Harcourt Petroleum N.L.

Underground Water Impact Report

ATP 564

CDM Smith

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Underground Water Impact Report ATP 564

17 June 2016

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Document History and Status

Revision	Date Issued	Reviewed By	Approved By	Date Approved	Revision Type
Draft	16/04/2013	Rikito Gresswell	Lloyd Townley	16/4/2013	A
Final	18/04/2013	John Leyland	Lloyd Townley	18/4/2013	**B**
Update – REV0	07/06/2016	Rikito Gresswell	Dougal Currie	07/06/2013	Draft
Update – REV1	17/06/2016	Harcourt	Dougal Currie	17/06/2016	Final

Distribution of Copies

Version	Date Issued	Quantity	Electronic	Issued To
Draft	16/4/2013	1	Yes	Harcourt
Final	18/4/2013	1	Yes	Harcourt
Final	14/06/2013	1	Yes	EHP
Update - Draft	07/06/2016	1	Yes	Harcourt
Update – Final	17/06/2016	1	Yes	Harcourt

Printed:	17 June 2016
Last Saved:	17 June 2016 11:42 AM
File Name:	BWS160008-01-RPT-Harcourt_UWIR_ATP564-REV1.docx
Author:	Katarina David/Andrew Brooker/Mauricio Taulis/Dougal Currie
Project Manager:	Dougal Currie
Client:	Harcourt Petroleum N.L.
Document Title:	Underground Water Impact Report - ATP 564
Document Version:	Update – REV01
Project Number:	BWS160008.01

Executive Summary

Harcourt Petroleum N.L. (Harcourt) has been granted an authority to prospect permit for ATP 546 where Harcourt is the majority owner. ATP 546 is located in the Dawson River valley near Moura, 150 km southwest from Gladstone, Queensland, with target coal seams located at depths of approximately 450 m below ground level. The project is currently at an early testing stage. Within the coming 3 years it is anticipated that 3 production wells will be put into operation in the northern Harcourt Area of ATP 564.

CDM Smith Australia Pty Ltd (CDM Smith) has been commissioned by Harcourt to prepare an Underground Water Impact Report (UWIR) for petroleum coal seam gas (CSG) operations within ATP 564 to enable Harcourt to manage the impacts from their testing or production activities. This UWIR provides information about the relevant underground water extractions and potential impacts on aquifers within ATP 564 as a result of the exercise of underground water rights during the period 2016 to 2019.

This report represents a revision to the inaugural UWIR that was approved in 2013. No production occurred in 2013–2016, and the proposed level of production in 2016–2019 is substantially less than that evaluated in the 2013 version of UWIR. However, much of the analysis previously presented is reproduced in this report as it provides a conservative assessment of potential impacts.

A conceptual hydrogeological model was developed following review of published reports, coal seam testing and water level data. Two aquifers, the shallow alluvium and basalt, and the deeper Baralaba Coal Measures were identified as potentially affected by the exercise of underground water rights. A numerical model was developed utilising available information and projected water extraction rates from coal seam gas (CSG) operations. Predicted water level declines were compared to the regulatory trigger levels of 2 m in unconsolidated aquifers and 5 m in consolidated aquifers.

Immediately Affected Areas (IAAs) were mapped in the Baralaba Coal Measures at the end of 3 years of CSG operation. No IAAs were identified in the unconsolidated alluvium aquifer. No Long Term Affected Areas (LTAAs) were predicted after cessation of water extraction in 3 years.

A water monitoring strategy was developed to quantify changes in water levels and water quality, and to improve understanding of the local hydrogeologic parameters. The monitoring strategy will be implemented not only in aquifers identified as Immediately Affected, but also as a precautionary measure in the shallow aquifer, where the majority of registered landholder bores are sited.

Monitoring will allow annual review of the accuracy of the maps when information changes substantially. The collected data will be reported, and an update of this UWIR will be generated in three years.

Section 1 Introduction

CDM Smith Australia Pty Ltd (CDM Smith) has been engaged by Harcourt Petroleum N.L. (Harcourt) to prepare this Underground Water Impact Report (UWIR) to meet requirements for the operation of Authority to Prospect (ATP) 564. These requirements are set out within the Level 2 Environmental Authority (EA PEN200008607) issued by the Queensland Government Department of Environment and Resource Management (DERM) now administered by the Department of Environment and Heritage Protection (EHP). Harcourt is the majority owner and operator of ATP 564.

This report has been prepared in accordance with Underground Water Impact Report (UWIR) guidelines and its purpose is to address Chapter 3 and in particular section 376 of the Water Act (Qld) 2000 which stipulates that a UWIR must include:

- The quantity of water produced or taken from the area as a result of previous gas exploration or production activities;
- an estimate of quantity of water to be produced or taken as a result of gas exploration or production for a 3-year period starting on the consultation day for the report;
- information about aquifers affected, or likely to be affected;
- maps showing the area of the affected aquifer(s) where underground water levels are expected to decline;
- a water monitoring strategy; and
- a spring impact management strategy.

This UWIR provides information about the relevant underground water extractions and the potential impacts on aquifers within ATP 564 as a result of dewatering during production testing.

This report represents a revision to the inaugural UWIR that was approved in 2013. No production occurred in 2013–2016, and the proposed level of production in 2016–2019 is substantially less than that evaluated in the 2013 version of UWIR. However, much of the analysis previously presented is reproduced in this report as it provides a conservative assessment of potential impacts.

1.1 Project area

The Project Area is located approximately 150 km southwest of Gladstone, in central Queensland. ATP 564 comprises two areas: the main area including Harcourt North and Harcourt (15 km northeast of Moura) and Southern Tenement where no pilot or production testing is proposed (**Figure 1-1**). No pilot or production testing will be undertaken within the Northern Tenements, therefore this area has been excluded from further analysis and reporting.

Test wells in the Harcourt area were drilled in 2002. The installation involved drilling of vertical wells and laterals, coring, geophysical logging and testing for permeability.

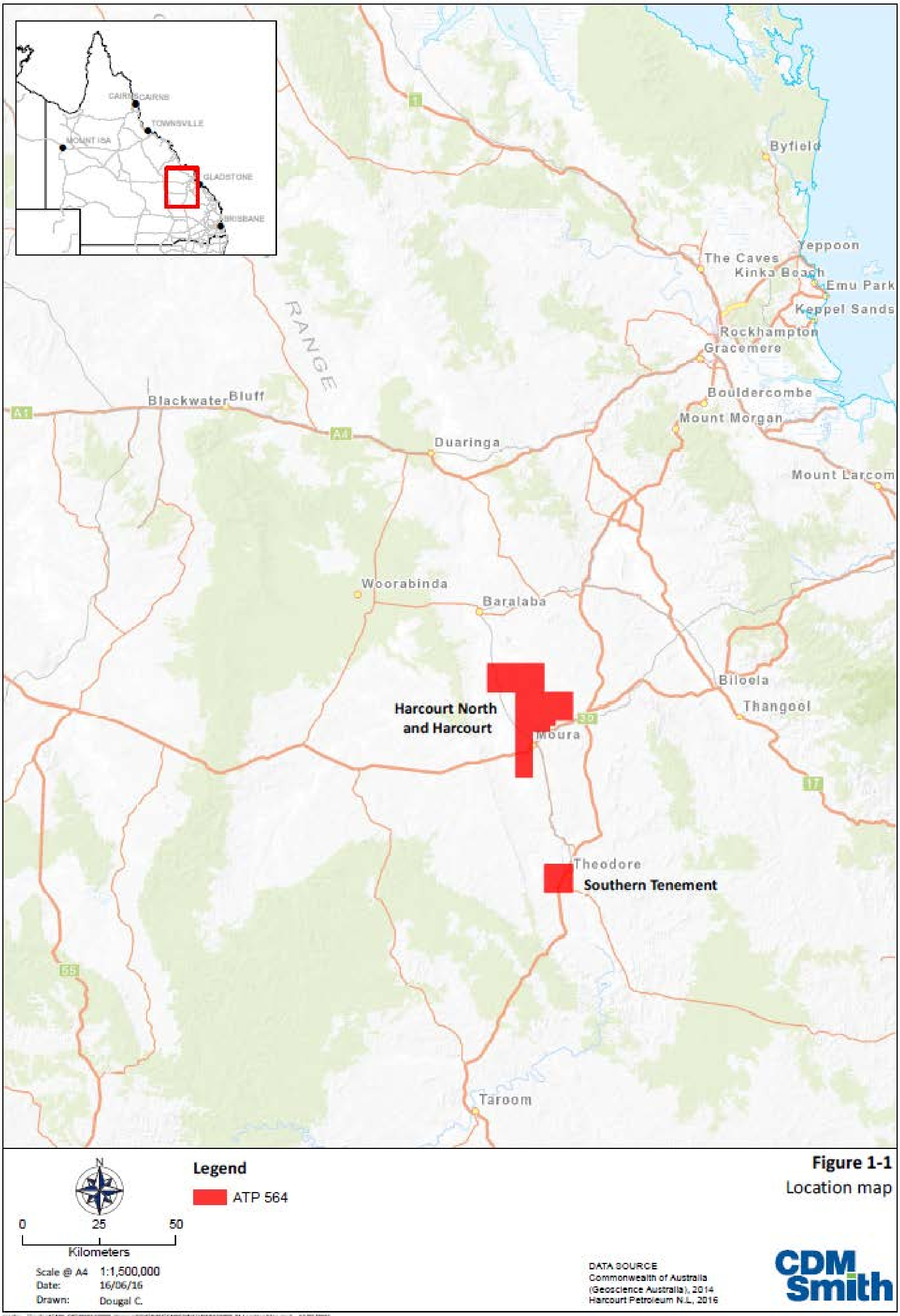


Figure 1-1 Location map

1.2 Legislative requirements

The primary legislative requirements for the management of groundwater with respect to coal seam gas activities for ATP 564 are summarised below.

1.3 Petroleum Act 1923 (QLD)

ATP 564 was granted under the *Petroleum Act 1923* (Qld). Under the *Petroleum Act 1923* (Qld), the petroleum tenure holder may take or interfere with groundwater to the extent that it is necessary and unavoidable during the course of an activity authorised under the petroleum tenure. The Act requires tenure holders to comply with underground water obligations specified in the *Water Act 2000* (Qld).

1.4 Water Act 2000 (QLD)

The Water Act 2000 (Qld):

- Provides a comprehensive regime for the planning and management of all water resources (including vesting to the State the rights over the use, flow and control of all surface water, groundwater, rivers and springs) in Queensland;
- Regulates water use and the obligations of coal seam gas producers in relation to groundwater monitoring, reporting, impact assessment and management of impacts on other water users;
- Provides a framework and conditions for preparing a Baseline Assessment Plan and outlines the requirements of bore owners to provide information that the petroleum holder reasonably requires to undertake a baseline assessment of any bore;
- Sets out the process for applying for a Water Licence (where water is utilised outside of a petroleum lease or not on adjacent land owned by the same person); and
- Sets out the process for assessing, reporting, monitoring, and negotiating with other water users regarding the impact of coal seam gas production on aquifers.

The management of impacts on groundwater caused by the exercise of groundwater right by petroleum tenement holders is achieved primarily by:

- Providing a regulatory framework that:
    - Requires petroleum tenure holders to monitor and assess the impact of the exercise of underground water rights on water bores and to enter into “make good” agreements with the owners of the bores;
    - Requires the preparation of UWIRs that establish underground water obligations, including obligations to monitor and manage impacts on aquifers and springs;
- Giving the Queensland Water Commission functions and powers for managing underground water in declared cumulative impact areas.

If a water bore has an impaired capacity as a result of CSG activities, an agreement is required to be negotiated with the owner of the bore about the following:

- The reason for the bore’s impaired capacity;

- The measures the petroleum tenement holder will take to ensure the bore owner has access to a reasonable quantity and quality of water for the authorised uses and purpose of the bore; and
- Any monetary or non-monetary compensation payable to the bore owner for impact on the bore.

If an agreement relating to a water bore is made the agreement is taken to be a “make good” agreement for the bore. An UWIR will identify whether an Immediately Affected Area will result from CSG activities. An Immediately Affected Area is defined as an area where the predicted decline in water levels within 3 years is above the trigger threshold:

- ›5 m for a consolidated aquifer;
- 2 m for an unconsolidated aquifer; and
- 0.2 m for a spring.

UWIRs are published to enable the community, including bore owners and other stakeholders, within the area of testing, to make comments. Submissions made by stakeholders will be reviewed and summarised, addressed as appropriate and provided to the Department of Environment and Heritage Protection (EHP) together with the UWIR. UWIRs are submitted for approval by EHP.

1.5 Summary of methods

An assessment of impacts on underground water from the pilot testing activities within ATP 564 has been undertaken by referencing available relevant data and reports, including available geological and hydrogeological reports, records obtained from DNRM and the Australian Bureau of Meteorology.

A desktop review of these data was undertaken to provide develop a conceptual hydrogeological model for this part of the Bowen Basin. The potential impacts of the current coal seam gas activities outside but in the vicinity of the ATP 564 were not incorporated in this assessment due to the limited knowledge of these activities. From this conceptual hydrogeological understanding a computer based numerical groundwater model was developed. This model was then used to predict the potential for impacts to groundwater levels. The model underpins the development of management strategies for this and any future flow testing programs.

A summary of the UWIR requirements under the Water Act and the relevant sections of this report in which they have been addressed is included in **Table 1-1**.

- It should be noted that a requirement of the UWIR is to predict the magnitude of water level declines for affected aquifers. To this end, the UWIR must include maps showing the area of the aquifer where groundwater level is predicted to decline by more than the applicable trigger value as a result of the activities assessed. These maps must present the results of predictions of groundwater levels within 3 years following the report consultation day (this area is defined as the Immediately Affected Area); and
- at any time (this area is defined as the Long Term Affected Area).

Trigger threshold values, as defined by the Water Act, are 5 m declines in water level within consolidated rock (e.g. sandstone) aquifers, 2 m declines in unconsolidated aquifers, and 0.2 m declines in water level for aquifers related to springs.

Water level declines have been predicted through application of a numerical hydrogeological model (refer to **Section 4**).

Table 1-1 Summary of UWIR requirements and sections where this is addressed in the report

Part	Section UWIR
Underground water extractions	2.0
Information about affected aquifers	3.0
Maps showing the areas of affected aquifer	4.0
Water monitoring strategy	5.0
Spring impact management strategy	6.0

Section 2 Water Production Schedule (Part A)

2.1 Summary of historically produced water

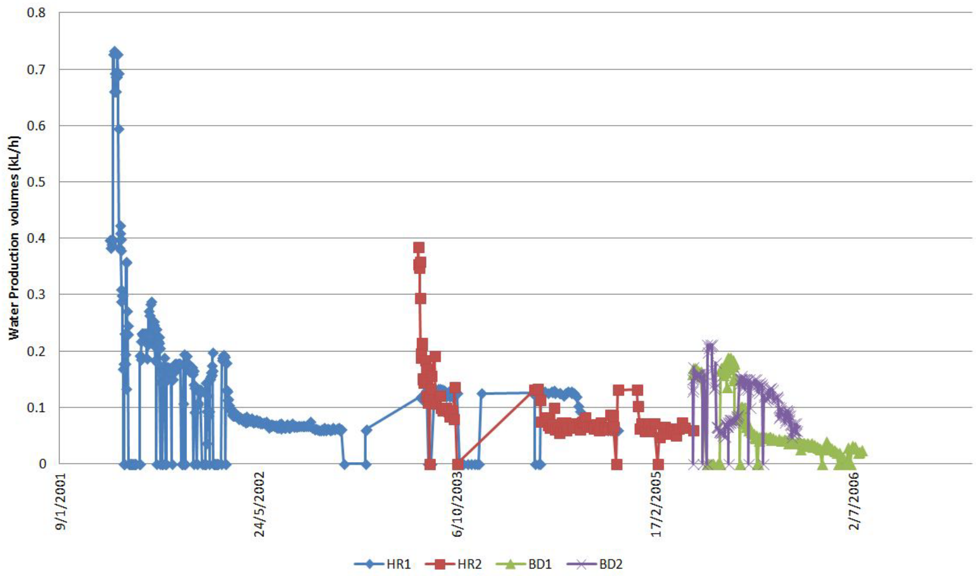
Between 1995 and 2007 production testing of coal seam gas wells installed within the Baralaba Coal Measures was conducted in various well fields within ATP 564 petroleum tenure. This testing was conducted prior to the commencement of the *Water Act 2000* amendments on 1 December 2010. No testing was occurring at the time of or since the enactment of these amendments. No further testing of these wells is anticipated. The wells installed as part of the earlier program were subsequently abandoned. A summary of production testing undertaken to date is included in **Table 2-1** below.

Table 2-1 Summary of historical production testing

Well	Permit	Area	Pump On	Pump Off	Volume KL
Bindaree 2	564	Harcourt	23/05/2005	11/02/2006	693
Bindaree 1	564	Harcourt	23/05/2005	23/07/2006	521
Gibihi-1	564	Mungi West	18/10/1995	31/10/1996	430
Gibihi-2	564	Mungi West	16/02/1995	30/04/1996	513
Gibihi-3	564	Mungi West	21/01/1996	30/10/1996	364
Harcourt 1	564	Harcourt	16/05/2001	16/11/2004	3114
Harcourt 2	564	Harcourt	5/07/2003	6/07/2005	1558
Moura 27	564	Mungi West	30/11/1996	7/05/1997	149
Kinma 3	564	Mungi West	30/12/1996	20/12/1997	163

Detailed water production information on a daily basis was available for Harcourt 1 and Harcourt 2 and Bindaree 1 and Bindaree 2 test wells. These data are presented in **Table 2-1** below. The extraction volumes were measured using the flow meter on the pump.

Figure 2-1 Gas well historical test pumping



2.2 Summary of gas production wells

Harcourt is proposing to undertake a pilot program within the main area of the tenement which will consist of a series of vertical fracture stimulation wells. The thicker seams will be targeted for simulation including the A, B, C and D seams of the Baralaba Coal Measures.

The development of the Harcourt field is still to be determined and will be guided by the results from the proposed pilot program.

2.3 Summary of water to be produced in the next three years

A total of 3 production wells are proposed to be installed and operational over the next year. The approximate location of the wells is given in **Figure 2-2** Estimated total water production (based on historical records) is listed in **Table 2-2**.

Table 2-2 Summary of water to be produced over the next five years

Number of Wells	Year	Average abstraction rate per well (KL/day)	Total abstraction rate (KL/day)
3	1	2.1	4.1
0	2	0	0
0	3	0	0

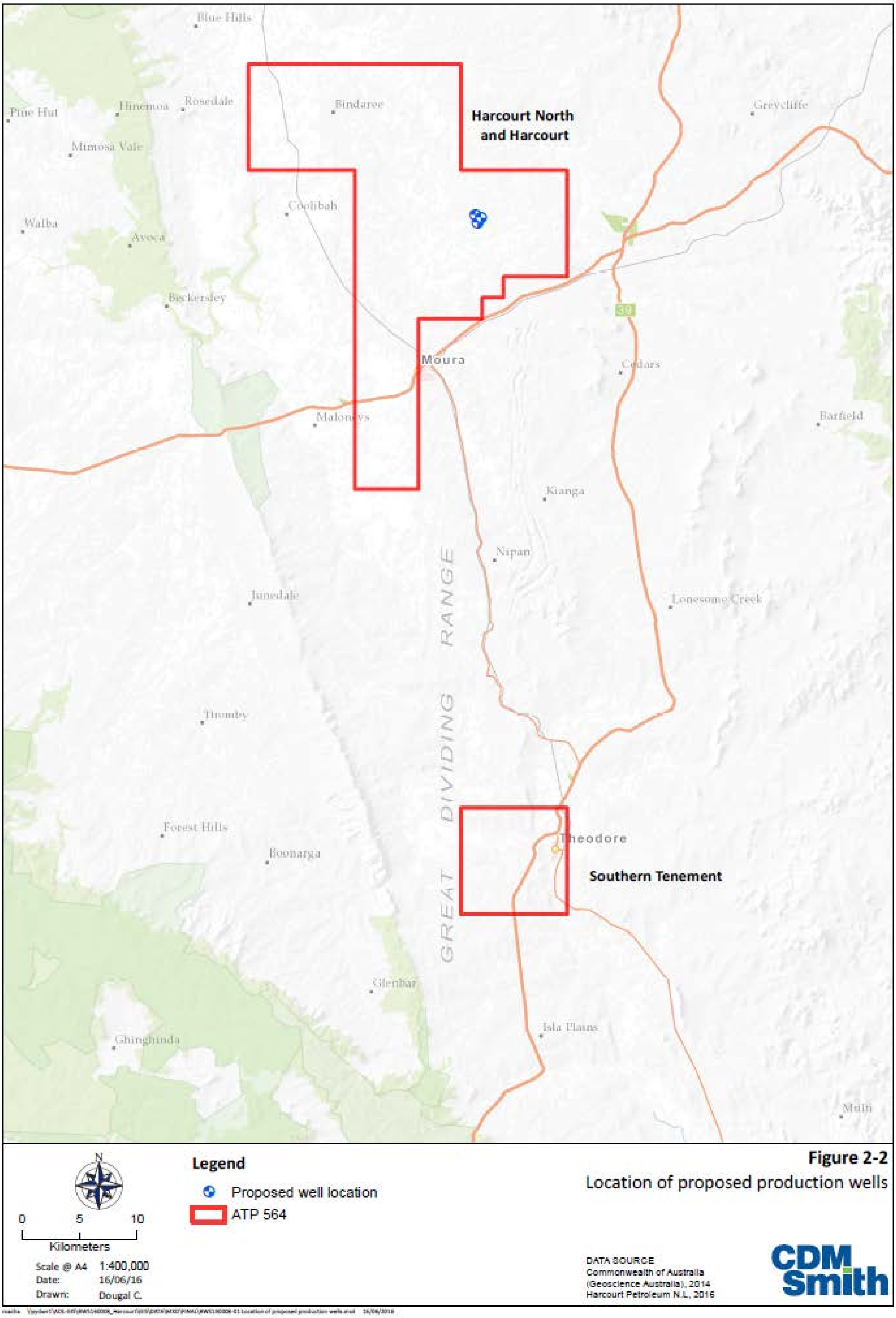


Figure 2-2 Estimated locations of proposed production wells

Section 3 Existing Geological and Hydrogeological Regime (Part B)

3.1 Regional geology

The Bowen Basin is one of the major coal basins in the world and covers an area over 60,000 km^2 from Collinsville to Theodore within Central Queensland. The Project area covers part of the Permo-Triassic, back-arc extensional to foreland basin that is made up of north-northwest to south-southeast trending shelves, separated by sedimentary troughs (Baker 1993; Fielding 1993). The two major troughs in the basin are the Taroom Trough and the Denison Trough. The Project area lies to the east of the Taroom Trough a north-south trending slightly asymmetric syncline, in the central part of the Bowen Basin (**Figure 3-1**). The Mimosa Syncline is a structural feature developed over the southern Taroom Trough and west of the Project area.

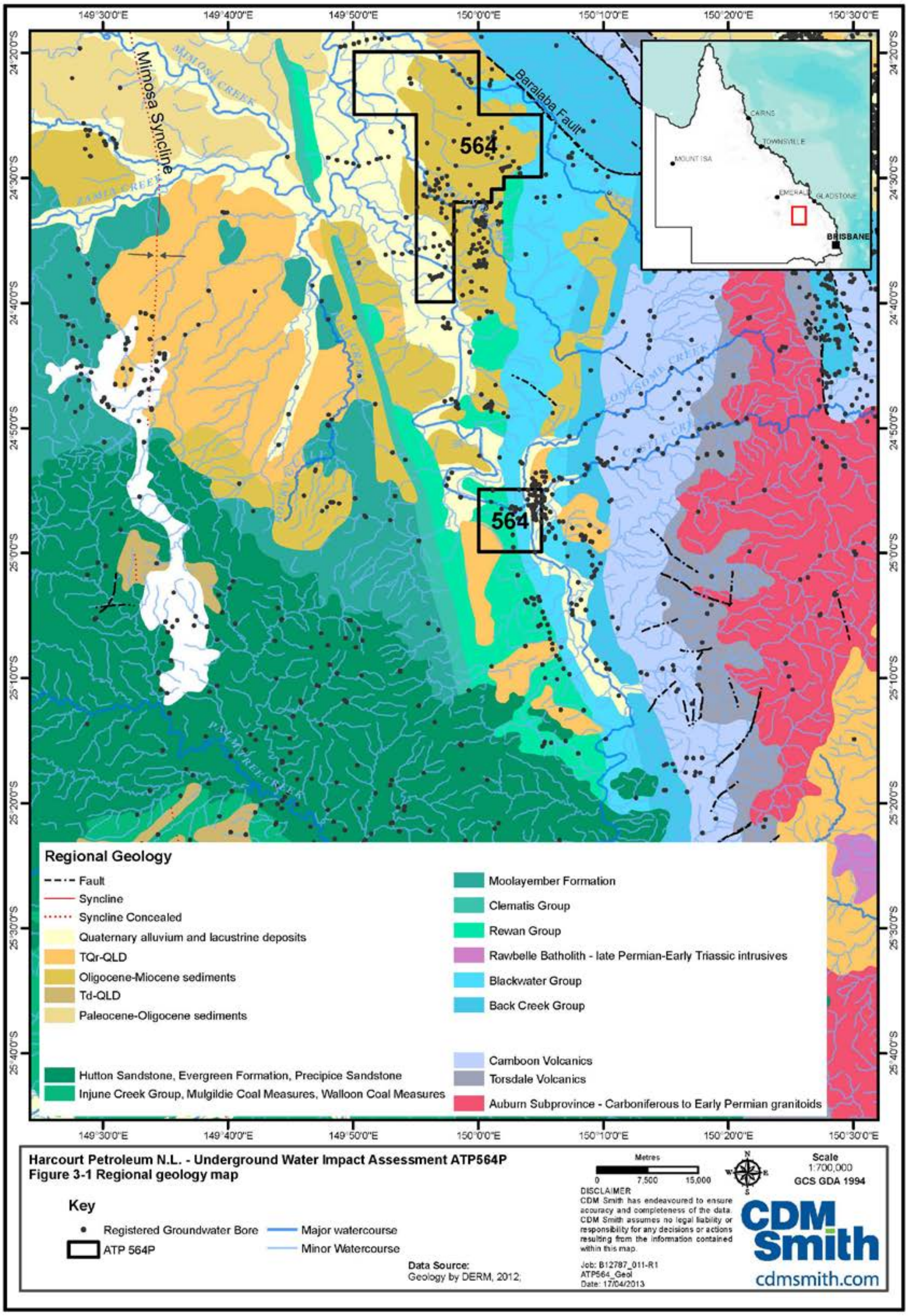


Figure 3-1 Regional geology map

The sedimentary deposition within the Basin comprises Permian, Triassic, and young Tertiary and Quaternary sediments. Most of the sedimentation in the Project area occurred in the non-marine shallow waters (Olgers, 1966). The oldest outcropping rocks (in the east of the Project area) are part of the upper Permian Gyranda Subgroup which is conformably overlain by the Rangal and Baralaba Coal Measures. Rewan Group sandstones and siltstones are the lowermost of the Triassic sequence and are overlain by the Clematis sandstone and the Moolayember Formation. The Rewan Group, Clematis Group and the Moolayember Formation outcrop to the west of the project area and the central area is covered by younger Tertiary and Quaternary sediments.

The fold and fault axis in this area generally trend north-northwest, which is parallel to the regional Bowen Basin trend and axis of Mimosa Syncline to the west. The east of the Project area is bound by the Banana Fault, the east dipping thrust zone at about 8 degrees.

A schematic geological cross section (**Figure 3-2**) prepared by CDM Smith indicates the dipping of the layers (and the whole sedimentary sequence) to the west at around 6 to 8 degrees and the presence of faults in the area.

A summary of the regional stratigraphy of the Bowen Basin is given in **Table 3-1**.

Table 3-1 Regional stratigraphy of the Bowen Basin

Period	Group	West	East
Triassic		Moolayember Formation	Moolayember Formation
		Clematis Group	Clematis Group
		Rewan Group	Rewan Group
Upper Permian	Blackwater Group	Bandanna Formation	Baralaba Coal- Rangal Coal Measures
	Back Creek Group		Gyranda Subgroup
			Flat Top Formation Bartfield Formation Oxtrack Formation
Lower Permian	Back Creek Group	Catherine Sandstone Ingelara Formation	Rennes Beds

Source: Dear et al, 1971 and Olgers, F.1966

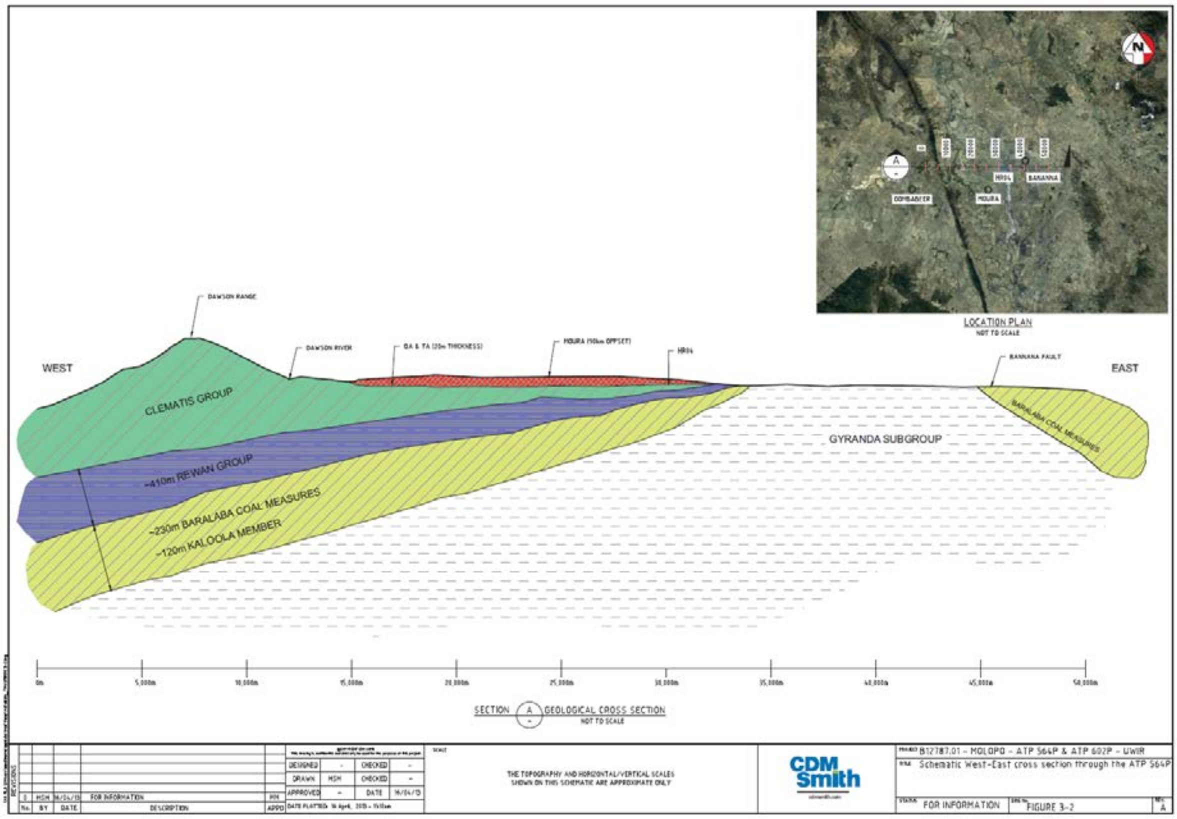


Figure 3-2 Schematic West to East cross section through ATP 564

3.2 Hydrogeology

On a regional scale the Triassic and Permian sediments are generally not regarded as significant groundwater resource, however fractured sandstone interbeds and coal seams have generally higher permeability than the interburden material. The most productive aquifers locally are Quaternary alluvium and Tertiary basalt.

