

ASSOCIATED WATER LICENCE

Water Act 2000



Reference	617264	Expiry Date	30/06/2077
Licensee	ADANI MINING PTY LTD		
Authorised Activity	The taking of associated water from Betts Creek Beds and adjacent formations with the point of take on or under the area of mining leases 70505, 70506 and 70441 (Mining Leases).		
Authorised Purpose	Dewatering during the course of, or resulting from, the carrying out of an authorised activity for the Mining Leases.		

Conditions

This associated water licence is subject to the conditions set out in Annexure A.

This associated water licence is given under the Water Act, on this *29* day of *March, 2017*

A handwritten signature in black ink, appearing to be 'Darren Moor', written over a horizontal line.

Darren Moor

Executive Director, Central Region

Delegate of the Chief Executive

Department of Natural Resources and Mines

Associated Water Licence
Expiry Date: 30/06/2077

Conditions: Annexure A

BACKGROUND

- A. Adani Mining Pty Ltd ("the Licensee") is the holder of the mining leases for the Carmichael Coal Mine and Rail Project and proposes to construct and operate an open cut and underground coal mine approximately 150km north-west of the town of Clermont ("the mine") on the mining leases.
- B. The Licensee will take associated water from the Betts Creek Formation and diffuse take will also occur from adjacent formations. The water taken as associated water may be re-used for any purpose without further authorisation under the Water Act 2000.
- C. The take of associated water will have an impact on the underground water levels in the region of the mine during the life of the mine and for a period after the mine's closure.
- D. The Licensee prepared an environmental impact statement¹ (EIS) under part 4 of the *State Development and Public Works Organisation Act 1971* that deals with the hydrology of the area and the effects of the proposed take on underground water. The EIS included predictions of the impact of the take of associated underground water on the aquifers in the region. These predictions, were referenced in the following reports:
- "Adani Mining Pty Ltd: Carmichael Coal Mine and Rail SEIS Mine Hydrogeology Report Addendum October 2013"*
- "Adani Mining Pty Ltd Carmichael Coal Mine and Rail Project SEIS: Report for Mine Hydrogeology Report. November 2013"*
- "Adani Mining Pty Ltd Carmichael Coal Project – Response to Federal Approval Conditions – Groundwater Flow Model, GHD November 2015".*
- E. The Licensee prepared the report "*Environmental Authority EPML01470513 – Carmichael Coal Mine Condition E3 - Baseline Monitoring Program, AECOM 31 May 2016*" (AECOM report), which outlines the underground water baseline monitoring network.
- F. The Licensee has been granted an associated water licence under section 1250F of the Act, on the following conditions.

1. DEFINITIONS

Terms not otherwise defined in this licence have the same meaning as in the Act, except where a contrary intention appears:

"Act" means the *Water Act 2000* (Qld).

¹ Evaluated in the report: Carmichael Coal Mine and Rail Project: Coordinator General's evaluation report on the environmental impact statement May 2014

"affected area" for the purposes of this licence, means the area identified by the most current numerical underground water model where the water level is predicted to decline, at any time because of the Authorised Purpose authorised by this associated water licence, by more than -

- (a) for a consolidated aquifer – 5 m; or
- (b) for an unconsolidated aquifer – 2 m.

"Annual Monitoring Report" means a report as described in Condition 53 of this licence.

"appropriately qualified hydrogeologist" means an individual who has the minimum experience or qualifications, stated in the guidelines made under section 413 of the *Water Act 2000*, for undertaking a bore assessment.

"appropriately qualified person" means a person who has professional qualifications, training, skills, or experience related to the nominated subject matter and can give authoritative assessment, advice and analysis on performance relative to the subject matter using the relevant protocols, standards, methods or literature.

"associated water" has the meaning set out in section 839(5) of the *Mineral Resources Act 1989* (Qld).

"authorised activity" has the meaning set out in schedule 2 of the *Mineral Resources Act 1989* (Qld).

"baseline monitoring program" means the report titled "*Environmental Authority EPML01470513 – Carmichael Coal Mine Condition E3 - Baseline Monitoring Program*, AECOM 31 May 2016".

"bore owner", of a water bore, means the owner of the land on which the bore is located.

"business day" means a day on which trading banks are open for normal banking business in Brisbane.

