527	-14.2	GDA94	-18.6309	125.811
W000057	Goldwyer 1	1438.7	Granite	1420	-18.7	GDA94	-18.3795	122.384
W001278	Goodenia 1	163.3	Metasediment	2500	2336.7	GDA94	-19.863	125.23
W000111	Goorda 1	152.0	Gneiss	1700	1548.0	GDA94	-18.5725	122.94
W000058	Grant Range 1	3936.5	uncertain	10500	6563.5	GDA94	-18.0149	124.009
W001087	Great Sandy 1	1771.0	Metasediment	2300	529.0	GDA94	-19.2119	122.356
W001661	Great Sandy 2	1576.1	Metasediment	2300	723.9	GDA94	-19.2119	122.356
W001172	Grevillea 1	2585.8	Granite	2557	-28.8	GDA94	-18.3509	125.633
W001285	Hakea 1	1703.0	Metasediment	3800	2097.0	GDA94	-17.6923	124.465

W001272	Halgania 1	500.0	Metasediment	3800	3300.0	GDA94	-19.6897	125.397
W001246	Hangover 1	1655.0	Precambrian schist	3800	2145.0	GDA94	-17.5761	124.277
W001520	Harold 1	1550.0	Metasediment	2500	950.0	GDA94	-17.5598	124.573
W000017	Hawkstone Peak 1	1187.8	Metasediment	1175	-12.8	GDA94	-17.2386	124.41
W001343	Hedonia 1	1543.0	Granite	1531	-12.0	GDA94	-18.2753	122.403
W001525	Hibiscus 1	2394.0	Metasediment	3800	1406.0	GDA94	-19.6367	125.432
W001524	Hilltop 1	1770.0	Granite	1736	-34.0	GDA94	-18.2922	122.29
W001333	Hoya 1	450.0	Granite	6000	5550.0	GDA94	-20.3923	126.09
W001193	Janpam 1	2263.0	Precambrian schist	3500	1237.0	GDA94	-17.6008	124.416
W001527	Janpam North 1	2202.0	Precambrian schist	3500	1298.0	GDA94	-17.5672	124.418
W000902	Jones Range 1	2540.0	uncertain	11500	8960.0	GDA94	-19.3606	125.67
W001464	Jum Jum 1	2600.0	Gabbro/Metasediment	5500	2900.0	GDA94	-17.121	123.084
W001472	Juno 1	1750.0	Metasediment	2900	1150.0	GDA94	-19.3638	122.063
W001390	Justago 1	3150.0	Metasediment	3450	300.0	GDA94	-18.8665	126.237
	Kambara	3147	Metasediment	3500	353.0	GDA94	-16.7416	122.439
W001914	Kanak 1	1365.0	Granite	1500	135.0	GDA94	-18.3768	122.384
W001248	Katy 1	1952.0	Precambrian schist	3900	1948.0	GDA94	-17.643	124.359
W000710	Kemp Field 1	1181.1	Metasediment	5200	4018.9	GDA94	-20.318	123.465
W001456	Kennedia 1	3387.5	Metasediment	4600	1212.5	GDA94	-17.7529	124.607
W000130	Kidson 1	4431.5	Metasediment	5200	768.5	GDA94	-22.6165	125.01
W001357	Kilang Kilang 1	2300.0	uncertain	8500	6200.0	GDA94	-20.2116	127.128
W001184	Kora 1	3101.0	Precambrian schist	3400	299.0	GDA94	-17.2593	123.83
W001344	Kunzea 1	450.0	Metasediment	1500	1050.0	GDA94	-19.5337	124.991
W000804	Lake Betty 1	3145.8	uncertain	9500	6354.2	GDA94	-19.5683	126.333
W002247	Lake Hevern 1	2296.0	Metasediment	3200	904.0	GDA94	-21.4645	127.579
W000015	Langoora 1	1617.0	Precambrian schist	1597	-20.0	GDA94	-17.3017	124.115
W001587	Leo 1	2411.3	Metasediment	2319	-92.3	GDA94	-19.2473	122.346
W001517	Lloyd 1	2001.0	Precambrian schist	3200	1199.0	GDA94	-17.4662	124.25
W001538	Lloyd 2	1580.0	Precambrian schist	3200	1620.0	GDA94	-17.4684	124.253
W002251	Lloyd 3	1590.3	Precambrian schist	3200	1609.7	GDA94	-17.4684	124.253
W000810	Logue 1	2698.7	Metasediment	6900	4201.3	GDA94	-18.1245	123.391
W002050	Looma 1	2535.0	Metasediment	2490	-45.0	GDA94	-19.1236	123.994
W002163	Loris 1	1897.0	Precambrian schist	3750	1853.0	GDA94	-17.5068	124.228
W001662	Lovells Pocket 1	1924.0	Precambrian schist	2000	76.0	GDA94	-18.5145	123.437

W001477	Lukins 1	1675.0	Metasediment	2500	825.0	GDA94	-17.536	124.536
W002171	Mahe 1	1098.0	Metasediment	6100	5002.0	GDA94	-18.126	123.153
W001457	Mangaloo 1	3100.0	Metasediment	6000	2900.0	GDA94	-19.5868	125.568
W001572	Margaret 1	955.0	Granite	1100	145.0	GDA94	-18.2614	125.911
W001349	Mariana 1	1700.0	Precambrian schist	3500	1800.0	GDA94	-17.5643	124.454
W000741	Matches Spring 1	2834.6	Precambrian schist	3000	165.4	GDA94	-18.6892	124.052
W000664	May River 1	1677.9	Precambrian schist	1642	-35.9	GDA94	-17.2456	124.086
W000693	McLarty 1	2590.8	Metasediment	2800	209.2	GDA94	-19.3941	123.657
W000055	Meda 1	2685.0	Precambrian schist	2640	-45.0	GDA94	-17.3989	124.192
W000088	Meda 2	2325.0	Precambrian schist	2700	375.0	GDA94	-17.4097	124.191
W001334	Melaleuca 1	450.0	Metasediment	5100	4650.0	GDA94	-19.6869	125.547
W001521	Mellany 1	1476.0	Metasediment	1428	-48.0	GDA94	-17.4004	124.29
W001938	Metters 1	1505.0	uncertain	8000	6495.0	GDA94	-17.9434	124.743
W002139	Millard 1	1680.0	Precambrian schist	6000	4320.0	GDA94	-17.3922	123.919
W000876	Mimosa 1	4117.0	Metasediment	4600	483.0	GDA94	-17.7479	124.585
	Minjin 1	1850	Metasediment	3500	1650.0	GDA94	-16.8008	122.38
W001394	Mirbelia 1	2670.0	Metasediment	3400	730.0	GDA94	-19.6507	125.361
W001595	Mirbelia 2	2818.6	Metasediment	3400	581.4	GDA94	-19.649	125.362
W002494	Missing 1	1810.0	Metasediment	2750	940.0	GDA94	-19.5661	124.603
W001013	Moogana 1	2213.0	Metasediment/Dolerite	2105	-108.0	GDA94	-16.9367	122.692
W000749	Mowla 1	762.9	Metasediment	2000	1237.1	GDA94	-18.7292	123.711
W000104	Mt Alexander 1	62.0	Metasediment	2200	2138.0	GDA94	-18.6908	123.668
W000883	Mt Hardman 1	3360.0	uncertain	8000	4640.0	GDA94	-18.0091	124.915
W000925	Mt Wynne 1	273.0	uncertain	11000	10727.0	GDA94	-18.1	124.45
W000926	Mt Wynne 3	657.0	uncertain	11000	10343.0	GDA94	-18.1	124.45
W000809	Munda 1	1066.8	Granite	2900	1833.2	GDA94	-19.4727	122.294
W000822	Munro 1	2115.6	Granite	2106	-9.6	GDA94	-19.8639	122.49
W001180	Musca 1	1535.0	Metasediment	2200	665.0	GDA94	-19.3373	122.957
W000780	Myroodah 1	1829.1	uncertain	10500	8670.9	GDA94	-18.2694	124.192
W000731	Napier 1	1801.4	Gneiss	1772	-29.4	GDA94	-17.2041	124.528
W000744	Napier 2	1606.9	Metasediment	1588	-18.9	GDA94	-17.0805	124.357
W000748	Napier 4	965.0	Metasediment	943	-22.0	GDA94	-16.9153	124.094
W000782	Napier 5	1657.8	Gneiss	1650	-7.8	GDA94	-17.1069	124.47
W001531	Needle Eye Rocks 1	1664.9	Granite	1521	-143.9	GDA94	-18.2398	125.821

