

29 June 2020

Independent Planning Commission NSW  
Attention: John Hann, Panel Chair  
C/- Brad James, Senior Planning Officer  
Level 3, 201 Elizabeth Street  
Sydney NSW 2000

Via email: [ipcn@ipcn.nsw.gov.au](mailto:ipcn@ipcn.nsw.gov.au)

Dear Mr Hann

**RE: VICKERY EXTENSION PROJECT – ADDITIONAL INFORMATION IN RESPONSE TO IPC QUERIES**

Thank you for the opportunity to brief the NSW Independent Planning Commission (IPC) in regard to the Vickery Extension Project (the Project) on 18 June 2020.

In response to queries raised by the IPC Panel members during the briefing, Enclosure 1 of this letter provides additional information regarding the following:

1. Narrabri Shire Council Planning Agreement offer.
2. Koala offsets and management.
3. Emplacement of waste rock on alluvium.
4. Water Security.
5. Use of void water.
6. Management of noise at property ID 127.
7. Clarification of Amendment Report.

Please do not hesitate to contact the undersigned if you have any queries or would like to discuss.

Yours sincerely

**WHITEHAVEN COAL LIMITED**



**Mark Stevens**  
EGM – Project Delivery

[Redacted]  
[Redacted]

*Enclosure 1: Additional Information in Response to IPC Queries*

**Whitehaven Coal Limited** ABN 68 124 425 396

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**ENCLOSURE 1**

**ADDITIONAL INFORMATION IN RESPONSE TO IPC QUERIES**

## 1. Narrabri Shire Council Planning Agreement offer

A Voluntary Planning Agreement for the approved Vickery Coal Project (the Approved Mine) was agreed with the Narrabri Shire Council (NSC) in 2014 for \$2.25 million (M). Table 1 provides a summary of key correspondence between the NSC and Whitehaven regarding a revised Planning Agreement (PA) offer for the Project.

**Table 1: Summary of Planning Agreement-related Correspondence between Whitehaven and NSC**

Date	Details of Correspondence
17 April 2019	<ul style="list-style-type: none"> <li>Whitehaven letter to NSC with a revised Planning Agreement (PA) offer for the Project of \$2.71M.</li> </ul>
9 August 2019	<ul style="list-style-type: none"> <li>NSC letter to the IPC stating the PA offer not accepted and that Council intends to consult with the Boggabri community to determine an acceptable offer.</li> </ul>
21 October 2019 <sup>1</sup>	<ul style="list-style-type: none"> <li>NSC letter to Whitehaven which notes outcomes of consultation undertaken by NSC with the Boggabri Community and requesting increase of PA offer to \$14.87M and an additional \$7.46M to upgrade Braymont Road<sup>2</sup>.</li> </ul>
14 November 2019 <sup>3</sup>	<ul style="list-style-type: none"> <li>WHC letter to NSC providing revised PA offer of \$3.2M.</li> <li>Proposed division of the PA offer across local initiatives identified by the Boggabri Community is as follows (subject to further refinement following scoping): <ul style="list-style-type: none"> <li>Upgrade to Boggabri Pool - \$500,000</li> <li>Community meeting space - \$500,000</li> <li>Retirement units in Boggabri - \$850,000</li> <li>Merton Street Streetscape Project - \$500,000</li> <li>Showground improvements - \$750,000</li> <li>Contribution to a community development role for Boggabri - \$100,000</li> </ul> </li> </ul>
13 January 2020 <sup>4</sup>	<ul style="list-style-type: none"> <li>NSC letter to IPC stating revised PA offer not accepted.</li> </ul>

<sup>1</sup> <https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-7480%2120200520T064812.414%20GMT>

<sup>2</sup> Note Condition B79, Schedule 2 of the recommended Development Consent prohibits development-related traffic using Braymont Road, except in an emergency to avoid the loss of lives, property and/or environmental harm. This condition does not apply to employees who may reside on Braymont Road or the use of Braymont Road for consultation, environmental monitoring and inspection/maintenance of nearby infrastructure.

<sup>3</sup> <https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-7480%2120200520T065607.230%20GMT>

<sup>4</sup> <https://www.ipcn.nsw.gov.au/resources/pac/media/files/pac/projects/2018/11/vickery-extension-project/correspondence-after-final-issues-report/200113innarrabri-shire-council-re-vickery-extension-project.pdf>

## 2. Koala offsets and management

Figure 5-2 of the Koala Plan of Management<sup>5</sup> for the Project (reproduced below) provides mapping of potential and core Koala habitat within the Project area. While impacts to Koala habitat have been avoided as far as practical, in particular core Koala habitat, the Project would impact a total of 50.3 ha comprising:

- 1 ha of core Koala habitat (within the Project rail spur corridor); and
- 49.3 ha of potential Koala habitat.

Impacts to Koala habitat would be offset using species and ecosystem credits. The determined Koala offset requirement is incorporated in Tables 10 and 11 in Condition B59, Schedule 2 of the recommended Development Consent (refer Plates 1 and 2), and comprises:

- Ecosystem credits for disturbance of 1 ha of core Koala habitat (River Red Gum Riparian Tall Woodland [NA193]).
- Ecosystem credits for disturbance of 49.3 ha of potential Koala habitat, comprising:
  - 3.6 ha of Poplar Box Woodland on Alluvial Clay Soils (NA185);
  - 19.2 ha of Pilliga Box – Poplar Box Shrubby Woodland (NA324);
  - 0.5 ha of White Box – Silver-leaved Ironbark Shrubby Open Forest (NA349); and
  - 26 ha of Narrow-leaved Ironbark – White Box Shrubby Forest (NA311).
- 1,308 species credits for clearance of 50.3 ha of Koala habitat within the Project area and rail spur corridor.