"Carmichael Coal Mine and Rail Project" means the Carmichael Coal Mine and Rail Project which was declared a coordinated project under the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWOA) on 26 November 2010 and declared on 7 October 2016 as a critical infrastructure project pursuant to s.76E(1) of the SDPWOA.

"chief executive" means the Chief Executive to the Department, unless otherwise specified.

"cooling off period" for a make good agreement for a water bore or a WCS water source, means a period of 5 business days—

- (a) starting on the day the make good agreement is entered into; and
- (b) ending at 5p.m. on the fifth business day.

"cumulative impacts" means the cumulative impacts of the exercise of 2 or more resource tenure holder's underground water rights.

"cumulative management area" has the meaning set out in section 362 of the Act.

"Department" means the Department of Natural Resources and Mines and includes the Department's successor.



"EPBC Approval" means Approval Carmichael Coal Mine and Rail Infrastructure Project, Queensland (EPBC 2010/5736) made under sections 130(1) and 133 of the *Environmental Protection and Biodiversity Conservation Act 1999*.

"existing water bore" means any water bore in existence before the original issue date of this associated water licence.

"expiry date" means the date this licence expires being 30 June 2077.

"first water year" means the period from the commencement of take of underground water under the authority of this licence to 30 June in the following year.

"GAB Springs Research Plan" means the research plan specified in Condition 25 of the EPBC Approval.

"impact report", means the following combined reports:

- (a) *Adani Mining Pty Ltd: Carmichael Coal Mine and Rail SEIS Mine Hydrogeology Report Addendum* October 2013;
- (b) *Adani Mining Pty Ltd Carmichael Coal Mine and Rail Project SEIS: Report for Mine Hydrogeology Report*. November 2013; and
- (c) *Adani Mining Pty Ltd Carmichael Coal Project – Response to Federal Approval Conditions – Groundwater Flow Model*, GHD November 2015.

or any approved amendment or replacement to such reports.

"impaired capacity" for an **existing water bore** has the meaning set out in subsection 412(1) and (3) of the Act.

"impaired capacity" for a **new water bore** has the meaning set out in section 412(2) of the Act.

"Licensee" means Adani Mining Pty Ltd.

"make good agreement" means each of the following, as the context requires:

- (a) an agreement between the Licensee and the bore owner of a water bore, if the bore is affected, or is likely to be affected by the taking of underground water in the area of the Licensee's Mining Leases; or
- (b) an agreement between the Licensee and a WCS water source user, where the taking of water under the licence may be causing either a material reduction in the supply of water from a WCS water source or a material increase in the cost of maintaining the supply of water from a WCS water source.

A make good agreement made under this licence in relation to a water bore is taken to be a make good agreement under Chapter 3 of the Act, in accordance with section 1250U of the Act. For clarification, an agreement in relation to the supply of water from a WCS water source is not taken to be a make good agreement under Chapter 3 of the Act.

"make good measure" for a water bore has the meaning set out in section 421 of the Act.

"Mining Leases" has the meaning defined on the front page of this licence.

"monitoring bores" means the water monitoring bores as identified in the baseline monitoring program, and any water monitoring bores identified in the underground water monitoring program.

"new water bore" means a water bore other than an existing water bore.

"numerical underground water model" means the numerical model, reported in the impact report, used to predict impacts due to the take of associated water authorised by this licence.

"offset" means an activity or measure undertaken to counterbalance impacts from the take of associated water authorised by this licence on the Dunda Beds and Clematis Sandstone geological formations.

"published" for the purposes of this licence, has the meaning set out section 1009A of the Act, that is, by publishing on the Licensee's website.

"Rewan Connectivity Research Plan" means the research plan specified in Condition 27 of the EPBC Approval.

"tenure area" means the area bounded by the Mining Leases.

"underground water rights" has the meaning set out in section 334ZP of the *Mineral Resources Act 1989* (Qld).

"Underground Water Monitoring Program" is a monitoring program that must meet the following objectives:

- (a) to assess the effects of the take of underground water authorised under this licence, including:
 - (i) to provide for the monitoring of impacts on springs and watercourses dependent on underground water flow (Doongmabulla Spring Complex, Mellaluka Spring Complex and Carmichael River alluvium and baseflow);
 - (ii) to provide for the monitoring of impacts on other underground water users;
 - (iii) to provide for underground water level monitoring in all identified geological units across and adjacent to the mine site;
 - (iv) to monitor impacts on the Dunda Beds and Clematis Sandstone aquifers;
 - (v) to monitor source aquifers identified as potential alternative water supplies for owners of bores with predicted impaired capacity;
 - (vi) to estimate underground water inflow to, and take from mine workings;
- (b) to provide for the refinement and validation of the numerical underground water model used to assess impacts; and
- (c) to take into account requirements of any regional underground water monitoring and assessment program developed to address potential cumulative impacts.