W001885	Nemile 1	1601.0	Metasediment	6500	4899.0	GDA94	-17.8589	124.558
W000781	Nerrima 1 (AFO)	2765.2	uncertain	10000	7234.9	GDA94	-18.4486	124.371
W000927	Nerrima 1 (FKO)	1302.0	uncertain	10000	8698.0	GDA94	-18.4711	124.401
W001356	Ngalti 1	2758.0	uncertain	8000	5242.0	GDA94	-19.8675	127.314
W001301	Nita Downs 1	1849.0	Metasediment	3000	1151.0	GDA94	-19.1542	122.2
W001455	Nollamara 1	1719.0	Precambrian schist	5900	4181.0	GDA94	-18.566	124.232
W001337	Notabilis 1	2811.5	Metasediment	7000	4188.5	GDA94	-18.3287	123.551
W001383	Nuytsia 1	1350.0	Precambrian schist	6000	4650.0	GDA94	-18.5564	124.193
W001306	Olios 1	1963.5	Granite	6000	4036.5	GDA94	-19.5042	126.793
W001066	Orange Pool 1	1171.3	Metasediment	1133	-38.3	GDA94	-17.3035	124.211
W001530	Oscar Hill 1	1853.6	Metasediment	2000	146.4	GDA94	-18.1003	125.584
W001529	Padilpa 1	2184.3	Gabbro/Metasediment	1791	-393.3	GDA94	-17.016	123.194
W000833	Palm Spring 1	1066.8	Metasediment	4500	3433.2	GDA94	-17.8141	124.887
W001330	Pandanus 1	880.0	Granite	880	0.0	GDA94	-20.4269	120.704
W001386	Pandorea 1	2274.5	Metasediment	3500	1225.5	GDA94	-19.8562	125.345
W001274	Panicum 1	278.0	Granite	2850	2572.0	GDA94	-19.5397	125.134
W000105	Parda 1	1908.8	Gneiss	1777	-131.8	GDA94	-18.934	122.009
	Patience 1	1869.0	Metasediment	4500	2631.0	GDA94	-23.3614	125.67
W002426	Patience 2	4184.0	Metasediment	4500	316.0	GDA94	-23.3614	125.67
	Pearl 1	2203	Precambrian schist	3300	1097.0	GDA94	-17.8498	122.029
W001570	Pegasus 1	2995.0	Metasediment	3900	905.0	GDA94	-20.096	123.952
W000831	Pender 1	911.7	Metasediment	904	-7.7	GDA94	-16.6787	122.836
W001458	Percival 1	2447.6	Metasediment	6200	3752.4	GDA94	-20.3307	126.083
	Perindi	1867	metasediment	3400	1533.0	GDA94	-16.827	122.264
W001536	Petaluma 1	2086.0	uncertain	10500	8414.0	GDA94	-18.2668	124.326
W001387	Philydrum 1	1608.0	Metasediment	5100	3492.0	GDA94	-17.8151	124.634
W001346	Pictor 1	2146.0	Metasediment	2121	-25.0	GDA94	-18.763	123.716
W001716	Pictor 2	1085.0	Metasediment	2100	1015.0	GDA94	-18.7645	123.714
W002337	Placer Camelgooda 1	1170.0	Precambrian schist	6000	4830.0	GDA94	-18.5967	124.38
W000128	Point Moody 1	2441.1	Metasediment	3500	1058.9	GDA94	-21.2594	127.806
W001821	Point Torment 1	2130.0	Precambrian schist	3000	870.0	GDA94	-17.1647	123.739
W002157	Point Torment 1 Deepening	2603.6	Precambrian schist	3000	396.4	GDA94	-17.1647	123.739
W000928	Poole Range 3	995.0	uncertain	10000	9005.0	GDA94	-18.885	125.789
W000929	Poole Range 5	470.9	uncertain	10000	9529.1	GDA94	-18.8742	125.817

W001276	Pratia 1	464.0	Precambrian schist	1500	1036.0	GDA94	-19.3639	124.996
W000930	Prices Creek 1	307.0	Gneiss	500	193.0	GDA94	-18.675	125.917
W000931	Prices Creek 2	104.0	Gneiss	750	646.0	GDA94	-18.6778	125.932
W000932	Prices Creek 3	247.0	Gneiss	1500	1253.0	GDA94	-18.6903	125.921
W000933	Prices Creek 4	135.0	Gneiss	1500	1365.0	GDA94	-18.6819	125.901
W001011	Puratte 1	3750.0	Metasediment	5000	1250.0	GDA94	-17.0864	123.239
W002480	Robert 1	1628.0	Metasediment	2400	772.0	GDA94	-19.1561	124.33
W000066	Roebuck Bay 1	1222.3	Precambrian schist	1500	277.8	GDA94	-18.1592	122.459
W001518	Runthrough 1	1380.0	Precambrian schist	3500	2120.0	GDA94	-17.4883	124.2
W000091	Sahara 1	2120.2	Metasediment	4100	1979.8	GDA94	-21.0767	123.394
W002718	Sally May 1	1700.0	Metasediment	3200	1500.0	GDA94	-19.7442	124.296
W000065	Samphire Marsh 1	2031.2	Granite	1709	-322.2	GDA94	-19.5203	121.183
W001284	Santalum 1A	629.2	Metasediment	1800	1170.8	GDA94	-19.4717	124.87
W001711	Scarpia 1	1600.0	uncertain	8500	6900.0	GDA94	-18.0521	124.845
	Scrubby 1	1250.0	Precambrian schist	3600	2350.0	GDA94	-17.5099	124.242
W001350	Selenops 1	1263.0	Metasediment	2200	937.0	GDA94	-19.4139	126.718
W001598	Setaria 1	955.5	Precambrian schist	1500	544.5	GDA94	-19.4008	124.976
W001913	Sharon Ann 1	1830.0	Metasediment	1900	70.0	GDA94	-18.4763	122.002
W001277	Solanum 1	834.0	Precambrian schist	1500	666.0	GDA94	-19.365	124.963
W001452	South Auld 1	857.0	Metasediment	2500	1643.0	GDA94	-21.7928	123.045
W000117	St George Range 1	4437.3	uncertain	11000	6562.7	GDA94	-18.6914	125.138
W000094	Stansmore Range 1	106.7	Metasediment	3000	2893.3	GDA94	-21.2597	127.965
W000095	Stansmore Range 2	102.1	Metasediment	2800	2697.9	GDA94	-21.2639	128
W000096	Stansmore Range 3	105.2	Metasediment	3500	3394.8	GDA94	-21.2611	127.872
W000097	Stansmore Range 4	32.0	Metasediment	3500	3468.0	GDA94	-21.2444	127.858
W000098	Stansmore Range 5	53.3	Metasediment	3500	3446.7	GDA94	-21.2792	127.781
W001194	Sundown 1	2736.0	Precambrian schist	3800	1064.0	GDA94	-17.5514	124.243
W001247	Sundown 2	1965.0	Precambrian schist	3800	1835.0	GDA94	-17.5536	124.246
W001384	Sundown 3	1645.0	Precambrian schist	3800	2155.0	GDA94	-17.5567	124.248
W002156	Sundown 3H	1645.0	Precambrian schist	3800	2155.0	GDA94	-17.5567	124.248
W001465	Sundown 4	1800.0	Precambrian schist	3800	2000.0	GDA94	-17.5519	124.245
W001874	Sundown 5	1151.7	Precambrian schist	3800	2648.3	GDA94	-17.5553	124.245
W001791	Sunshine 1	738.0	Gneiss	1400	662.0	GDA94	-18.4572	122.895
W001450	Sunup 1	1500.0	Precambrian schist	3900	2400.0	GDA94	-17.6189	124.317

W000075	Tandalgoo 1	33.5	Metasediment	4500	4466.5	GDA94	-21.1	123.45
W000076	Tandalgoo 2	152.4	Metasediment	4500	4347.6	GDA94	-21.1167	123.45
W000077	Tandalgoo 3	125.0	Metasediment	4300	4175.0	GDA94	-21.3	123.45
W000801	Tappers Inlet 1	2856.3	Metabasalt	2834	-22.3	GDA94	-16.8591	122.591
W001342	Terrace 1	2389.0	Precambrian schist	3500	1111.0	GDA94	-17.5051	124.256
	Thangoo 1	1059.0	Precambrian schist	1550	491.0	GDA94	-18.3668	122.892
W000059	Thangoo 1/1A	1654.8	Precambrian schist	1680	25.2	GDA94	-18.3622	122.887
W000872	Thangoo 2	1472.2	Gneiss	1438	-34.2	GDA94	-18.4409	122.91
W000016	The Sisters 1	2995.6	Metasediment	4750	1754.4	GDA94	-17.7239	124.42
W001192	Thompsons 1	2009.0	Precambrian schist	3500	1491.0	GDA94	-17.6101	124.387
W001273	Triodia 1	631.0	Granite	3100	2469.0	GDA94	-19.6367	125.234
W001516	Twin Buttes 1	1600.3	Gneiss	1750	149.7	GDA94	-18.5436	122.946
W001283	Typha 1	395.0	Metasediment	2000	1605.0	GDA94	-19.528	125.073
W001181	Vela 1	1908.0	Metasediment	4000	2092.0	GDA94	-19.4105	122.895
W000064	Wallal Corehole 1	309.1	Gneiss	680	370.9	GDA94	-19.7382	120.743
W001949	Wattle 1	3056.0	Precambrian schist	3600	544.0	GDA94	-17.4691	124.228
W001451	West Blackstone 1	1943.0	Precambrian schist	3500	1557.0	GDA94	-17.5741	124.338
W001329	West Kora 1	2606.0	Precambrian schist	3200	594.0	GDA94	-17.2451	123.818
W001441	West Philydrum 1	1110.5	Metasediment	5100	3989.5	GDA94	-17.8043	124.616
W001448	West Terrace 1	1250.0	Precambrian schist	3500	2250.0	GDA94	-17.5059	124.26
W001468	West Terrace 2	1200.0	Precambrian schist	3500	2300.0	GDA94	-17.5027	124.261
W001790	Whistler 1	884.0	Precambrian schist	1550	666.0	GDA94	-18.371	122.897
W001133	White Hills 1	4148.0	Metasediment	5800	1652.0	GDA94	-21.1542	127.589
W001335	Whitewell 1	1753.8	Precambrian schist	3800	2046.2	GDA94	-17.5658	124.262
W000115	Willara 1	3903.3	Granite	4300	396.7	GDA94	-19.1816	122.073
W000706	Willara Hill 1	858.0	Metasediment	4500	3642.0	GDA94	-19.0588	121.883
W000696	Wilson Cliffs 1	3722.2	Metasediment	3503	-219.2	GDA94	-22.2761	126.783
W001389	Wood Hills 1	1978.0	Granite	4100	2122.0	GDA94	-19.5747	122.02
W001067	Yarrada 1	3295.5	Precambrian schist	3400	104.5	GDA94	-17.3651	124.104
W000662	Yulleroo 1	4572.3	Metasediment	6750	2177.7	GDA94	-17.8531	122.908