Conceptually the area consists of five distinct hydrostratagraphic units (HSUs) (**Figure 3-2**) (from youngest to oldest):

- Tertiary basalt and Quaternary alluvium;
- Clematis Group;
- Rewan Group;
- Rangal and Baralaba Coal Measures; and
- Gyranda Subgroup.

3.2.1 Quaternary alluvial aquifers and Tertiary basalt

The alluvium is generally a highly transmissive unit comprised of layers of gravel, sand, and clays. It is classed as a porous medium since groundwater occurs within voids between grain particles. In the Project area alluvial aquifers are associated with Dawson River and Castle Creek, and surface water and groundwater interaction is likely. Monitoring data suggest that the alluvial aquifer is unconfined and in connection with surface water features such as streams and rivers. The primary source of recharge to the aquifer is rainfall and to a minor extent interaction with surface water. The alluvial system loses water via baseflow (contribution to surface water), evapotranspiration and flow to other connected aquifers. The thickness of this unit is around 20 m and the yield is up to 35 L/s (DNRM groundwater database).

Basalt outcrops over a very small area of the tenement, however a number of groundwater bores within the ATP 564 have been installed in this unit. Flow through basalt occurs mostly via fractures with the yields of up to 5.6 L/s (DNRM groundwater database) within this region.

Local aquifers in alluvium and basalt provide the most reliable water supply within the Project area.

3.2.2 Triassic sedimentary aquifers

Triassic sedimentary units within the Project area include Moolayember Formation, Clematis Group and Rewan Group. The Moolayember Formation outcrops to the west of the Project area, however both the Clematis Group and Rewan Group outcrop within the central area of the project.

The Lower to Middle Triassic Clematis sediments are primarily represented by quartz sandstone with minor siltstone and mudstone. They form a major aquifer within the Great Artesian Basin, however locally this formation is a less reliable source of water due to increasing depth of cover and small outcrop area. Flow via primary porosity is limited, with the vast majority of flow through the system via secondary porosity (fractures). For the purposes of this project an average horizontal and vertical conductivity is considered suitable. The average porosity of the sandstone is reported (Gray, 1968) to be 21%, and hydraulic conductivity is reported in the range from 0.4 to 37 m/d, with an average of 8.5 m/d. The thickness of this unit is approximately 150 m in the eastern edge of Bowen basin and is largely uniform.

Recharge to this unit occurs via direct rainfall where the strata outcrops, but also via leakage from overlaying alluvium (where present). Discharge occurs either via lateral down-gradient flow or evapotranspiration.

The Lower Triassic Rewan Group is represented by argillaceous mudstone, siltstone and labile sandstone and is generally regarded as the low permeability strata. Within the Project area this formation is around 410 m thick. Gray (1968) states that the average porosity of the sandstone in the Rewan Group is 16 to 17%, and hydraulic conductivity varies from negligible in the lower Rewan to 1.25×10^{-3} m/d in the upper Rewan Group.

3.2.3 Permian coal measures

The Permian sequence in this area comprises the Back Creek Group and Blackwater Group. Blackwater Group comprises the Baralaba Coal Measures which is made up of the upper economically valuable coal measures approximately 220 m thick (in Moura area) and the lower Kaloola Member about 120 m thick (in the same area) comprising mudstones and thin coal beds. The number of coal seams varies between the north and the south, however four main seams are identified in the Baralaba-Banana area compared to 12 further to the south.

The coal seams are considered to be the most permeable unit within the Baralaba/Rangal Coal Measures. The lower Kaloola Member comprises sandstones, tuffs and mudstones with thin coal plies and is considered to be low permeability unit.

Groundwater recharge within the coal seams occurs via direct rainfall recharge at the outcrop, and leakage from the overlying aquifers. The discharge is likely to be via lateral flow and by groundwater extraction as a result of coal seam gas and mining activities.

3.2.4 Hydrogeological properties

Permeability testing has been undertaken over the project area targeting mainly coal seams. For other hydrogeological units the data was obtained from literature in the Bowen Basin. A summary of values is provided in **Table 3-2** below including references.

Table 3-2: Summary of hydrogeological properties for major HSUs in the Bowen Basin.

Formation	Type	Kh [m/d]	Kv [m/d]	T [m2/d]	Sy [-]	Ss [1/m]	Source
Quaternary Alluvium	Aquifer	1 to 40	0.2-2		0.05-0.18	0.0005	2
		100	10		0.25	0.001	1
		0.7-1.5		6 to 15			3
		10	1		0.2	0.0001	7
		0.088-0.38					5
Tertiary Basalt	Aquifer	0.005-0.19					5
		0.05	0.005		0.05	0.00005	2
Clematis Group	Aquifer	0.0025 - 2.5			0.2		8
Rewan Group	Aquiclude	0.00001-0.0001	0.000001-0.00001		0.005	0.000001	1
		0.00075	0.0000001		0.05	0.00005	2
		0.1			0.05	0.000005	6
Rangal and Baralaba Coal Measures	Coal Seams, Aquifers	0.0028-0.47		0.008-1.9			4
				0.3-178.6			3
		0.000001-1	0.000001-1		0.01	0.000001	1
		0.000041-0.16	0.0000083-0.082		0.01	0.0000002	2
		0.111-0.9			0.08	0.0004	7
		5			0.05	0.000005	6
		0.001-20			0.01-0.05		10
	Interburden, Aquicludes	0.0001	0.00000007		0.05	0.00001	2
		0.1			0.05	0.000005	6
Back Creek Group	Aquitard/ Basement	0.01-0.001	0.001-0.00001		0.03--0.18	5E-4 - 5E-6	9

Source of data is 1: AGE (2006), 2: Ausenco-Norwest (2012), 3: JBT (2012), 4: Parsons Brinckerhoff (2011), 5: URS (2009), 6: BHP Billiton Mitsubishi Alliance (2009), 8: Gray (1968), 9: URS (2012), 10; Simeone, S.F. and Corbett, B.J. (2003)

3.3 Conceptual hydrogeological model

3.3.1 Groundwater levels and flow

The primary source of groundwater data was the Department of Natural Resources and Mines (DNRM) groundwater database, field survey of registered bores and historical testing of wells for coal seam gas purposes. Within the Project area water level data is available for alluvium associated with creeks and rivers, Tertiary basalts, the Clematis Group and the Moolayember Formation and the Rewan Group, the Baralaba Coal Measures and the Gyranda Subgroup. However, not all bores have recorded water levels.

This dataset includes 256 bores within a 10km perimeter of the ATP 564 boundary. Groundwater levels in the shallow alluvium vary from 0.5 to 20 m below ground. **Figure 3-3** shows the interpreted groundwater level contours within the alluvium and Tertiary basalt using the full dataset of 855 bores within a 17,600 km^2 area around ATP 564 that was obtained from the groundwater database. Groundwater flow within these shallow aquifers tends to follow the topography and is generally toward local rivers and creeks. The list of bores used is given in Appendix A. The yield in those bores averages 9 L/s with the maximum recorded 65 L/s for a bore in the Krombit Creek alluvium (DNRM groundwater database). Over two thirds of the bores have stated yields less than 2 L/s (DNRM groundwater database).

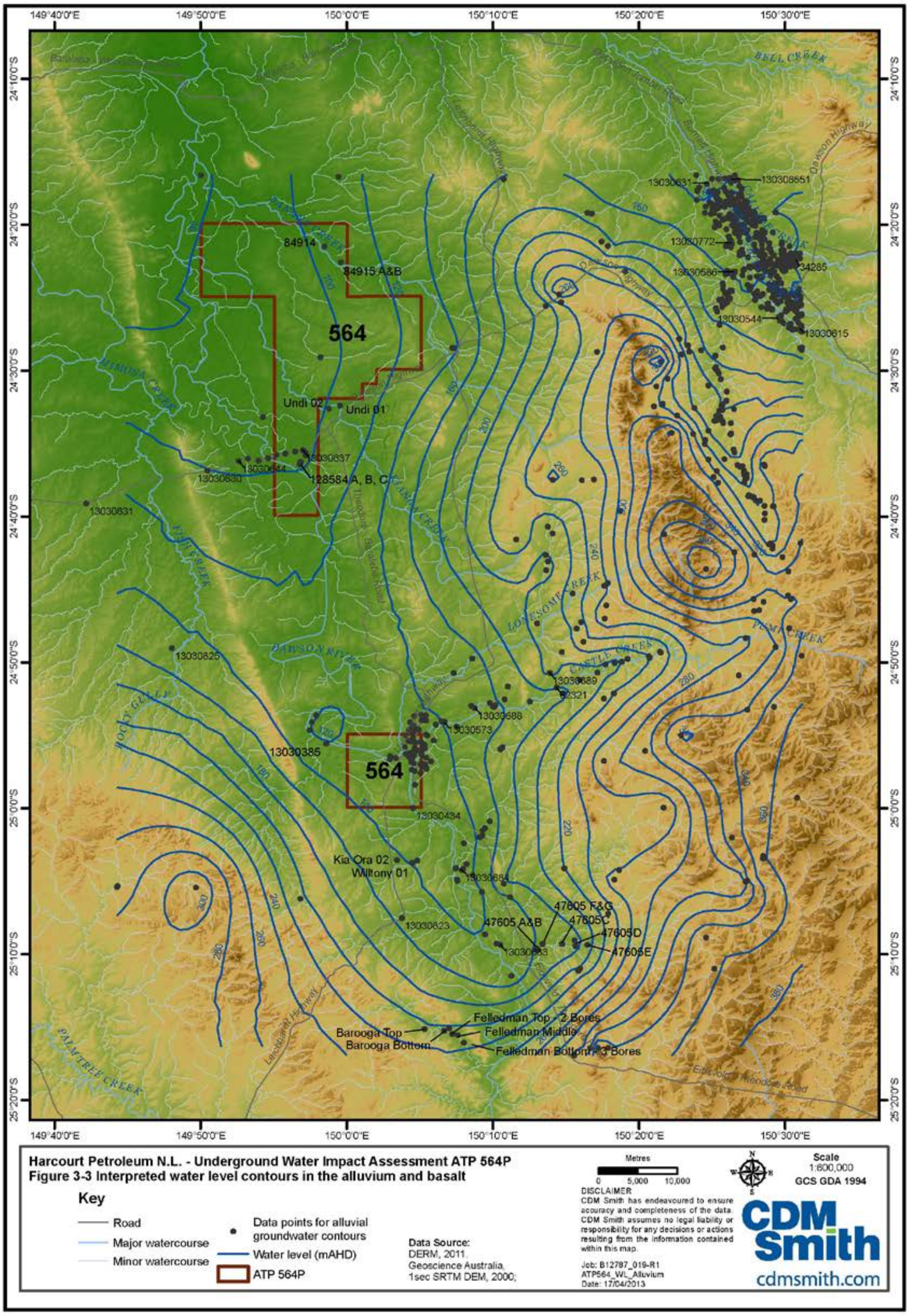


Figure 3-3 Interpreted water level contours in the alluvium and basalt

The database holds records for 18 DNRM registered bores installed in the Clematis Group and the Moolayember Formation with recorded water levels; these are listed in **Table 3-3** below. The water strike (during drilling) in these two hydrostratagraphic units varied from 5.6 mbgl to 33.8 mbgl, however this information was recorded when the bores were installed and may not be representative of current conditions. It is also noted that these bores are located in the area where these units outcrop and therefore represent the shallow and unconfined part of the aquifer. Water yield is low, generally below 1 L/s. **Figure 3-4** shows the interpreted groundwater contours for the Clematis Group and the Moolayember Formation based on the available groundwater levels within the registered bores. The interpreted groundwater flow (based on data available for the area to the west of the Project) is to the west and follows the overall dip of the sedimentary sequence.

Table 3-3 Summary of registered bores in the Clematis Group and the Moolayember Formation

Bore ID (RN)	Latitude	Longitude	Aquifer	Water quality (µS/cm)	Yield (L/s)	Standing water level (mbgl)
30691	-24.9414	150.0748	Moolayember Formation	NA	0.22	33.8
62042	-24.3239	150.4521	Moolayember Formation	Brackish	0.63	21.3
89556	-24.554	150.3769	Moolayember Formation	Salty	0.5	20
89623	-24.3505	150.4383	Moolayember Formation	NA	0.4	18.3
89692	-24.418	150.4254	Moolayember Formation	Brackish	0.78	17.7
128305	-24.8742	150.1597	Moolayember Formation	Potable/Brackish	0.78	16.5
44057	-24.4001	150.4814	Moolayember Formation	6900	0.5	15.9
62557	-25.2709	149.6703	Moolayember Formation	6600	0.25	15.2
62558	-24.374	150.5113	Moolayember Formation	2700	0.76	15
89948	-24.3331	150.4252	Moolayember Formation	4800	1.4	14.17
44055	-24.3057	150.4547	Moolayember Formation	6150	0.76	12
62632	-24.427	150.5041	Moolayember Formation	2720	0.63	9.3
44056	-24.3409	150.4523	Moolayember Formation	1555	0.95	8.6
67007	-24.3651	150.4523	Clematis Group	990	1.89	18.29
89557	-24.5701	150.3711	Clematis Group	Potable	1.9	8
43557	-24.3815	150.4996	Clematis Group	NA	NA	NA
47008	-24.3046	150.4258	Clematis Group	900	0.08	5.6
43557	-24.3815	150.4996	Clematis Group	570	0.39	27.58

Note: Information from the DNRM groundwater database
NA –information not available

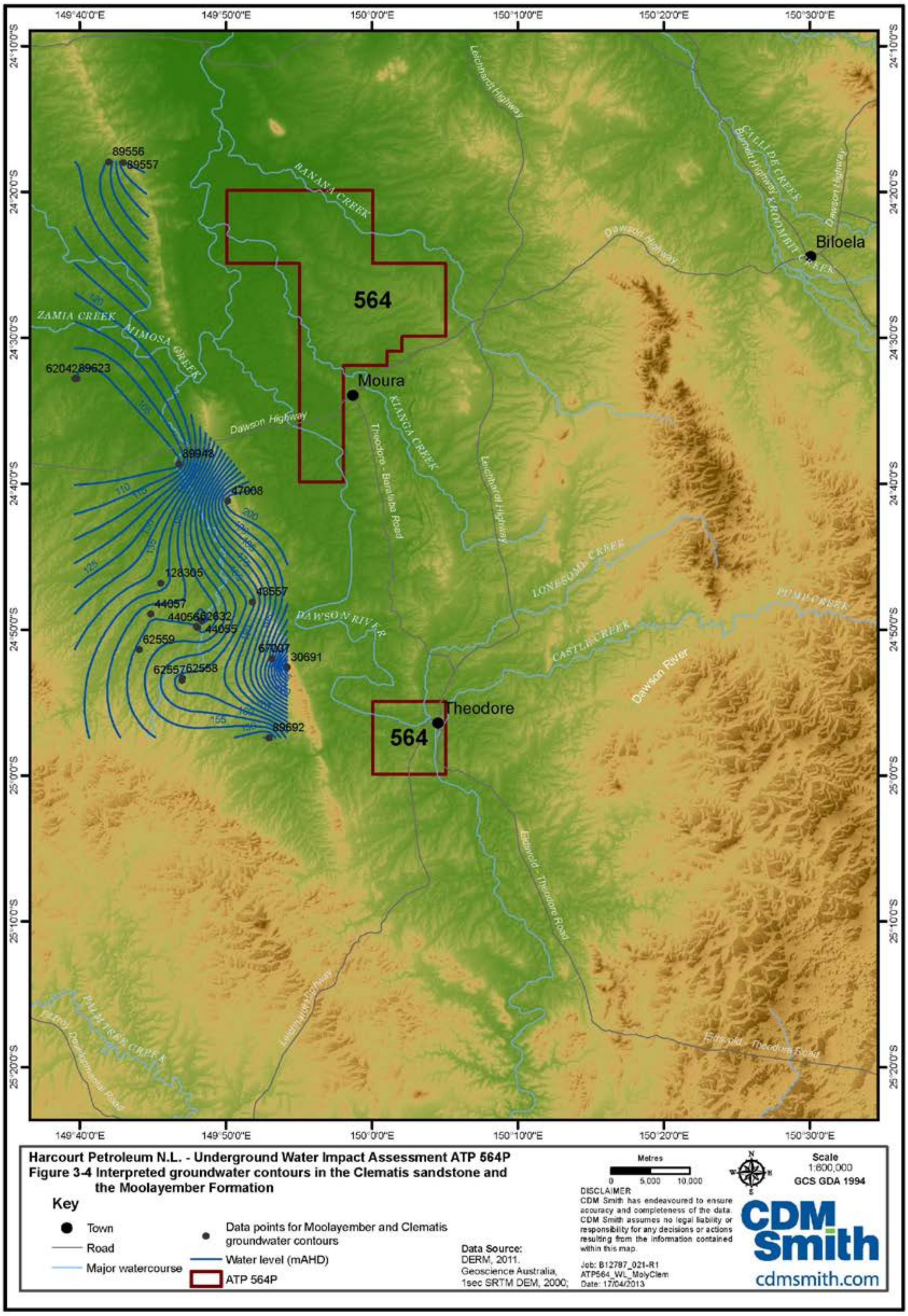


Figure 3-4 Interpreted groundwater contours in the Clematis Group and the Moolayember Formation

Water level information is available for five bores installed in Baralaba Coal Measures, summary is provided in **Table 3-4**.

Table 3-4 Summary of registered bores installed in the Baralaba Coal Measures

Bore name (RN)	Latitude	Longitude	Aquifer	Electrical Conductivity (µS/cm)	Yield (L/s)	Standing water level (mbgl)
84909	-24.3865	150.4352	Baralaba Coal Measures	Brackish	0.5	33.1
84912	-24.3163	150.4192	Baralaba Coal Measures	8600	1.33	20.5
84913	-24.3572	150.5054	Baralaba Coal Measures	4600	0.52	20
128169	-24.3175	150.4638	Baralaba Coal Measures	NA	1.4	13
128045	-24.424	150.5189	Baralaba Coal Measures	870	1.5	11

Note: NA –not available

Groundwater levels in the Baralaba Coal Measures range from 11 mbgl to 33.1 mbgl, and reflect the status in the shallow unconfined part of the aquifer. The recorded yield is relatively low with a maximum recorded 1.5 L/s. The available water levels were used in preparation of the groundwater contour map. **Figure 3-5** shows the interpreted groundwater contours in the central area only, due to the location of registered bores and therefore available data. The interpreted groundwater based on this limited data set is to the north. However, it is considered likely that the groundwater gradient in this unit is to the north west and is influenced by the dip of the coal measures to some degree.

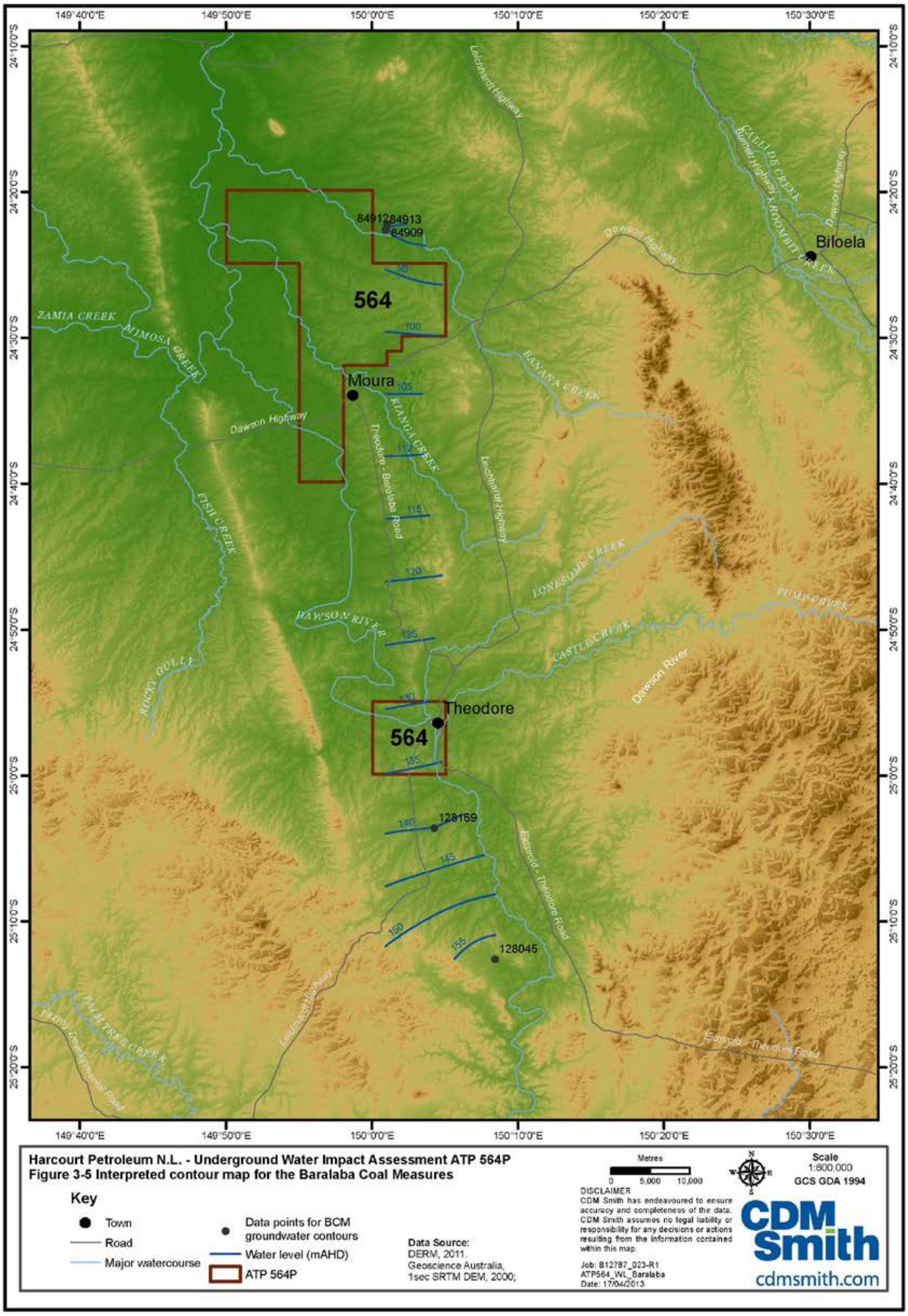


Figure 3-5 Interpreted contour maps for Baralaba Coal Measures

3.3.2 Aquifer recharge and discharge

Recharge to shallow alluvium and basalt occurs directly via rainfall recharge, with small volumes of leakage from the losing/ephemeral stream systems. Some connectivity between groundwater and the surface water system is evident and it is likely that some contribution to deeper aquifers is made by flow from the overlying volcanic system.

Groundwater recharge to Triassic and Permian units also occurs via direct recharge to the rock outcrop. Where these are covered by younger basalt flows and Tertiary units, vertical leakage is possible.

The cumulative deviation from mean (CDFM) method is often used to identify whether observed water level fluctuations are due to rainfall recharge or other processes. CDFM is the accumulated difference between the actual rainfall recorded (e.g. in a month or a year) and the long term mean. If there is poor correlation between groundwater level hydrographs and the CDFM, it may be concluded that rainfall recharge is not significant, or that some other recharge processes are dominant (e.g. regional inflow, upward leakage from the deeper aquifer systems etc.).

The closest Bureau of Meteorology (BoM) rainfall station (Station number 039071) is located at Moura. The data from this station was used in the CDFM analysis, along with long term groundwater level data from bores installed in the alluvium and the Rewan Group. The hydrographs and data are further discussed in the next section.

3.3.3 Historical groundwater level trend analysis

DNRM have a number of long term monitoring bores within the Project area[1], most of which are installed in alluvium, namely Castle Creek Alluvium and Dawson River Alluvium. The data ranges for a period from 1968 to present. A small number of bores installed in the Moolayember Formation and Rewan Group have also been monitored on a continual basis since 2001.

Figure 3-6 shows hydrographs for bores installed in shallow Dawson River alluvium, which are superposed on the long term rainfall data presented as CDFM.

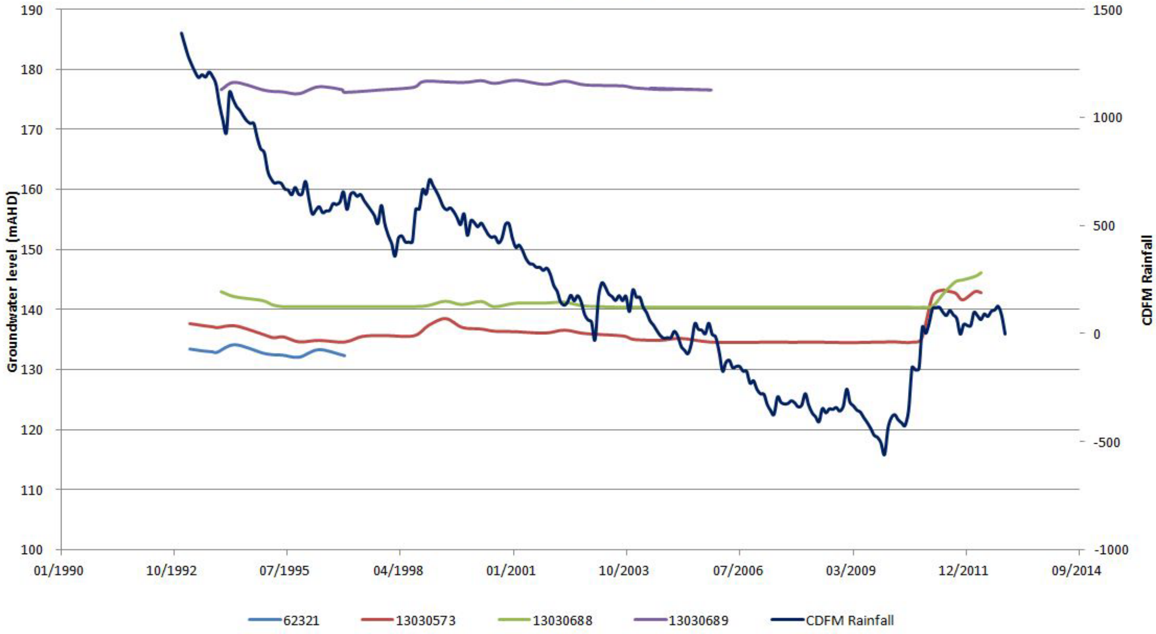
Selected hydrographs for the Dawson River alluvium are plotted in **Figure 3-6** these generally indicate that groundwater level reacts to rainfall recharge events; however the response is subdued during recession periods and pronounced during recovery periods. This may indicate that there is a good connection between this aquifer and surface water which most likely provides recharge to the aquifer during low rainfall periods. The observed groundwater levels fluctuate by up to 5m during the monitored period.

[1] The water level data presented is the most recent available, based on the DNRM groundwater database dated 13/04/16.

Figure 3-6 Hydrographs for selected bores installed in the Dawson River alluvium

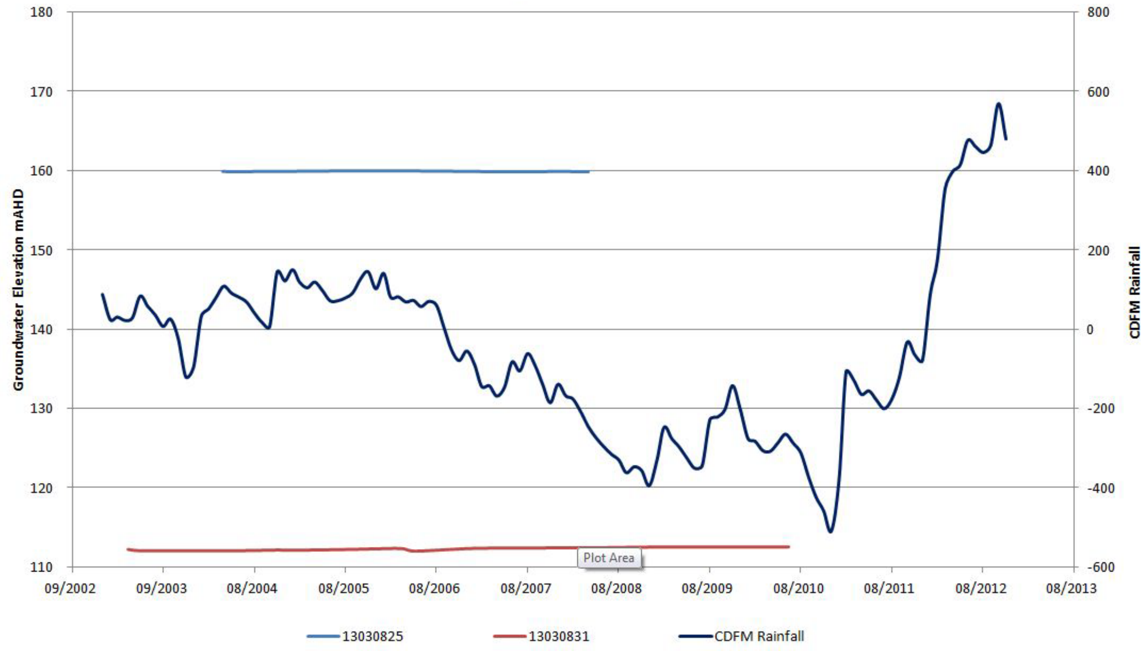
A small number of bores installed (4) and monitored in Castle Creek alluvium, indicate similar pattern (see **Figure 3-7**), with the response to rainfall evident during recharge periods but absent or minor during recession periods. Groundwater levels fluctuate over time by up to 5m within the registered bores in this aquifer.