Note: the requirements of the Underground Water Monitoring Program may be incorporated within monitoring programs as required under Federal or State Government approvals.

"WCS water source" means each of the Doongmabulla Spring Complex, Mellaluka Springs Complex and the Carmichael River alluvium and baseflow that is used as a water supply by a WCS water source user.

“WCS water source assessment” means an assessment of a WCS water source required under Condition 14.

“WCS water source user” means an owner of land authorised under section 96 of the Act to take water from a watercourse or spring that is dependent on groundwater flow.

“water bore” means a water bore to which chapter 3 of the Act applies.

“water quality” means the water quality parameters specified under condition 45 of these conditions.

“water year” means the period from 1 July to 30 June the following year.

2. INTERPRETATION

In this Licence:

- (a) headings to conditions are for ease of reference only and shall not in any way affect the meaning of the conditions;
- (b) a reference to days or months is a reference to business days and calendar months; and
- (c) words in the singular shall include the plural and vice versa.
- (d) a reference to the Department includes the Department's successor;
- (e) a reference to a document (including this licence) is to that document as varied, or replaced from time to time;
- (f) a reference to a statute includes its delegated legislation and a reference to a statute or delegated legislation or a provision of either includes consolidations, amendments, re-enactments and replacements;
- (g) a reference to a schedule, attachment or annexure is a reference to a schedule, attachment or annexure to or of this licence (or, if the reference is to a schedule of an Act, is a reference to a schedule of that Act), and a reference to this licence includes all schedules, attachments and annexures to it;
- (h) a word importing the singular includes the plural (and vice versa), and a word indicating a gender includes every other gender;
- (i) if a word or phrase is given a defined meaning, any other part of speech or grammatical form of that word or phrase has a corresponding meaning;
- (j) 'includes' in any form is not a word of limitation; and
- (k) a reference to \$ or dollar is to Australian currency.

3. NOTICES

- (a) Form of Notice

Any notices, consents, document, invoice or other communication ("notice") required or permitted to be given by this licence:

- (i) must be in writing; and
- (ii) may be given by being delivered or sent by prepaid registered post, or by electronic mail.
- (iii) Underground water reports are to be submitted electronically via the online QDEX system.

The Chief Executive:



The Chief Executive
C/- The Manager
Water Management and Use
Department of Natural Resources and Mines
PO Box 1762
ROCKHAMPTON QLD 4700

Telephone: 1800 822 100
centralwaterservices@dnrm.qld.gov.au

Licensee:

Adani Mining Pty Ltd
GPO BOX 2569
BRISBANE QLD 4001
Attention: Manager, Hydrogeology & Approvals

Telephone: (07) 3223 4803

(b) Time Service Occurs

A notice is deemed to be served on a party, in the case of post, on the third business day after posting and, in the case of electronic mail, on the day of transmission if the transmission is before 5.00pm on a business day and in all other circumstances on the business day following transmission of the facsimile or electronic mail.

ADMINISTRATION AND ENFORCEMENT OF THE ACT

4. The Licensee is to provide any relevant information reasonably required by the chief executive for the administration or enforcement of the Act.

CUMULATIVE IMPACTS

5. The chief executive may cancel or amend the conditions of this licence to be consistent with any cumulative management area that is declared over the area to which this licence authorises take.
6. The Licensee must, if requested by the chief executive:
 - (a) contribute to the ongoing operation of any regional underground water monitoring and assessment program developed to address potential cumulative impacts, including pro-rata funding; and
 - (b) provide monitoring data in the format and at intervals specified in any protocol developed by the chief executive specifically for the coordination of regional underground water data for the purposes of assessment of cumulative impacts.