Attachment D: Summary of measured rock thermal conductivity data for the Canning Basin (from Antriasian, 2009, Appendix 1)

Sample	Well	Depth from [m]	Depth to [m]	Conductivity [W/mK]	Formation	Lithology
DIR037	Blina 1	1220.5	1220.6	2.84 ± 0.14	Yellow Drum Formation	light grey dolomite
DIR038	Blina1	1233.1	1233.2	2.78 ± 0.16	Yellow Drum Formation	yellow/buff dolomite
DIR039	Babrongan 1	929.0	934.2	2.20 ± 0.23	Clanmeyer Siltstone	light greenish grey claystone
DIR040	Babrongan 1	1676.1	1677.6	2.26 ± 0.03	Clanmeyer Siltstone	light greenish grey claystone
DIR041	Cudalgarra 2	1465.5	1465.6	2.63 ± 0.34	Nita Formation	dolomite with extensive fluorite and barite miner-alisation
DIR042	Goldwyer 1	1407.5	1407.6	3.23 ± 0.40	Basement [boulder from Nambeet Formation]	granite
DIR043	Goldwyer 1	1392.3	1394.2	3.51 ± 0.12	Basement [boulder from Nambeet Formation]	granite
DIR044	Goldwyer 1	1223.2	1226.8	2.98 ± 0.10	Willara Formation	grey silty dolomite
DIR045	Goldwyer 1	909.8	912.6	2.03 ± 0.35	Goldwyer Formation	grey limestone with frequent calcilutite stringers giving a clotted texture
DIR046	Goldwyer 1	1217.7	1223.2	3.54 ± 0.30	Willara Formation	Grey silty dolomite
DIR047	Goldwyer 1	979.9	983.6	1.06 ± 0.28	Goldwyer Formation	dark brown claystone with subordinate siltstone
DIR048	Kemp Field 1	2849.8	2849.9	2.23 ± 0.14	Tandalgoo Sandstone	red/brown coarse-grained sandstone
DIR049	Langoora 1	1596.8	1602.6	2.21 ± 0.24	Basement	metasediment
DIR050	Kidson 1	2608.5	2611.5	3.43 ± 0.45	Carribuddy Group A [Sahara Formation]	red/brown mottled fine-grained to silty dolomite
DIR051	Cycas 1	2468.6	2468.7	4.37 ± 0.29	Anderson Formation	grey fine- to coarse-grained sandstone with occa-sional siltstone stringers
DIR052	Cycas 1	2467.5	2467.7	1.83 ± 0.13	Anderson Formation	dark brown [carbonaceous?] claystone with sub-ordinate siltstone
DIR053	Edgar Range 1	1934.6	1937.6	2.76 ± 0.29	Basement	schist
DIR054	Frome Rocks 2	1805.9	1809.0	2.58 ± 0.24	Luluigui Formation	thinly interbedded grey/brown fine-grained sand-stone with frequent siltstone stringers
DIR055	Frome Rocks 2	1470.7	1481.6	2.08 ± 0.20	Luluigui Formation	thinly interbedded grey siltstone to claystone, bioturbated/mottled?

DIR056	Frome Rocks 2	1141.8	1143.3	2.05 ± 0.21	Luluigui Formation	thinly interbedded grey siltstone, bioturbated/mottled?
DIR057	Frome Rocks 2	1086.3	1088.4	2.42 ± 0.23	Luluigui Formation	thinly interbedded grey/brown siltstone to fine-grained sandstone with occasional floating medium-grained quartz grains, bioturbated/mottled?
DIR058	Roebuck Bay 1	364.2	367.0	1.75 ± 0.29	Alexander Fm	brown micaceous carbonaceous siltstone
DIR059	Frome Rocks 2	1310.6	1312.2	2.31 ± 0.22	Luluigui Formation	thinly interbedded grey/brown siltstone to fine-grained sandstone, bioturbated/mottled?
DIR060	Hawkstone Peak 1	1186.9	1187.2	Not measured	Basement	quartzite
DIR061	Justago 1	1108.2	1108.3	2.51 ± 0.47	Virgin Hills Formation	massive light pink/grey to red/brown limestone with rare thin shale partings
DIR062	Kidson 1	4191.6	4193.7	1.78 ± 0.07	Carribuddy Group E [Bongabinni Formation]	red/brown mottled halite-bearing silty dolomite
DIR063	Kidson 1	4031.3	4034.3	2.07 ± 0.29	Carribuddy Group D [Mt Troy Formation]	red/brown mottled halite-bearing silty dolomite
DIR064	Kidson 1	3866.1	3867.0	3.58 ± 0.95	Carribuddy Group C [Nibil Formation]	dark red/brown halite-rich siltstone
DIR065	Kidson 1	3865.2	3867.0	3.70 ± 0.30	Carribuddy Group C [Nibil Formation]	grey poorly bedded halite-rich, anhydritic [chicken wire texture?] sandy limestone
DIR066	Kidson 1	3098.0	3098.9	4.89 ± 0.32	Carribuddy Group B [Mallowa Salt]	massive red/brown/orange halite
DIR067	Kidson 1	2608.5	2611.5	2.63 ± 0.15	Carribuddy Group A [Sahara Formation]	red/brown mottled green spots fine-grained dolomite
DIR068	Napier 4	717.1	717.2	2.50 ± 0.13	Poulton Formation	grey/green medium-grained sandstone
DIR069	Ngalti 1	1788.0	1788.1	4.62 ± 0.33	Knobby Sandstone	light grey to buff arkosic medium-grained sandstone
DIR070	Ngalti 1	1781.4	1781.5	2.55 ± 0.34	Knobby Sandstone	grey to dark grey arkosic fine-grained sandstone with frequent siltstone stringers
DIR071	Parda 1	1834.0	1834.9	3.29 ± 0.11	Basement	gneiss
DIR072	St Georges Range 1	1362.2	1362.2	5.83 ± 0.22	Grant Group [Reeves Formation]	light grey fine-grained sandstone
DIR073	West Terrace 1	1167.2	1167.3	4.17 ± 0.08	Grant Group [Betty Formation]	light grey medium- to coarse-grained micaceous sandstone

DIR074	West Terrace 1	1064.0	1064.2	3.61 ± 0.18	Grant Group [Winifred Formation]	fine-grained light grey sandstone with common siltstone stringers
DIR075	West Terrace 1	1081.6	1081.7	2.44 ± 0.32	Grant Group [Winifred Formation]	dark grey [carbonaceous?] blocky fine-grained sandstone to siltstone with floating coarse quartz grains
DIR076	Yarrada 1	2035.8	2035.9	3.13 ± 0.02	Windjana Limestone	light grey limestone
DIR077	Yarrada 1	1856.7	1856.8	2.75 ± 0.02	Laurel Formation [Lower Member]	dark grey/brown stylolitic limestone with rare clay partings
DIR078	Yarrada 1	1820.2	1820.3	1.93 ± 0.37	Laurel Formation [Upper Member]	finely laminated grey to brown micaceous silt-stone
DIR079	Frome Rocks 2	457.2	460.2	3.12 ± 0.07	Poole Sandstone	brown carbonaceous poorly consolidated fine-grained sandstone with cemented siltstone inter-beds
DIR080	Napier 4	536.8	536.9	3.14 ± 0.14	Pillara Formation	grey [weathered brown/yellow] dolomite / dolo-mitic limestone, vuggy in part
DIR081	Napier 4	369.0	369.1	Not measured	Pillara Formation	limestone
DIR082	Blackstone 1	1688.6	1690.7	2.03 ± 0.20	Gum Hole Formation	Bioturbated calcilutite, convoluted bedding?
DIR083	Blackstone 1	1713.6	1727.3	2.53 ± 0.03	Gum Hole Formation	limestone with thin clay partings
DIR084	Terrace 1	935.5	935.6	3.69 ± 0.25	Grant Group [Carolyn For-mation]	medium-grained light brown sandstone [quartz grains]
DIR085	Roebuck Bay 1	484.6	487.7	1.77 ± 0.13	Noonkanbah Formation	brown micaceous carbonaceous siltstone
DIR086	Roebuck Bay 1	515.1	518.2	1.28 ± 0.19	Noonkanbah Formation	brown micaceous carbonaceous claystone
DIR087	Blina 1	1535.6	1535.7	3.33 ± 0.02	Nullara Limestone	recrystallised grey limestone with relict fossil structures
DIR088	Roebuck Bay 1	576.1	579.1	1.77 ± 0.20	Noonkanbah Formation	interbedded light grey micaceous siltstone to fine-grained sandstone

Attachment E: Formation conductivities for the Canning Basin based on lithology mixing methods