Figure 3-7 Hydrographs for bores installed in Castle Creek alluvium



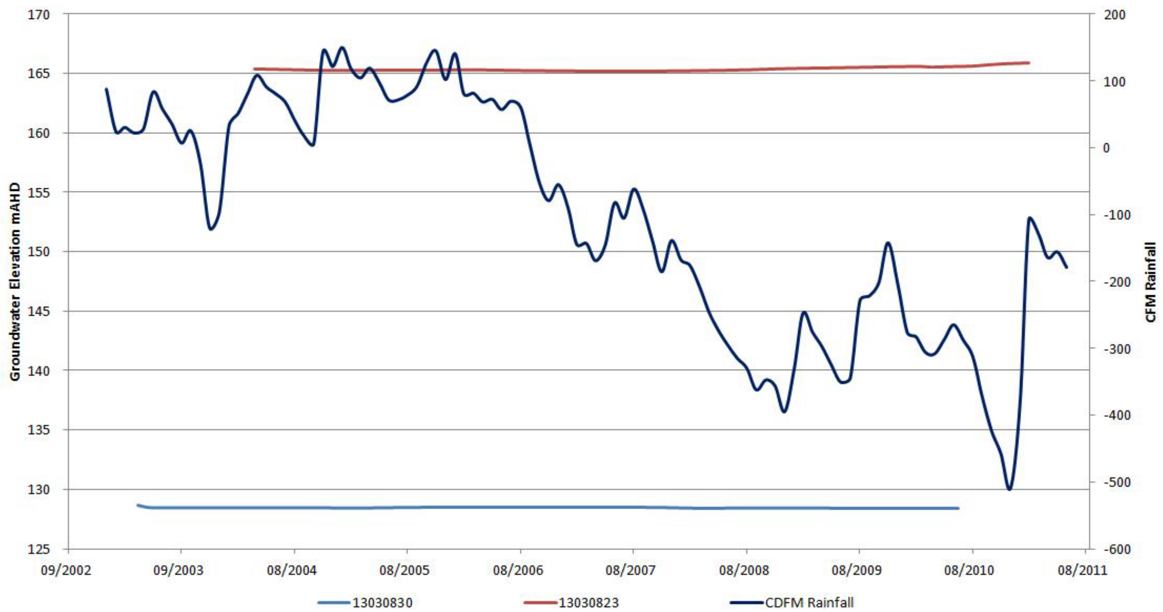
The hydrographs for bores installed in the Moolayember Formation (see **Figure 3-8**), show minor fluctuations over time with a maximum variation of 0.5 m between 2004 and mid 2010. Groundwater does not respond to short duration rainfall events, with the water level remaining stable or rising slightly in extended wet periods.

Figure 3-8 Hydrographs for bores installed in the Moolayember Formation



Hydrographs for two bores installed in the Rewan Group (see **Figure 3-9**) indicate that this HSU is not actively recharged by rainfall. The maximum water level fluctuation is up to 0.8 m between 2004 and 2010. The water level remains stable over time, with a slight rise unlikely to be associated with specific recharge events.

Figure 3-9 Hydrographs for bores installed in the Rewan Group



3.3.4 Groundwater quality

Groundwater quality data was obtained from the DNRM database and from field investigations undertaken as part of this UWIR.

The information available from the database indicates that groundwater within alluvium and Tertiary basalt is fresh to saline, with salinity up to 5000 µS/cm in the Callide Creek alluvium, 1050 µS/cm in the Castle Creek alluvium, up to 10000 µS/cm in the Dawson River alluvium, 7800 µS in the Kroombit River alluvium and 6750 µS/cm in the Prospect Creek alluvium.

The groundwater quality of the Moolayember Formation is typically brackish to saline, with the recorded salinity ranging from 1555 µS/cm to 6900 µS/cm (**Table 3-3**). Within the Clematis Group the water quality is less saline and described as "potable" with the maximum reported salinity being 990 µS/cm.

Water quality recorded in the DNRM database for the Baralaba Coal Measures, indicates that the groundwater is brackish with maximum recorded salinity being 8600 µS/cm (**Table 3-4**).

In addition to a review of the groundwater database fieldwork was undertaken in January 2013. Field work involved gauging of groundwater levels, purging and sampling of selected groundwater bores where possible. Sampled bores are included in **Figure 3-10.** The water levels are provided in **Table 3-5** and water quality in **Table 3-6**. Some of the bores where water level was measured were not available for water quality sampling.

Table 3-5 Summary of water levels as recorded during field sampling

Closest registered bore (RN)	Field ID	Formation	Latitude	Longitude	Surface Elevation (mAHD)	Depth to Ground-water (mbgl)	Ground-water elevation (mAHD)
	Undi 01	Alluvium	-24.5392	149.9927	116.42	7.281	109.14
	Undi 02	Alluvium	-24.5428	149.9800	114.20	12.235	101.97
13030385	13030385	Dawson River Alluvium	-24.9256	149.9773	136.78	9.2	127.58
13030393	13030393	Dawson River Alluvium	-24.9218	150.0994	142.04	4.609	137.43
13030394	13030394A	Dawson River Alluvium	-24.9152	150.0910	142.29	5.188	137.10
84914	84914	Gyranda	-24.3572	149.9750	103.99	17.624	86.37
84915	84915A	Gyranda	-24.3755	149.9936	108.29	26.395	81.90
84915	84915B	Gyranda	-24.3755	149.9936	108.29	26.68	81.61
128584	Stockyard	Unknown	-24.5928	149.9533	109.45	13.678	95.77
13030830	13030830	Rewan Group	-24.6137	149.8413	137.53	28.473	109.06
573	13030573		-24.9005	150.1120	150.41	8.868	141.54
738	13030738		-24.9409	150.0743	140.82	7.855	132.96
9239	9239	Gyranda	-24.9726	150.0779	142.53	5.214	137.31

Table 3-6 Summary of field parameters recorded during field investigations

Field ID	Date visited	Electrical Conductivity (µ/cm)	DO (mg/L)	ORP (mV)	pH	Temp (°C)	Formation
13030385	19/01/2013	1482	0.54	-203.3	7.19	24.6	Dawson River Alluvium
13030394A	16/01/2013	1240	1.34	-53.4	6.89	23.2	Dawson River Alluvium
84914	14/01/2013	1382	1.03	-213.7	7.35	24.6	Gyranda
84915A	14/01/2013	2319	2.32	-232.5	7.19	25.4	Gyranda
9239	19/01/2013	4600	2.47	-78.3	7.97	28.3	Gyranda
13030830	18/01/2013	25978	7.65	-87.4	7.67	27.2	Rewan
128587	18/01/2013	992	4.15	-32.3	7.45	26.1	Unknown

The groundwater field data indicate that groundwater in the shallow alluvium is of relatively good quality (fresh to brackish), while the water quality in the stratigraphically lower Rewan Group is poor (saline). The water quality of the samples taken from the Gyranda Subgroup is relatively brackish with EC up to 4600 (µS/cm).

The water quality data collected in the field aligns well with overall water quality given in the DNRM groundwater database.

Full laboratory analysis of samples taken during January 2013 fieldwork is provided in **Appendix C**.

Water quality from the Baralaba Coal Measures was obtained from limited sampling undertaken in 2009 and 2010. The results are summarised in **Table 3-7**.

Table 3-7 Summary of water quality from production wells in Baralaba Coal Measures

Parameter	Average value
pH	8.4
Electrical Conductivity (µS/cm)	10582

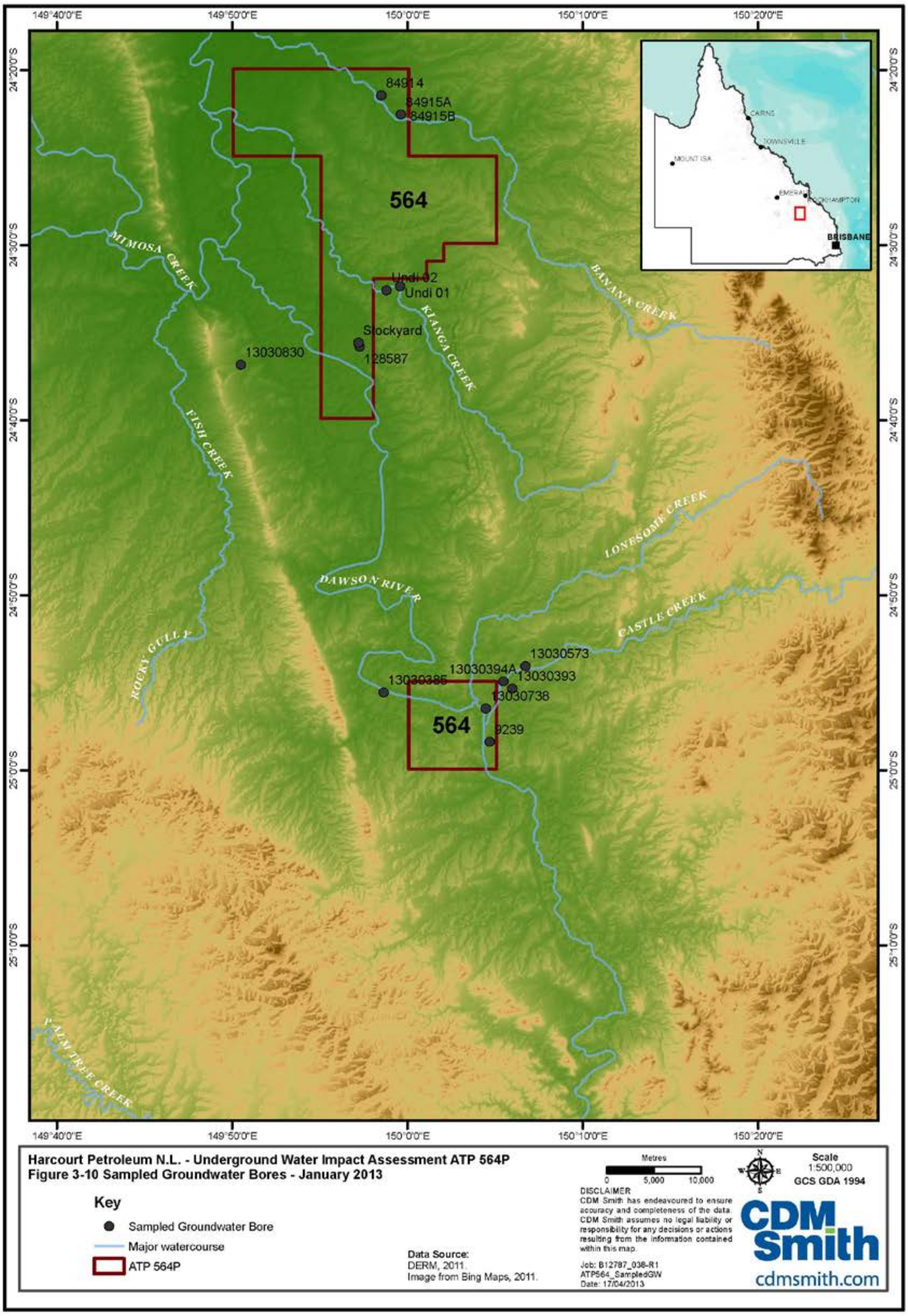


Figure 3-10 Sampled Groundwater Bores - January 2013

3.3.5 Aquifer connectivity

Regionally within the Bowen Basin, northwest to southeast trending faults run through the project area. This faulting is as a result of tectonic activity following the Early Permian (Silwa et al. 2008). These faults exhibit significant throw and are believed to act as groundwater barriers to underground water flow east-west across the faults. Numerous minor fault zones are present within the project area, and within the central area a reverse fault with mapped with vertical throw of over 60 m. Geological interpretation of aerial photographs and cores suggest that a local set of faults trends east-west , the strata being downthrown on the south (Chong, 1971). A review of groundwater levels in monitoring water bores relative to the faults in the project area was inconclusive in determining whether the faults truly are sealing, as insufficient data exists.

Connectivity between underlying and overlying aquifers has not been assessed through pumping tests, however long term monitoring and water quality analysis provides some information on the aquifer connectivity. Generally, the superficial alluvial aquifer is separated from the Baralaba Coal Measures by low conductivity interburden and the low conductivity Triassic Rewan Group. Review of long term alluvial trend analysis indicates that the fluctuation in shallow aquifer are the result of rainfall recharge condition and are not impacted by numerous gas testing that were historically undertaken in the vicinity of the project area. In addition, the water quality data suggests that there is limited vertical connectivity between the alluvium and the underlying aquifers based on the generally better water quality within the alluvium compared to the Clematis Group and the Baralaba Coal Measures.

3.3.6 Groundwater use

A review of DNRM database was undertaken to identify the registered water bores use within the ATP 564 area. No information was found which indicates the bore use, however during the field assessment it was found that the bore use in this area is predominantly for stock watering with some bores in isolated areas used for domestic supply.

3.3.7 Summary

The hydrogeological characterisation for ATP 564 can be summarised by the following key points, with reference to **Figure 3-1** to **Figure 3-9**:

- The sedimentary sequence comprises four hydraulic units (superficial Quaternary/Tertiary, Triassic, Permian coal seam groups, and lower Permian) with various hydraulic conductivities. The older Permian units outcrop over the central and eastern part of the project, while the Triassic units occur to the west. The presence of the Mimosa Syncline to the west of ATP 564 results in the whole sedimentary sequence dipping relatively steeply towards the syncline axis at about 10 to 40 degrees;

- The project area is bound to the east by the Banana Fault which extends in a north south direction (similar to other structures in the Bowen Basin), and to the south by granite intrusions. To the west, the axis of Mimosa Syncline represents the barrier to flow;

- Groundwater flow in the low permeability Triassic and Permian strata is relatively slow and has long residence times; therefore the groundwater quality is generally poor as the water slowly flows through the rock dissolving soluble salts. Available groundwater data indicate that the groundwater in the Permian and Triassic strata is saline;

- Groundwater flow in the shallow basalt and alluvium follows the topography. The flow in the Clematis Group is in an easterly direction and follows the dip of the strata. The assessment of flow in the Baralaba Coal Measures (to the northwest) is limited to bores located along the structural lineament extending north-south. This interpretation is based on data collected over different time periods and within the outcrop zone only, and may not be entirely accurate;

- Water level contouring of the heads in alluvium and basalt demonstrates that heads correlate with topography, indicating recharge at higher outcrop areas and discharge at low-lying areas. The rainfall represents important source of recharge to alluvial aquifers and water level fluctuation of 5m reflects this finding;
- In areas where the Permian strata outcrops and is not overlain by alluvium or basalt, the aquifer is unconfined to semi-confined. With depth, underlying units such as the Rewan Group and the Baralaba Coal Measures become confined;
- The shallow aquifer system is recharged mainly through rainfall infiltration. Groundwater recharge occurs in areas of high relief where strata outcrops, as well as through better drained soils in the mid and lower slopes and in the valley where Permian rocks subcrop. Deeper hydrostratagraphic units are recharged at the outcrop;
- Where the water table is shallow, evapotranspiration can become an aquifer discharge process; and
- Historical water level trend and water quality data analysis indicates that there is limited connectivity between the shallow alluvial aquifers and the deeper Baralaba Coal Measures. Connectivity is further limited by the presence of the low permeability Rewan Group.

Section 4 Impacts to Groundwater System (Part C)

The 2013 UWIR undertook an impact analysis using a numerical groundwater model (see Appendix C). This analysis is no longer entirely relevant because the production and water abstraction rates modelled substantially exceeded that which is proposed for ATP 564 over the next few years.

The modelling did, however, show that under these higher than proposed abstractions there were no Immediate or Long Term Affected Areas predicted at ATP 564 in the coal seams where extraction takes place or in the overlying Alluvium aquifer. Therefore, significant groundwater impacts are considered very unlikely under the much lower planned abstraction rates over the next three years.

Section 5 Water Monitoring Strategy (Part D)

5.1 Rationale

The underground water monitoring strategy has been developed to address the findings of this UWIR, and to keep track of water level and water quality changes caused by the exercise of underground water rights at ATP 564.

Local registered bores are primarily drawing a water supply from the shallow Quaternary alluvial and Tertiary basalt aquifers. These superficial aquifers are separated from the perforated and exposed intervals of the coal seam production wells by lower permeability interburden and Rewan formations. In addition, the production wellbores are cemented and cased to best practice to avoid aquifer cross-contamination. Modelling results show no anticipated significant impact in the shallow aquifers. Therefore, it is not considered necessary for the underground water monitoring strategy to focus on these aquifers.

There are no springs identified within ATP 564 or the surrounding 40km, as discussed in **Section** 6 Therefore, this monitoring strategy also does not include provisions for monitoring springs.

Given that actual abstraction rates are planned to be significantly less than those modelled in **Appendix C**, drawdown impacts would also be expected to be much less. Therefore, a large-scale groundwater monitoring program is not warranted for the purpose of verifying localised, temporary drawdown impacts.

5.1.1 Monitoring threshold criteria

In order to identify adverse impacts, the monitoring strategy requires the development of criteria that detect significant changes against baseline or ongoing measurements. The following criteria will be used to identify significant changes in water quality and quantity:

- **Adverse chemical impacts:** Compare concentrations of following analytes to previous monitoring rounds – if either (a) value exceeds highest previous measurement by >25% or (b) three subsequent monitoring events record an increase in one or more analytes concentration then a potential adverse impact has been identified; and

- **Adverse water level Impacts:** Compare measured water level to previous monitoring rounds – if either (a) water level is lower than previous lowest measurement by >5m or (b) three subsequent monitoring events record a fall in water level >1m then a potential adverse impact has been identified.

These criteria are included in the Groundwater Monitoring Checklist included in **Appendix C**.

5.2 Monitoring strategy and timetable

The monitoring strategy is designed to quantify changes occur as a result of water extraction during petroleum operations. The strategy covers the water extracted from the coal seams, and as a precaution, regional impacts in the area. As there is no Long Term Affected area, baseline sampling within or without ATP 564 is not warranted.

5.2.1 Extracted underground water

As in the past, Harcourt will maintain records of underground water extracted while exercising water rights. These quantities will be tabulated on a daily and monthly basis and graphed each year, and presented in a style similar to **Figure 2-1**. Results will be included in annual reports.

5.2.2 Field locations

The 2013 UWIR lists some potential bores for inclusion in a monitoring program. However, all of these bores are located at some distance (5 km or more) from the proposed production area and given the low proposed abstraction rates they are not considered relevant or useful for verifying predicted low level impacts in the immediate vicinity of the production area.

A reconnaissance will be conducted to locate bores within 2 km of the proposed production area. The reconnaissance will focus on locating bores within the Baralaba Coal Measures, as this aquifer is most likely to be affected by the proposed production wells. Any suitable bores identified during the reconnaissance will be included in the monitoring program.

5.2.3 Water level monitoring

Water level monitoring is designed to verify the model predictions and to provide early notification of any unexpected water level decline. Standing groundwater elevation will be recorded in Australian Height Datum (AHD). Groundwater levels will be determined using an electronic dip meter. The reference point below which the depth to water was measured will be recorded and photographed such that consistency with historical and future measurements can be maintained. Where applicable casing collar height above ground level will be measured and recorded. The threshold criteria discussed in **Section 4** will be utilised to determine if groundwater level changes are significant.

Once production has commenced, monitoring of bores within 2 km shall comprise measurement of groundwater levels on a monthly basis for the first 12 months. On completion of one year of monthly monitoring to establish any seasonal or annual natural variations, it may be possible to reduce groundwater level sampling to quarterly or bi-annual as appropriate and based on the results of monitoring.

5.2.4 Water quality monitoring

Water quality monitoring is designed to assess whether CSG operations are contributing to altered water quality within the affected aquifer. Accordingly, the suite of analytical parameters described in **Table 5-1** focuses on parameters which may help distinguish aquifer water sources, and on hydrocarbon occurrence. All water quality analysis will be performed by a NATA accredited laboratory.

Monitoring shall comprise collection of groundwater samples from the bores on a quarterly basis for the first 12 months. Samples will be scheduled for laboratory analysis for the suite included in **Table 5-1**. On completion of one year of quarterly monitoring to establish any seasonal or annual natural variations it may be possible to reduce groundwater quality sampling to bi-annual or annual as appropriate and based on the results of monitoring.

Table 5-1 Groundwater analytical suite

General Parameters			
pH	Electrical conductivity	Total Dissolved Solids (TDS)	Total Suspended Solids (TSS)
Major ions			
Cations		Anions	
calcium		chloride	
magnesium		carbonate	
sodium		bicarbonate	
potassium		sulphate	
Nutrients			
Nitrate	Nitrite	Ammonia	
Hydrocarbons			
Phenol compounds	Polycyclic aromatic hydrocarbons (PAH)	Total petroleum hydrocarbons	Methane (dissolved)

Sampling will conform to detailed quality management guidelines. The guidelines should include procedures for sample preservation/packaging/shipping, chain of custody protocol, sample documentation, decontamination procedures. All measured data will be subjected to quality assurance and quality control objectives on data completeness, comparability, representativeness, precision and accuracy, and laboratory procedures.

5.3 Reporting program

Harcourt will prepare an annual report on the findings of the Water Monitoring Strategy discussed in **Section 5**. Information relating to the completion of the monitoring requirements associated with this Underground Water Impact Report should be collated annually. The checklist provided in Appendix D should be completed and attached to any relevant documentation which should then be attached to this report. Any indicated actions prompted by a material change in the information or predictions should be implemented.

This UWIR will be updated in three years, incorporating the annual reviews and any other relevant or new information on the hydrogeological regime or the quantity of water produced. The need to undertake any new impact assessments will be reviewed at this time.

Section 6 Spring Impact Management (Part E)

The Water Act requires UWIRs to identify springs which could be potentially affected by underground water extraction activities. For these springs where predicted water levels within the source aquifer would decline more than 0.2 metres, a spring impact management strategy is required.

6.1 Spring inventory

A desktop review of spring inventories has been completed, searching for springs within 10 km of ATP 564 boundaries. Springs and watercourses were identified using the following sources of information, and cross-checking against project maps.

- Queensland Government Information Service (Queensland Wetland Data – Springs)
- WetlandInfo Website
- Great Artesian Basin Resource Operation Plan Spring Register

Based on these data no springs have been identified within the boundary of ATP 564. The closest springs are located 40 km to the south of the southern area, where no production wells are proposed (**Figure 6-1**). Based on this finding, impact to springs as a result of this UWIR has not been further considered in this report.

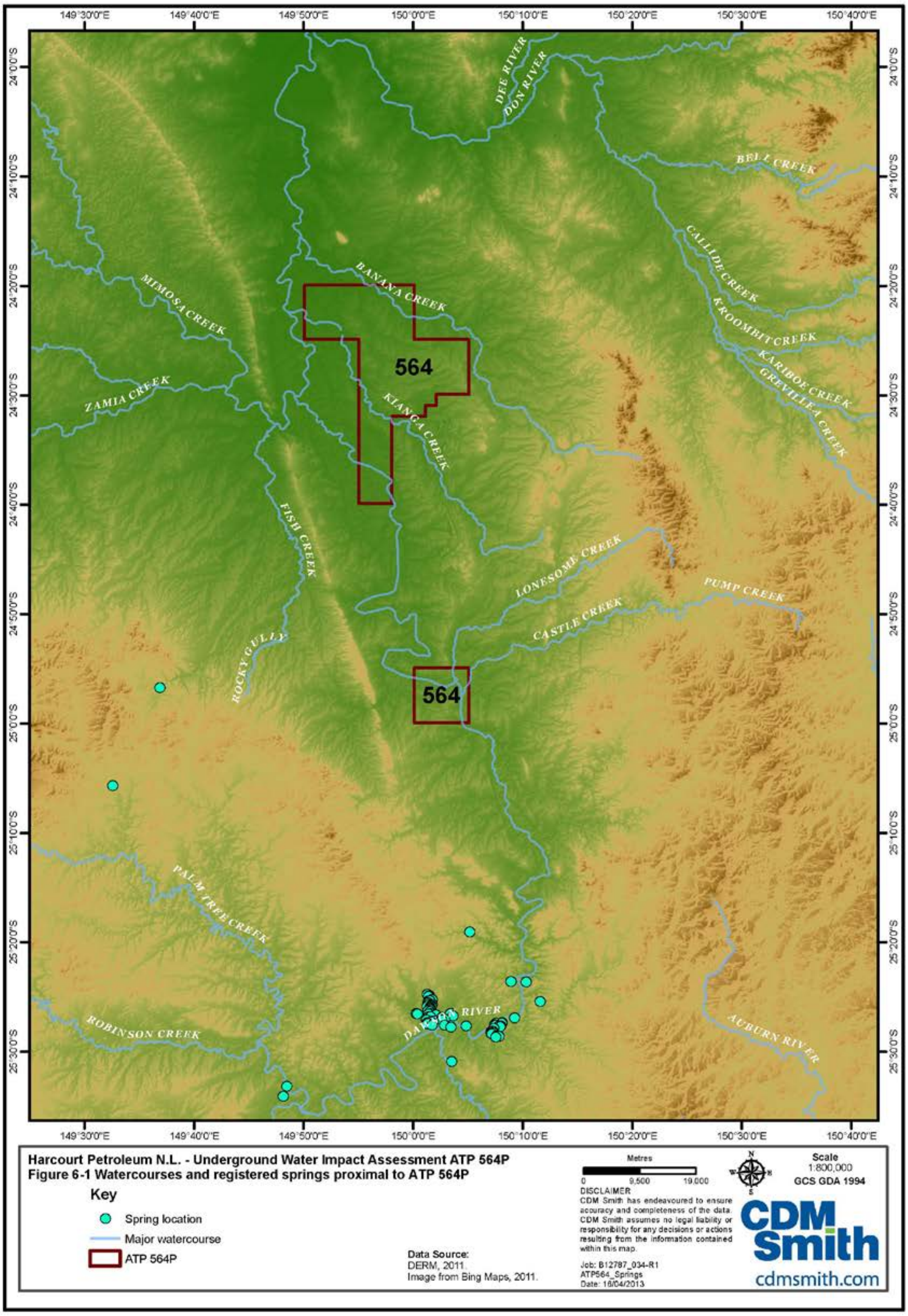


Figure 6-1 Location of closest registered springs to ATP 564

Section 7 Conclusion

This Underground Water Impact Report was prepared for Harcourt ATP 564 in Queensland. The report conforms to reporting requirements laid out in the Water Act of 2000.

Review of published reports, registered bore extraction and water level data, and projected CSG operations at ATP 564 led to the identification of one aquifer which is likely to be affected by the exercise of underground water rights. Modelling has predicted that the shallow alluvium and basalt aquifers are not likely to be affected by underground water extraction and no Immediately Affected or Long Term Affected Areas are found in this aquifer. The Baralaba Coal Measures were identified as containing Immediately Affected Areas within the central tenement.

A program was designed to quantify changes in water quality or levels as a result of water extraction during the projected petroleum operations. Although not required by law, the strategy covers regional monitoring in both the Baralaba Coal Measures and precautionary monitoring in the alluvial aquifer.

Data gathering will allow annual review of the accuracy of the maps when information changes substantially. The collected data will be reported, and an update of this UWIR will be generated in three years.