MAKE GOOD OBLIGATIONS FOR WATER BORES

7. For all water bores located in the tenure area and the affected area, where a make good agreement is not already in place between the Licensee and the bore owner prior to the date of this licence, the Licensee must:
 - (a) undertake a bore assessment of the bore in accordance with Conditions 9 to 12, prior to the take of associated water authorised under this licence;
 - (b) enter into a make good agreement with the bore owner of the bore as required under Condition 17;
 - (c) comply with the make good agreement.
8. If the impact report is superseded or amended; and the new impact report or amendment to the report changes the area, or location of an affected area of an aquifer:
 - (a) for each bore in the affected area that is not already the subject of a make good agreement, the Licensee must, unless the Licensee has a reasonable excuse, undertake a bore assessment of the bore in accordance with Conditions 9 to 12;
 - (b) enter into a make good agreement with the bore owner of the bore as required under Condition 17; and
 - (c) comply with the make good agreement.

Paragraph (a) does not apply if a bore assessment of the bore has already been undertaken.

BORE ASSESSMENTS

9. The bore assessment undertaken by the Licensee must establish:
 - (a) whether the bore has an impaired capacity; or
 - (b) whether the bore is likely to start having an impaired capacity.
10. In undertaking a bore assessment of a water bore, the Licensee must comply with the most recent version of the "Bore Assessment Guidelines" as made under section 413 of the Act by the chief executive of the agency responsible for Chapter 3 of the Act.
11. The Licensee must, at least 10 business days before undertaking a bore assessment of a water bore, give the bore owner a notice stating:
 - (a) when the bore assessment will be undertaken; and
 - (b) who will undertake the bore assessment.
12. The Licensee must give notice of the outcome of a bore assessment to the chief executive and the bore owner within:
 - (a) if the bore assessment was undertaken before the granting of this licence - 30 business days after the granting of this licence; or
 - (b) otherwise – 30 business days after undertaking the bore assessment.

MAKE GOOD OBLIGATIONS FOR WCS WATER SOURCES

13. If, in the opinion of the chief executive, the taking of water under the licence may be causing either a material reduction in the supply of water from a WCS water source; or a material increase in the cost of maintaining the supply of water from a WCS water source, the Licensee must:

- (a) undertake an assessment of the WCS water source in accordance with Condition 14;
 - (b) enter into a make good agreement with the WCS water source user as required under Condition 17;
 - (c) comply with the make good agreement; and
 - (d) if asked to vary the make good agreement, negotiate a variation of the make good agreement.
14. The WCS water source assessment undertaken by the Licensee must establish whether there has been, or likely has been:
- (a) a material reduction in the supply of water from the WCS water source; or
 - (b) a material increase in the cost of maintaining the supply of water from the WCS water source.
15. The Licensee must, at least 10 business days before undertaking a WCS water source assessment, give the WCS water source user a notice stating:
- (a) when the WCS water source assessment will be undertaken; and
 - (b) who will undertake the WCS water source assessment.
16. The Licensee must give notice of the outcome of a WCS water source assessment to the chief executive and the WCS source user within 30 business days after undertaking the WCS water source assessment.

MAKE GOOD AGREEMENTS

17. Where a make good agreement is required under Conditions 7, 8 or 13, the Licensee must use the Licensee's best endeavours to enter into a make good agreement, for the bore with the bore owner, or for the WCS water source with the WCS water source user by:
- (a) the day that is 40 business days after the bore assessment or WCS water source assessment is undertaken; or
 - (b) if the chief executive agrees to a later day—that day.
18. A make good agreement between the Licensee and the bore owner must provide for each of the following matters:
- (a) the outcome of the bore assessment for the bore;
 - (b) whether the bore has or is likely to have an impaired capacity;
 - (c) if the bore has or is likely to have an impaired capacity—the make good measures for the bore to be taken by the Licensee; and
 - (d) that the agreement may be terminated by the bore owner at any time during the cooling off period of the agreement.
19. A make good agreement between the Licensee and the WCS water source user must provide for each of the following matters:
- (a) the outcome of the WCS water source assessment for the WCS water source;
 - (b) whether there has been, or likely has been:
 - (i) a material reduction in the supply of water from the WCS water source; or
 - (ii) a material increase in the cost of maintaining the supply of water from the WCS water source.
 - (c) if either of the matters in clause 19(b) apply — the make good measures for the WCS water source to be taken by the Licensee; and
 - (d) that the agreement may be terminated by the WCS water source user at any time during the cooling off period of the agreement.

20. The Licensee must reimburse the bore owner or WCS water source user for any accounting, hydrogeology, legal or valuation costs the bore owner or WCS water source user necessarily and reasonably incurs in negotiating or preparing a make good agreement. However the Licensee is not required to reimburse the bore owner or WCS water source user for hydrogeology costs incurred for work performed other than by an appropriately qualified hydrogeologist.
21. The Licensee must advise the chief executive by written notice if the Licensee enters into a make good agreement.