Formation	Conductivity [W/mK]	Notes
Alluvium	1.42 ± 0.14	Value taken from Beardsmore's Carnarvon Basin work *Exploration Geophysics* 2005
Broome Sandstone	3.12 ± 0.07	Value based on DIR079
Jarlemai Siltstone	1.57 ± 0.17	Value calculated from DIR085 [33.3% of the representative lithology], DIR086 [33.3% of the representative lithology] and DIR088 [33.3% of the representative lithology]
Alexander Formation	2.70 ± 0.11	Value calculated from DIR079 [80% of the representative lithology] and DIR058 [20% of the representative lithology]
Wallal Sandstone	3.12 ± 0.07	Value based on DIR079
Erskine / Culvida Sandstone	3.12 ± 0.07	Value based on DIR079
Blina Shale	1.28 ± 0.19	Value based on DIR086
Millyit Sandstone	3.12 ± 0.07	Value based on DIR079
Liveringa Group	2.70 ± 0.08	Value calculated from DIR079 [80% of the representative lithology] and DIR085 [20% of the representative lithology]
Noonkanbah Formation	1.57 ± 0.17	Value calculated from DIR085 [33.3% of the representative lithology], DIR086 [33.3% of the representative lithology] and DIR088 [33.3% of the representative lithology]
Poole Sandstone [Tuckfield Member]	3.12 ± 0.07	Value based on DIR079
Poole Sandstone [Nura Nura Member]	3.12 ± 0.07	Value based on DIR079
Grant Group Unit A [Carolyn Formation]	3.07 ± 0.28	Value calculated from DIR084 [60% of the representative lithology] and DIR075 [40% of the representative lithology]
Grant Gp Unit B [Winifred Formation]	2.61 ± 0.30	Value calculated from DIR075 [80% of the representative lithology] and DIR074 [20% of the representative lithology]
Grant Gp Unit C [Betty Formation]	4.17 ± 0.08	Value based on DIR073
Lower Grant Gp [Reeves Formation]	5.83 ± 0.22	Value based on DIR072
Anderson Formation [Unit A to C]	2.58 ± 0.21	Value calculated from DIR051 [50% of the representative lithology] and DIR052 [50% of the representative lithology]
Fairfield Group [Laurel Formation]	2.27 ± 0.19	Value calculated from DIR077 [50% of the representative lithology] and DIR078 [50% of the representative lithology]

Fairfield Group [Yellow Drum Formation]	2.81 ± 0.15	Value calculated from DIR037 [50% of the representative lithology] and DIR038 [50% of the representative lithology]
Fairfield Group [Gumhole Formation]	2.25 ± 0.12	Value calculated from DIR082 [50% of the representative lithology] and DIR083 [50% of the representative lithology]
Fairfield Group [Luluigui Formation]	2.27 ± 0.22	Value calculated from DIR054 [20% of the representative lithology], DIR055 [20% of the representative lithology], DIR056 [20% of the representative lithology], DIR057 [20% of the representative lithology] and DIR059 [20% of the representative lithology]
Nullara Limestone	3.33 ± 0.02	Value based on DIR087
Windjana Limestone	3.13 ± 0.02	Value based on DIR076
Clanmeyer Siltstone	2.23 ± 0.13	Value calculated from DIR039 [50% of the representative lithology] and DIR040 [50% of the representative lithology]
Knobby Sandstone	3.97 ± 0.33	Value calculated from DIR069 [80% of the representative lithology] and DIR070 [20% of the representative lithology]
Napier Formation	2.51 ± 0.47	Value based on DIR061
Virgin Hills Formation	2.51 ± 0.47	Value based on DIR061
Pillara Limestone	3.14 ± 0.14	Value based on DIR080
Gogo Formation	2.51 ± 0.47	Value based on DIR061
Tandalgoo Sandstone	2.23 ± 0.14	Value based on DIR048
Poulton Formation	2.50 ± 0.13	Value based on DIR068
Worral Formation	2.50 ± 0.13	Value based on DIR068
Carribuddy Group [Unit A Sahara Formation]	2.98 ± 0.30	Value calculated from DIR067 [50% of the representative lithology] and DIR050 [50% of the representative lithology]
Carribuddy Group [Unit B Mallowa Salt]	4.89 ± 0.32	Value based on DIR066
Carribuddy Group [Unit C Nibil Formation]	3.64 ± 0.63	Value calculated from DIR064 [50% of the representative lithology] and DIR065 [50% of the representative lithology]
Carribuddy Group [Unit D Mt Troy Formation]	2.07 ± 0.29	Value based on DIR063
Carribuddy Group [Unit E Bongabinni Formation]	1.78 ± 0.07	Value based on DIR062
Nita Formation	2.03 ± 0.35	Value based on DIR045
Goldwyer Formation	2.03 ± 0.35	Value based on DIR045
Willara Formation	3.24 ± 0.20	Value calculated from DIR044 [50% of the representative lithology] and DIR046 [50% of the representative lithology]

Nambeet Formation	2.03 ± 0.35	Value based on DIR045
Basement [Schist]	2.76 ± 0.29	Value based on DIR053
Basement [Gneiss]	3.29 ± 0.11	Value based on DIR071
Basement [Metasediment]	4.01 ± 1.00	Value calculated from DIR049 [25% of the representative lithology] and average value for a quartzite [75% of the representative lithology]
Basement [Granite]	3.36 ± 0.26	Value calculated from DIR042 [50% of the representative lithology] and DIR043 [50% of the representative lithology]
Basement [Basalt]	1.80 ± 0.18	Value represents an average values for the representative lithology
Basement [Metabasalt]	1.80 ± 0.18	Value represents an average values for the representative lithology
Basement [Metagabbro]	1.80 ± 0.18	Value represents an average values for the representative lithology
Basement [Metasediment-Gabbro]	2.49 ± 0.59	Value calculated from Basement [metasediment] value [50% of the representative lithology] and average value for a gabbro [50% of the representative lithology]
Basement [Uncertain]	3.36 ± 0.42	Value calculated as the average of the sum of all known Basement lithologies
Dolerite intrusions	1.80 ± 0.18	Value represents an average values for the representative lithology
Tertiary Limestone	1.93 ± 0.15	Value taken from Beardsmore's PIRSA study 2004 [Gambier Limestone]

Attachment F: Estimated heat generation for granitic samples adjacent to the Canning Basin

Region	Province	Latitude	Longitude	Datum	Lithname	Description	K_2O by weight %	K (ppm)	U (ppm)	Th (ppm)	Ave. assumed density (g/cm^3)	Heat Gen. from isotopic abundance ratios (mW/m^3)
Halls Creek Region	Halls Creek Orogen	-17.43342	128.07993	GDA94	granite	fine-medium grained granite QZ-KFS-PL-BT - [informal_name: Eastern Leucocratic granitoid]-, |Old Lithgroup:felsic intrusive|	0.52	4320	0.4	1	2.68	0.21
Halls Creek Region	Halls Creek Orogen	-17.4327	128.08224	GDA94	granite	foliated QZ-FELD granite with BT clots - [informal_name: Mabel Downs tonalite]-, |Old Lithgroup:felsic intrusive|	0.63	5230	0.1	1	2.68	0.15
Halls Creek Region	Halls Creek Orogen	-17.43549	128.07931	GDA94	granite	garnet bearing leucogranite lacking BT-?MS coronas - [informal_name: Eastern Leucocratic granitoid]-, |Old Lithgroup:felsic intrusive|	2.47	20500	0.2	2	2.68	0.39
Halls Creek Region	Halls Creek Orogen	-17.40657	128.04142	GDA94	granite	foliated light grey k-feldspar-biotite granite - [informal_name: Mabel Downs tonalite]-, |Old Lithgroup:felsic intrusive|	2.75	22800	0.9	12	2.68	1.29
Halls Creek Region	Halls Creek Orogen	-18.03366	127.65595	GDA94	granite	foliated meta granite, |Old Lithgroup:felsic intrusive|	2.83	23500	2.5	18	2.68	2.14
Halls Creek Region	Halls Creek Orogen	-17.94706	127.81711	GDA94	granite	meta granite, |Old Lithgroup:felsic intrusive|	3.42	28400	3.5	18	2.68	2.44
Halls Creek Region	Halls Creek Orogen	-17.79309	127.62805	GDA94	granite	biotite granite - [informal_name: Springvale intrusion]-, |Old Lithgroup:felsic intrusive|	3.67	30500	4	24	2.68	3.01
Halls Creek	Halls Creek	-18.90817	127.30166	GDA94	granite	-[informal_name: Sans Sou granite]-, |Old Lithgroup:felsic	4.18	34700	6	33	2.68	4.21

Region	Orogen					intrusive|						
Halls Creek Region	Halls Creek Orogen	-18.60988	127.28569	GDA94	granite	even-grained granite, |Old Lithgroup:felsic intrusive|	4.3	35700	6	28	2.68	3.86
Halls Creek Region	Halls Creek Orogen	-18.60988	127.28569	GDA94	granite	biotite granite with pink K-feldspar phenocrysts - [informal_name: Eastmans granite]-, |Old Lithgroup:felsic intrusive|	4.3	35700	6	29	2.68	3.93
Halls Creek Region	Halls Creek Orogen	-18.31603	127.86194	GDA94	granite	, |Old Lithgroup:felsic intrusive|	4.61	38300	2	11	2.68	1.65
Halls Creek Region	Halls Creek Orogen	-18.07855	127.89466	GDA94	granite	meta granite, ts, |Old Lithgroup:felsic intrusive|	4.71	39100	2.5	19	2.68	2.35
Halls Creek Region	Halls Creek Orogen	-17.90554	127.72282	GDA94	granite	porphyritic biotite granite, Sally Downs batholith - Palm Creek Monzogranite, |Old Lithgroup:felsic intrusive|	4.77	39600	3	19	2.68	2.49
Halls Creek Region	Halls Creek Orogen	-18.12168	127.85186	GDA94	granite	fine grained, leucocratic granite, |Old Lithgroup:felsic intrusive|	4.95	41100	1	20	2.68	2.05
Halls Creek Region	Halls Creek Orogen	-17.7809	127.68096	GDA94	granite	biotite granite - [informal_name: Granite in the Springvale intrusion]-, |Old Lithgroup:felsic intrusive|	5.08	42200	3	24	2.68	2.86
Halls Creek Region	Halls Creek Orogen	-16.75962	128.28507	GDA94	granite	felsic, weakly porphyritic granite, |Old Lithgroup:felsic intrusive|	5.2	43200	5	24	2.68	3.39
Halls Creek Region	Halls Creek Orogen	-17.63856	127.69294	GDA94	granite	biotite-muscovite granite, |Old Lithgroup:felsic intrusive|	5.33	44200	4	35	2.68	3.92
Halls Creek Region	Halls Creek Orogen	-17.75329	127.62232	GDA94	granite	biotite granite - [informal_name: Granite in the Springvale intrusion]-, |Old Lithgroup:felsic intrusive|	5.93	49200	4	38	2.68	4.18
Halls Creek	Halls Creek	-18.06445	127.66516	GDA94	granite	unfoliated meta granite, |Old Lithgroup:felsic intrusive|	5.94	49300	4	25	2.68	3.26