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Appendix A - Summary of registered bores installed in alluvium

Bore ID (RN)	Latitude	Longitude	Hydraulic unit	Water quality (µS/cm)	Yield (L/s)	Water level (mbgl)
68124	-24.4287	150.4846	BACK CREEK ALLUVIUM		1.9	7.45
62897	-24.37	150.4969	BACK CREEK ALLUVIUM	2740	25.2	6.7
67341	-24.3267	150.4638	BASALT		1.14	30.5
128449	-25.088	149.7387	BASALT	5000	0.63	29.6
128300	-24.9522	149.8513	BASALT	POTABLE	1.23	28.5
128582	-24.6476	150.4719	BASALT	POTABLE	5.6	25
128448	-24.9568	149.8831	BASALT	2400	0.2	23.8
128456	-24.4278	150.4797	BASALT	POTABLE	0.2	22.5
128639	-24.8149	150.4894	BASALT	POTABLE		22.5
128620	-24.4232	150.4316	BASALT	2.8 PPM	1.2	20
128626	-24.6439	149.7797	BASALT	POTABLE	1.81	19.5
128619	-24.3722	150.5016	BASALT		0.1	18
128614	-24.2801	150.4241	BASALT	POTABLE	1.2	16.4
128638	-24.3857	150.3177	BASALT	POTABLE	0.4	15.3
128453	-24.3783	150.5135	BASALT	SALTY	0.21	11.9
128625	-25.2355	149.6579	BASALT	POTABLE	1.8	11.8
128301	-25.0142	150.1633	BASALT	POTABLE	2.15	11.5
128615	-24.4145	150.5008	BASALT	POTABLE	0.8	10.5
128586	-24.2961	150.4391	BASALT	POTABLE	5.61	10
128648	-24.6242	150.2351	BASALT	POTABLE	1.23	10
128616	-24.4056	150.5176	BASALT	POTABLE	0.2	9.2
128634	-24.6236	150.2825	BASALT	POTABLE	0.18	8.5
128635	-24.367	150.1777	BASALT	POTABLE	1.5	8.5
128627	-24.4317	150.4231	BASALT	POTABLE	0.6	8
128618	-24.7729	150.471	BASALT		0.5	7.77
128628	-24.4265	150.51	BASALT	POTABLE	2.15	5.5
128457	-24.3946	150.4931	BASALT	POTABLE	0.5	5.4
89807	-24.3789	150.4905	BASALT	CONDT. 2200	1.34	4.5
13030685	-24.8531	150.2664	BOAM CREEK ALLUVIUM			7.79
89516	-24.349	150.459	BOAM CREEK ALLUVIUM	COND 2030	40	5.61
89527	-24.3767	150.4924	BOAM CREEK ALLUVIUM	COND 2650	38.5	4.52
89528	-24.3651	150.4782	BOAM CREEK ALLUVIUM	COND 2750	39	4.34
89529	-24.3655	150.5131	BOAM CREEK ALLUVIUM	COND 3050	39	2.42
68688	-24.38	150.4594	CALLIDE CREEK ALLUVIUM		15	18.5
68881	-24.3841	150.4975	CALLIDE CREEK ALLUVIUM		0.63	17.5
68318	-24.4245	150.43	CALLIDE CREEK ALLUVIUM		0.5	17.3
31064	-24.9414	150.091	CALLIDE CREEK ALLUVIUM		1.5	17
68564	-24.4074	150.438	CALLIDE CREEK ALLUVIUM		0.5	17
89746	-24.4034	150.4615	CALLIDE CREEK ALLUVIUM		8.06	16.9
89795	-24.4898	150.1578	CALLIDE CREEK ALLUVIUM		1	16.9
68763	-24.3712	150.5009	CALLIDE CREEK ALLUVIUM		1	16.8
13030671	-25.2739	150.2875	CALLIDE CREEK ALLUVIUM	BRACKISH		16.72
128032	-24.3647	150.4718	CALLIDE CREEK ALLUVIUM	POTABLE	25	16.7
13030604	-24.4247	150.5168	CALLIDE CREEK ALLUVIUM	COND 1000		16.64
68874	-24.4078	150.4396	CALLIDE CREEK ALLUVIUM		0.5	16.6
68768	-24.5631	150.475	CALLIDE CREEK ALLUVIUM		0.38	16.36

Bore ID (RN)	Latitude	Longitude	Hydraulic unit	Water quality (µS/cm)	Yield (L/s)	Water level (mbgl)
68459	-24.4106	150.4664	CALLIDE CREEK ALLUVIUM		16.4	16.3
128395	-24.5462	149.6655	CALLIDE CREEK ALLUVIUM	POTABLE	1.6	16.3
68608	-24.296	150.4936	CALLIDE CREEK ALLUVIUM		0.63	16.1
68793	-24.4137	150.4672	CALLIDE CREEK ALLUVIUM		1	16
68711	-24.4267	150.473	CALLIDE CREEK ALLUVIUM		15	15.95
13030558	-24.3766	150.5003	CALLIDE CREEK ALLUVIUM	COND 3640		15.9
68740	-24.3786	150.5019	CALLIDE CREEK ALLUVIUM	COND 834		15.9
13030561	-25.1825	150.4197	CALLIDE CREEK ALLUVIUM			15.8
89841	-25.149	149.8025	CALLIDE CREEK ALLUVIUM		1	15.65
13030553	-24.4062	150.5164	CALLIDE CREEK ALLUVIUM	`COND 1478		15.6
13030606	-24.3863	150.488	CALLIDE CREEK ALLUVIUM	COND 1100		15.53
68460	-24.4217	150.5027	CALLIDE CREEK ALLUVIUM		26	15.5
68685	-24.4349	150.5189	CALLIDE CREEK ALLUVIUM		13.86	15.5
13030552	-24.4958	150.0912	CALLIDE CREEK ALLUVIUM	COND 610		15.3
836	-24.5861	149.9604	CALLIDE CREEK ALLUVIUM	TDS 472 MG/L	0	15.24
68109	-24.392	150.4411	CALLIDE CREEK ALLUVIUM		17.7	15
89881	-24.3419	150.473	CALLIDE CREEK ALLUVIUM		0.8	14.9
62910	-24.3729	150.4976	CALLIDE CREEK ALLUVIUM		16.3	14.8
89874	-24.3804	150.5008	CALLIDE CREEK ALLUVIUM		1.1	14.7
34488	-24.4376	150.4932	CALLIDE CREEK ALLUVIUM	TDS 330 MG/L	0.8	14.6
68613	-24.6214	150.4613	CALLIDE CREEK ALLUVIUM		0.5	14.5
89902	-24.38	150.4949	CALLIDE CREEK ALLUVIUM		1	14.5
128653	-24.4123	150.2427	CALLIDE CREEK ALLUVIUM	POTABLE	1	14.5
13030715	-24.9297	150.1783	CALLIDE CREEK ALLUVIUM			14.38
13030559	-24.3779	150.5005	CALLIDE CREEK ALLUVIUM	COND 1220		14.3
453	-24.4733	149.8008	CALLIDE CREEK ALLUVIUM	COND 585	0.8	14.3
13030557	-24.3763	150.5003	CALLIDE CREEK ALLUVIUM	COND 1120		14.2
62884	-24.4251	150.5091	CALLIDE CREEK ALLUVIUM	COND 450	10.1	14.2
13030555	-24.3742	150.4993	CALLIDE CREEK ALLUVIUM	COND 3230		14.1
57616	-24.405	150.4908	CALLIDE CREEK ALLUVIUM		11	14
13030605	-24.2997	150.4206	CALLIDE CREEK ALLUVIUM	COND 3650		13.94
68785	-24.5615	150.4947	CALLIDE CREEK ALLUVIUM		1	13.87
13030551	-24.4778	150.286	CALLIDE CREEK ALLUVIUM	COND 750		13.8
68317	-24.5	150.4264	CALLIDE CREEK ALLUVIUM	COND 767	25.2	13.8
89698	-24.4226	150.5136	CALLIDE CREEK ALLUVIUM		15.12	13.8
128038	-24.3772	150.4871	CALLIDE CREEK ALLUVIUM	POTABLE	8	13.8
128391	-25.0759	150.1438	CALLIDE CREEK ALLUVIUM	POTABLE	1.6	13.75
128394	-24.5456	149.6597	CALLIDE CREEK ALLUVIUM	POTABLE	1.6	13.75
13030556	-24.3756	150.4988	CALLIDE CREEK ALLUVIUM	COND 3870		13.7
128392	-25.0676	150.1252	CALLIDE CREEK ALLUVIUM	POTABLE	1.6	13.6
128393	-24.9272	149.8361	CALLIDE CREEK ALLUVIUM	POTABLE	1.6	13.6
34285	-24.3763	150.4242	CALLIDE CREEK ALLUVIUM	COND 700	8.5	13.5
128390	-25.0823	150.1264	CALLIDE CREEK ALLUVIUM	POTABLE	1.6	13.5
128396	-24.5462	149.6608	CALLIDE CREEK ALLUVIUM	POTABLE	1	13.5
68439	-24.4063	150.4867	CALLIDE CREEK ALLUVIUM		36.6	13.25
13030594	-24.4082	150.499	CALLIDE CREEK ALLUVIUM	COND 1680		13.1
13030579	-24.7558	150.5039	CALLIDE CREEK ALLUVIUM	COND 1117		13.08
62934	-24.5024	150.4247	CALLIDE CREEK ALLUVIUM		0.6	13
13030554	-24.3742	150.4987	CALLIDE CREEK ALLUVIUM	COND 2600		12.7
62415	-24.4525	150.5167	CALLIDE CREEK ALLUVIUM		31.5	12.7
89754	-24.8775	150.2094	CALLIDE CREEK ALLUVIUM		28.7	12.7
7841	-24.929	150.0666	CALLIDE CREEK ALLUVIUM	TDS 469 MG/L	0	12.65

Bore ID (RN)	Latitude	Longitude	Hydraulic unit	Water quality (µS/cm)	Yield (L/s)	Water level (mbgl)
68441	-24.3622	150.4668	CALLIDE CREEK ALLUVIUM		0.5	12.6
68167	-24.5569	150.4289	CALLIDE CREEK ALLUVIUM		0.5	12.5
68026	-24.4154	150.4864	CALLIDE CREEK ALLUVIUM		0.5	12.4
62940	-24.2934	150.4188	CALLIDE CREEK ALLUVIUM	COND 680	18.9	12.4
34518	-24.9797	150.1417	CALLIDE CREEK ALLUVIUM	COND 1710	7.6	12.4
89809	-24.3803	150.4984	CALLIDE CREEK ALLUVIUM		22.7	12.32
31374	-24.4731	150.1225	CALLIDE CREEK ALLUVIUM	COND 1000	29	12.3
68276	-24.446	150.5072	CALLIDE CREEK ALLUVIUM	COND 738	12.5	12.27
68693	-24.3118	150.4095	CALLIDE CREEK ALLUVIUM		1.4	12.27
32755	-24.3627	150.4662	CALLIDE CREEK ALLUVIUM		26	12.2
47105	-24.9779	150.1036	CALLIDE CREEK ALLUVIUM		0.8	12.2
57830	-24.3822	150.4727	CALLIDE CREEK ALLUVIUM		13.9	12.2
825	-24.7978	149.9562	CALLIDE CREEK ALLUVIUM	TDS 390 MG/L	1.14	12.19
68544	-24.3828	150.5152	CALLIDE CREEK ALLUVIUM		18.9	12.15
31534	-24.3114	150.4466	CALLIDE CREEK ALLUVIUM		31.57	12.04
13030141	-24.5536	150.3758	CALLIDE CREEK ALLUVIUM	COND 5000		12
34444	-24.442	150.4955	CALLIDE CREEK ALLUVIUM		0.01	11.9
57617	-24.5559	150.4277	CALLIDE CREEK ALLUVIUM	COND 5100	1	11.9
68297	-24.5403	150.4278	CALLIDE CREEK ALLUVIUM		15	11.9
13030541	-24.5245	150.1091	CALLIDE CREEK ALLUVIUM	COND 740		11.8
13030723	-24.8739	150.2936	CALLIDE CREEK ALLUVIUM			11.65
68935	-24.3036	150.423	CALLIDE CREEK ALLUVIUM		19.4	11.65
47130	-24.9873	150.1161	CALLIDE CREEK ALLUVIUM		7.6	11.6
68510	-24.6001	150.431	CALLIDE CREEK ALLUVIUM		0.5	11.6
13030534	-24.8446	150.1223	CALLIDE CREEK ALLUVIUM	COND 2650		11.5
13030560	-24.3787	150.4952	CALLIDE CREEK ALLUVIUM	COND 1710		11.4
62474	-24.339	150.4489	CALLIDE CREEK ALLUVIUM		1.4	11.3
415	-24.4813	149.834	CALLIDE CREEK ALLUVIUM		0.03	11.3
47356	-25.2566	149.9782	CALLIDE CREEK ALLUVIUM		0.58	11.3
57789	-24.3078	150.4414	CALLIDE CREEK ALLUVIUM		0.3	11.3
68230	-24.4211	150.5084	CALLIDE CREEK ALLUVIUM		26.5	11.3
13030581	-24.8836	150.4878	CALLIDE CREEK ALLUVIUM	COND 1143		11.28
31533	-24.3235	150.4358	CALLIDE CREEK ALLUVIUM		25.26	11.28
34064	-24.3801	150.5118	CALLIDE CREEK ALLUVIUM	COND 2430	1	11.2
89914	-24.3188	150.2751	CALLIDE CREEK ALLUVIUM	COND 1082	0.88	11.16
31332	-24.2944	150.4327	CALLIDE CREEK ALLUVIUM	GOOD	16.4	11
57919	-24.3211	150.4536	CALLIDE CREEK ALLUVIUM		21.4	10.8
31512	-24.3158	150.4201	CALLIDE CREEK ALLUVIUM	COND 1762	27.1	10.7
38301	-24.4044	150.5114	CALLIDE CREEK ALLUVIUM	COND 1250	12.5	10.7
68487	-24.3881	150.4353	CALLIDE CREEK ALLUVIUM		0.5	10.7
62911	-24.3802	150.4985	CALLIDE CREEK ALLUVIUM		21.9	10.6
13030717	-24.8681	150.305	CALLIDE CREEK ALLUVIUM			10.5
47469	-24.6267	150.4541	CALLIDE CREEK ALLUVIUM		1.3	10.5
68491	-24.3489	150.4371	CALLIDE CREEK ALLUVIUM		25	10.5
13030591	-24.2882	150.4435	CALLIDE CREEK ALLUVIUM	COND 1476		10.4
31942	-24.3188	150.4519	CALLIDE CREEK ALLUVIUM	COND 1050	26.9	10.4
31517	-24.3163	150.4194	CALLIDE CREEK ALLUVIUM		0.36	10.3
34286	-24.4294	150.4845	CALLIDE CREEK ALLUVIUM		8.84	10.2
68024	-24.4218	150.4917	CALLIDE CREEK ALLUVIUM	COND 1350		10.2
31945	-24.3144	150.4493	CALLIDE CREEK ALLUVIUM		0.8	10.1
8230	-24.9159	150.0672	CALLIDE CREEK ALLUVIUM		0.63	10.06
33069	-24.3485	150.4726	CALLIDE CREEK ALLUVIUM	COND 1025	15.2	10

Bore ID (RN)	Latitude	Longitude	Hydraulic unit	Water quality (µS/cm)	Yield (L/s)	Water level (mbgl)
33375	-24.3917	150.491	CALLIDE CREEK ALLUVIUM	COND 1200	24	9.98
33752	-24.3635	150.4847	CALLIDE CREEK ALLUVIUM		20.8	9.9
35817	-25.2498	149.7042	CALLIDE CREEK ALLUVIUM			9.9
37063	-24.3802	150.4836	CALLIDE CREEK ALLUVIUM	POTABLE	28.5	9.9
33067	-24.3807	150.4614	CALLIDE CREEK ALLUVIUM	COND 1060	12.5	9.8
13030580	-24.7558	150.5039	CALLIDE CREEK ALLUVIUM	COND 2350		9.7
34009	-24.3652	150.5069	CALLIDE CREEK ALLUVIUM		4.42	9.7
62022	-24.3214	150.4495	CALLIDE CREEK ALLUVIUM		27.7	9.6
13030153	-25.1469	150.4103	CALLIDE CREEK ALLUVIUM	COND 1950		9.6
13030154	-24.3765	150.4733	CALLIDE CREEK ALLUVIUM	COND 1000	9.73	9.54
7684	-24.9433	150.0492	CALLIDE CREEK ALLUVIUM		9.5	9.5
47150	-25.004	150.1528	CALLIDE CREEK ALLUVIUM	COND 843	1	9.5
57326	-24.6082	150.4771	CALLIDE CREEK ALLUVIUM		15	9.5
8420	-24.9101	150.0719	CALLIDE CREEK ALLUVIUM		1.5	9.45
47151	-25.0162	150.1525	CALLIDE CREEK ALLUVIUM		1	9.4
47695	-24.6083	150.4515	CALLIDE CREEK ALLUVIUM	COND 980	1	9.3
13030151	-24.7879	150.2172	CALLIDE CREEK ALLUVIUM	COND 1110		9.3
13030152	-24.5204	150.1755	CALLIDE CREEK ALLUVIUM			9.3
13030593	-24.5147	150.5028	CALLIDE CREEK ALLUVIUM	COND 1620		9.2
31944	-24.3325	150.4492	CALLIDE CREEK ALLUVIUM	COND 1480	17.7	9.2
31511	-24.3165	150.4192	CALLIDE CREEK ALLUVIUM	POTABLE	22.3	9.2
13030592	-24.386	150.4348	CALLIDE CREEK ALLUVIUM	COND 1090		9.1
34284	-24.417	150.4351	CALLIDE CREEK ALLUVIUM		5.05	9.1
33574	-24.3774	150.4829	CALLIDE CREEK ALLUVIUM		6.3	9
47149	-25.0048	150.1197	CALLIDE CREEK ALLUVIUM	COND 1170	1	9
32324	-24.3129	150.4558	CALLIDE CREEK ALLUVIUM		47.99	8.94
47081	-24.9823	150.0889	CALLIDE CREEK ALLUVIUM	COND 1420	1.3	8.9
8231	-24.9006	150.0727	CALLIDE CREEK ALLUVIUM		0.76	8.84
37313	-24.3049	150.4393	CALLIDE CREEK ALLUVIUM			8.5
33573	-24.3774	150.4826	CALLIDE CREEK ALLUVIUM		23.99	8.47
31531	-24.3037	150.4408	CALLIDE CREEK ALLUVIUM	COND 1790	25.3	8.46
47648	-24.6089	150.4488	CALLIDE CREEK ALLUVIUM		0.8	8.4
32746	-24.3276	150.4689	CALLIDE CREEK ALLUVIUM	COND 1640	2.1	8.3
31530	-24.3252	150.4324	CALLIDE CREEK ALLUVIUM	COND 950	32.8	8.3
32770	-24.3292	150.4589	CALLIDE CREEK ALLUVIUM		42.3	8.2
33186	-24.3835	150.4538	CALLIDE CREEK ALLUVIUM	COND 1580	19.7	8.2
33187	-24.3246	150.4748	CALLIDE CREEK ALLUVIUM		36	8.2
47616	-24.4167	150.4377	CALLIDE CREEK ALLUVIUM		25	8.2
33188	-24.345	150.4754	CALLIDE CREEK ALLUVIUM		0.5	8.1
44650	-24.3694	150.458	CALLIDE CREEK ALLUVIUM		32	8
47530	-24.523	150.434	CALLIDE CREEK ALLUVIUM	COND 890	45.4	7.9
32325	-24.354	150.4396	CALLIDE CREEK ALLUVIUM		19.4	7.9
32745	-24.3552	150.4653	CALLIDE CREEK ALLUVIUM	COND 1100	19.4	7.9
47458	-25.0031	150.5033	CALLIDE CREEK ALLUVIUM			7.9
31073	-24.938	150.0773	CALLIDE CREEK ALLUVIUM	TDS 375 MG/L	45.46	7.86
32518	-24.321	150.4626	CALLIDE CREEK ALLUVIUM	COND 3150	37.8	7.7
34067	-24.4107	150.4321	CALLIDE CREEK ALLUVIUM	COND 1126	19.5	7.7
57579	-24.6437	150.4644	CALLIDE CREEK ALLUVIUM			7.7
31943	-24.3234	150.1047	CALLIDE CREEK ALLUVIUM	COND 1500	37.8	7.6
57821	-24.3797	150.4785	CALLIDE CREEK ALLUVIUM		23.9	7.5
8368	-24.9076	150.0739	CALLIDE CREEK ALLUVIUM	TDS 415 MG/L	2.3	7.5
31532	-24.3311	150.4242	CALLIDE CREEK ALLUVIUM	COND 1820	24	7.5

Bore ID (RN)	Latitude	Longitude	Hydraulic unit	Water quality (µS/cm)	Yield (L/s)	Water level (mbgl)
32767	-24.3244	150.4675	CALLIDE CREEK ALLUVIUM	GOOD	1.21	7.32
13030132	-24.7253	150.4061	CALLIDE CREEK ALLUVIUM	COND 1070		7.1
13030140	-24.5705	150.3951	CALLIDE CREEK ALLUVIUM	COND 1820		6.8
57607	-24.644	150.4636	CALLIDE CREEK ALLUVIUM		0.8	6.8
57820	-24.3122	150.4471	CALLIDE CREEK ALLUVIUM		12.6	6.3
32754	-24.3387	150.4747	CALLIDE CREEK ALLUVIUM		15.1	5.7
13030138	-24.5254	150.4478	CALLIDE CREEK ALLUVIUM	COND 2250		5.2
13030234	-24.809	150.2702	CALLIDE CREEK ALLUVIUM	COND 2400		5.2
34489	-24.7567	150.1503	CALLIDE CREEK ALLUVIUM		20.6	5.2
13030233	-25.1194	150.2988	CALLIDE CREEK ALLUVIUM			4.7
111914	-24.4317	150.5132	CAMBOON VOLCANICS	680 US/CM	1.1	37
89968	-24.39	150.4516	CAMBOON VOLCANICS	980 CON	5.8	36
68678	-24.4109	150.5127	CAMBOON VOLCANICS		1.1	30
128263	-24.3681	149.9883	CAMBOON VOLCANICS	900PPM	2.27	27
31384	-24.3046	150.439	CAMBOON VOLCANICS		0.06	21.3
128178	-24.3992	150.4885	CAMBOON VOLCANICS	2300 M/S	0.25	21
128171	-24.4378	150.5157	CAMBOON VOLCANICS	5500 M/S	0.3	20.7
128175	-24.3929	150.4606	CAMBOON VOLCANICS	3400 M/S	0.26	20.7
128198	-24.5374	150.3609	CAMBOON VOLCANICS	1180 M/S	2.38	20.7
128200	-24.3333	150.4398	CAMBOON VOLCANICS		2.15	19.5
31442	-24.3093	150.4421	CAMBOON VOLCANICS		0.63	19.2
111910	-24.3093	150.4375	CAMBOON VOLCANICS	670 US/CM	1	18.6
31448	-24.3089	150.431	CAMBOON VOLCANICS		0.38	16.7
128182	-24.4727	150.4294	CAMBOON VOLCANICS	3430 M/S	0.63	16
128201	-24.41	150.4997	CAMBOON VOLCANICS		2.53	15.5
89805	-24.3793	150.4913	CAMBOON VOLCANICS		7.5	15.3
89799	-24.3128	150.4532	CAMBOON VOLCANICS	2900 US/CM	0.68	15.15
34522	-24.436	150.5193	CAMBOON VOLCANICS		0.04	14.6
68580	-24.3118	150.4543	CAMBOON VOLCANICS	COND 5400	1.9	14
128144	-24.3187	150.4192	CAMBOON VOLCANICS		0.6	14
128173	-24.3676	150.4711	CAMBOON VOLCANICS	4900 M/S	2.66	13.7
33925	-24.4062	150.4296	CAMBOON VOLCANICS		0.19	12.8
89802	-24.3208	150.4377	CAMBOON VOLCANICS	2000 US/CM	1.37	12.72
47604	-24.2843	150.4386	CAMBOON VOLCANICS		3.5	12.2
31441	-24.3128	150.4243	CAMBOON VOLCANICS		0.25	12.2
128174	-24.4242	150.5109	CAMBOON VOLCANICS	3400 M/S	3.55	12
128183	-24.3029	150.4465	CAMBOON VOLCANICS	970 M/S	1.9	12
89901	-24.4398	150.4952	CAMBOON VOLCANICS	COND 1000	0.56	11.8
31446	-24.3001	150.451	CAMBOON VOLCANICS		0.63	10.6
57732	-24.5559	150.4219	CAMBOON VOLCANICS		0.88	10.6
128216	-25.2801	149.7392	CAMBOON VOLCANICS		0.45	10.5
9265	-24.935	150.0772	CAMBOON VOLCANICS		0.63	10.27
31241	-24.28	150.417	CAMBOON VOLCANICS	POTABLE	0.63	10.06
128179	-24.4157	150.5176	CAMBOON VOLCANICS	830 M/S	0.19	10
128181	-24.4154	150.5185	CAMBOON VOLCANICS	2400 M/S	4.68	10
84680	-24.4161	150.5019	CAMBOON VOLCANICS	COND 2500	1	9.8
68951	-24.4281	150.5055	CAMBOON VOLCANICS	700	1.42	9.6
128199	-24.3753	150.4804	CAMBOON VOLCANICS		1.5	9.5
128215	-25.2476	149.7492	CAMBOON VOLCANICS		0.78	9.5
34211	-24.372	150.5134	CAMBOON VOLCANICS		0.19	9.3
38951	-24.3803	150.4579	CAMBOON VOLCANICS		0.6	9.2
47606	-24.4401	150.5125	CAMBOON VOLCANICS		1.29	9.1

Bore ID (RN)	Latitude	Longitude	Hydraulic unit	Water quality (µS/cm)	Yield (L/s)	Water level (mbgl)
68527	-24.5782	150.443	CAMBOON VOLCANICS		0.22	8.9
31242	-24.9034	150.1016	CAMBOON VOLCANICS	POTABLE	0.25	8.84
68659	-24.6725	150.4912	CAMBOON VOLCANICS		0.58	8.23
34212	-24.411	150.4322	CAMBOON VOLCANICS		0.19	8.2
57512	-24.2841	150.488	CAMBOON VOLCANICS		1.07	8.2
111915	-24.2915	150.4508	CAMBOON VOLCANICS	COND 5900	3.3	8.2
128180	-24.3659	150.4522	CAMBOON VOLCANICS	840 M/S	0.76	8.2
57516	-24.2787	150.4369	CAMBOON VOLCANICS		1.04	8
128262	-24.3617	149.9755	CAMBOON VOLCANICS	1600PPM	0.57	8
128383	-24.4981	150.1733	CAMBOON VOLCANICS		0.14	8
89521	-24.3772	150.5071	CAMBOON VOLCANICS		0.5	7.96
57734	-24.5431	150.4422	CAMBOON VOLCANICS		0.2	7.6
57400	-24.3571	150.4329	CAMBOON VOLCANICS	BRACKISH	0.4	6.4
128644	-24.2777	149.9907	CAMBOON VOLCANICS	POTABLE	1.25	6.2
31443	-24.3056	150.4241	CAMBOON VOLCANICS		0.19	6.1
84872	-24.4179	150.5044	CAMBOON VOLCANICS	2500 US/CM	0.8	6.1
128044	-24.5579	150.4872	CAMBOON VOLCANICS	1100 US/CM	1.51	5
47605	-24.5711	150.4391	CAMBOON VOLCANICS		1.29	4.6
33924	-24.3616	150.499	CAMBOON VOLCANICS		0.19	3.6
128209	-24.3339	150.4432	CAMBOON VOLCANICS		0.22	3
128261	-24.3767	150.0158	CAMBOON VOLCANICS	1600PPM	0.63	0.2
128142	-24.3548	150.4342	CASTLE CREEK ALLUVIUM		0.5	16
128143	-24.3182	150.4651	CASTLE CREEK ALLUVIUM			16
13030688	-24.8678	150.2467	CASTLE CREEK ALLUVIUM			14.05
89590	-24.2908	150.4508	CASTLE CREEK ALLUVIUM	COND 1280		11.84
89563	-24.542	150.3969	CASTLE CREEK ALLUVIUM		20	8.65
84678	-24.4089	150.493	CASTLE CREEK ALLUVIUM	COND 1100	26	8.57
128151	-24.4999	150.4234	CASTLE CREEK ALLUVIUM		1.81	8.4
13030689	-24.821	150.2457	CASTLE CREEK ALLUVIUM			8.13
62918	-24.4727	150.5195	CASTLE CREEK ALLUVIUM		0.68	7.33
68091	-24.3419	150.4677	CASTLE CREEK ALLUVIUM		15	7.06
13030573	-24.8866	150.457	CASTLE CREEK ALLUVIUM	COND 790		6.87
84615	-24.3768	150.48	CASTLE CREEK ALLUVIUM		26	6.83
89508	-24.3683	150.5075	CASTLE CREEK ALLUVIUM		1.25	6
128210	-25.1259	149.7783	CASTLE CREEK ALLUVIUM		1.81	6
62321	-24.3209	150.463	CASTLE CREEK ALLUVIUM	COND 1050	31	5.9
62322	-24.3212	150.4613	CASTLE CREEK ALLUVIUM	COND 960	33	5.3
68021	-24.4189	150.4892	CASTLE CREEK ALLUVIUM		27.7	4.57
128211	-25.1073	149.7914	CASTLE CREEK ALLUVIUM		1.23	4
68022	-24.4116	150.4872	CASTLE CREEK ALLUVIUM		15.4	2.79
128193	-24.38	150.4649	CATTLE CREEK ALLUVIUM	800 PPM	22	11
128164	-24.3853	150.4343	CATTLE CREEK ALLUVIUM		0.99	6.5
128574	-24.4806	150.3822	CLAY	52.7 M.S	0.01	36
128585	-24.413	150.4358	CLAY	650	2.8	13.8
128386	-24.8939	150.0772	CONTACT CREEK ALLUVIUM	POTABLE	1	16.2
89785	-24.8559	149.7347	CONTACT CREEK ALLUVIUM		1	16.05
68853	-24.3031	150.4377	CONTACT CREEK ALLUVIUM		1	15.7
128221	-24.8787	150.1633	CONTACT CREEK ALLUVIUM		0.76	15.5
13030693	-24.8351	150.2953	CONTACT CREEK ALLUVIUM			14.2
68845	-24.4501	150.5049	CONTACT CREEK ALLUVIUM			11.7
43667	-24.3708	150.5173	CONTACT CREEK ALLUVIUM		1.8	9.8
31466	-24.3165	150.4192	CONTACT CREEK ALLUVIUM		26	7.6