DISPUTE RESOLUTION

22. Conditions 23 – 44A apply if:
 - (a) the Licensee and a bore owner or WCS water source user cannot agree on the terms of a make good agreement within the period provided for under condition 17; or
 - (b) the Licensee and a WCS water source user have entered into a make good agreement and cannot agree about:
 - (i) whether a matter stated in the agreement is inappropriate because:
 - (A) of a material change in circumstances; or
 - (B) 1 or more of the make good measures agreed to is not effective; or
 - (C) another effective and more efficient make good measure is available; or
 - (ii) the terms of any variation of the agreement; or
 - (c) the Licensee and a WCS water source user have entered into a make good agreement and one party reasonably believes the other party has not complied with the agreement.

Parties may seek conference or independent ADR

23. If a dispute about a matter mentioned in Condition 22 arises, either party may, by a notice (an ***election notice***):
 - (a) given to the other party and the chief executive—ask the chief executive to direct an authorised officer to call a conference to negotiate a resolution of the dispute; or
 - (b) given to the other party—call for the other party to agree to an alternative dispute resolution process (an ***ADR***) to negotiate a resolution of the dispute.
24. The election notice must state—
 - (a) details of the matters the subject of the dispute; and
 - (b) the contact details of the party giving the notice.
25. Also, if the election notice calls for an ADR, it must identify the ADR and if the party giving the notice is the Licensee — state that the Licensee bears the costs of the person who will facilitate the ADR.
26. An ADR may be a process of any kind, including, for example, conciliation or mediation.
27. However, the person who facilitates the ADR must be independent of both parties.
28. The Licensee must bear the costs of the person who will facilitate the ADR.



Duration of conference or ADR

29. If an election notice is given, the following applies:
- (a) If a conference is requested, the authorised officer directed under Condition 30 to conduct the conference must take all reasonable steps to ensure it is finished within 30 business days after the election notice is given (the **usual period**).
 - (b) If an ADR is called for, the parties must use their reasonable endeavours to finish it within 30 business days after the election notice is given (also the **usual period**).
 - (c) Either party may, within the usual period, ask the other party to agree to a longer period to finish the conference or ADR.
 - (d) If the parties agree to the longer period, that period applies instead of the usual period.
 - (e) If an ADR is called for, Conditions 37 and 41 apply to the ADR as if a reference in Conditions 37 and 41 to a conference were a reference to an ADR.

Calling conference

30. If an election notice is given requesting a conference, the chief executive must direct an authorised officer to conduct the conference.
31. The authorised officer must, by notice, ask the parties to attend a conference to negotiate a resolution of the dispute.
32. The notice must state what the subject of the conference is and when and where it will be held.

Who may attend conference

33. The authorised officer directed to conduct the conference under Condition 30 and the parties to the dispute may attend it.
34. A party may be represented by an agent only if the authorised officer agrees.
35. Also, with the authorised officer's approval, someone else may be present to help a party attending the conference.
36. However, a party cannot be represented by a lawyer unless the other party agrees and the authorised officer is satisfied there is no disadvantage to a party.

What happens if a party does not attend

37. If a party given notice of a conference under Conditions 31 and 32 and does not attend a conference, a party who attended the conference may apply to any expert appointed under Condition 42B for an order for costs requiring the party who did not attend to pay the attending party's reasonable costs of attending. The expert may award the attending party's reasonable costs of attending, if any. If no expert is appointed under Condition 42B, then no costs are to be awarded.

Conduct of conference

38. In conducting a conference, the authorised officer must endeavour to help those attending to negotiate an early and inexpensive settlement of the dispute.
39. The authorised officer must decide how the conference is conducted.
40. The authorised officer may only conduct a conference after first obtaining the agreement of the parties that what is said during a conference conducted under Conditions 38 to 39 is confidential between the parties to the conference and that the parties agree that what is said is not admissible during any subsequent proceedings.
41. If, at the conference, the parties negotiate an agreement about the matters the subject of the conference, the agreement must be written and signed by or for the parties. The agreement may be a make good agreement or a variation of an existing make good agreement between the parties.