Region	Orogen											
Halls Creek Region	Halls Creek Orogen	-17.5842	127.67364	GDA94	granite	biotite-muscovite granite - [informal_name: Granite in the Toby intrusion]-, |Old Lith-group:felsic intrusive|	6.73	55900	15.5	102	2.68	11.73
Halls Creek Region	Halls Creek Orogen	-17.42494	128.04556	GDA94	granodiorite	coarse grained well foliated lt grey granodiorite - [informal_name: Mabel Downs tonalite]-, |Old Lith-group:felsic intrusive|	1.29	10700	0.3	5	2.68	0.53
Halls Creek Region	Halls Creek Orogen	-17.43639	128.00238	GDA94	granodiorite	medium grained grey grano-diorite plagioclase-biotite - [informal_name: Mabel Downs tonalite]-, |Old Lith-group:felsic intrusive|	1.31	10900	0.3	2	2.68	0.32
Halls Creek Region	Halls Creek Orogen	-17.39497	128.09128	GDA94	granodiorite	medium grained light grey BT-PL granodiorite - [informal_name: Mabel Downs tonalite]-, |Old Lith-group:felsic intrusive|	1.42	11800	0.6	8	2.68	0.83
Halls Creek Region	Halls Creek Orogen	-17.43244	128.06426	GDA94	granodiorite	dark-medium grained grano-diorite. Very homogeneous - [informal_name: Mabel Downs tonalite]-, |Old Lith-group:felsic intrusive|	1.45	12000	0.6	7	2.68	0.76
Halls Creek Region	Halls Creek Orogen	-17.44265	128.00743	GDA94	granodiorite	strongly foliated medium grained grey BT-HBL grano-diorite -[informal_name: Mabel Downs tonalite]-, |Old Lithgroup:felsic intrusive|	1.47	12200	0.5	13	2.68	1.16
Halls Creek Region	Halls Creek Orogen	-17.39396	128.08818	GDA94	granodiorite	light grey foliated QZ-HBL-PL homogeneous grandiorite - [informal_name: Mabel Downs tonalite]-, |Old Lith-group:felsic intrusive|	1.51	12500	0.5	6	2.68	0.67

Halls Creek Region	Halls Creek Orogen	-17.43075	128.01356	GDA94	granodiorite	coarse grained well-foliated hb-rich granodiorite/tonalite -[informal_name: Mabel Downs tonalite]-, |Old Lith-group:felsic intrusive|	1.52	12600	1.4	3	2.68	0.69
Halls Creek Region	Halls Creek Orogen	-17.45342	128.01147	GDA94	granodiorite	medium grained well foliated PL-QZ-BT-HBL granodiorite -[informal_name: Mabel Downs tonalite]-, |Old Lith-group:felsic intrusive|	1.53	12700	0.4	7	2.68	0.72
Halls Creek Region	Halls Creek Orogen	-17.44265	128.00743	GDA94	granodiorite	homogeneous ?granodiorite (feld rich) mingled material -[informal_name: Mabel Downs tonalite]-, |Old Lith-group:felsic intrusive|	1.54	12800	0.5	4	2.68	0.53
Halls Creek Region	Halls Creek Orogen	-17.44048	128.00744	GDA94	granodiorite	PL-QZ-BT-HBL granodiorite (next to enclave 96596051B) -[informal_name: Mabel Downs tonalite]-, |Old Lith-group:felsic intrusive|	1.59	13200	1.1	29	2.68	2.45
Halls Creek Region	Halls Creek Orogen	-17.42193	128.03974	GDA94	granodiorite	weakly deformed dark grey coarse grained HBL-PL granodiorite -[informal_name: Mabel Downs tonalite]-, |Old Lithgroup:felsic intrusive|	1.76	14600	0.8	3	2.68	0.56
Halls Creek Region	Halls Creek Orogen	-17.44048	128.00744	GDA94	granodiorite	dark homogeneous granodio-rite/tonalite PL-HBL-BT (-QZ) -[informal_name: Mabel Downs tonalite]-, |Old Lith-group:felsic intrusive|	1.77	14700	0.3	1	2.68	0.29
Halls Creek Region	Halls Creek Orogen	-17.45514	128.01169	GDA94	granodiorite	coarse, well foliated BT-HBL-?MS rich granodiorite/tonalite -[informal_name: Mabel Downs tonalite]-, |Old Lith-group:intermediate intrusive|	1.81	15000	0.7	10	2.68	1.03

Halls Creek Region	Halls Creek Orogen	-17.41625	128.06142	GDA94	granodiorite	well foliated pale-grey PL-rich granodiorite -[informal_name: Mabel Downs tonalite]-, |Old Lithgroup:felsic intrusive|	1.86	15400	0.7	4	2.68	0.61
Halls Creek Region	Halls Creek Orogen	-17.45514	128.01169	GDA94	granodiorite	fine grained quartz rich grano-diorite found on grid - [informal_name: Mabel Downs tonalite]-, |Old Lith-group:felsic intrusive|	2.14	17800	0.3	3	2.68	0.46
Halls Creek Region	Halls Creek Orogen	-17.11295	128.06509	GDA94	granodiorite	foliated biotite granodiorite, |Old Lithgroup:felsic intrusive|	2.84	23600	2	18	2.68	2.01
Halls Creek Region	Halls Creek Orogen	-17.10798	128.07126	GDA94	granodiorite	foliated biotite granodiorite, |Old Lithgroup:felsic intrusive|	2.87	23800	3	14	2.68	1.99

Attachment G: Estimated heat generation for gneiss samples adjacent to the Canning Basin

Region	Province	Latitude	Longitude	Datum	Lith-name	Description	K_2O by weight %	K (ppm)	U (ppm)	Th (ppm)	Ave. assumed density (g/cm^3)	Heat Gen. from isotopic abundance ratios (mW/m^3)
Halls Creek Region	Halls Creek Orogen	-17.4625	128.05629	GDA94	gneiss	layered medium grained orthogneiss QZ-PL-?KFS-BT-?MS-?HBL - [informal_name: Mabel Downs tonalite]-, |Old Lith-group:felsic gneiss|	1.49	12400	0.6	23	2.65	1.87
Halls Creek Region	Halls Creek Orogen	-17.45793	128.04671	GDA94	gneiss	fine grained BT-GNT-CRD-QZ-KFELD pelitic gneiss, |Old Lithgroup:felsic gneiss|	2.67	22200	1.3	27	2.65	2.42
Kimberley Region	Halls Creek Orogen	-17.49579	127.50127	GDA94	gneiss	banded gneiss, |Old Lith-group:felsic gneiss|	3.43	28500	4.0	21	2.65	2.75

Attachment H: Estimated heat generation for sedimentary rock samples adjacent to the Canning Basin

Region	Province	Latitude	Longitude	Datum	Lithname	Description	K_2O by weight %	K (ppm)	U (ppm)	Th (ppm)	Ave. assumed density (g/cm^3)	Heat Gen. from isotopic abundance ratios (mW/m^3)
Halls Creek Region	Halls Creek Orogen	-18.32319	127.84959	GDA94	sandstone	meta sandstone, |Old Lithgroup:metasediment|	2.83	23500	5.5	20	2.5	2.85
Halls Creek Region	Halls Creek Orogen	-18.90817	127.30166	GDA94	sandstone	, |Old Lithgroup:clastic sediment|	3.17	26300	1.5	19	2.5	1.84
Halls Creek Region	Halls Creek Orogen	-17.46078	128.1707	GDA94	sandstone	volcaniclastic, ts - [informal_name: Winnama beds]-, |Old Lithgroup:clastic sediment|	3.25	27000	6.0	24	2.5	3.26
Halls Creek Region	Halls Creek Orogen	-17.84422	128.1024	GDA94	turbidite	meta-turbidite, |Old Lithgroup:metasediment|	1.40	11600	4.5	14	2.5	2.11
Halls Creek Region	Halls Creek Orogen	-17.66354	128.12829	GDA94	turbidite	meta-turbidite, |Old Lithgroup:metasediment|	1.44	12000	2.5	18	2.5	1.89
Halls Creek Region	Halls Creek Orogen	-17.96351	127.94744	GDA94	turbidite	, |Old Lithgroup:clastic sediment|	6.92	57400	7.0	23	2.5	3.71

Attachment I: Modelled heat flow values and estimates of reliability for wells in the Canning Basin