Bore ID (RN)	Latitude	Longitude	Hydraulic unit	Water quality (µS/cm)	Yield (L/s)	Water level (mbgl)
31395	-24.3197	150.4161	CONTACT CREEK ALLUVIUM		11.37	4
13030385	-24.5173	150.3533	DAWSON RIVER ALLUVIUM	COND 1090	3.9	17.1
13030435	-24.4246	150.4197	DAWSON RIVER ALLUVIUM	TDS 291.7 MG/L	1.52	14.33
13030392	-24.4493	150.5194	DAWSON RIVER ALLUVIUM			13.9
89578	-24.3727	150.4976	DAWSON RIVER ALLUVIUM		12.6	13.5
13030436	-24.3086	150.4164	DAWSON RIVER ALLUVIUM	TDS 229 MG/L	1.5	13.3
13030434	-24.4704	150.3894	DAWSON RIVER ALLUVIUM	COND 680		13.1
13030432	-24.4197	150.4242	DAWSON RIVER ALLUVIUM	COND 245		12.9
89686	-24.3364	150.4491	DAWSON RIVER ALLUVIUM	POTABLE	18.9	12.8
13030437	-24.4353	150.4088	DAWSON RIVER ALLUVIUM	TDS 343.2 MG/L	1.5	12.8
13030391	-24.6575	150.4494	DAWSON RIVER ALLUVIUM	COND 1100		12.7
13030428	-24.8603	150.1841	DAWSON RIVER ALLUVIUM	COND 1700	4.4	12.5
89690	-24.355	150.4964	DAWSON RIVER ALLUVIUM	POTABLE	2.4	12.5
128188	-24.6474	150.4669	DAWSON RIVER ALLUVIUM	350 PPM	2	12.5
89755	-24.4088	150.4988	DAWSON RIVER ALLUVIUM	POTABLE	0.45	12.3
89593	-25.1259	149.8375	DAWSON RIVER ALLUVIUM		11.3	11.97
13030420	-24.445	150.5075	DAWSON RIVER ALLUVIUM	COND 950		11.8
89575	-24.4629	150.3794	DAWSON RIVER ALLUVIUM		25	11.6
13030641	-24.6594	150.3122	DAWSON RIVER ALLUVIUM	COND 528		11.54
13030429	-24.7866	150.2677	DAWSON RIVER ALLUVIUM	COND 380		11.5
13030637	-24.4731	150.1208	DAWSON RIVER ALLUVIUM	COND 595		11.46
13030683	-25.126	150.1114	DAWSON RIVER ALLUVIUM			11.34
13030387	-24.5398	150.3508	DAWSON RIVER ALLUVIUM		1.9	11.3
13030422	-24.7272	150.2278	DAWSON RIVER ALLUVIUM	COND 22,300		11.2
13030427	-24.9243	150.0778	DAWSON RIVER ALLUVIUM	COND 4200		11.1
13030423	-24.6919	150.1936	DAWSON RIVER ALLUVIUM	COND 23,750		11.1
89598	-24.4447	150.5155	DAWSON RIVER ALLUVIUM	GOOD	10.5	11.07
13030684	-24.9453	150.2939	DAWSON RIVER ALLUVIUM			11.04
13030418	-24.54	150.0247	DAWSON RIVER ALLUVIUM	COND 920	4.9	10.9
13030403	-24.6852	150.235	DAWSON RIVER ALLUVIUM	COND 5850		10.9
13030430	-24.7799	149.759	DAWSON RIVER ALLUVIUM	COND 460	1.9	10.9
13030426	-25.2671	150.1334	DAWSON RIVER ALLUVIUM	COND 5350		10.8
13030390	-24.5717	150.3953	DAWSON RIVER ALLUVIUM	COND 2340		10.8
89581	-24.4547	150.5192	DAWSON RIVER ALLUVIUM		13.5	10.75
89597	-25.117	149.8461	DAWSON RIVER ALLUVIUM		16.4	10.74
13030415	-24.4265	150.5094	DAWSON RIVER ALLUVIUM	COND 298		10.7
13030402	-24.7066	150.4426	DAWSON RIVER ALLUVIUM	COND 4900		10.7
13030421	-24.7536	150.2581	DAWSON RIVER ALLUVIUM		35.3	10.7
13030586	-25.0831	150.4553	DAWSON RIVER ALLUVIUM	COND 660		10.53
13030400	-24.6861	150.3628	DAWSON RIVER ALLUVIUM	COND 6700		10.5
38975	-24.3125	150.4994	DAWSON RIVER ALLUVIUM	COND 1760	30.7	10.47
13030425	-24.4736	150.1225	DAWSON RIVER ALLUVIUM	COND 9600		10.4
13030639	-24.4737	150.0188	DAWSON RIVER ALLUVIUM	COND 777		10.36
13030410	-24.8204	150.3576	DAWSON RIVER ALLUVIUM	COND 595		10.3
13030424	-24.4715	150.1225	DAWSON RIVER ALLUVIUM	COND 30,000		10.3
13030401	-24.726	150.4102	DAWSON RIVER ALLUVIUM	COND 2500		10.3
13030411	-24.7939	150.2628	DAWSON RIVER ALLUVIUM			10.3
13030394	-24.2761	149.8342	DAWSON RIVER ALLUVIUM	COND 2400		10.2
13030419	-25.0472	149.6689	DAWSON RIVER ALLUVIUM	COND 1300	9.5	10.2
13030638	-24.4839	149.9703	DAWSON RIVER ALLUVIUM	COND 2500		10.19
13030640	-24.4958	150.0912	DAWSON RIVER ALLUVIUM	COND 1580		10.13
89577	-24.386	150.4351	DAWSON RIVER ALLUVIUM		10	10.1

Bore ID (RN)	Latitude	Longitude	Hydraulic unit	Water quality (µS/cm)	Yield (L/s)	Water level (mbgl)
13030417	-24.4734	150.125	DAWSON RIVER ALLUVIUM	COND 755	5.68	10.03
13030404	-24.6776	150.2296	DAWSON RIVER ALLUVIUM	COND 5100		10
13030396	-24.4713	150.1213	DAWSON RIVER ALLUVIUM	COND 1880		10
13030406	-24.3031	150.4228	DAWSON RIVER ALLUVIUM	COND 1210	2.8	9.9
13030405	-24.7677	150.2966	DAWSON RIVER ALLUVIUM	COND 1975	27.8	9.9
13030395	-24.6216	150.4628	DAWSON RIVER ALLUVIUM	COND 1400		9.9
13030433	-24.4701	150.3891	DAWSON RIVER ALLUVIUM	COND 28400		9.9
13030397	-24.9048	150.0892	DAWSON RIVER ALLUVIUM	COND 10,000		9.8
89546	-24.6994	150.4862	DAWSON RIVER ALLUVIUM	COND 3200	20	9.72
13030412	-24.7451	150.2941	DAWSON RIVER ALLUVIUM			9.7
13030393	-24.43	150.5112	DAWSON RIVER ALLUVIUM	COND 2130		9.7
89547	-24.4276	150.5102	DAWSON RIVER ALLUVIUM	COND 1300	38	9.55
13030399	-24.7096	150.4653	DAWSON RIVER ALLUVIUM	COND 11500	3.79	9.5
13030407	-24.3863	150.4412	DAWSON RIVER ALLUVIUM	COND 1070		9.5
13030738	-24.95	149.849	DAWSON RIVER ALLUVIUM			9.5
13030409	-24.8274	150.3459	DAWSON RIVER ALLUVIUM		1.52	9.5
13030398	-24.9095	150.0826	DAWSON RIVER ALLUVIUM	COND 10,000		9.4
13030416	-24.4096	150.495	DAWSON RIVER ALLUVIUM	COND 341	2.5	9.2
13030408	-24.7418	150.2983	DAWSON RIVER ALLUVIUM	COND 815	5.8	9.2
13030576	-24.9983	150.3619	DAWSON RIVER ALLUVIUM	COND 540		9.13
13030590	-24.2894	150.4456	DAWSON RIVER ALLUVIUM			9.07
13030735	-24.8286	150.3206	DAWSON RIVER ALLUVIUM			9.07
13030414	-24.7545	150.4921	DAWSON RIVER ALLUVIUM			8.8
13030413	-24.7824	150.5092	DAWSON RIVER ALLUVIUM	COND 5090		8.7
13030389	-24.5503	150.377	DAWSON RIVER ALLUVIUM	COND 4150		8.7
13030584	-25.0819	150.4572	DAWSON RIVER ALLUVIUM	COND 7200		8.26
128298	-24.9242	149.8896	DAWSON RIVER ALLUVIUM	POTABLE		8
13030582	-25.0856	150.1794	DAWSON RIVER ALLUVIUM	BRACKISH		7.8
13030575	-25.0043	150.4561	DAWSON RIVER ALLUVIUM	COND 4000		7.1
13030583	-25.1007	150.187	DAWSON RIVER ALLUVIUM	COND 3600		7.08
89509	-24.3832	150.4862	DAWSON RIVER ALLUVIUM		1.26	6
13030574	-25.0327	150.44	DAWSON RIVER ALLUVIUM	COND 2520		5.92
47549	-24.6233	150.4406	DAWSON RIVER ALLUVIUM		0.6	3
128163	-24.3993	150.4947	GLANDORE GRANODIORITE		0.78	20
89987	-24.3737	150.5114	GLANDORE GRANODIORITE		0.01	18.3
89987	-24.3737	150.5114	GLANDORE GRANODIORITE	COND 12600	0.01	18.3
128196	-24.3988	150.4943	GLANDORE GRANODIORITE	2600 M/S	0.69	18.3
89961	-24.3615	150.4964	GLANDORE GRANODIORITE	3000 US/CM	0.43	17.12
128153	-24.3843	150.501	GLANDORE GRANODIORITE	1900 M/S	1.64	15
111911	-24.4459	150.5057	GLANDORE GRANODIORITE	COND 1200	1.13	12
128197	-24.4092	150.4925	GLANDORE GRANODIORITE	2580 M/S		11.6
128148	-24.3089	150.4488	GLANDORE GRANODIORITE	1600 US/CM	1.26	10
128153	-24.3843	150.501	GLANDORE GRANODIORITE	1780 M/S	0.76	9
128153	-24.3843	150.501	GLANDORE GRANODIORITE	1720 M/S	2.78	8
128153	-24.3843	150.501	GLANDORE GRANODIORITE	1920 M/S	0.52	4.9
57511	-24.2912	150.4513	GLENHALVERN GRANITE		1.26	7.6
128446	-24.5525	149.9044	GRANITE	POTABLE	0.63	75
128467	-24.4061	150.4865	GRANITE	POTABLE	0.5	63.3
128444	-25.1686	150.106	GRANITE	POTABLE	2.52	28
128623	-24.3536	150.4823	GRANITE	POTABLE	0.13	18.8
128631	-24.4237	150.5149	GRANITE	POTABLE	0.2	17
128640	-24.8248	150.5194	GRANITE	POTABLE	0.3	15.3

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128432	-25.2255	149.9426	GRANITE	GOOD	0.2	14
128629	-24.3608	150.4901	GRANITE	POTABLE	0.2	12.8
128466	-24.3995	150.4958	GRANITE	POTABLE	0.13	11.5
128630	-24.7739	150.465	GRANITE	POTABLE	0.07	8.5
111909	-24.3724	150.5132	GRANITE	1300 US/CM	10	8.2
128632	-24.3907	150.4835	GRANITE	POTABLE	0.3	8.2
128413	-25.1015	149.8415	GRANITE	BRACKISH	0.44	7
128633	-24.426	150.2273	GRANITE	POTABLE	1.24	5.4
68557	-24.3669	150.4774	GREVILLEA CREEK ALLUVIUM	COND 1920	3.8	16.4
68553	-24.2813	150.4466	GREVILLEA CREEK ALLUVIUM		0.5	15.9
68362	-24.5509	150.4222	GREVILLEA CREEK ALLUVIUM		1.7	15.3
89705	-24.5464	149.6633	GREVILLEA CREEK ALLUVIUM		0.9	15.3
62403	-24.3192	150.4658	GREVILLEA CREEK ALLUVIUM		1.9	14.4
68130	-24.2944	150.4005	GREVILLEA CREEK ALLUVIUM		1.5	14.3
13030544	-24.4672	150.1259	GREVILLEA CREEK ALLUVIUM	COND 1050		14.2
128206	-24.4093	150.5	GREVILLEA CREEK ALLUVIUM		1	13.8
33681	-24.3813	150.4972	GREVILLEA CREEK ALLUVIUM		1.5	13.6
37244	-24.3124	150.4415	GREVILLEA CREEK ALLUVIUM	COND 2470	1.6	13.4
36463	-24.3603	150.4836	GREVILLEA CREEK ALLUVIUM		1.1	12.7
57595	-24.6542	150.4864	GREVILLEA CREEK ALLUVIUM	COND 3400	16	12.7
32926	-24.3811	150.4607	GREVILLEA CREEK ALLUVIUM		44.2	12.1
33263	-24.393	150.473	GREVILLEA CREEK ALLUVIUM		0.6	11.8
128149	-24.5157	150.4871	GREVILLEA CREEK ALLUVIUM			11.55
37331	-24.3207	150.4354	GREVILLEA CREEK ALLUVIUM		0	10.7
32633	-24.3417	150.4563	GREVILLEA CREEK ALLUVIUM	COND 2950	3.4	9.7
57795	-24.3034	150.4466	GREVILLEA CREEK ALLUVIUM		0.5	9.3
47092	-24.9715	150.0944	GREVILLEA CREEK ALLUVIUM	COND 6200	1.9	8.4
8362	-24.8923	150.0849	GREVILLEA CREEK ALLUVIUM		2	6.7
32632	-24.8849	150.1462	GREVILLEA CREEK ALLUVIUM		1.89	6
128185	-24.415	150.518	KARIBOE CREEK ALLUVIUM		12.6	18.05
89736	-24.3375	150.4332	KARIBOE CREEK ALLUVIUM		1	16.1
68452	-24.3847	150.4778	KARIBOE CREEK ALLUVIUM		1.5	15.7
13030545	-24.4943	150.2504	KARIBOE CREEK ALLUVIUM	COND 1650		13.9
31980	-24.327	150.4563	KARIBOE CREEK ALLUVIUM	COND 2800	45.5	9
31132	-24.9377	150.0773	KARIBOE CREEK ALLUVIUM	COND 2475	30.2	8.8
34106	-24.4114	150.4323	KARIBOE CREEK ALLUVIUM		4.7	7.5
13030084	-25.2097	150.1411	KARIBOE CREEK ALLUVIUM	COND 2230		4.8
31527	-24.6862	149.8354	KARIBOE CREEK ALLUVIUM		37.8	4.6
31528	-25.155	150.1756	KARIBOE CREEK ALLUVIUM		38.4	3.3
68835	-24.3204	150.4372	KROOMBIT CREEK ALLUVIUM		1.38	59.5
128220	-24.8998	150.1083	KROOMBIT CREEK ALLUVIUM		0.63	18
128187	-24.5719	150.4381	KROOMBIT CREEK ALLUVIUM		25.26	17.7
89963	-24.3845	150.4527	KROOMBIT CREEK ALLUVIUM		0.63	17.55
89957	-24.3787	150.5135	KROOMBIT CREEK ALLUVIUM	POTABLE	9.99	17.5
68489	-24.4145	150.5019	KROOMBIT CREEK ALLUVIUM		0.4	17.4
68829	-24.3056	150.433	KROOMBIT CREEK ALLUVIUM		1	17.2
416	-24.4843	149.8417	KROOMBIT CREEK ALLUVIUM		0.01	16.8
68592	-24.6354	150.4702	KROOMBIT CREEK ALLUVIUM		1.3	16.7
68552	-24.3859	150.435	KROOMBIT CREEK ALLUVIUM	COND 920	1.3	16.6
128596	-24.339	150.4488	KROOMBIT CREEK ALLUVIUM	POTABLE	0.8	16.4
13030694	-24.8443	150.2866	KROOMBIT CREEK ALLUVIUM			16.35
68843	-24.347	150.4716	KROOMBIT CREEK ALLUVIUM	POTABLE	11.25	16.35

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89890	-24.3325	150.4572	KROOMBIT CREEK ALLUVIUM		1	16.28
89794	-24.8295	149.8	KROOMBIT CREEK ALLUVIUM		0.38	16.2
13030615	-24.3814	150.4989	KROOMBIT CREEK ALLUVIUM			16.13
89737	-24.4106	150.499	KROOMBIT CREEK ALLUVIUM		20.2	16
13030669	-25.1503	150.2606	KROOMBIT CREEK ALLUVIUM			15.8
68456	-24.4092	150.4941	KROOMBIT CREEK ALLUVIUM		20.2	15.8
89733	-24.3374	150.4523	KROOMBIT CREEK ALLUVIUM		1	15.8
89730	-24.41	150.4958	KROOMBIT CREEK ALLUVIUM		1	15.4
68866	-24.7024	150.4858	KROOMBIT CREEK ALLUVIUM		1	15.3
68903	-24.4091	150.4919	KROOMBIT CREEK ALLUVIUM	COND 830	1.89	15.15
89908	-24.2944	150.4138	KROOMBIT CREEK ALLUVIUM	POTABLE	17.5	14.95
68802	-24.4195	150.4347	KROOMBIT CREEK ALLUVIUM		23.94	14.86
13030477	-24.3222	150.4258	KROOMBIT CREEK ALLUVIUM			14.8
31134	-24.9478	150.0768	KROOMBIT CREEK ALLUVIUM	COND 990	0.88	14.6
35002	-24.9828	150.14	KROOMBIT CREEK ALLUVIUM	COND 840	0.76	14.52
43863	-24.305	150.4543	KROOMBIT CREEK ALLUVIUM		35.9	14.4
89956	-24.482	150.421	KROOMBIT CREEK ALLUVIUM	POTABLE	1.2	14.38
32683	-24.3186	150.465	KROOMBIT CREEK ALLUVIUM		0.5	14.2
89873	-24.545	150.4251	KROOMBIT CREEK ALLUVIUM		0.8	14.15
68543	-24.3701	150.5153	KROOMBIT CREEK ALLUVIUM		1.89	14.1
128341	-24.2986	149.6997	KROOMBIT CREEK ALLUVIUM	POTABLE	10.25	14.05
34972	-24.437	150.4186	KROOMBIT CREEK ALLUVIUM		13.9	14
47084	-24.9792	150.0891	KROOMBIT CREEK ALLUVIUM		25.2	13.8
128017	-24.3281	150.4422	KROOMBIT CREEK ALLUVIUM		8	13.8
13030259	-25.0603	150.0714	KROOMBIT CREEK ALLUVIUM			13.73
68057	-24.5376	150.4292	KROOMBIT CREEK ALLUVIUM	POTABLE	1.1	13.7
62034	-24.3261	150.4455	KROOMBIT CREEK ALLUVIUM		0.8	13.7
68605	-24.3045	150.3994	KROOMBIT CREEK ALLUVIUM	COND 2650	1.2	13.7
89857	-25.2773	149.7392	KROOMBIT CREEK ALLUVIUM	POTABLE	0.8	13.7
128028	-24.4268	150.5141	KROOMBIT CREEK ALLUVIUM		1.26	13.7
68911	-24.8226	149.8055	KROOMBIT CREEK ALLUVIUM			13.5
89789	-24.4262	150.4286	KROOMBIT CREEK ALLUVIUM		0.76	13.5
128002	-24.3387	150.4566	KROOMBIT CREEK ALLUVIUM		0.8	13.4
128654	-24.3582	150.4383	KROOMBIT CREEK ALLUVIUM	POTABLE		13.35
68981	-24.3657	150.4964	KROOMBIT CREEK ALLUVIUM	POTABLE	0.56	13.34
68611	-24.6073	150.4462	KROOMBIT CREEK ALLUVIUM		12.6	13.3
128010	-24.3572	150.5143	KROOMBIT CREEK ALLUVIUM		8.75	13.3
68761	-24.3738	150.5011	KROOMBIT CREEK ALLUVIUM		1.4	13.2
68912	-24.8306	149.8011	KROOMBIT CREEK ALLUVIUM		1	13.15
68950	-24.2953	150.4233	KROOMBIT CREEK ALLUVIUM		0.75	13.13
68621	-24.4189	150.4263	KROOMBIT CREEK ALLUVIUM		19	13.1
68801	-25.2423	149.6972	KROOMBIT CREEK ALLUVIUM	COND 500	15.12	13
68800	-24.4026	150.4835	KROOMBIT CREEK ALLUVIUM		0.88	13
68618	-24.3978	150.4875	KROOMBIT CREEK ALLUVIUM		7.56	12.95
47252	-25.2817	150.26	KROOMBIT CREEK ALLUVIUM		0.6	12.9
128369	-24.8984	150.0878	KROOMBIT CREEK ALLUVIUM	POTABLE	12	12.9
13030679	-25.2729	150.2783	KROOMBIT CREEK ALLUVIUM	COND 1250	1.26	12.8
43088	-24.3413	150.4862	KROOMBIT CREEK ALLUVIUM	COND 2110	11.3	12.8
47251	-25.0679	150.2483	KROOMBIT CREEK ALLUVIUM		0.6	12.8
68735	-24.3852	150.4771	KROOMBIT CREEK ALLUVIUM		12.6	12.7
47249	-24.9584	150.1083	KROOMBIT CREEK ALLUVIUM		0.6	12.6
57496	-24.329	150.4209	KROOMBIT CREEK ALLUVIUM		1	12.6

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68960	-24.4065	150.4599	KROOMBIT CREEK ALLUVIUM		38	12.6
8659	-24.9387	150.0709	KROOMBIT CREEK ALLUVIUM	TDS 686 MG/L	1.1	12.5
67278	-24.3638	150.449	KROOMBIT CREEK ALLUVIUM	POTIABLE	1.76	12.5
68999	-24.3764	150.5059	KROOMBIT CREEK ALLUVIUM		12.6	12.5
68697	-24.4187	150.4661	KROOMBIT CREEK ALLUVIUM		1	12.4
47250	-24.9804	150.1036	KROOMBIT CREEK ALLUVIUM		0.63	12.37
68732	-24.4284	150.4797	KROOMBIT CREEK ALLUVIUM		0.63	12.35
13030696	-25.0564	150.475	KROOMBIT CREEK ALLUVIUM			12.2
47248	-24.9581	150.1136	KROOMBIT CREEK ALLUVIUM		0.6	12.2
57694	-24.5592	150.4299	KROOMBIT CREEK ALLUVIUM		31.5	12.2
62116	-24.3641	150.4704	KROOMBIT CREEK ALLUVIUM		0.5	12.2
13030680	-25.2731	150.2989	KROOMBIT CREEK ALLUVIUM	COND 1500	1.26	12.15
47297	-25.199	149.825	KROOMBIT CREEK ALLUVIUM	COND 1657	15.14	12.08
13030631	-24.3772	150.5069	KROOMBIT CREEK ALLUVIUM			11.9
68018	-24.409	150.5146	KROOMBIT CREEK ALLUVIUM	POTABLE	1	11.9
62315	-25.1853	149.6424	KROOMBIT CREEK ALLUVIUM			11.9
68482	-24.3653	150.4976	KROOMBIT CREEK ALLUVIUM		0.5	11.9
34023	-24.3657	150.5173	KROOMBIT CREEK ALLUVIUM		0.3	11.8
68198	-24.3284	150.4429	KROOMBIT CREEK ALLUVIUM		18.9	11.8
13030670	-25.1542	150.2458	KROOMBIT CREEK ALLUVIUM			11.4
89964	-24.3655	150.5121	KROOMBIT CREEK ALLUVIUM		25.25	11.4
47617	-24.4125	150.4347	KROOMBIT CREEK ALLUVIUM		0.6	11.3
33294	-24.3673	150.4878	KROOMBIT CREEK ALLUVIUM	COND 5400	7.6	11.3
47161	-25.0162	150.1525	KROOMBIT CREEK ALLUVIUM		0.6	11.3
68834	-24.4524	150.5083	KROOMBIT CREEK ALLUVIUM		22.73	11.27
62237	-24.4084	150.4686	KROOMBIT CREEK ALLUVIUM		0.6	11.2
68029	-24.4358	150.4958	KROOMBIT CREEK ALLUVIUM		0.5	11.1
68478	-24.3286	150.4714	KROOMBIT CREEK ALLUVIUM		33	11.05
13030548	-24.5091	150.258	KROOMBIT CREEK ALLUVIUM	COND 2900		10.9
33651	-24.3592	150.4827	KROOMBIT CREEK ALLUVIUM	COND 1270	8.9	10.9
47971	-24.6133	150.4534	KROOMBIT CREEK ALLUVIUM		12.6	10.9
62118	-24.4228	150.4816	KROOMBIT CREEK ALLUVIUM		0.6	10.9
68862	-24.319	150.4088	KROOMBIT CREEK ALLUVIUM		34.02	10.9
68975	-24.325	150.47	KROOMBIT CREEK ALLUVIUM		20.16	10.75
13030724	-24.8333	150.3058	KROOMBIT CREEK ALLUVIUM			10.7
89860	-25.1768	149.7858	KROOMBIT CREEK ALLUVIUM			10.65
68238	-24.5315	150.4333	KROOMBIT CREEK ALLUVIUM	COND 3500	1.9	10.6
68805	-24.4451	150.4989	KROOMBIT CREEK ALLUVIUM		1	10.6
68932	-24.8154	149.7478	KROOMBIT CREEK ALLUVIUM	POTABLE		10.6
37312	-24.3604	150.4958	KROOMBIT CREEK ALLUVIUM		1	10.5
62914	-24.3608	150.4746	KROOMBIT CREEK ALLUVIUM		0.6	10.5
68982	-24.3736	150.5066	KROOMBIT CREEK ALLUVIUM	POTABLE	0.9	10.5
89714	-24.3792	150.5055	KROOMBIT CREEK ALLUVIUM		0.5	10.5
43662	-24.3756	150.5113	KROOMBIT CREEK ALLUVIUM		0.3	10.4
13030635	-24.3594	150.4817	KROOMBIT CREEK ALLUVIUM			10.1
32335	-24.3538	150.4397	KROOMBIT CREEK ALLUVIUM		31.6	10
38577	-24.3767	150.4818	KROOMBIT CREEK ALLUVIUM	COND 7800	7.6	10
47185	-24.9629	150.1489	KROOMBIT CREEK ALLUVIUM		1.7	10
47542	-24.6141	150.4223	KROOMBIT CREEK ALLUVIUM		16.4	10
62426	-24.4065	150.4823	KROOMBIT CREEK ALLUVIUM		1.1	10
89722	-24.4173	150.503	KROOMBIT CREEK ALLUVIUM	POTABLE	1.25	10
13030716	-25.0628	150.1372	KROOMBIT CREEK ALLUVIUM			9.95

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68806	-24.4034	150.4591	KROOMBIT CREEK ALLUVIUM		26.46	9.91
57792	-24.3162	150.4444	KROOMBIT CREEK ALLUVIUM	COND 5550	12.6	9.9
47600	-24.6219	150.4567	KROOMBIT CREEK ALLUVIUM		16.1	9.9
32681	-24.3415	150.4564	KROOMBIT CREEK ALLUVIUM		23.2	9.9
33987	-24.3183	150.4899	KROOMBIT CREEK ALLUVIUM		0.63	9.9
32006	-24.3319	150.4534	KROOMBIT CREEK ALLUVIUM	POTABLE		9.8
31133	-24.999	150.0758	KROOMBIT CREEK ALLUVIUM		21.7	9.7
31739	-24.3216	150.4391	KROOMBIT CREEK ALLUVIUM		25.2	9.6
43149	-24.3661	150.5071	KROOMBIT CREEK ALLUVIUM		17.7	9.6
47299	-25.2004	149.765	KROOMBIT CREEK ALLUVIUM		10.61	9.53
13030269	-24.4775	150.391	KROOMBIT CREEK ALLUVIUM	COND 2200	13.9	9.5
62425	-24.3115	150.4174	KROOMBIT CREEK ALLUVIUM		1	9.5
34174	-24.4092	150.4912	KROOMBIT CREEK ALLUVIUM		11.4	9.4
36051	-24.3815	150.26	KROOMBIT CREEK ALLUVIUM	COND 2600	1	9.3
36145	-24.6623	150.477	KROOMBIT CREEK ALLUVIUM		22	9.3
13030266	-24.7603	150.507	KROOMBIT CREEK ALLUVIUM	COND 2340		9.29
47298	-25.1606	149.8125	KROOMBIT CREEK ALLUVIUM	COND 1950		9.2
13030144	-24.4733	150.4055	KROOMBIT CREEK ALLUVIUM	COND 1950	41.7	9.2
35050	-24.3517	150.2908	KROOMBIT CREEK ALLUVIUM		0.6	9.2
447	-24.4764	149.8125	KROOMBIT CREEK ALLUVIUM	TDS 350 MG/L	0	9.14
34011	-24.977	150.1372	KROOMBIT CREEK ALLUVIUM		2.5	9.1
32717	-24.3174	150.4544	KROOMBIT CREEK ALLUVIUM	COND 2500	39	8.9
34553	-24.4276	150.5134	KROOMBIT CREEK ALLUVIUM		0.6	8.9
32893	-24.4127	150.4917	KROOMBIT CREEK ALLUVIUM	COND 3000	18.1	8.8
34131	-24.4113	150.5072	KROOMBIT CREEK ALLUVIUM	COND 1750	17.8	8.7
47599	-24.6204	150.4559	KROOMBIT CREEK ALLUVIUM		15.1	8.5
32892	-24.3711	150.4991	KROOMBIT CREEK ALLUVIUM	POTABLE	64.6	8.5
34066	-24.4104	150.4324	KROOMBIT CREEK ALLUVIUM		2	8.5
13030149	-24.8834	150.1685	KROOMBIT CREEK ALLUVIUM	COND 1750	33.1	8.47
31740	-24.3118	150.4436	KROOMBIT CREEK ALLUVIUM		21.7	8.4
44510	-24.3712	150.4747	KROOMBIT CREEK ALLUVIUM		27.2	8.3
13030157	-24.9303	150.0778	KROOMBIT CREEK ALLUVIUM			8.2
8359	-24.9159	150.0925	KROOMBIT CREEK ALLUVIUM		2.3	8.2
32801	-24.3651	150.471	KROOMBIT CREEK ALLUVIUM		12.6	8.2
68530	-24.5901	150.419	KROOMBIT CREEK ALLUVIUM		0.8	8.1
13030150	-24.883	150.1672	KROOMBIT CREEK ALLUVIUM	COND 1560		8.05
13030095	-25.0806	150.3056	KROOMBIT CREEK ALLUVIUM	COND 2410		7.8
13030267	-24.5821	150.1577	KROOMBIT CREEK ALLUVIUM	COND 1310		7.6
32334	-24.307	150.4548	KROOMBIT CREEK ALLUVIUM	COND 1840	22.4	7.6
62269	-24.4468	150.4256	KROOMBIT CREEK ALLUVIUM		1.1	7.6
13030143	-24.5177	150.3544	KROOMBIT CREEK ALLUVIUM	COND 2060		7.5
13030112	-24.6869	150.3603	KROOMBIT CREEK ALLUVIUM	COND 1150		7.5
13030147	-24.8139	150.0999	KROOMBIT CREEK ALLUVIUM	COND 2600	46.6	7.5
32722	-24.3298	150.4643	KROOMBIT CREEK ALLUVIUM			7.44
13030146	-24.3125	150.0044	KROOMBIT CREEK ALLUVIUM	COND 1960		7.4
57822	-24.3805	150.476	KROOMBIT CREEK ALLUVIUM		25.2	7.3
32905	-24.3661	150.4736	KROOMBIT CREEK ALLUVIUM	COND 2150	30	7.3
33199	-24.3914	150.4741	KROOMBIT CREEK ALLUVIUM		3.8	7.3
34015	-24.3495	150.4975	KROOMBIT CREEK ALLUVIUM		0.25	7.3
62189	-24.3003	150.4224	KROOMBIT CREEK ALLUVIUM	COND 3500	26.5	7.3
13030145	-24.3803	150.4336	KROOMBIT CREEK ALLUVIUM	COND 2100		7.3
13030268	-24.4761	150.4046	KROOMBIT CREEK ALLUVIUM	COND 920		7.2