Chief executive's decision on dispute

42. If an election notice is given under Condition 23 and:
 - (a) if a party asked the chief executive to direct an authorised officer to conduct a conference—the authorised officer does not finish the conference within the period required under Condition 29 (the **required period**); or
 - (b) if a party called for an ADR—the parties do not finish the ADR within the period required under Condition 29 (also the **required period**),

any party to the dispute may notify the chief executive and request that the chief executive decide the matter the subject of the election notice.

- 42A. If —
 - (a) only 1 of the parties attended the conference or ADR; or
 - (b) both parties attended the conference or ADR and, at the end of the required period, there is no resolution of the dispute,

a party who attended the conference or ADR may notify the chief executive in writing and request that the matter the subject of the election notice be referred to the chief executive.

- 42B. Within 20 business days of being notified under condition 42 or condition 42A, the chief executive must notify the parties in writing that either:
 - (a) the chief executive will decide the matter the subject of the election notice; or
 - (b) the parties will be required to submit the matter to expert determination in accordance with the Resolution Institute Expert Determination Rules, 2016 Edition.
43. If condition 42B(a) applies, the chief executive may require the Licensee to provide any information required to assist the chief executive in deciding the matter the subject of the election notice.
44. Without limiting how the chief executive may decide the matter the subject of the election notice where condition 42B(a) applies, the chief executive may decide:

- (a) if the dispute is about the terms of a make good agreement—the terms of the agreement;
- (b) if the dispute is about varying the terms of a make good agreement:
 - i. whether a matter stated in the agreement is inappropriate; or
 - ii. the terms of any variation of the agreement; or
- (c) if the dispute is about whether a party to a make good agreement has complied with the agreement—whether anything must be done by a party to comply with the agreement.

44A. The chief executive's decision under condition 42B(a) and the expert's determination under Condition 42B(b) is final and binding and the Licensee must implement, at the cost of the Licensee, all make good measures and associated matters decided by the chief executive under Condition 44 and notified to the Licensee.

MONITORING AND ASSESSMENT

45. The approved Underground Water Monitoring Program, from the date of grant of the licence is taken to be use of:
- (a) the monitoring bores listed in the baseline monitoring program (AECOM May 2016);
 - (b) the springs and watercourse monitoring sites as outlined in Table 1 and 2 below; and
 - (c) for water quality parameters to be measured, the parameters listed in Table 3.

Table 1 – Spring monitoring sites

Monitoring Location	Description	Latitude	Longitude	Monitoring Frequency
MS01	Mellaluka Spring	-22.318086	146.48369	At least Quarterly for water quality
MS02	Stories Spring	-22.296555	146.481523	At least Quarterly for water quality
MS03	Lignum Spring	-22.26406	146.47457	At least Quarterly for water quality
DS1	Little Moses Spring	-22.091048	146.269163	At least Quarterly for water quality
DS4	Moses Spring 1	-22.086698	146.239912	At least Quarterly for water quality
DS10	Joshua Spring	-22.069449	146.23513	At least Quarterly for water quality and flow at the outlet pipe

Table 2 – River flow monitoring sites

Monitoring Location	Description	Latitude	Longitude	Monitoring and Frequency
CAR01	Carmichael River downstream	-22.0740740	146.4675990	Continuous monitoring of flow and EC
CAR04	Carmichael River at upstream Gauging Station	-22.1087960	146.3527180	Continuous Monitoring of flow and EC

Table 3 – Monitoring water quality characteristics

Category	Parameters
Physical parameters	pH (field and laboratory) electrical conductivity (field and laboratory) dissolved oxygen
Ions	calcium chloride



	fluoride magnesium potassium sodium sulphate sulphide
Dissolved metals	Aluminium, arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, selenium, silver, uranium, vanadium, zinc, and mercury;
Alkalinity and hardness	alkalinity - bicarbonate, carbonate, hydroxide and total as CaCO ₃ (field and laboratory) total hardness as CaCO ₃