Well Name	Total Depth [m]	Probable Basement Lithology	Depth to Basement [m]	Depth from Total Depth to Basement [m]	Onshore or Offshore	Datum	Latitude	Longitude	DST Temp Data [y/n]	Horner Temp Data [y/n]	Overall Reliability [1 lowest to 5 highest]	Heat Flow [mW/m^2]	uncertainty ± [mW/m2]
Anna Plains 1	1161.0	Granite	1650	489.0	ON	GDA94	-19.337092	121.468007	n	y	3	66	1.6
Antares 1	1298.5	Metasediment	2000	701.5	ON	GDA94	-18.732665	123.69517	y	y	5	83	4.8
Auld 1	817.0	Metasediment	2500	1683.0	ON	GDA94	-21.780291	123.026047	y	y	5	69	4.0
Bindi 1	2507.0	uncertain	10000	7493.0	ON	GDA94	-19.720774	126.800617	y	y	5	62	4.8
Blina 4 Deepening	1526.2	Precambrian schist	3500	1973.8	ON	GDA94	-17.620279	124.50033	n	y	3	63	1.5
Blina 6	1260.0	Precambrian schist	3500	2240.0	ON	GDA94	-17.623188	124.502085	y	n	4	59	1.4
Blina 7	1551.0	Precambrian schist	3500	1949.0	ON	GDA94	-17.626942	124.501078	n	y	3	61	1.5
Blina 8	1550.0	Precambrian schist	3500	1950.0	ON	GDA94	-17.618347	124.492798	n	y	3	64	1.6
Boundary 1	1670.0	Precambrian schist	3500	1830.0	ON	GDA94	-17.485873	124.245199	y	y	5	63	1.8
Calamia 1	1700.0	Granite	1671	-29.0	ON	GDA94	-19.579	121.797723	n	y	3	90	2.4
Canegrass 1	2006.5	Metasediment	1866	-140.5	ON	GDA94	-17.390263	124.22684	y	y	5	75	4.1
Chestnut 1	2669.0	Metasediment	3400	731.0	ON	GDA94	-17.728132	124.857104	y	y	5	75	3.1

Chirup 1	762.6	Granite	900	137.4	ON	GDA94	-19.848476	120.436034	n	n	2	66	1.5
Contention Heights 1	1790.7	Metasediment	2400	609.3	ON	GDA94	-22.425258	127.226588	n	n	2	67	3.9
Corbett 1	800.0	Granite	900	100.0	ON	GDA94	-20.067792	120.612706	n	n	1	63	1.4
Crab Creek 1	1790.0	Precambrian schist	3100	1310.0	ON	GDA94	-18.018288	122.524188	n	y	3	68	1.7
Crimson Lake 1	1980.9	Metasediment	6100	4119.1	ON	GDA94	-17.883381	124.677828	y	y	5	68	2.3
Crystal Creek 1	2504.0	Precambrian schist	2800	296.0	ON	GDA94	-18.556184	123.602221	n	y	4	73	2.5
Cudalgarra 2	1550.0	Metasediment	2500	950.0	ON	GDA94	-19.204173	122.276097	y	y	5	103	5.8
Cudalgarra North 1	1220.0	Metasediment	2100	880.0	ON	GDA94	-19.16947	122.298612	n	y	3	104	6.0
Curringa 1	2335.0	Metasediment	2800	465.0	ON	GDA94	-16.831522	122.742921	n	y	4	52	2.6
Darriwell 1	1600.0	Granite	4100	2500.0	ON	GDA94	-19.588483	122.105318	n	n	2	86	4.9
Dodonea 1	2215.0	Metasediment	2185	-30.0	ON	GDA94	-19.385041	125.162043	y	y	5	74	4.1
Dodonea 2	1688.0	Metasediment	2200	512.0	ON	GDA94	-19.403597	125.179349	n	n	2	75	4.0
Eremophila 3	464.0	Metasediment	2700	2236.0	ON	GDA94	-19.778042	125.238242	y	n	3	93	5.4
Frankenstein 1	2803.0	Metasediment	2666	-137.0	ON	GDA94	-21.380715	123.017122	n	y	4	64	3.1
Freney 1	1116.0	Precambrian schist	3100	1984.0	ON	GDA94	-18.014897	122.471667	n	y	3	73	2.9
Gap Creek 1	1541.2	Metagabbro	1527	-14.2	ON	GDA94	-18.630917	125.811159	n	n	2	75	2.3

Goodenia 1	163.3	Metasediment	2500	2336.7	ON	GDA94	-19.863042	125.230187	y	n	3	160	9.9
Great Sandy 2	1576.1	Metasediment	2300	723.9	ON	GDA94	-19.21187	122.356064	n	y	3	80	4.3
Harold 1	1550.0	Metasediment	2500	950.0	ON	GDA94	-17.559842	124.572964	n	y	3	62	3.1
Hibiscus 1	2394.0	Metasediment	3800	1406.0	ON	GDA94	-19.636651	125.431572	n	n	2	88	3.6
Hilltop 1	1770.0	Granite	1736	-34.0	ON	GDA94	-18.292199	122.290036	n	y	3	90	2.5
Janpam North 1	2202.0	Precambrian schist	3500	1298.0	ON	GDA94	-17.567164	124.417944	y	y	5	62	1.7
Jum Jum 1	2600.0	Gabbro / Metasediment	5500	2900.0	ON	GDA94	-17.121026	123.083903	n	y	3	59	3.1
Juno 1	1750.0	Metasediment	2900	1150.0	ON	GDA94	-19.363843	122.06328	y	y	5	83	4.4
Kambara 1	3147.0	Metasediment	3500	353.0	OFF	GDA94	-16.741618	122.438868	n	y	3	57	2.6
Kanak 1	1365.0	Granite	1500	135.0	ON	GDA94	-18.376755	122.383998	y	y	5	106	2.6
Kemp Field 1	1181.1	Metasediment	5200	4018.9	ON	GDA94	-20.317996	123.464572	y	n	4	65	3.4
Kennedia 1	3387.5	Metasediment	4600	1212.5	ON	GDA94	-17.752871	124.606646	n	y	4	55	2.9
Kidson 1	4431.5	Metasediment	5200	768.5	ON	GDA94	-22.616533	125.009702	n	n	2	60	1.9
Kilang Kilang 1	2300.0	uncertain	8500	6200.0	ON	GDA94	-20.211641	127.128233	n	y	3	72	5.4
Lake Hevern 1	2296.0	Metasediment	3200	904.0	ON	GDA94	-21.464455	127.578946	n	n	1	67	3.7
Leo 1	2411.3	Metasediment	2319	-92.3	ON	GDA94	-19.247269	122.345641	y	y	5	94	5.1
Lloyd 1	2001.0	Precambrian	3200	1199.0	ON	GDA94	-17.466159	124.250296	n	y	3	61	1.7

		schist											
Lloyd 2	1580.0	Precambrian schist	3200	1620.0	ON	GDA94	-17.468394	124.253049	y	y	5	63	1.8
Looma 1	2535.0	Metasediment	2490	-45.0	ON	GDA94	-19.123573	123.994283	y	y	5	93	5.5
Loris 1	1897.0	Precambrian schist	3750	1853.0	ON	GDA94	-17.506806	124.228106	n	y	3	59	1.6
Lovells Pocket 1	1924.0	Precambrian schist	2000	76.0	ON	GDA94	-18.514483	123.437218	n	n	2	123	4.2
Lukins 1	1675.0	Metasediment	2500	825.0	ON	GDA94	-17.535995	124.535817	n	y	3	60	2.9
Mahe 1	1098.0	Metasediment	6100	5002.0	ON	GDA94	-18.126036	123.153091	n	n	2	99	6.4
Mangaloo 1	3100.0	Metasediment	6000	2900.0	ON	GDA94	-19.586761	125.568376	n	y	3	65	2.3
Margaret 1	955.0	Granite	1100	145.0	ON	GDA94	-18.261387	125.910681	n	y	3	73	1.8
Mellany 1	1476.0	Metasediment	1428	-48.0	ON	GDA94	-17.400423	124.289559	n	y	3	76	4.7
Metters 1	1505.0	uncertain	8000	6495.0	ON	GDA94	-17.94345	124.743344	n	n	1	73	2.0
Millard 1	1680.0	Precambrian schist	6000	4320.0	ON	GDA94	-17.392227	123.919353	n	y	3	57	1.6
Minjin 1	1850.0	Metasediment	3500	1650.0	OFF	GDA94	-16.800761	122.380382	n	y	3	63	3.8
Mirbelia 2	2818.6	Metasediment	3400	581.4	ON	GDA94	-19.648977	125.362197	n	y	4	68	3.4
Missing 1	1810.0	Metasediment	2750	940.0	ON	GDA94	-19.566102	124.602965	n	y	3	102	6.6
Moogana 1	2213.0	Metasediment / Dolerite	2105	-108.0	ON	GDA94	-16.936661	122.692135	n	y	4	58	3.5