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13030602	-24.4168	150.5025	KROOMBIT CREEK ALLUVIUM	COND 1880		7.11
8369	-24.9054	150.0758	KROOMBIT CREEK ALLUVIUM	TDS 1616 MG/L	2.3	7
31273	-24.2962	150.4225	KROOMBIT CREEK ALLUVIUM	COND 6620	0.63	7
32333	-24.3386	150.4493	KROOMBIT CREEK ALLUVIUM		27.9	6.9
13030603	-24.4186	150.5042	KROOMBIT CREEK ALLUVIUM	COND 1750		6.83
32336	-24.3235	150.4556	KROOMBIT CREEK ALLUVIUM		1	6.8
35037	-24.4967	150.4206	KROOMBIT CREEK ALLUVIUM		55.9	6.78
62523	-24.3408	150.4437	KROOMBIT CREEK ALLUVIUM	COND 2800	18.9	6.75
13030135	-24.7013	150.4439	KROOMBIT CREEK ALLUVIUM	COND 2620		6.7
31625	-24.3228	150.4383	KROOMBIT CREEK ALLUVIUM	COND 4250	18.9	6.7
31270	-25.0325	150.1516	KROOMBIT CREEK ALLUVIUM	COND 3150	14.2	6.7
36614	-24.3061	150.4235	KROOMBIT CREEK ALLUVIUM	COND 8420	0.9	6.7
13030601	-24.3833	150.4811	KROOMBIT CREEK ALLUVIUM	COND 1950		6.65
57745	-24.4301	150.5113	KROOMBIT CREEK ALLUVIUM		29	6.6
13030240	-24.7603	150.4808	KROOMBIT CREEK ALLUVIUM	COND 1580		6.55
31657	-24.3032	150.4418	KROOMBIT CREEK ALLUVIUM		1.2	6.5
43862	-24.3133	150.4586	KROOMBIT CREEK ALLUVIUM		37.9	6.5
13030600	-24.6242	150.4214	KROOMBIT CREEK ALLUVIUM	COND 1580		6.5
32906	-24.3664	150.4738	KROOMBIT CREEK ALLUVIUM	COND 1500	38	6.3
62119	-24.3072	150.4144	KROOMBIT CREEK ALLUVIUM		0.5	6.3
32162	-24.3219	150.3938	KROOMBIT CREEK ALLUVIUM	COND 3300	32.83	6.25
31886	-24.3207	150.4488	KROOMBIT CREEK ALLUVIUM		0.5	6.2
47607	-24.4376	150.5158	KROOMBIT CREEK ALLUVIUM			6.1
8366	-24.8612	150.2397	KROOMBIT CREEK ALLUVIUM		2.3	6.1
32720	-24.2789	150.3341	KROOMBIT CREEK ALLUVIUM	COND 3250	45	5.99
32719	-24.3675	150.4485	KROOMBIT CREEK ALLUVIUM	COND 1840	24.7	5.97
31626	-24.2804	150.4406	KROOMBIT CREEK ALLUVIUM		20.7	5.9
31526	-24.3087	150.431	KROOMBIT CREEK ALLUVIUM	COND 3700	39.4	5.8
13030262	-24.7935	150.5052	KROOMBIT CREEK ALLUVIUM			5.64
8276	-24.937	150.0676	KROOMBIT CREEK ALLUVIUM	TDS 644 MG/L	0.9	5.6
13030108	-24.7669	150.5173	KROOMBIT CREEK ALLUVIUM	COND 1960		5.5
34003	-24.3187	150.4893	KROOMBIT CREEK ALLUVIUM		0.74	5.4
32721	-24.279	150.3342	KROOMBIT CREEK ALLUVIUM	COND 2000	35.5	5.3
32783	-25.1592	150.2172	KROOMBIT CREEK ALLUVIUM	COND 2800	30	5.18
33418	-24.3862	150.4882	KROOMBIT CREEK ALLUVIUM		19.8	5.18
13030261	-24.6208	150.4187	KROOMBIT CREEK ALLUVIUM			5.13
13030263	-24.7628	150.4652	KROOMBIT CREEK ALLUVIUM			5.13
13030110	-24.8834	150.4576	KROOMBIT CREEK ALLUVIUM	COND 1910		5.1
13030111	-24.7127	150.4612	KROOMBIT CREEK ALLUVIUM	COND 1950	32.8	5.1
13030096	-24.7164	150.2851	KROOMBIT CREEK ALLUVIUM	COND 1900		5.1
13030109	-24.8524	150.4598	KROOMBIT CREEK ALLUVIUM	COND 1930		5.1
32022	-24.3351	150.4478	KROOMBIT CREEK ALLUVIUM	2305 US/CM	27.8	4.8
32902	-24.9059	150.1258	KROOMBIT CREEK ALLUVIUM		18.9	4.8
32718	-24.3523	150.4487	KROOMBIT CREEK ALLUVIUM	COND 3750	52.3	4.7
31749	-24.3305	150.4418	KROOMBIT CREEK ALLUVIUM	COND 2850	34.1	4.6
13030265	-24.7603	150.4645	KROOMBIT CREEK ALLUVIUM			4.49
32161	-24.316	150.4591	KROOMBIT CREEK ALLUVIUM	COND 3130	20.2	4.4
32904	-24.3329	150.463	KROOMBIT CREEK ALLUVIUM	COND 2390	36.5	4.4
32781	-24.4723	150.1508	KROOMBIT CREEK ALLUVIUM	COND 3300	63	4.34
32903	-24.3414	150.4771	KROOMBIT CREEK ALLUVIUM	COND 2420	25	4.3
13030264	-24.7632	150.476	KROOMBIT CREEK ALLUVIUM			4.12
13030093	-25.0698	150.311	KROOMBIT CREEK ALLUVIUM	COND 4100		4.1

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13030098	-24.7694	150.4541	KROOMBIT CREEK ALLUVIUM	COND 3500		4
13030137	-24.5217	150.4486	KROOMBIT CREEK ALLUVIUM	COND 3400		3.8
31529	-24.3268	150.4293	KROOMBIT CREEK ALLUVIUM		52.7	3.6
13030238	-24.7615	150.4763	KROOMBIT CREEK ALLUVIUM	COND 3000		3.3
13030100	-24.8585	150.4642	KROOMBIT CREEK ALLUVIUM	COND 1440		2.9
13030102	-24.8583	150.4633	KROOMBIT CREEK ALLUVIUM			2.8
13030106	-24.7572	150.4583	KROOMBIT CREEK ALLUVIUM			2.8
13030103	-24.8583	150.4632	KROOMBIT CREEK ALLUVIUM			2.7
13030107	-24.7584	150.4615	KROOMBIT CREEK ALLUVIUM	COND 2840		2.6
13030105	-24.8056	150.5129	KROOMBIT CREEK ALLUVIUM	COND 3010	31.6	2.6
13030099	-24.7798	150.4637	KROOMBIT CREEK ALLUVIUM	COND 2450		2.5
13030104	-24.8249	150.4862	KROOMBIT CREEK ALLUVIUM	COND 3000		2.3
13030237	-24.8318	150.3143	KROOMBIT CREEK ALLUVIUM			2.06
128378	-25.1541	150.1713	LONESOME CREEK ALLUVIUM	POTABLE	0.99	9.5
128311	-25.022	150.158	LONESOME CREEK ALLUVIUM	POTABLE	0.99	8.7
89582	-24.3615	150.4669	LONESOME CREEK ALLUVIUM		10	8.5
68337	-24.6275	150.4239	LONESOME CREEK ALLUVIUM	COND 3850	23	6.15
68104	-24.3436	150.4744	LONESOME CREEK ALLUVIUM	COND 3850	22.7	5.95
68105	-24.4078	150.4966	LONESOME CREEK ALLUVIUM	COND 670	23.9	5.8
68103	-24.3427	150.4757	LONESOME CREEK ALLUVIUM	COND 1350	43.6	5.65
68338	-24.6415	150.4591	LONESOME CREEK ALLUVIUM	COND 4600	23	5.54
89591	-24.3858	150.4987	LONESOME CREEK ALLUVIUM	COND 3300	25.3	5.3
128154	-24.3233	150.442	MOOCOOROOBA GRANITE	1220 M/S	0.25	17
128154	-24.3233	150.442	MOOCOOROOBA GRANITE	1110 M/S	1.14	9
128154	-24.3233	150.442	MOOCOOROOBA GRANITE	1430 M/S	0.25	6.4
47186	-24.9851	150.15	OAKY CREEK ALLUVIUM		1	12.1
13030714	-24.9317	150.1756	OAKY CREEK ALLUVIUM			9.25
13030713	-24.9161	150.3817	OAKY CREEK ALLUVIUM	BRACKISH		9.1
128195	-24.3674	150.4775	OXTRACK FORMATION	1200 M/S	0.6	26.5
10926	-24.9415	150.0749	OXTRACK FORMATION	FAIR	1.8	3
44642	-24.3723	150.4921	PROSPECT CREEK ALLUVIUM		10.1	14
89903	-24.3714	150.4836	PROSPECT CREEK ALLUVIUM		0.76	13.95
89832	-24.4124	150.4735	PROSPECT CREEK ALLUVIUM		22.7	13.65
36418	-24.3917	150.4689	PROSPECT CREEK ALLUVIUM	COND 1520	0.3	13
128021	-24.3499	150.4722	PROSPECT CREEK ALLUVIUM		0.44	12.45
34774	-25.1247	150.0633	PROSPECT CREEK ALLUVIUM		0.9	12.3
33848	-24.3995	150.4295	PROSPECT CREEK ALLUVIUM		1.69	12.2
128037	-24.3306	150.4652	PROSPECT CREEK ALLUVIUM	POTABLE	0.9	12.2
31234	-24.9553	150.0744	PROSPECT CREEK ALLUVIUM		0.57	11.7
128207	-24.3848	150.4526	PROSPECT CREEK ALLUVIUM		3	11.5
68985	-24.3754	150.5071	PROSPECT CREEK ALLUVIUM		1.26	11.4
34210	-24.4126	150.4325	PROSPECT CREEK ALLUVIUM		0.19	11.1
43137	-24.2971	150.4501	PROSPECT CREEK ALLUVIUM	COND 2100	1.3	10.84
62577	-24.4267	150.5097	PROSPECT CREEK ALLUVIUM	COND 2720	13.9	10.7
68777	-24.5595	150.4839	PROSPECT CREEK ALLUVIUM		0.75	10.15
68313	-24.495	150.4214	PROSPECT CREEK ALLUVIUM		0.5	10
31235	-24.2762	150.399	PROSPECT CREEK ALLUVIUM	COND 2060	31.6	9.8
31385	-24.3201	150.4158	PROSPECT CREEK ALLUVIUM		10.1	9.1
34492	-24.4318	150.501	PROSPECT CREEK ALLUVIUM		0.12	9.1
68674	-24.7282	150.5037	PROSPECT CREEK ALLUVIUM	COND?? 2800	8.4	8.66
68676	-24.4177	150.4283	PROSPECT CREEK ALLUVIUM		1.76	8.1
31239	-24.2859	150.4113	PROSPECT CREEK ALLUVIUM	POTABLE	9.25	7.92

Bore ID (RN)	Latitude	Longitude	Hydraulic unit	Water quality (µS/cm)	Yield (L/s)	Water level (mbgl)
31884	-24.3351	150.4447	PROSPECT CREEK ALLUVIUM		0.25	7.9
13030010	-24.7171	150.2296	PROSPECT CREEK ALLUVIUM	COND 1380		7.8
57850	-24.3833	150.47	PROSPECT CREEK ALLUVIUM		29	7.7
33073	-24.3858	150.4346	PROSPECT CREEK ALLUVIUM	COND 1250	24	7.6
33933	-24.414	150.4718	PROSPECT CREEK ALLUVIUM		0.63	7.6
33202	-24.3863	150.4434	PROSPECT CREEK ALLUVIUM	COND 3100	1.9	7.4
68322	-24.4212	150.4344	PROSPECT CREEK ALLUVIUM		0.5	7.4
33374	-24.3892	150.4326	PROSPECT CREEK ALLUVIUM		18.9	7.3
47188	-24.9854	150.1522	PROSPECT CREEK ALLUVIUM	COND 1400	12.95	7.2
35065	-24.8212	150.3583	PROSPECT CREEK ALLUVIUM		0.38	6.96
31267	-25.0697	150.1317	PROSPECT CREEK ALLUVIUM		2.5	6.9
68871	-24.4196	150.4956	PROSPECT CREEK ALLUVIUM		0.63	6.6
31236	-24.9568	150.0777	PROSPECT CREEK ALLUVIUM	COND 3850	2.3	6.55
31130	-24.9537	150.0769	PROSPECT CREEK ALLUVIUM	COND 1200	26	6.5
68275	-24.4384	150.4197	PROSPECT CREEK ALLUVIUM	COND 2700	17	6.5
68906	-24.3457	150.4361	PROSPECT CREEK ALLUVIUM	1500PPM	1.89	6.4
35965	-24.4211	150.2446	PROSPECT CREEK ALLUVIUM	COND 2380	1.1	6.2
68905	-24.4095	150.495	PROSPECT CREEK ALLUVIUM	TDS 630 PPM	6.3	6.2
31883	-24.3	150.4476	PROSPECT CREEK ALLUVIUM		14	6
34326	-24.4272	150.5126	PROSPECT CREEK ALLUVIUM	COND 4200	2.3	6
47303	-25.2334	149.7297	PROSPECT CREEK ALLUVIUM	COND 3100	7.2	5.9
13030009	-24.339	150.1634	PROSPECT CREEK ALLUVIUM	COND 1950		5.8
33849	-24.4171	150.4667	PROSPECT CREEK ALLUVIUM			5.8
34892	-24.3361	150.5119	PROSPECT CREEK ALLUVIUM		15.2	5.8
68278	-24.3665	150.513	PROSPECT CREEK ALLUVIUM		9.1	5.8
13030003	-24.4217	150.4287	PROSPECT CREEK ALLUVIUM	COND 6750		5.7
13030006	-24.4319	149.9005	PROSPECT CREEK ALLUVIUM	COND 2060	31.16	5.6
13030008	-24.3682	150.5157	PROSPECT CREEK ALLUVIUM	COND 2060		5.5
13030007	-24.3868	150.4423	PROSPECT CREEK ALLUVIUM	COND 1900		5.5
35064	-24.8254	150.345	PROSPECT CREEK ALLUVIUM	COND 2100	0.25	5.5
31238	-24.8989	150.091	PROSPECT CREEK ALLUVIUM		1.26	5.49
13030005	-24.3203	150.4548	PROSPECT CREEK ALLUVIUM	COND 1850		5.4
35063	-24.4255	150.2273	PROSPECT CREEK ALLUVIUM		0.38	5.29
68907	-24.432	150.5134	PROSPECT CREEK ALLUVIUM	3000PPM	2.5	5.1
13030215	-24.9872	150.5142	PROSPECT CREEK ALLUVIUM	COND 2800		4.73
68031	-24.3	150.4369	PROSPECT CREEK ALLUVIUM		30.2	4.7
31440	-24.3083	150.4409	PROSPECT CREEK ALLUVIUM	COND 1440	18.9	4.7
34584	-25.1565	150.2614	PROSPECT CREEK ALLUVIUM	COND 1950	7.6	4.57
13030004	-24.4091	150.4924	PROSPECT CREEK ALLUVIUM	COND 5700		4.1
68753	-24.3763	150.5015	PROSPECT CREEK ALLUVIUM	COND 2840	18.9	4.04
31240	-24.2936	150.3999	PROSPECT CREEK ALLUVIUM	POTABLE	1.26	4.03
31381	-24.9008	150.112	PROSPECT CREEK ALLUVIUM			3.8
32671	-24.6136	149.8414	PROSPECT CREEK ALLUVIUM	COND 2950	11.9	3.7
13030214	-24.8473	150.4474	PROSPECT CREEK ALLUVIUM	BRACKISH		3.5
34069	-24.4112	150.4323	PROSPECT CREEK ALLUVIUM		27.3	3.38
31444	-24.2992	150.4205	PROSPECT CREEK ALLUVIUM		20.2	3.3
57561	-24.6362	150.4694	PROSPECT CREEK ALLUVIUM			3.3
13030002	-24.3031	150.4227	PROSPECT CREEK ALLUVIUM	COND 1560		3.2
31065	-24.9381	150.0861	PROSPECT CREEK ALLUVIUM	COND 2050	1.5	2.6
13030218	-24.4378	150.1402	PROSPECT CREEK ALLUVIUM			2.51
33757	-24.3669	150.4998	PROSPECT CREEK ALLUVIUM		13.89	2.44
13030216	-24.4451	150.1028	PROSPECT CREEK ALLUVIUM	COND 1150		2.29

Bore ID (RN)	Latitude	Longitude	Hydraulic unit	Water quality (µS/cm)	Yield (L/s)	Water level (mbgl)
68003	-24.3833	150.498	PROSPECT CREEK ALLUVIUM	POTABLE	17.6	2.2
33774	-24.3439	150.5	PROSPECT CREEK ALLUVIUM		13.9	1.8
13030001	-24.3789	150.4992	PROSPECT CREEK ALLUVIUM	COND 2120		1.5
31050	-24.9421	150.0726	PROSPECT CREEK ALLUVIUM	POTABLE	1	1.5
31051	-24.9487	150.0843	PROSPECT CREEK ALLUVIUM		8.8	1.5
31071	-24.9409	150.0744	PROSPECT CREEK ALLUVIUM		11.4	1.5
62281	-24.4466	150.4255	PROSPECT CREEK ALLUVIUM		10	1.4
33915	-24.3525	150.4969	PROSPECT CREEK ALLUVIUM		0.63	0.72
31072	-24.9464	150.0738	PROSPECT CREEK ALLUVIUM		5.7	0.5
33916	-24.414	150.4717	PROSPECT CREEK ALLUVIUM		0.63	0.37
68211	-24.3681	150.5078	QUATERNARY - UNDEFINED	COND 2810	0.4	4.2
68210	-24.3709	150.5108	QUATERNARY - UNDEFINED	COND 2750	0.8	2.8
128502	-24.3856	150.4829	SAND			26
128556	-24.3067	150.457	SAND	POTABLE	1.1	16.3
128539	-25.1583	149.8965	SAND	POTABLE	0.78	15.5
128583	-24.3095	150.4428	SAND	1200	2.8	13.69
128636	-24.3566	150.2983	SAND	2400		13.5
128584	-24.2842	150.4146	SAND	1200	2.5	13.47
128587	-24.4644	150.4305	SAND	820	5	11.8
128651	-24.2808	150.1796	SAND	POTABLE		11.5
128571	-24.6697	150.4768	SAND	POTABLE	0.45	9
128624	-25.177	149.6527	SAND	POTABLE	3	8.8
84698	-24.4172	150.503	SAND		2.6	8.1
128534	-24.5988	149.9106	SAND	GOOD		7.5
128328	-25.0304	150.155	TORSDALE VOLCANICS	1560 MS	0.12	37
89986	-24.3803	150.4984	TORSDALE VOLCANICS	COND 3700	1.7	20.9
128170	-24.3093	150.424	TORSDALE VOLCANICS	2400 M/S	0.13	20.1
68508	-24.5924	150.4424	TORSDALE VOLCANICS	COND 2400	2.3	18.3
128329	-24.9398	150.0498	TORSDALE VOLCANICS	720MS	0.22	17
128177	-24.4304	150.5028	TORSDALE VOLCANICS	1300 M/S	0.58	13.4
89970	-24.9042	150.0766	TORSDALE VOLCANICS	2100 CON	0.57	13
89803	-24.388	150.4844	TORSDALE VOLCANICS	COND 1900	1.1	12.42
89804	-24.276	150.443	TORSDALE VOLCANICS	COND 1650	1.38	12.42
111917	-24.2885	150.4482	TORSDALE VOLCANICS	1000 US/CM	0.5	11.3
31069	-24.8984	150.086	TORSDALE VOLCANICS		0.4	10.4
89971	-24.4417	150.496	TORSDALE VOLCANICS	2000 CON	0.76	10.3
128162	-24.365	150.5118	TORSDALE VOLCANICS		4.99	9
128046	-24.4092	150.5001	TORSDALE VOLCANICS	1500 US/CM	0.9	7
33075	-24.3863	150.4436	TORSDALE VOLCANICS		0.38	6.7
33850	-24.4021	150.43	TORSDALE VOLCANICS		0.03	4.6
128047	-24.4099	150.4968	TORSDALE VOLCANICS	2100 US/CM	0.3	4
89693	-24.3494	150.4772	TUALKA CREEK ALLUVIUM	POTABLE	0.32	7.5
89753	-24.422	150.4919	TUALKA CREEK ALLUVIUM	POTABLE	0.45	7.5
68010	-24.4129	150.5097	UNDIFF BASALT		0.6	6
89759	-24.4097	150.5001	WASHPOOL GULLY ALLUVIUM		1	14.14
68757	-24.3721	150.5012	WASHPOOL GULLY ALLUVIUM		0.88	13.8
68380	-24.6428	150.4624	WASHPOOL GULLY ALLUVIUM		20.7	13.4
68945	-24.4278	150.4216	WASHPOOL GULLY ALLUVIUM		0.6	13.3
68377	-24.5565	150.4197	WASHPOOL GULLY ALLUVIUM		1.9	13.1
35688	-25.1851	150.2644	WASHPOOL GULLY ALLUVIUM	COND 674	17	12.9
62964	-24.3609	150.4512	WASHPOOL GULLY ALLUVIUM		2.3	12.8
62944	-24.312	150.4316	WASHPOOL GULLY ALLUVIUM	POTABLE	1.5	12.7

Bore ID (RN)	Latitude	Longitude	Hydraulic unit	Water quality (µS/cm)	Yield (L/s)	Water level (mbgl)
68522	-24.6007	150.4128	WASHPOOL GULLY ALLUVIUM		0.5	12.7
68502	-24.5815	150.4424	WASHPOOL GULLY ALLUVIUM		0.5	12.6
62958	-24.3749	150.4805	WASHPOOL GULLY ALLUVIUM		0.63	12.15
62957	-24.3753	150.4767	WASHPOOL GULLY ALLUVIUM		17.6	11.8
35687	-24.5443	150.4288	WASHPOOL GULLY ALLUVIUM	COND 1150	28.4	11.6
35689	-25.2329	149.7169	WASHPOOL GULLY ALLUVIUM		10.6	11.6
68595	-24.6542	150.4872	WASHPOOL GULLY ALLUVIUM		0.5	11.5
68020	-24.4136	150.4979	WASHPOOL GULLY ALLUVIUM	POTABLE	1.2	11.27
89747	-24.5335	150.4336	WASHPOOL GULLY ALLUVIUM		1	11.07
35691	-24.3837	150.2859	WASHPOOL GULLY ALLUVIUM		13	10.8
62056	-24.3203	150.4549	WASHPOOL GULLY ALLUVIUM		0.5	10.8
68776	-24.5576	150.4858	WASHPOOL GULLY ALLUVIUM	COND 3400	0.88	10.32
35690	-24.5125	150.5114	WASHPOOL GULLY ALLUVIUM	COND 1260	11.5	9.9
47162	-24.9723	150.1616	WASHPOOL GULLY ALLUVIUM		1	9.3
68182	-24.3679	150.5008	WASHPOOL GULLY ALLUVIUM		32.8	9
57638	-24.5679	150.4127	WASHPOOL GULLY ALLUVIUM		28.4	8.7
47192	-24.9756	150.1378	WASHPOOL GULLY ALLUVIUM	COND 865	15.2	8.57
32353	-24.3412	150.4551	WASHPOOL GULLY ALLUVIUM		30.3	8.5
68070	-24.5162	150.4127	WASHPOOL GULLY ALLUVIUM		0.5	8.2
32355	-24.3461	150.4476	WASHPOOL GULLY ALLUVIUM		1.6	7.8
47615	-24.4349	150.5191	WASHPOOL GULLY ALLUVIUM			7.7
32354	-24.3188	150.4578	WASHPOOL GULLY ALLUVIUM		35.3	7.4
57310	-24.6163	150.4536	WASHPOOL GULLY ALLUVIUM		24	7.1
47247	-24.9667	150.1261	WASHPOOL GULLY ALLUVIUM	COND 2570	1	6.9
62923	-24.4732	150.5177	WASHPOOL GULLY ALLUVIUM		0.6	6.8
57737	-24.5487	150.4297	WASHPOOL GULLY ALLUVIUM		1.3	6.4
35626	-24.538	150.428	WASHPOOL GULLY ALLUVIUM		0.6	6.1
47520	-24.282	150.4435	WASHPOOL GULLY ALLUVIUM		20	6.1
34010	-24.4062	150.4297	WASHPOOL GULLY ALLUVIUM		0.6	2.4

Appendix B - Summary of laboratory results for registered bores sampled in Jan 2013

Description			ANZECC 2000[A] Freshwater 95% *	ANZECC 2000 Agriculture Irrigation	ANZECC 2000 Livestock	NHMRC 2011[B] Drinking Water Guidelines - Health	NHMRC 2011 Drinking Water Guidelines - Aesthetic											
Reference								84478	84253	84479	84477	84477	84477	84322	84321	84479	84477	84477
Sample								128169A	128284C	128587	128636A	128636B	13030385	13030394A	13030823	13030830	9239	47605B
Date								14/01/2013	15/01/2013	18/01/2013	17/01/2013	17/01/2013	17/01/2013	16/01/2013	16/01/2013	18/01/2013	17/01/2013	17/01/2013
	PQL	Units																
Inorganics																		
Calcium - Dissolved	0.5	mg/L			1000			19	77	50	130	77	77	60	450	360	15	85
Potassium - Dissolved	0.5	mg/L						2.8	2.7	5.3	4	10	13	1.6	6.1	60	18	6.1
Sodium - Dissolved	0.5	mg/L		230		20	180	400	170	160	320	38	170	290	1400	4500	54	120
Magnesium - Dissolved	0.5	mg/L						7.2	28	14	61	22	38	45	52	570	8.9	39
Hydroxide Alkalinity (OH^-) as CaCO3	5	mg/L						<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as CaCO3	5	mg/L						680	460	310	440	53	370	500	390	400	480	390
Carbonate Alkalinity as CaCO3	5	mg/L						<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Total Alkalinity as CaCO3	5	mg/L						680	460	310	440	53	370	500	390	400	480	390
Sulphate, SO4	1	mg/L			1000	500	250	<1	12	15	51	<1	<1	26	65	76	<1	2
Chloride, Cl	1	mg/L		350				240	140	140	550	250	320	380	3400	10000	12	240
Ionic Balance		%						-3.8	-0.08	0.72	0.55	-2.5	-5.1	-3.7	-8.1	-5.3	-40	-6.8
Total Dissolved Solids	5	mg/L					600	1200	730	660	1400	740	870	1100	7800	18000	300	820
pH		pH Units		7 - 8.5		6.5 - 8.6		7.7	-	7.4	-	-	-	-	6.9	8.1	-	-
Electrical Conductivity	1	µS/cm						1900	-	1100	-	-	-	-	10000	26000	-	-
Ammonia as N in water	0.005	mg/L	0.9				0.5	0.64	0.073	-	0.074	2.1	14	0.018	0.63	-	76	17
Nitrate as N in water	0.005	mg/L	0.7		339	50		<0.005	0.007	-	0.092	<0.005	<0.005	0.24	<0.005	-	<0.005	<0.005
Nitrite as N in water	0.005	mg/L						<0.005	0.007	-	<0.005	<0.005	<0.005	0.024	<0.005	-	<0.005	<0.005
TKN in water	0.1	mg/L						0.7	0.2	-	0.3	2.3	15	0.2	0.7	-	68	18
Gases																		
Carbon Dioxide CO_2	0	mg/L						24	-	23	-	-	-	-	47	7.2	-	-
Sulphide	0.5	mg/L						<0.5	-	<0.5	-	-	-	-	<0.5	<0.5	-	-
Methane	5	µg/L						14000	-	<5	-	-	-	-	34	<5	-	-

Notes:

A: Australia and New Zealand Environment Conservation Council and Agriculture Resource Management Council of Australia and New Zealand (ANZECC/ARMCANZ) 2000. Australia and New Zealand Guidelines for Fresh and Marine Water Quality, October, 2000

B: National Health and Medical Research Council (NHMRC) 2011. National Water Quality Management Strategy: Australian Drinking Water Guidelines 6.

Description			ANZECC 2000[A] Freshwater 95% *	ANZECC 2000 Agriculture Irrigation	ANZECC 2000 Livestock	NHMRC 2011[B] Drinking Water Guidelines - Health	NHMRC 2011 Drinking Water Guidelines - Aesthetic							
Reference								84477	84187	84187	84253	84253	84253	84253
Sample								47605D	84914	84915A	89509-12	89509-13	89509-15A	89509-16
Date								17/01/2013	14/01/2013	14/01/2013	15/01/2013	15/01/2013	15/01/2013	15/01/2013
	PQL	Units												
Inorganics														
Calcium - Dissolved	0.5	mg/L			1000			**97**	**27**	**53**	**66**	**67**	**53**	**74**
Potassium - Dissolved	0.5	mg/L						**0.8**	**3.7**	**4.3**	**1.2**	**2.9**	**2.1**	**3.1**
Sodium - Dissolved	0.5	mg/L		230		20	180	**87**	**310**	**570**	**120**	**65**	**59**	**170**
Magnesium - Dissolved	0.5	mg/L						**44**	**19**	**46**	**33**	**24**	**19**	**59**
Hydroxide Alkalinity (OH^-) as CaCO3	5	mg/L						<5	<5	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as CaCO3	5	mg/L						**350**	**400**	**750**	**310**	**360**	**270**	**640**
Carbonate Alkalinity as CaCO3	5	mg/L						<5	<5	<5	<5	<5	<5	<5
Total Alkalinity as CaCO3	5	mg/L						**350**	**400**	**750**	**310**	**360**	**270**	**640**
Sulphate, SO4	1	mg/L			1000	500	250	**46**	**8**	**81**	**14**	**10**	**5**	**12**
Chloride, Cl	1	mg/L		350				**170**	**270**	**370**	**180**	**39**	**51**	**140**
Ionic Balance		%						**-2.4**	**2.9**	**7.4**	**-1.6**	**-1.6**	**-0.74**	**-2.5**
Total Dissolved Solids	5	mg/L					600	**770**	**800**	**1300**	**630**	**470**	**380**	**830**
pH		pH Units		7 - 8.5		6.5 - 8.6		-	**7.6**	**7.3**	-	-	-	-
Electrical Conductivity	1	µS/cm						-	**1500**	**2500**	-	-	-	-
Ammonia as N in water	0.005	mg/L	0.9				0.5	<0.005	-	-	<0.005	**0.029**	**0.079**	**2.7**
Nitrate as N in water	0.005	mg/L	0.7		339	50		**0.38**	-	-	**0.8**	<0.005	**0.007**	<0.005
Nitrite as N in water	0.005	mg/L						<0.005	-	-	<0.005	<0.005	<0.005	<0.005
TKN in water	0.1	mg/L						**0.2**	-	-	**0.2**	**0.2**	<0.1	**3.5**
Gases														
Carbon Dioxide CO_2	0	mg/L						-	**21**	**70**	-	-	-	-
Sulphide	0.5	mg/L						-	<0.5	**1.7**	-	-	-	-
Methane	5	µg/L						-	**1900**	**2600**	-	-	-	-

Notes:
A: Australia and New Zealand Environment Conservation Council and Agriculture Resource Management Council of Australia and New Zealand (ANZECC/ARMCANZ) 2000. Australia and New Zealand Guidelines for Fresh and Marine Water Quality, October, 2000
B: National Health and Medical Research Council (NHMRC) 2011. National Water Quality Management Strategy: Australian Drinking Water Guidelines 6.