46. The Licensee must, through an appropriately qualified person, undertake monitoring in accordance with the Underground Water Monitoring Program and any subsequent revisions or replacements of that Program.
47. The Licensee must, through an appropriately qualified person, provide to the chief executive for approval, at least 30 days prior to the commencement of the take of associated water authorised under this licence, recommended locations for additional bores to monitor the Colinlea Sandstone below the E seam, south of the Mining Leases. The chief executive will advise the Licensee of approval in writing.
48. The Licensee must provide to the chief executive, at least 30 days prior to the commencement of take of associated water authorised by this licence, all existing underground water level and water quality data collected through the baseline monitoring program, or through other pre-mining monitoring.
49. Any revisions to the Underground Water Monitoring Program must be undertaken by an appropriately qualified person, and be approved by the chief executive. The chief executive will advise the Licensee of the approval in writing.
50. The Licensee must, through an appropriately qualified person, if directed by the chief executive, make any amendments considered necessary to the Underground Water Monitoring Program to ensure that it continues to meet the objectives specified in the definition of the Underground Water Monitoring Program.
51. Monitoring data required to be collected under the Underground Water Monitoring Program is to be Published with the following timeframes:
 - (a) for water level data, within 10 business days from measurement; and
 - (b) for water quality data, within 40 business days from measurement.
52. The volume of associated water taken, under the authority of this licence, must be measured and reported in accordance with requirements prescribed in section 334ZP of the *Mineral Resources Act 1989* and sections 31A and 31B of the *Mineral Resources Regulation 2013*.
53. The Licensee must provide an Annual Monitoring Report to the chief executive. These reports must include:
 - (a) the underground water levels in the monitoring bores of the approved Underground Water Monitoring Program;
 - (b) any changes in water quality (Table 3 of Condition 45) in the monitoring bores;

- (c) quarterly monitoring information relating to springs and watercourses dependent on underground water flow by application of Tables 1 and 2 listed in Condition 45;
- (d) an estimate of spring flows for each of the spring groups including details of the method used to estimate the spring flows;
- (e) maps showing the actual water level drawdown contours caused by the take of associated water for each aquifer;
- (f) details of any review undertaken of the numerical underground water model since the previous Annual Monitoring Report, as required under Conditions 55 or 56;
- (g) an assessment of any differences between the actual water level impact and the impact predicted for the same period in the most current numerical underground water model;
- (h) details of any bores which are predicted by the most current numerical underground water model to be located in the affected area; and
- (i) raw data provided in a format as requested by the chief executive.

54. An Annual Monitoring Report will be due three months after the end of the relevant water year

55. The Licensee, through an appropriately qualified person, must review the numerical underground water model within two years from the commencement of the take of associated water authorised under this licence and at least 5 years thereafter. The review must provide a revised numerical groundwater model based on a transient calibration. The review and revised model must include:
- (a) incorporation of measured mine dewatering volumes and underground water monitoring data;
 - (b) any revised hydrogeological conceptualisation and assumptions of the model, including:
 - (i) any revised geological interpretation;
 - (ii) any revised hydrogeological parameters or assumptions on recharge
 - (iii) any outcomes from the Rewan Connectivity Research Plan or GAB Springs Research Plan;
 - (iv) any assumptions of outflows from springs and other water users; and
 - (c) any recommendations in the document "Carmichael Coal Project Groundwater Flow Model Independent Review (Re: Approval Conditions 22 & 23) Middlemis Hydrogeologic, 28 November 2014";
 - (d) an update of predicted impacts including:
 - (i) revised predicted impacts on springs and watercourses dependent on underground water flow, and other users, including any changes to the affected area;
 - (ii) revised predicted impacts on the Dunda Bed and Clematis Sandstone aquifer, including the modelled diffuse take from those aquifers;
 - (iii) revised predicted underground water inflows into mine workings during mining operations and post closure;
 - (iv) maps showing the revised prediction of the total water level impact from the commencement of underground extraction to at least 190 years after the commencement of underground extraction or such other period as the chief executive may determine; and
 - (v) maps showing the difference between these predicted water level impacts and the water level impacts as predicted at the time of application for this water licence;
 - (e) an evaluation of the accuracy of the predicted impacts from the model.



56. Despite the timeframes specified in Condition 55, the Licensee must, if directed by the chief executive, review the numerical underground water model if the chief executive is of the reasonable opinion that the groundwater model predictions are not representative of actual monitoring data or impacts.