Napier 2	1606.9	Metasediment	1588	-18.9	ON	GDA94	-17.080538	124.356835	n	y	3	55	3.3
Napier 4	965.0	Metasediment	943	-22.0	ON	GDA94	-16.915261	124.094334	n	n	2	73	4.9
Napier 5	1657.8	Gneiss	1650	-7.8	ON	GDA94	-17.106927	124.469613	n	n	2	88	1.3
Needle Eye Rocks 1	1664.9	Granite	1521	-143.9	ON	GDA94	-18.239809	125.820892	n	y	4	85	2.3
Nemile 1	1601.0	Metasediment	6500	4899.0	ON	GDA94	-17.858904	124.558318	n	n	2	79	2.4
Ngalti 1	2758.0	uncertain	8000	5242.0	ON	GDA94	-19.867471	127.314063	n	y	4	81	8.0
Nollamara 1	1719.0	Precambrian schist	5900	4181.0	ON	GDA94	-18.566033	124.232458	y	y	5	80	3.5
Olios 1	1963.5	Granite	6000	4036.5	ON	GDA94	-19.504212	126.793024	y	y	5	73	6.1
Oscar Hill 1	1853.6	Metasediment	2000	146.4	ON	GDA94	-18.100311	125.58406	n	y	4	83	5.0
Padilpa 1	2184.3	Gabbro / Metasediment	1791	-393.3	ON	GDA94	-17.016021	123.194217	y	y	5	74	4.6
Patience 1	1869.0	Metasediment	4500	2631.0	ON	GDA94	-23.36138	125.669956	n	y	3	63	2.3
Pearl 1	2203.0	Precambrian schist	3300	1097.0	OFF	GDA94	-17.849756	122.0291	n	y	4	55	1.9
Pegasus 1	2995.0	Metasediment	3900	905.0	ON	GDA94	-20.096001	123.952452	n	y	3	68	3.6
Pender 1	911.7	Metasediment	904	-7.7	ON	GDA94	-16.678666	122.836167	n	n	2	55	3.7
Percival 1	2447.6	Metasediment	6200	3752.4	ON	GDA94	-20.330733	126.083325	y	y	5	72	8.4
Perindi 1	1867.0	metasediment	3400	1533.0	OFF	GDA94	-16.826995	122.26444	y	y	5	63	3.5

Petaluma 1	2086.0	uncertain	10500	8414.0	ON	GDA94	-18.26683	124.326341	n	y	4	62	1.6
Pictor 2	1085.0	Metasediment	2100	1015.0	ON	GDA94	-18.764487	123.714464	n	y	3	80	4.6
Point Moody 1	2441.1	Metasediment	3500	1058.9	ON	GDA94	-21.259444	127.806111	y	n	4	76	3.3
Point Torment 1 Deepening	2603.6	Precambrian schist	3000	396.4	ON	GDA94	-17.164658	123.738751	y	y	5	67	2.2
Puratte 1	3750.0	Metasediment	5000	1250.0	ON	GDA94	-17.086415	123.239457	y	y	5	62	2.2
Runthrough 1	1380.0	Precambrian schist	3500	2120.0	ON	GDA94	-17.48828	124.200255	n	y	3	59	1.7
Sahara 1	2120.2	Metasediment	4100	1979.8	ON	GDA94	-21.076731	123.394436	n	n	2	69	2.7
Samphire Marsh 1	2031.2	Granite	1709	-322.2	ON	GDA94	-19.520317	121.183036	n	n	2	73	3.0
Scarpia 1	1600.0	uncertain	8500	6900.0	ON	GDA94	-18.052141	124.844624	y	y	5	65	1.9
Selenops 1	1263.0	Metasediment	2200	937.0	ON	GDA94	-19.413919	126.718238	n	y	3	59	3.9
Setaria 1	955.5	Precambrian schist	1500	544.5	ON	GDA94	-19.40082	124.975739	y	y	5	81	3.1
Sharon Ann 1	1830.0	Metasediment	1900	70.0	ON	GDA94	-18.476283	122.001803	n	y	3	84	5.0
Solanum 1	834.0	Precambrian schist	1500	666.0	ON	GDA94	-19.364987	124.962962	y	n	3	20	0.8
South Auld 1	857.0	Metasediment	2500	1643.0	ON	GDA94	-21.792791	123.044936	n	y	3	60	3.1
Sundown 4	1800.0	Precambrian schist	3800	2000.0	ON	GDA94	-17.551912	124.245033	y	y	5	62	1.6
Sundown 5	1151.7	Precambrian	3800	2648.3	ON	GDA94	-17.555255	124.244944	y	y	5	72	1.9

		schist											
Sunshine 1	738.0	Gneiss	1400	662.0	ON	GDA94	-18.457232	122.894743	n	n	1	68	1.1
Sunup 1	1500.0	Precambrian schist	3900	2400.0	ON	GDA94	-17.618928	124.317334	n	y	3	61	1.6
Tappers Inlet 1	2856.3	Metabasalt	2834	-22.3	ON	GDA94	-16.859109	122.590774	n	y	4	63	2.2
Twin Buttes 1	1600.3	Gneiss	1750	149.7	ON	GDA94	-18.510313	122.946298	n	y	4	96	2.0
Wattle 1	3056.0	Precambrian schist	3600	544.0	ON	GDA94	-17.469114	124.227655	y	y	5	59	1.5
West Black-stone 1	1943.0	Precambrian schist	3500	1557.0	ON	GDA94	-17.574058	124.338024	n	y	3	47	1.8
West Terrace 2	1200.0	Precambrian schist	3500	2300.0	ON	GDA94	-17.502675	124.260947	n	y	3	63	1.8
Whistler 1	884.0	Precambrian schist	1550	666.0	ON	GDA94	-18.37097	122.896969	n	n	1	80	2.5
White Hills 1	4148.0	Metasediment	5800	1652.0	ON	GDA94	-21.154237	127.588791	y	y	5	69	3.1

Attachment J: Estimated isotherm depths and basement temperatures for wells in the Canning Basin

* Purple hue indicates isotherm depth is modelled to a known formation as reported in the well completion report

Well Name	Overal Reliability [1 lowest to 5 highest]	Heat Flow [mW/m^2]	Uncertainty ± [mW/m2]	Temp at 5,000 m [°C]	Uncertainty ± [°C]	Possible Formation at 5,000 m	Depth to 100°C [m]	Possible Formation at 100°C	Depth to 150°C [m]	Possible Formation at 150°C	Depth to 200°C [m]	Possible Formation at 200°C
Anna Plains 1	3	66	1.6	147	8	Basement	2827	Basement	5139	Basement	7511	Basement
Antares 1	5	83	4.8	170	21	Basement	2153	Basement	4184	Basement	6163	Basement
Auld 1	5	69	4.0	155	16	Basement	2395	Goldwyer Fm	4752	Basement	7214	Basement
Bedout 1	not modelled as well too far offshore											
Bindi 1	5	62	4.8	156	5	Pillara Lst	2602	Laurel Fm	4777	Pillara Lst	6402	Willara Fm
Blina 4 Deepening	3	63	1.5	160	6	Basement	2683	Pillara Lst	4633	Basement	6474	Basement
Blina 6	4	59	1.4	150	5	Basement	2920	Pillara Lst	4989	Basement	7005	Basement
Blina 7	3	61	1.5	155	6	Basement	2796	Pillara Lst	4803	Basement	6727	Basement
Blina 8	3	64	1.6	163	6	Basement	2608	Pillara Lst	4533	Basement	6335	Basement
Boundary 1	5	63	1.8	167	7	Basement	2395	Pillara Lst	4367	Basement	6187	Basement
Calamia 1	3	90	2.4	202	12	Basement	1846	Basement	3427	Basement	4952	Basement
Canegrass 1	5	75	4.1	162	19	Basement	2176	Basement	4454	Basement	6714	Basement
Chestnut 1	5	75	3.1	169	12	Basement	2305	Pillara Lst	4206	Basement	6319	Basement
Chirup 1	2	66	1.5	134	8	Basement	3346	Basement	5807	Basement	8372	Basement
Contention Heights 1	2	67	3.9	152	19	Basement	2365	Nambeet Fm	4875	Basement	7453	Basement
Corbett 1	1	63	1.4	129	8	Basement	3481	Basement	6110	Basement	8907	Basement
Crab Creek 1	3	68	1.7	171	7	Basement	2656	Tandalgoo Gp	4301	Basement	5997	Basement
Crimson Lake 1	5	68	2.3	168	4	Pillara Lst	2458	Pillara Lst	4366	Pillara Lst	6123	Basement
Crystal Creek 1	4	73	2.5	182	11	Basement	2426	Willara Fm	3993	Basement	5559	Basement
Cudalgarra 2	5	103	5.8	217	24	Basement	1766	Goldwyer Fm	3013	Basement	4502	Basement
Cudalgarra North 1	3	104	6.0	207	25	Basement	1826	Goldwyer Fm	3309	Basement	4809	Basement
Curringa 1	4	52	2.6	125	11	Basement	3304	Basement	6808	Basement	10808	Basement
Darriwell 1	2	86	4.9	219	14	Basement	2092	Goldwyer Fm	3372	Nambeet Fm	4462	Basement
Dodonea 1	5	74	4.1	156	18	Basement	2414	Basement	4719	Basement	7010	Basement
Dodonea 2	2	75	4.0	160	17	Basement	2283	Basement	4542	Basement	6781	Basement
East Mermaid 1	not modelled as well too far offshore											
Eremophila 3	3	93	5.4	204	22	Basement	2037	Nambeet Fm	3226	Basement	4886	Basement