Description	PQL	Units	ANZECC 2000[A] Freshwater 95%	ANZECC 2000 Agriculture Irrigation	ANZECC 2000 Livestock	NHMRC 2011[B] Drinking Water Guidelines - Health	NHMRC 2011 Drinking Water Guidelines - Aesthetic										
Reference								84478	84253	84479	84477	84477	84477	84322	84321	84479	84477
Sample								128169A	128284C	128587	128636A	128636B	13030385	13030394A	13030823	13030830	9239
Date								14/01/2013	15/01/2013	18/01/2013	17/01/2013	17/01/2013	17/01/2013	16/01/2013	16/01/2013	18/01/2013	17/01/2013
	PQL	Units															
Field Parameters																	
Conductivity (uS/cm)								1781	1154	992	2368	962	1482	1240	9451	25978	4.6
Specific Conductance (uS/cm)								-	-	-	-	945	1492	1284	9349	-	4.3
Dissolved Oxygen (mg/L)								1.43	1.62	4.15	3.28	0.16	0.54	1.34	1.49	7.65	2.47
ORP (mV)								-111.3	-146.3	-32.3	-14.3	-224.8	-203.3	-53.4	-86.1	-87.4	-78.3
pH								7.52	6.87	7.45	6.66	7.01	7.19	6.89	6.76	7.67	7.97
Temperature (^{o}C)								25.2	24.8	26.1	24.1	26	24.6	23.2	25.6	27.2	28.3
Metals Disolved																	
Arsenic-Dissolved	1	µg/L	24	100	500	10		<1	<1	<1	<1	**1**	**1**	**1**	**5**	**1**	<1
Cadmium-Dissolved	0.1	µg/L	0.2	10	10	2		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	1	µg/L		100	1000	50		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper-Dissolved	1	µg/L	1.4	200	400	2000	1000	**2**	**4**	**2**	**2**	<1	<1	<1	**2**	**2**	**1**
Lead-Dissolved	1	µg/L	3.4	2000	100	10		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Mercury-Dissolved	0.05	µg/L	0.6	2	2	1		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	1	µg/L	11	200	1000	20		<1	<1	<1	<1	<1	<1	<1	**3**	**8**	**2**
Zinc-Dissolved	1	µg/L	8	2000	20000		3000	**5**	**8**	**6**	**17**	**7**	**3**	<1	**25**	**39**	**6**
Aluminium-Dissolved	10	µg/L	55	5000	5000		100	<10	-	<10	-	-	-	-	**10**	<10	-
Iron-Dissolved	10	µg/L		200			300	**170**	-	<10	-	-	-	-	**2000**	**53**	-
Beryllium-Dissolved	0.5	µg/L		100		60		<0.5	-	<0.5	-	-	-	-	<0.5	<0.5	-
Barium-Dissolved	1	µg/L				2000		**280**	-	**150**	-	-	-	-	**1200**	**400**	-
Boron-Dissolved	5	µg/L	370	500	5000	4000		**320**	-	**68**	-	-	-	-	**190**	**1200**	-
Cobalt-Dissolved	1	µg/L		50	1000			<1	-	<1	-	-	-	-	**2**	**3**	-
Manganese-Dissolved	5	µg/L	1900	200		500	100	**16**	-	<5	-	-	-	-	**1500**	**660**	-
Molybdenum-Dissolved	1	µg/L						<1	-	<1	-	-	-	-	<1	<1	-
Selenium-Dissolved	1	µg/L						<1	-	**2**	-	-	-	-	<1	<1	-
Uranium-Dissolved	0.5	µg/L						<0.5	-	**1**	-	-	-	-	**2.1**	**2.8**	-
Vanadium-Dissolved	1	µg/L	6	100				<1	-	**4**	-	-	-	-	<1	<1	-
Metals Total																	
Arsenic-Total	1	µg/L	24	100		10		-	<1	-	<1	**3**	**2**	<1	-	-	<1
Cadmium-Total	0.1	µg/L	0.2	10		2		-	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	-	<0.1
Chromium-Total	1	µg/L		100		50		-	<1	-	<1	**1**	<1	<1	-	-	<1
Copper-Total	1	µg/L	1.4	200		2000		-	<1	-	<1	**2**	**2**	1	-	-	**6**
Lead-Total	1	µg/L	3.4	2000		10		-	<1	-	<1	**1**	**5**	<1	-	-	<1
Mercury-Total	0.05	µg/L	0.6	2		1		-	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	-	<0.05
Nickel-Total	1	µg/L	11	200		20		-	<1	-	<1	**2**	**1**	<1	-	-	**3**
Zinc-Total	5	µg/L	8	2000				-	**3**	-	**11**	**14**	**13**	**3**	-	-	**15**

Notes:

A: Australia and New Zealand Environment Conservation Council and Agriculture Resource Management Council of Australia and New Zealand (ANZECC/ARMCANZ) 2000. Australia and New Zealand Guidelines for Fresh and Marine Water Quality, October, 2000

B: National Health and Medical Research Council (NHMRC) 2011. National Water Quality Management Strategy: Australian Drinking Water Guidelines 6.

Description			ANZECC 2000[A] Freshwater 95% *	ANZECC 2000 Agriculture Irrigation	ANZECC 2000 Livestock	NHMRC 2011[B] Drinking Water Guidelines - Health	NHMRC 2011 Drinking Water Guidelines - Aesthetic								
Reference								84477	84477	84187	84187	84253	84253	84253	84253
Sample								47605B	47605D	84914	84915A	89509-12	89509-13	89509-15A	89509-16
Date								17/01/2013	17/01/2013	14/01/2013	14/01/2013	15/01/2013	15/01/2013	15/01/2013	15/01/2013
	PQL	Units													
Field Parameters															
Conductivity (uS/cm)								1387	125.3	1382	2319	1077	690	571	1333
Specific Conductance (uS/cm)								1394	-	1394	2302				1383
Dissolved Oxygen (mg/L)								1.16	2.76	1.03	2.32	3.49	2.18	4.95	1.88
ORP (mV)								-288.5	-54.7	-213.7	-232.5	-40.7	-70	-62.2	-239.8
pH								6.72	7.42	7.35	7.19	6.81	7.12	7.25	6.7
Temperature (^{o}C)								24.7	28.3	24.6	25.4	27.7	23.7	23.1	23.1
Metals Dissolved															
Arsenic-Dissolved	1	µg/L	24	100	500	10		<1	1	**2**	**3**	<1	<1	<1	**2**
Cadmium-Dissolved	0.1	µg/L	0.2	10	10	2		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	1	µg/L		100	1000	50		<1	<1	<1	<1	<1	<1	<1	<1
Copper-Dissolved	1	µg/L	1.4	200	400	2000	1000	<1	**3**	**3**	<1	**2**	**2**	**1**	<1
Lead-Dissolved	1	µg/L	3.4	2000	100	10		<1	<1	<1	<1	<1	<1	<1	<1
Mercury-Dissolved	0.05	µg/L	0.6	2	2	1		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	1	µg/L	11	200	1000	20		<1	<1	<1	**2**	<1	<1	<1	**5**
Zinc-Dissolved	1	µg/L	8	2000	20000		3000	**2**	**7**	**4**	<1	**9**	**16**	**10**	<1
Aluminium-Dissolved	10	µg/L	55	5000	5000		100	-	-	<10	<10	-	-	-	-
Iron-Dissolved	10	µg/L		200			300	-	-	**68**	**41**	-	-	-	-
Beryllium-Dissolved	0.5	µg/L		100		60		-	-	<0.5	<0.5	-	-	-	-
Barium-Dissolved	1	µg/L				2000		-	-	**56**	**66**	-	-	-	-
Boron-Dissolved	5	µg/L	370	500	5000	4000		-	-	**110**	**330**	-	-	-	-
Cobalt-Dissolved	1	µg/L		50	1000			-	-	<1	<1	-	-	-	-
Manganese-Dissolved	5	µg/L	1900	200		500	100	-	-	**240**	**260**	-	-	-	-
Molybdenum-Dissolved	1	µg/L						-	-	**2**	**3**	-	-	-	-
Selenium-Dissolved	1	µg/L						-	-	<1	<1	-	-	-	-
Uranium-Dissolved	0.5	µg/L						-	-	<0.5	<0.5	-	-	-	-
Vanadium-Dissolved	1	µg/L	6	100				-	-	**1**	**2**	-	-	-	-
Metals Total															
Arsenic-Total	1	µg/L	24	100		10		<1	**1**	-	-	<1	<1	<1	**3**
Cadmium-Total	0.1	µg/L	0.2	10		2		<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1
Chromium-Total	1	µg/L		100		50		<1	<1	-	-	<1	<1	<1	**4**
Copper-Total	1	µg/L	1.4	200		2000		**3**	<1	-	-	<1	**2**	**6**	**9**
Lead-Total	1	µg/L	3.4	2000		10		**1**	<1	-	-	<1	**1**	<1	**2**
Mercury-Total	0.05	µg/L	0.6	2		1		<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.05
Nickel-Total	1	µg/L	11	200		20		**1**	<1	-	-	<1	<1	<1	**10**
Zinc-Total	5	µg/L	8	2000				**17**	**2**	-	-	**6**	**15**	**8**	**22**

Notes:

A: Australia and New Zealand Environment Conservation Council and Agriculture Resource Management Council of Australia and New Zealand (ANZECC/ARMCANZ) 2000. Australia and New Zealand Guidelines for Fresh and Marine Water Quality, October, 2000

B: National Health and Medical Research Council (NHMRC) 2011. National Water Quality Management Strategy: Australian Drinking Water Guidelines 6.

Appendix C - Groundwater impact assessment undertaken for 2013 UWIR

Possible changes in groundwater levels in aquifers affected by the extraction of underground water rights in ATP 564 are predicted through the use of a numerical groundwater model. Throughout this analysis, the focus is on aquifers likely to be possibly affected by CSG pumping.

Modelling methodology

MODFLOW-SURFACT model implementation

The numerical groundwater flow model uses MODFLOW-SURFACT (SURFACT) developed and maintained by HydroGeoLogic Inc (HydroGeoLogic 1998). SURFACT is based on the MODFLOW code developed by the United States Geological Survey (McDonald and Harbaugh, 1988) and includes several modifications to address recognised limitations of MODFLOW. The modifications include better handling of dry cells, more accurate tracking of the water table and additional robust solvers packages (HydroGeoLogic, 1998, Panday and Huyakorn, 2008). The requirement of MODFLOW to retain laterally continuous model layers can result in numerous thin and mostly dry cells that can be problematic in areas where the water table extends across multiple layers, particularly in areas of steep topographic gradient. SURFACT is chosen in this study because it is better able to simulate these conditions and provides better numerical stability. All model layers are defined as confined or unconfined depending upon whether the water table lies within each particular model grid cell.

Model domain and grid

The model domain covers a total area of 15,000 km^2 and has an active area of 6,403 km^2. The model grid comprises 150 rows, 100 columns and 6 layers, giving a total of 90,000 cells (37,994 active cells). The grid is shown regionally in Figure 8-1. The south-western extent of the model domain is bounded by the extent of sub-cropping Jurassic formations and steeply dipping Mimosa Syncline. The west and northern model extents are placed sufficiently west and north of the proposed CSG pumping area. The eastern model extent is bounded by the Banana Fault and volcanics.

A rectangular model grid, rotated by 6 degrees (anti clockwise) to align with the Basin morphology, is adopted. The model origin is at 769209.6E, 7177873.346N (MGA Zone 55, GDA1994)

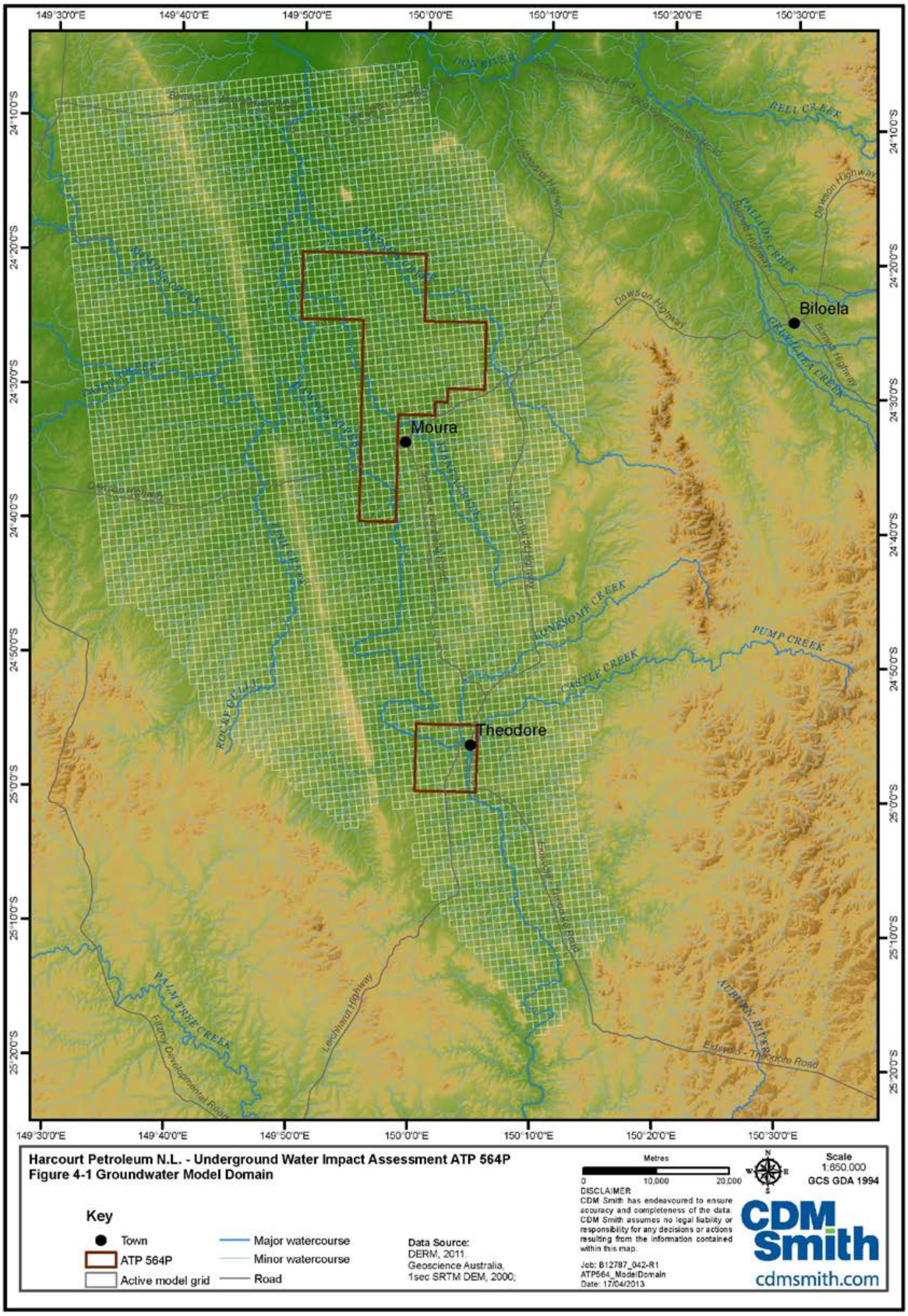


Figure 8-1 Model Domain

A uniform column and row spacing of 1 km is assigned. The model grid discretisation is coarse and is considered commensurate with the current understanding of the site hydrogeology. Refinement of the model grid is not considered warranted at this stage as it would not be expected to increase the confidence level of model predictions without additional site specific data.

Model layers

A 3D hydrogeological model was generated using the Baralaba Coal Measures (BCM) depth, outcrop zones, bore stratigraphy, and nominal dips and thicknesses from the literature. The model is represented by 6 layers in total (Figure 8-2 and Table 8-1). Figure 8-3 correlates the model layers and stratigraphy. The extent, top and base of each layer used in the numerical groundwater model has been sourced from the 3D Hydrogeological model. Due to requirements of SURFACT (specifically that model layers are not allowed to be discontinuous) where geological model layers outcrop then disappear, they are continued in the SURFACT model at a thickness of 1 metre and are assigned the parameters of the layer directly below them. Where the BCM outcrops for example, in the SURFACT model it is overlain by model layers that in other areas represent the full thickness of the Kaloola and Gyranda Subgroup. As previously noted, the Clematis Group does not represent a standalone unit within the Bowen Basin, rather a collection of lithologies in a certain area. The Clematis Group is therefore not allocated a model layer of its own, but where the Clematis Group, the Rewan Group and the Moolayember Formation cross into the area designated as "Clematis", they are all allocated the Clematis Group hydraulic parameters.

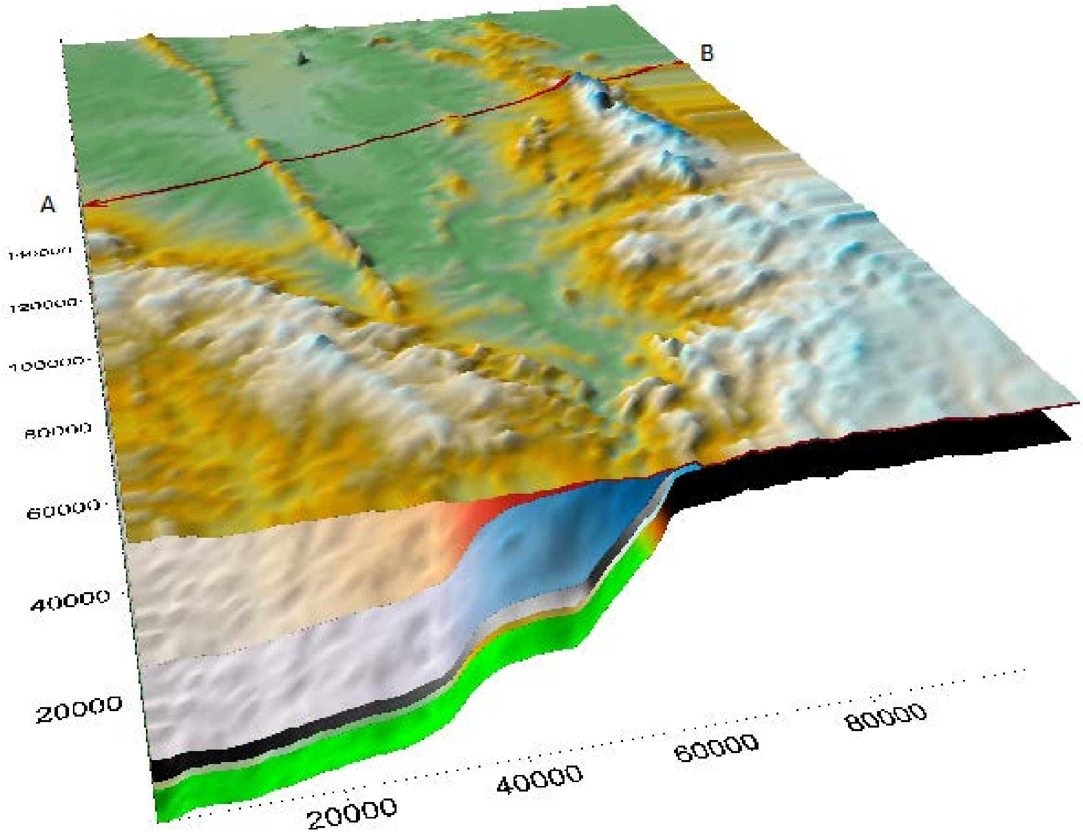


Figure 8-2 3D model of the ground surface and 6 model layers (base of all layers are presented, the alluvium is directly under the ground surface)

Figure 8-3 Down dip cross section through modelling area (cross section A-B)

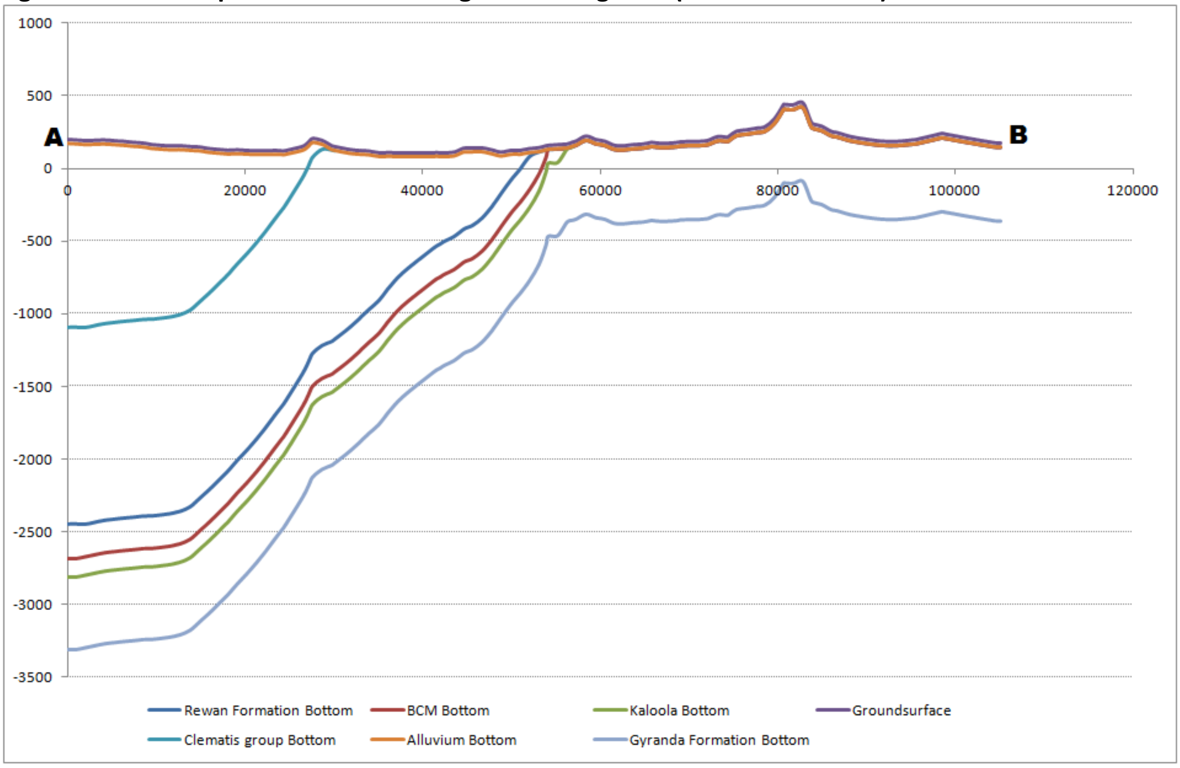


Table 8-1 Model Layers and Stratigraphy

Model Layer	Nominal Thickness (m)	Equivalent Stratigraphy
1	30	Dawson Creek and Boam Creek Alluvium. Sediments in some places.
2	-	Mainly Clematis Group but Rewan Group and Moolayember Formation in places
3	1350	Rewan Group
4	230	Baralaba Coal Measures
5	120	Kaloola member
6	500	Gyranda Subgroup

The top layer of the model is intended to represent the water table aquifer, comprising alluvium and weathered Permian sequences. A uniform thickness of 30 m is assumed for this layer. A typical east –west cross-section through the model domain is shown in Figure 8-4.

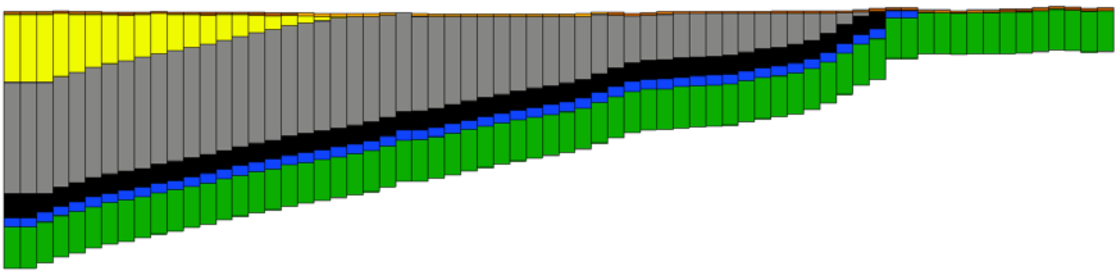


Figure 8-4 East - west model cross section showing the stratigraphy of row 45 (Northing ~7287800m)

Boundary conditions

A no flow boundary condition is assigned around the perimeter of the model. The use of a no flow boundary is conservative and is considered appropriate given the uncertainty in the site hydrogeology and broader hydrogeology beyond the model domain.

A uniform recharge rate of 18.25 mm/yr is assigned to the area of alluvials defined via regional geology to represent the background rainfall derived recharge. Evapotranspiration (ET) from the water table is simulated with an ET rate of 2 m/yr assigned to the top layer of the model and an extinction depth of 5 m.

Model cells in high elevation areas of Layer 1 (e.g. no aquifers present) are inactivated (no flow). Drain cells have been assigned to model Layer 1 for all the major surface drainages (Figure 8-5). Drain elevation equates to topographic level minus 1 to 7 m (to represent a nominal base of drainage channel). A conductance value of 1000 m^2/d has been assigned to drain cells. These drains represent the effect that discharge to shallow surface water bodies (e.g. intermittent creeks and streams) would have on the alluvium.

The implication of the selected boundary conditions is that under a baseline condition all of recharge into the model is balanced by ET and drain flow. Any water removed from simulated production activities will be derived initially from aquifer (and bounding aquitard) storage. The volume of water removed by ET and change will change if the simulated production activities result in drawdown at the water table where the water table lies within the specified ET extinction depth or above the drain base elevation.

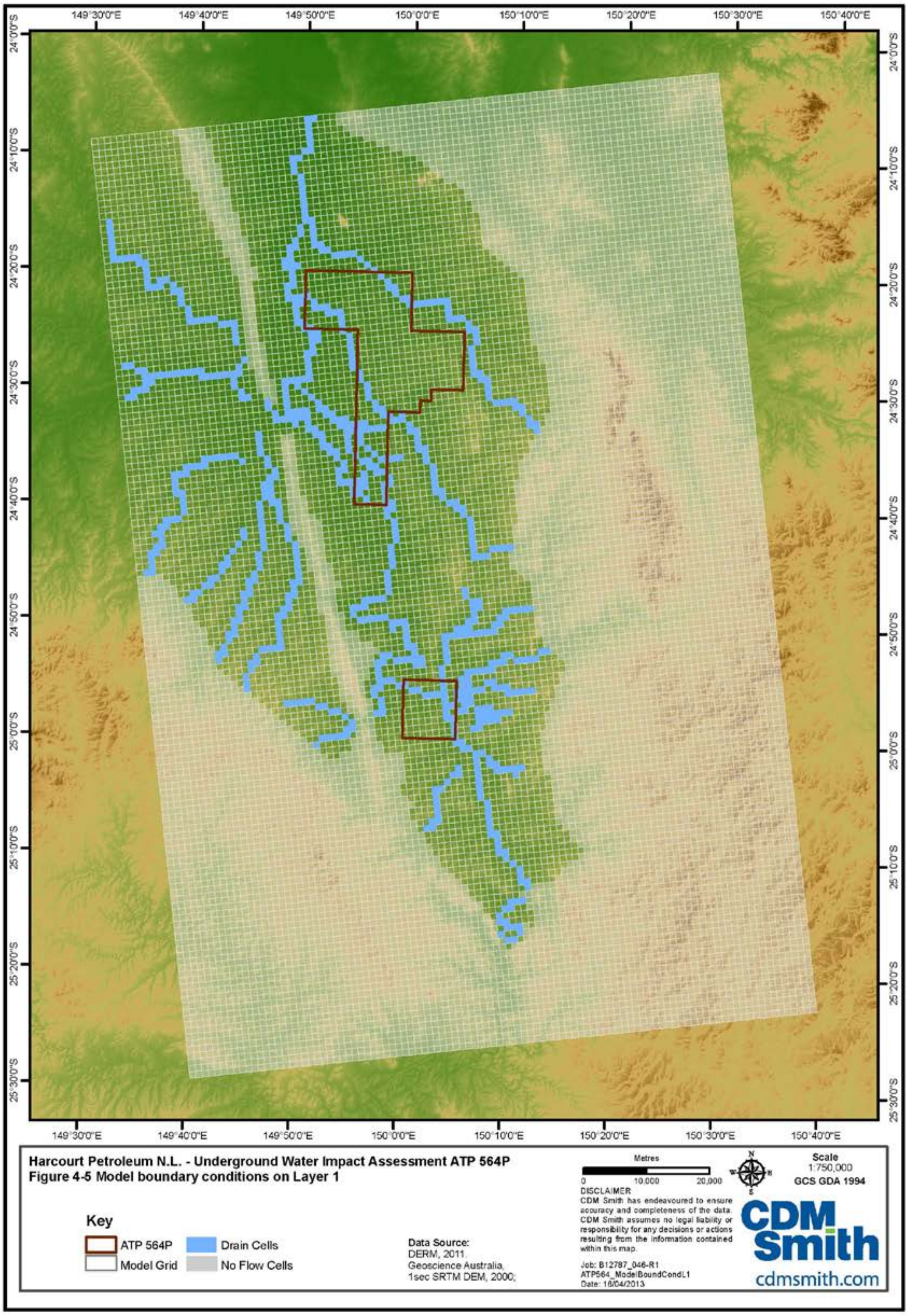


Figure 8-5 Model boundary conditions on Layer 1

Current conditions

The available groundwater level data indicate that the water table is a subdued reflection of topography, with recharge occurring in areas of topographic high and discharge in areas of topographic low. The interpreted groundwater flow direction is to the north. Few groundwater level data from deeper HSUs were available for calibration.

The groundwater elevation as simulated at the end of 2012 is shown in Figure 8-7**.** The topographic control on the baseline water table is simulated by ET and drains. Due to the choice of boundary conditions, the simulated water table is not strongly sensitive to the assumed hydraulic properties and does not assist in constraining the hydraulic properties. Rather, the objective of the steady state calibration presented herein is to establish a set of initial conditions for predictive simulations that are consistent with the available hydraulic head information and assumed hydraulic properties.