DUNDA BEDS AND CLEMATIS SANDSTONE AQUIFER THRESHOLD LEVELS

57. At least 2 months prior to the commencement of the take of associated water authorised under this licence, and following analysis of underground water monitoring data obtained from monitoring bores in the Dunda Beds and Clematis Sandstone aquifers, the Licensee must present a report outlining recommendations for low impact and high impact threshold levels for approval by the chief executive. The report must:
- (a) provide recommendations for low impact and high impact threshold levels for the Dunda Beds and Clematis Sandstone aquifers;
 - (b) include an assessment of natural seasonal variation in the Dunda Beds and Clematis Sandstone aquifers; and
 - (c) outline the investigation protocol when low impact and high impact threshold levels are exceeded,
 - (i) including any requirements for additional modelling or monitoring required; and
 - (ii) including how impacts attributed to the mining operations will be determined.
58. The chief executive will, based on the report provided under Condition 57, either approve the recommendations for the low and high impact thresholds, or specify other low and high impact thresholds. The chief executive will advise the Licensee of the threshold values in writing.
59. If, the low impact threshold level notified in accordance with Condition 58 is reached in any Dunda Beds or Clematis Sandstone bore, the Licensee must notify the chief executive within 30 business days and provide a report pursuant to Condition 57(c).
60. If the high impact threshold level notified in accordance with Condition 58 is reached in any Dunda Beds or Clematis Sandstone bore, an appropriately qualified person must complete an investigation pursuant to Condition 57(c) and provide a written report to the chief executive within 60 business days.
61. If the investigation under Condition 60 concludes that the exceedance of the high impact threshold level is a result of mining activities, the Licensee must:
- (a) review the latest numerical underground water model;
 - (b) review the Underground Water Monitoring Program; and
 - (c) offset the take of water from the Dunda Beds and/or the Clematis Sandstone aquifers, predicted by the latest numerical underground water model, for term of this licence or as determined by the chief executive.
62. In considering offset measures required under Condition 61(c), the chief executive may consider whether other offsets undertaken to meet conditions of other approvals, including the EPBC Approval, is sufficient for the purposes of meeting Condition 61(c).

CLOSURE OF CARMICHAEL COAL MINE OPERATIONS

63. The Licensee must provide to the chief executive for approval, a report (Pre-closure Report), the earlier of:
- (a) the day that is 1 year before the Expiry Date of this water licence, or
 - (b) the day that is 1 year before the term of the resource tenure/s, to which this licence applies, ends; or
 - (c) the day the Licensee makes application under the *Mineral Resources Act 1989* for the surrender of the resource tenure/s to which this licence applies.
64. Condition 63(b) does not apply if the Licensee makes an application to renew the resource tenure/s, to which this licence applies, under the *Mineral Resources Act 1989*.
65. The Pre-closure Report required under Condition 63 must contain:
- (a) a description of water quality (Table 3 of Condition 45) from the monitoring bores;
 - (b) the underground water levels in the monitoring bores;
 - (c) monitoring information relating to springs and watercourses dependent on underground water flow (Tables 1 and 2 of Condition 45);
 - (d) an assessment of the need for recalibration of the numerical underground water model used to assess water level impact;
 - (e) a recalibrated numerical underground water model as assessed under Condition 65(d);
 - (f) maps, using the most current model, showing
 - (i) the actual water level drawdown contours caused by the extraction of associated water for each aquifer;
 - (ii) the predicted drawdown contours for each aquifer; and
 - (iii) the revised predicted affected area for a period to at least 190 years after commencement of pumping or such other period as the chief executive may determine;
 - (g) identification of any water bores located in the affected area;
 - (h) identification of predicted long term impacts on springs and watercourses dependent on underground water flow; and
 - (i) recommendations and strategies to mitigate or offset predicted impacts on springs and watercourses dependent on underground water flow, including timeframes for implementation of those recommendations and strategies.
66. Where the report identifies bores located in an affected area, for each bore that is not already subject to a make good agreement, the Licensee must –
- (a) unless the Licensee has a reasonable excuse, undertake a bore assessment of the bore in accordance with Conditions 9 to 12;
 - (b) enter into a make good agreement with the bore owner of the bore as required under condition 17; and
 - (c) comply with the make good agreement.
67. Where the report identifies a WCS water source, for each WCS water source that is not already subject to a make good agreement, the Licensee must –
- (a) unless the Licensee has a reasonable excuse, undertake a WCS water source assessment in accordance with Condition 14 to 16;
 - (b) enter into a make good agreement with the WCS water source user as required under condition 17; and
 - (c) comply with the make good agreement.

68. The chief executive will advise the Licensee of acceptance of the Pre-closure Report in writing. The Licensee must submit an amended Pre-closure Report if notified by the chief executive that the report is considered unacceptable and that the Licensee must address specified deficiencies.