Frankenia 1	**cannot be modelled due to insufficient data**											
Frankenstein 1	4	64	3.1	149	14	Basement	2521	Goldwyer Fm	5048	Basement	7762	Basement
Freney 1	3	73	2.9	192	11	Basement	2292	Willara Fm	3722	Basement	5257	Basement
Gap Creek 1	2	75	2.3	230	18	Basement	2135	Basement	3248	Basement	4349	Basement
Goodenia 1	3	160	9.9	369	45	Basement	**Excluded from regional mapping - Anomalously high reading**					
Great Sandy 2	3	80	4.3	170	20	Basement	2176	Willara Fm	4187	Basement	6231	Basement
Harold 1	3	62	3.1	146	13	Basement	2474	Nambeet Fm	5224	Basement	8099	Basement
Hibiscus 1	2	88	3.6	204	12	Basement	2292	Pillara Lst	3449	Willara Fm	4877	Basement
Hilltop 1	3	90	2.5	201	12	Basement	1863	Basement	3441	Basement	4963	Basement
Janpam North 1	5	62	1.7	161	7	Basement	2605	Pillara Lst	4591	Basement	6462	Basement
Jum Jum 1	3	59	3.1	172	7	Nambeet Fm	2573	Anderson Fm	4367	Gogo Fm	5838	Basement
Juno 1	5	83	4.4	178	18	Basement	2222	Goldwyer Fm	3934	Basement	5839	Basement
Kambara 1	3	57	2.6	133	9	Basement	3207	Gogo Fm	6041	Basement	9216	Basement
Kanak 1	5	106	2.6	228	13	Basement	1719	Basement	3053	Basement	4321	Basement
Kemp Field 1	4	65	3.4	180	8	Goldwyer Fm	2958	Carribuddy Gp [Unit D]	4234	Goldwyer Fm	5759	Basement
Kennedia 1	4	55	2.9	165	8	Basement	2651	Nita Fm	4358	Nambeet Fm	6994	Basement
Keraudren 1	**not modelled as well too far offshore**											
Kidson 1	2	60	1.9	154	4	Nambeet Fm	2829	Carribuddy Gp [Unit A]	4897	Nambeet Fm	7215	Basement
Kilang Kilang 1	3	72	5.4	176	4	Worral Fm	2371	Laurel Fm	4230	Pillara Lst	5625	Nambeet Fm
La Grange 1	**not modelled as well too far offshore**											
Lacepede 1A	**not modelled as well too far offshore**											
Lake Hevern 1	1	67	3.7	158	13	Basement	2628	Nambeet Fm	4603	Basement	7060	Basement
Leo 1	5	94	5.1	197	23	Basement	1875	Goldwyer Fm	3435	Basement	5103	Basement
Lloyd 1	3	61	1.7	163	7	Basement	2493	Pillara Lst	4499	Basement	6424	Basement
Lloyd 2	5	63	1.8	168	8	Basement	2397	Pillara Lst	4346	Basement	6188	Basement
Looma 1	5	93	5.5	197	24	Basement	1910	Goldwyer Fm	3414	Basement	5092	Basement
Loris 1	3	59	1.6	159	6	Basement	2556	Pillara Lst	4664	Basement	6627	Basement
Lovells Pocket 1	2	123	4.2	315	23	Basement	1449	Goldwyer Fm	2262	Basement	3143	Basement
Lukins 1	3	60	2.9	144	12	Basement	2479	Nambeet Fm	5338	Basement	8356	Basement
Mahe 1	2	99	6.4	238	11	Nambeet Fm	1975	Betty Fm	3231	Goldwyer Fm	4226	Willara Fm
Mangaloo 1	3	65	2.3	181	5	Goldwyer	2414	Clanmeyer Fm	4148	Worral Fm	5585	Nambeet Fm

						Fm						
Margaret 1	3	73	1.8	152	9	Basement	2827	Basement	4934	Basement	7053	Basement
Mellany 1	3	76	4.7	152	21	Basement	2590	Basement	4906	Basement	7211	Basement
Metters 1	1	73	2.0	190	6	Pillara Lst	2263	Anderson Fm	3712	Yellow Drum Fm	5333	Pillara Lst
Millard 1	3	57	1.6	163	6	Nullara Lst	2421	Winifred Fm	4495	Yellow Drum Fm	6521	Basement
Minilya 1	**not modelled as well too far offshore**											
Minjin 1	3	63	3.8	154	12	Basement	2791	Nambeet Fm	4800	Basement	7430	Basement
Mirbelia 2	4	68	3.4	159	14	Basement	2716	Nambeet Fm	4548	Basement	6938	Basement
Missing 1	3	102	6.6	242	31	Basement	1608	Willara Fm	2522	Nambeet Fm	3808	Basement
Moogana 1	4	58	3.5	156	19	Basement	2822	Basement	4778	Basement	6778	Basement
Napier 2	3	55	3.3	118	15	Basement	3746	Basement	7346	Basement	11520	Basement
Napier 4	2	73	4.9	139	22	Basement	3037	Basement	5552	Basement	8095	Basement
Napier 5	2	88	1.3	196	6	Basement	2000	Basement	3589	Basement	5118	Basement
Needle Eye Rocks 1	4	85	2.3	180	11	Basement	2286	Basement	3999	Basement	5667	Basement
Nemile 1	2	79	2.4	203	6	Pillara Lst	2032	Anderson Fm	3387	Yellow Drum Fm	4900	Pillara Lst
Ngalti 1	4	81	8.0	196	8	Nambeet Fm	2620	Knobby Sst	3956	Goldwyer Fm	5081	Nambeet Fm
Nollamara 1	5	80	3.5	202	10	Willara Fm	2445	Pillara Lst	3825	Goldwyer Fm	4929	Willara Fm
Olios 1	5	73	6.1	195	11	Nambeet Fm	2562	Pillara Lst	3972	Nambeet Fm	5110	Nambeet Fm
Oscar Hill 1	4	83	5.0	170	20	Basement	2186	Basement	4219	Basement	6201	Basement
Padilpa 1	5	74	4.6	197	27	Basement	2150	Basement	3631	Basement	5088	Basement
Patience 1	3	63	2.3	154	5	Basement	3164	Carribuddy Gp [Unit D]	4801	Basement	7314	Basement
Patience 2	**cannot be modelled due to insufficient data**											
Pearl 1	4	55	1.9	141	7	Basement	3211	Nambeet Fm	5378	Basement	7638	Basement
Pegasus 1	3	68	3.6	175	15	Basement	2472	Goldwyer Fm	3870	Nambeet Fm	6122	Basement
Pender 1	2	55	3.7	105	16	Basement	4592	Basement	8564	Basement	13529	Basement
Percival 1	5	72	8.4	209	21	Nambeet Fm	2412	Nambeet Fm	3640	Nambeet Fm	4792	Nambeet Fm
Perindi 1	5	63	3.5	149	13	Basement	2863	Nambeet Fm	5037	Basement	7707	Basement
Petaluma 1	4	62	1.6	162	5	Yellow Drum Fm	2916	Anderson Fm	4591	Laurel Fm	6363	Pillara Lst

Phoenix 1	**not modelled as well too far offshore**											
Phoenix 2	**not modelled as well too far offshore**											
Pictor 2	3	80	4.6	170	20	Basement	2085	Nambeet Fm	4171	Basement	6227	Basement
Point Moody 1	4	76	3.3	171	11	Basement	2512	Luluigui Fm	4132	Basement	6201	Basement
Point Torment 1 Deepening	5	67	2.2	186	9	Basement	1996	Anderson Fm	3763	Basement	5457	Basement
Puratte 1	5	62	2.2	182	6	Basement	2383	Anderson Fm	4097	Pillara Lst	5860	Basement
Runthrough 1	3	59	1.7	160	6	Basement	2526	Pillara Lst	4618	Basement	6600	Basement
Sahara 1	2	69	2.7	170	8	Basement	2593	Carribuddy Gp [Unit C]	4092	Nambeet Fm	6329	Basement
Samphire Marsh 1	2	73	3.0	165	11	Basement	2399	Basement	4393	Basement	6376	Basement
Scarpia 1	5	65	1.9	167	5	Pillara Lst	2465	Laurel Fm	4357	Pillara Lst	6195	Pillara Lst
Selenops 1	3	59	3.9	135	16	Basement	2866	Basement	5901	Basement	9143	Basement
Setaria 1	5	81	3.1	209	19	Basement	1841	Basement	3315	Basement	4743	Basement
Sharon Ann 1	3	84	5.0	174	23	Basement	2047	Basement	4052	Basement	6002	Basement
Solanum 1	3	20	0.8	66	5	Basement	**Excluded from regional mapping - anomalously low reading**					
South Auld 1	3	60	3.1	138	12	Basement	2802	Basement	5725	Basement	8808	Basement
Sundown 4	5	62	1.6	165	7	Basement	2436	Pillara Lst	4459	Basement	6295	Basement
Sundown 5	5	72	1.9	190	7	Basement	2012	Laurel Fm	3781	Pillara Lst	5306	Basement
Sunshine 1	1	68	1.1	152	6	Basement	2735	Basement	4915	Basement	7104	Basement
Sunup 1	3	61	1.6	160	6	Basement	2580	Pillara Lst	4631	Basement	6507	Basement
Tappers Inlet 1	4	63	2.2	198	13	Basement	**Excluded from regional mapping - conductive model cannot be fitted to data**					
Twin Buttes 1	4	96	2.0	218	8	Basement	1723	Nambeet Fm	3143	Basement	4512	Basement
Wamac 1	**not modelled as well too far offshore**											
Wattle 1	5	59	1.5	162	6	Basement	2522	Yellow Drum Fm	4546	Basement	6512	Basement
West Blackstone 1	3	47	1.8	139	7	Basement	3139	Nambeet Fm	5596	Basement	8363	Basement
West Terrace 2	3	63	1.8	169	7	Basement	2352	Pillara Lst	4327	Basement	6144	Basement
Whistler 1	1	80	2.5	193	14	Basement	2222	Basement	3731	Basement	5197	Basement
White Hills 1	5	69	3.1	190	8	Willara Fm	2420	Luluigui Fm	3829	Luluigui Fm	5348	Nambeet Fm
Whitetail 1	**not modelled as well too far offshore**											