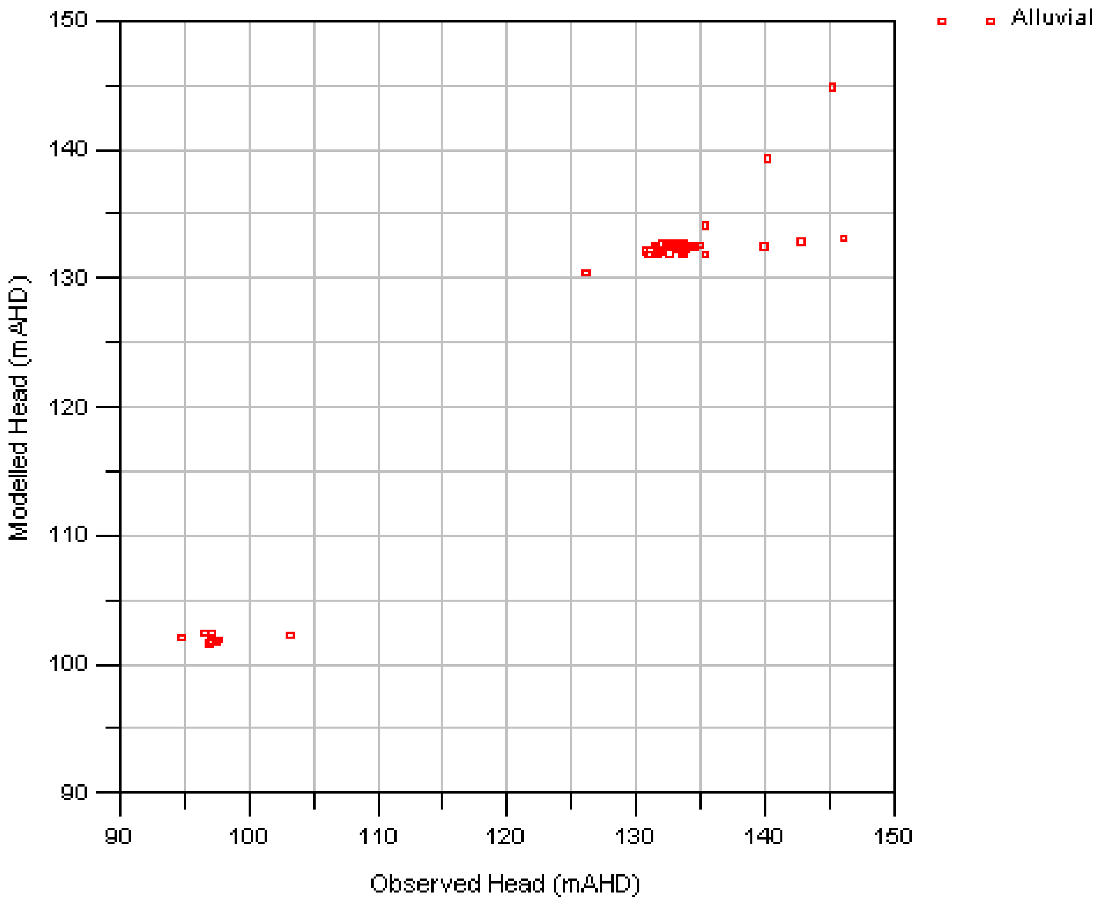
Figure 8-6 presents the plot of observed hydraulic head against simulated hydraulic head for the steady state model. The 56 observation water levels had a range of 51.4 m. The modelled root mean squared (RMS) error was 3.28 m, giving a scaled RMS error of 6.4%. This is considered a good fit and complies with Australian Groundwater Modelling Guidelines (SRMP between 5% and 10%).

The calibrated estimates of hydraulic properties are presented in Table 8-2 below. All values fall within the literature range presented in **Section 3.2.4**.

Table 8-2 Calibrated model hydraulic properties.

Unit	K_H (m/d)	K_V (m/d)	Ss (1/m)	Sy (-)
Alluvium/Weathered zone	20	2	1×10^{-6}	0.05
Clematis Group	0.2	0.02	1×10^{-6}	0.01
Rewan Group	1	0.001	1×10^{-6}	0.01
Baralaba Coal Measures	0.05	1×10^{-5}	1×10^{-6}	0.01
Kaloola member	0.01	0.001	1×10^{-6}	0.01
Gyranda Subgroup	0.01	0.001	1×10^{-6}	0.01

Figure 8-6 Calibration scatterplot of simulated hydraulic head versus observed hydraulic head [m] for steady-state model.



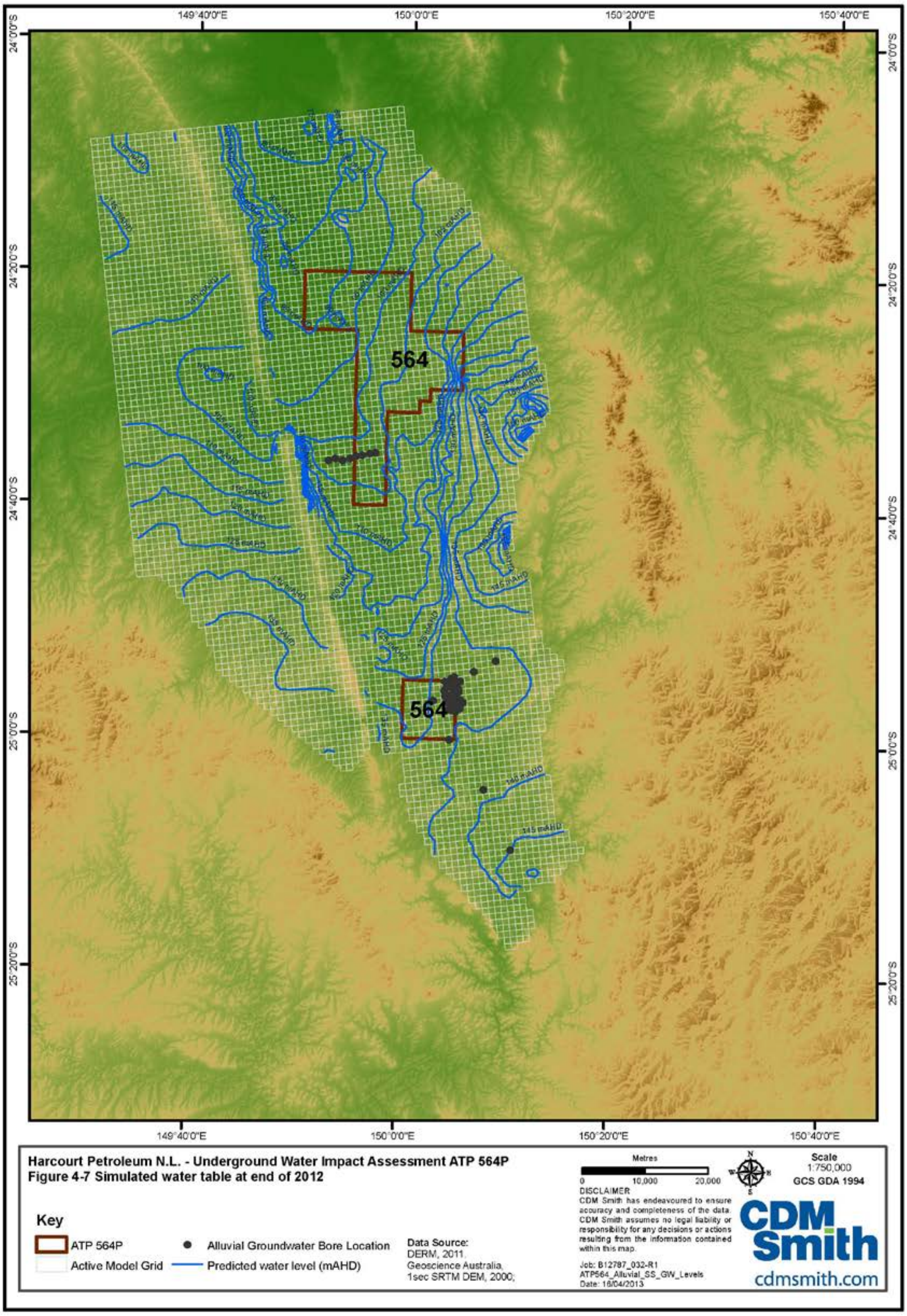


Figure 8-7 Simulated water table at end of 2012

Prediction methodology

The predictive simulations consider the potential impacts to groundwater due to the proposed production program. The production program will draw down the water levels within the targeted coal seams and bounding HSUs. Possible pathways of drawdown impacts to the water table include lateral flow via coal seams and vertical flow via overburden.

The water production from gas wells is simulated using SURFACT's WELL package by prescribing the production rate. The simulated CSG pumping produces water screened from the Baralaba Coal Measures (model layer 4) for a period of 3 years after which the pumping is switched off and the model run for a further 40 years. The production schedule modelled is detailed in Table 8-3 and Table 8-4 with the location of CSG wells shown in Figure 8-8. Due to proximity of ATP 602 tenement, and the knowledge of proposed pumping rates over the next three years, this information was also included in the groundwater model.

Table 8-3 ATP 564 predicted water production schedule

Bore Phase	Number of Pumping wells	Year 1 Pumping rates (kL/d)	Year 2 Pumping rates (kL/d)	Year 3 Pumping rates (kL/d)
ATP 564 Year 1	4	15.9	12.7	9.1
ATP 564 Year 2	6	0	12.7	9.1
ATP 564 Year 3	4	0	0	9.1
All Phases	14	63.6	127.2	127.2

Table 8-4 ATP 602 predicted water production schedule

Bore Phase	Number of Pumping wells	Year 1 Pumping rates (kL/d)	Year 2 Pumping rates (kL/d)	Year 3 Pumping rates (kL/d)
ATP602 Year 1	4	0	7.1	7.4
ATP602 Year 2	5	0	7.1	7.4
ATP602 Year 3	6	0	0	7.4
All Phases	14	0	63.6	111.3

It is acknowledged that the current generation of regional groundwater flow models, including this model, are not capable of simulating localised drawdown at production wells and the associated two-phase flow of water and gas in the near-area of the wells. The implication of neglecting two-phase flow is that drawdown at the wells is likely to be underestimated. The assessment of localised two-phase flow effect is beyond the scope of this Project and is not considered warranted for the purpose of assessing the regional scale impact to groundwater due to the proposed production program. Additionally it is acknowledged that the Baralaba Coal Measures is a sequence of coal seams and interburden units and that by combining coal seams and interburden into a single hydrostratagraphic unit the predicted drawdown will be an average drawdown across the entire unit. In reality, the drawdown may vary vertically throughout the BCM. However, given the proposed production schedule the inclusion of individual coal seams is not considered warranted.

Groundwater impact affected areas

Predicted water level decline maps

The Water Act defines the trigger threshold in the water level decline as 5 metres for a consolidated aquifer and 2 metres for an unconsolidated aquifer. In the groundwater model, the Quaternary Alluvium in layer 1 is defined as unconsolidated. All other aquifer layers are classified as consolidated. The results are divided in two categories: the Immediately Affected Area and the Long Term Affected Area. The Immediate Affected Area shows the impacted zones during the first three years following the report consultation (2014 to 2016). The Long Term Affected Area shows the impacted zones at any time following the three year period.

Immediately Affected Area maps and bores

The maximum drawdown occurs within the Baralaba Coal Measures at the end of 3 years production. This drawdown is shown in Figure 8-8. Note that the drawdown shown to the south of ATP 564 occurs as a result of pumping from the ATP 602 area that was simultaneously simulated in this model prediction. The simulated maximum drawdown within the BCM is 1.6 m. Hence, there are no areas that exceed the 5 m threshold for consolidated aquifers. Similarly, no areas exceed the 2 m threshold for drawdown in the unconsolidated aquifer in layer 1.

The model prediction is that no bores will be affected within 3 years.

Long term Affected Area

After the cessation of CSG pumping the simulated maximum drawdown within the BCM reduces to less than 1 m within a few months and zero drawdown is predicted within the alluvial aquifer. Hence, there are predicted to be no long term affected areas that exceed the 5 m threshold for consolidated aquifers or the 2 m threshold for unconsolidated aquifers.

Uncertainty analysis

Given the relatively small volumes of water to be produced and the minimal drawdown impacts predicted by the calibrated model a detailed predictive uncertainty analysis (Doherty, 2003) is not warranted.

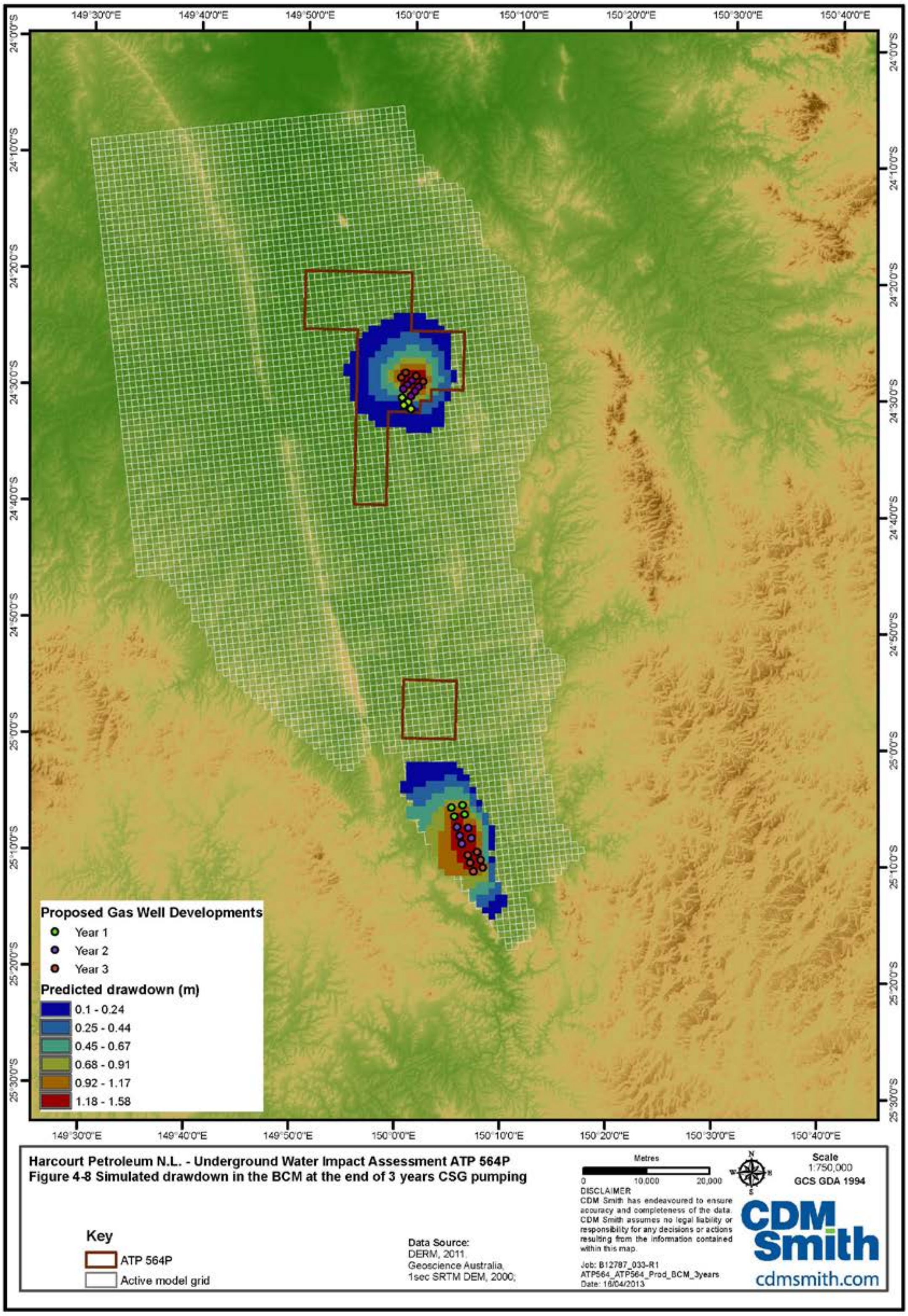


Figure 8-8 Simulated drawdown in the Baralaba Coal Measures at the end of 3 years CSG pumping.

Key findings and review procedures

This report identifies areas which are Immediately Affected and Long Term Affected by predicting drawdowns above the trigger levels, caused by underground water extraction.

Groundwater modelling using the best available information predicts that there will be no Immediate or Long Term Affected Areas at ATP 564 in the coal seams where extraction takes place or in the overlying Alluvium aquifer.

These findings depend upon several documents and data sources and will be reviewed on an annual basis to maintain accuracy of the maps. Reviews are particularly important whenever the modelling assumptions or data change significantly. A model review will be performed annually whenever new information that is likely to appreciably impact model results is available. Information which may fall under this category includes:

- geological structural information, e.g. from drill holes or geophysical surveys, which may modify aquifer extents;
- hydrogeological parameters, e.g. from pressure testing or core geophysical analysis, which may modify model parameters and affect aquifer connectivity;
- planned groundwater operations, including projected CSG water extraction rates;
- calibration data, e.g. pressure heads from new monitoring wells; and
- unexpected results from monitoring locations, where impacts do not correspond to predictions.

After a model update, new maps will be developed for assessing the Immediately Affected and Long Term Affected Areas. Reporting is further described in **Section 6**.

Appendix D - UWIR Groundwater Monitoring Checklist

The following checklist will be completed at each monitoring episode.

<table>
<tr><th>Task</th><th></th><th></th></tr>
<tr><td colspan="3">Verify monitoring completed as required</td></tr>
<tr><td>1</td><td>All monitored bores intact?</td><td>Y/N</td></tr>
<tr><td></td><td>If boreholes damaged amend registered details</td><td></td></tr>
<tr><td>2</td><td>All monitoring completed according to schedule</td><td>Y/N</td></tr>
<tr><td></td><td>If monitoring incomplete commission additional monitoring as required</td><td></td></tr>
<tr><td colspan="3">Review monitoring data</td></tr>
<tr><td>3</td><td>Potentially adverse impacts identified?
Compare measured water level to previous monitoring rounds – if either
(a) water level is lower than previous lowest measurement by >5m or
(b) three subsequent monitoring events record a fall in water level >1m then a potential adverse impact has been identified.</td><td>Y/N</td></tr>
<tr><td></td><td>If potentially adverse impacts identified then:
▪ Advise Environment Manager;
▪ Review operational activities;
▪ If appropriate commission review of data;
▪ Identify any requirement for and implement changes in operation to mitigate adverse impacts.</td><td></td></tr>
<tr><td rowspan="2">Checklist Reviewed by</td><td colspan="2">Name -</td></tr>
<tr><td colspan="2">Date -</td></tr>
</table>

Appendix E - Submissions Report for UWIR for ATP 564

PetroChina

HARCOURT PETROLEUM N.L.

ACN 055 269 040

ATP564 Underground Water Impact Report
Submissions Response Document

Contents

Appendices

1. Introduction

This report has been prepared to summarise and respond to submissions received in response to the Draft Underground Water Impact Report (UWIR) for Authority to Prospect (ATP) 564. The Draft UWIR was prepared in accordance with section 381 and section 382 of the Queensland Water Act 2000 (Water Act).

1.1. Context of the Project

Harcourt Petroleum N.L., as the Operator of Authority to Prospect (ATP) 564, proposes to conduct coal seam gas production testing and development within ATP 564, located near Moura in Central Queensland. As per the requirements of the Water Act, a Draft UWIR was prepared to meet the requirements for the operation of ATP 564. A total of 3 wells are proposed to be installed and commissioned for operation during the next three years.

1.2. Submissions Period

The Draft UWIR was released for public comment from 18 June 2016 until the close of business 15 July 2013.

In accordance with the Water Act, a public notice was published in the Biloela Central Telegraph on Friday 17 June 2016 (see Appendix A) and on the Biloela Central Telegraph website.

In addition, letters were sent to landowners, identified as an "owner of a water bore within the area to which the report relates" (Water Act). The purpose of the letter (Appendix B) was to:

- notify the bore owner of the public release of the UWIR for ATP 564;
- provide details on how to obtain copies of the report;
- provide details on how to make a submission on the report; and
- welcome any feedback during the public comment period.

Electronic and hard copies of the report were provided to the public upon request, as per the information in the public notice.

Throughout the public notification period, six (6) electronic copies of the report were requested by various members of the public.

2. Submissions Received

Throughout the public submission period no (0) submissions were received in response to the UWIR for ATP 564.

3. Conclusion

As no submissions were made amendment of the Draft UWIR for ATP 564 was not warranted and no changes have been made.

Liaison and communication between Harcourt Petroleum N.L. and landowners will continue to develop the understanding of groundwater conditions in and around the project area. Harcourt Petroleum N.L.'s baseline assessment of registered and identified unregistered bores is ongoing.

APPENDIX A

Tributes

Death Notices

YOULES, Melville

Of Biloela.
Passed into God's care on 12th June 2016.

Aged 50 years

Dearly Loved Husband of Tina. Loved Father of Biddy and Jock.

Family and Friends are respectfully invited to attend Mel's Funeral Service at the Biloela Bowls Club, commencing at 1.30pm on Wednesday 22nd June 2016.

CALLIDE DAWSON FUNERALS
PHONE: (07) 4992 2332
www.callidedawsonfunerals.com.au

Funeral Directors & Services

Celebrations, Classes & Events

Friendship & Relationships

SEEKING COMPANION 69 yo Independent Male. Have not had schooling. Good listener, honest. Non Drinker & Non Smoker. Looking for honest woman 65 - 70. Enjoys Fishing, BBQ's, going for coffees and drives. Contact Bob **0407 624 522.**

Notices

Legal Notices

NOTICE OF INTENTION TO APPLY FOR GRANT

After 14 days from today an application for a grant of probate of the will dated 1 March 2006 of **OLIVE MAY DALES** late of 24 Mouatt Street, Monto, Queensland and formerly of "Jindah", Moura, Queensland, deceased, will be made by **Clive Thomas Dales** and **Marie Ruth Frost** to the Supreme Court at Rockhampton.

You may object to the grant by lodging a caveat in that registry.

Lodged by: Adornato Law - 28 Gladstone Road, Biloela QLD 4715

NOTICE OF INTENTION TO APPLY FOR GRANT

After 14 days from today an application for a grant of Probate of the Will dated 15 July 2004 of **GRAHAM DOMINIC CARRIGAN** late of Palm Grove, Mungabunda Road, Moura, Queensland, deceased will be made by **CATHERINE MARY CARRIGAN** to the Supreme Court at Brisbane.

You may object to the grant by lodging a caveat in that registry.

Lodged by Edgar & Wood Solicitors of 118 Cunningham Street, Dalby, Queensland.

Found

IS THIS YOURS??

FOUND Something? DID you know that our found adverts are FREE!! So if you have found someone's pet or personal item, call the Classifieds now and we will help you find the owner 1300 136 181.

Notices

Public Notices

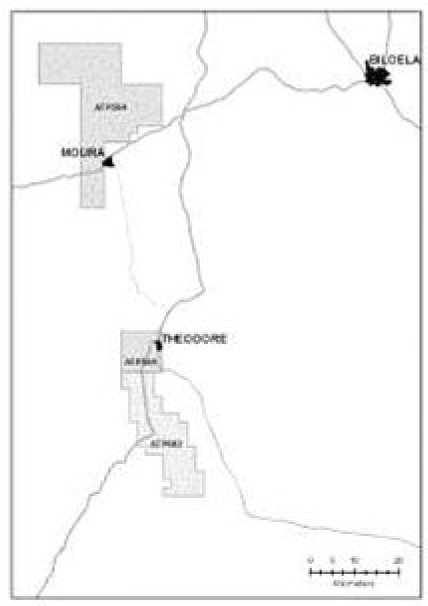
PUBLIC NOTICE Pursuant to Section 382 of the Water Act 2000
Release of UNDERGROUND WATER IMPACT REPORT

In accordance with the requirements of section 381 and section 382 of the Water Act 2000 (Water Act), Harcourt Petroleum NL has developed an underground water impact report (UWIR) for its operations within authority to prospect (ATP) 564 and 602 located north of Moura and south of Theodore in Central Queensland.

You have the opportunity to review and comment on these UWIRs.

The reports will be available for public comment from 18 June 2016. To obtain a copy (electronic or hard copy) please contact Mr Bernard Tan of Harcourt Petroleum NL on 07 3218 6199.

Written submissions on the UWIR may be made to Harcourt Petroleum NL and mailed to:
GPO Box 848
Brisbane Qld 4001
Or by emailing
hpcsgadmin@cnpcint.com.au



Your submission must be:

- In writing; and
- Received by COB on 15 July 2016.

Please note that as required by section 382(d) of the Water Act copies of all received submissions must be provided to the chief executive. The submissions will be considered as part of the assessment process for the UWIR.

For more information please phone Mr Bernard Tan on 07 3218 6199.

6317985aa

Banana Shire Council
PUBLIC NOTICE
Half Yearly Water Meter Readings

Residents are advised that Banana Shire Council will be carrying out a systematic inspection program in accordance with the Local Government Act 2009, of all metered premises connected to the water supply schemes in Banana, Baralaba, Biloela, Callide Dam, Cracow, Goovigen, Moura, Taroom, Thangool, Theodore and Wowan, to record water meter readings.

The water meter reading program will commence on Monday 13 June 2016 and end on Monday 11 July 2016 and will be conducted between the hours of 6.00am and 5.00pm daily.

Council officers and/or appointed persons with appropriate identification will undertake the water meter reading program and may be required to enter properties to gain access to and read the water meters. Residents are required to restrain their dogs during this period, and check that garden vegetation does not obstruct access to the water meters.

Enquires may be directed to Council's Water Services Section on (07) 4992 9500.

Ray Geraghty
CHIEF EXECUTIVE OFFICER

Tenders (Notices)

Banana Shire Council
Preferred Suppliers - Hire of Plant and Equipment
Tender No. T16/17.1

Council is seeking tenders to establish a Register of Preferred Suppliers - Hire of Plant and Equipment through a Wet Hire and Dry Hire arrangement. This contract will cover the period from the date that the tender is accepted to 30 June 2017.

The purpose of this contract is to identify a pool of suitable suppliers to call upon for Intermittent Hire at various times throughout the year. Plant required consists of but is not limited to Graders, Scrapers, Loaders, Dozers, Excavators, Water Trucks, Material Cartage Trucks (all combinations) and Compaction Equipment.

Tenders shall be prepared in accordance with the conditions of tendering available from Council. The Tender documents are to be received at Banana Shire Council Administration Complex located at 62 Valentine Plains Road, Biloela by **11.00am Friday 8th July 2016**.

Tender documents are to be downloaded by accessing www.banana.qld.gov.au and registering your details.

Ray Geraghty
Chief Executive Officer
Banana Shire Council
PO Box 412
BILOELA Q 4715

Jobs

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A career in multi-media
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The ideal applicant will need to possess the following:

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- A desire to work with clients in achieving their objectives
- A fundamental belief in the value of advertising
- An empathy for customer service and desire to provide solution and opportunity
- Outgoing personality and high level of communication and negotiation skills both written and oral
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Gladstone Newspapers is an equal opportunity employer

THE OBSERVER — AUSTRALIAN REGIONAL MEDIA APN

APPENDIX B

PetroChina **HARCOURT PETROLEUM N.L.**
ABN 37 055 269 040

A subsidiary of Petrochina International Investment Australia Pty Ltd.

Level 10, 345 Queen Street, Brisbane, QLD 4000 Australia
GPO Box 848, Brisbane, QLD 4001
Ph: +61 7 3218 6199 Fax: +61 7 3211 9872

Our ref: HP-007-20160414

14 April 2016

Dear Sir/Madam

Harcourt Petroleum NL (Harcourt) Underground Water Impact Reports – ATP 564P and ATP 602P

Harcourt is the Operator and one of the holders (in Joint Venture with Mitsui E&P Australia Pty Ltd) of Authority to Prospect 564P and Authority to Prospect 602P (the **Tenements**) where it is seeking to conduct coal seam gas production testing and development. The Tenements are located near Moura (ATP 564P) and south of Theodore (ATP 602P) in Central Queensland.

In accordance with the requirements of section 370 of the Water Act 2000 (**Water Act**), Harcourt has updated the initial Underground Water Impact Report (**UWIR**) for the Tenements and, in accordance with section 381 of the Water Act, these UWIRs are now available for public comment.

It has been identified that your property (which lies partially or wholly within one of the Tenements), has a registered groundwater bore. Harcourt is obliged under section 382 of the Water Act to provide all landholders with a registered bore within the Tenements this notice and the opportunity to review and comment on these UWIRs.

Please see the **attached** notice regarding how to obtain copies of the UWIRs and how to make a submission.

We welcome your feedback during the public comment period.

Kind regards,

Su Yi
Director & General Manager

Appendix F - Disclaimer and Limitations

This report has been prepared by CDM Smith Australia Pty Ltd (CDM Smith) for the sole benefit of Harcourt Petroleum] for the sole purpose of providing a Underground Water Impact Report for ATP 564 near Moura in Central Queensland.

This report should not be used or relied upon for any other purpose without CDM Smith's prior written consent. CDM Smith, nor any officer or employee of CDM Smith, accepts no responsibility or liability in any way whatsoever for the use or reliance of this report for any purpose other than that for which it has been prepared.

Except with CDM Smith's prior written consent, this report may not be:

(a) released to any other party, whether in whole or in part (other than to Harcourt Petroleum N.L.'s officers, employees and advisers);

(b) used or relied upon by any other party; or

(c) filed with any Governmental agency or other person or quoted or referred to in any public document.

CDM Smith, nor any officer or employee of CDM Smith, accepts no liability or responsibility whatsoever for or in respect of any use or reliance upon this report by any third party.

The information on which this report is based has been provided by Harcourt Petroleum N.L. and third parties. CDM Smith (including its officer and employee):

(a) has relied upon and presumed the accuracy of this information;

(b) has not verified the accuracy or reliability of this information (other than as expressly stated in this report);

(c) has not made any independent investigations or enquiries in respect of those matters of which it has no actual knowledge at the time of giving this report to Harcourt Petroleum N.L.; and

(d) makes no warranty or guarantee, expressed or implied, as to the accuracy or reliability of this information.

In recognition of the limited use to be made by Harcourt Petroleum N.L. of this report, Harcourt Petroleum N.L. agrees that, to the maximum extent permitted by law, CDM Smith (including its officer and employee) shall not be liable for any losses, claims, costs, expenses, damages (whether in statute, in contract or tort for negligence or otherwise) suffered or incurred by Harcourt Petroleum N.L. or any third party as a result of or in connection with the information, findings, opinions, estimates, recommendations and conclusions provided in the course of this report.

If further information becomes available, or additional assumptions need to be made, CDM Smith reserves its right to amend this report.