Ecosystem and species offset credits for the Koala would be satisfied as per the requirements of the NSW *Biodiversity Conservation Act, 2016*.

In addition to offsetting potential impacts to Koalas, Condition B56, Schedule 2 of the recommended Development Consent requires a Koala Plan of Management to be prepared and implemented for the Project. A draft Koala Plan of Management has been prepared which incorporates additional mitigation and management measures to be implemented over the life of the Project. The draft Koala Plan of Management describes that following construction, Whitehaven would implement restorative planting of River Red Gum Riparian Tall Woodland (NA193) within the disturbed Koala habitat in the Project rail spur alignment, focusing on species identified as potential feed trees. These plantings would occur as soon as is practical after construction of the Project rail spur.

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<sup>5</sup> <https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-7480%2120200520T065611.725%20GMT>



This figure shows the mapped potential (orange shading) and core (blue shading) Koala habitat within and immediately adjacent to the Project area.

Impacts to Koala habitat have been avoided as far as practicable and would be offset using species and ecosystem credits.

In addition, restorative planting of potential feed tree species would be undertaken within the core Koala habitat impacted by the Project

- LEGEND**
- Approximate Extent of Vickers Coal Project
  - Approximate Extent of Vickers Extension Project
  - Koala
  - Core Koala Habitat
  - Potential Koala Habitat within Extent of Vickers Extension Project

Sources: Orthophoto - Department of Land and Property Information, Aerial Photography (July 2011)

**WHITEHAVEN COAL**  
**VICKERS COAL MINE**  
 Koala Records and Potential Habitat  
 in the Project Area

Sources: (1) Future Ecology (2018)  
 (2) DEH (2018a)  
 (3) Kendall & Kendall Ecological Services (2011)

**Figure 5.2**

**Figure 5-2 of the Koala Plan of Management**



## BIODIVERSITY

### Translocation of Threatened Species

B55. The Applicant shall use its best endeavours to successfully translocate the Winged Peppercreep located within the disturbance boundary.

### Biodiversity Offset Strategy – transferred obligations from Vickery Coal Project as modified by the Vickery Extension Project

B56. The Applicant shall implement the biodiversity offset strategy described in the EIS, summarised in Table 9 and shown conceptually in Appendix 4, to the satisfaction of the Planning Secretary.

**Table 9: Summary of the biodiversity offset strategy – Vickery Coal Project**

Area	Offset Type	Minimum Size (hectares)
Willeroi East Offset Area	Existing vegetation to be enhanced, and additional vegetation to be established with the restoration of at least 156 ha of Box Gum Woodland EEC, as listed under the BC Act	1,671
Areas 2, 3, 4 & 5	Existing vegetation to be enhanced with the restoration of at least 127 ha of Poplar Box Woodland and 45 ha of Box Gum Woodland EEC, as listed under the BC Act	404.5
Rehabilitation Area	Re-establishment of native vegetation communities for a biodiversity conservation land use objective.	1,360

**Notes:**

- For the purposes of this consent Box Gum Woodland refers to the EEC listed as White Box Yellow Box Blakely's Red Gum Woodland under the TSC Act, or similar EEC as may be updated from time to time.
- Any area of the offset strategy in Table 9 may be substituted with an alternative offset area subject to demonstration of equivalent biodiversity outcomes and to the satisfaction of the Secretary

### Long Term Security of Offset

B57. The Applicant shall make suitable arrangements to provide appropriate long term security for the offset areas in Table 9:

- within 2 years of the date of commencement of development under this consent unless otherwise agreed by the Planning Secretary, for the Willeroi East Offset Area and Offset Areas 2, 3, 4 and 5; and
- within 6 months of cessation of mining operations, unless otherwise agreed by the Planning Secretary, for the woodland to be established in the Rehabilitation Area, as identified in Table 9,

to the satisfaction of the Planning Secretary.

**Note:** The Department acknowledges that the Applicant is investigating the potential to transfer part or all of the Willeroi East Offset Area directly to the national park estate, and accepts that interim conservation measures may be implemented prior to this transfer.

### Additional Biodiversity Offsets Required – Vickery Extension Project

B58. In addition to the biodiversity offset requirements in Table 9, within 2 years of the date of commencement of development under this consent, unless otherwise agreed by the Planning Secretary the Applicant must retire biodiversity credits of a number and class specified in Table 10 and Table 11 below to offset the biodiversity impacts of the development.

B59. The retirement of these credits must be carried out in accordance with the NSW Biodiversity Offsets Policy for Major Projects and can be achieved by acquiring or retiring 'biodiversity credits' within the meaning of the BC Act.

**Table 10: Ecosystem credit requirements**

Ecosystem credits	Code (BVT)	Code (PCT)	Credits Required
Poplar Box Woodland on Alluvial Clay Soils	NA185	101	3,540
Pilliga Box – Poplar Box Shrubby Woodland	NA324	397	6,955
White Box – Silver-leaved Ironbark Shrubby Open Forest	NA349	594	1,795
Narrow-leaved Ironbark – White Box Shrubby Forest	NA311	459	4,025

Table 10 in Condition B59, Schedule 2 of the recommended Development Consent details the Project's total ecosystem credit requirement, of which a portion offsets impacts to potential Koala habitat.

The remaining ecosystem and species credit requirements are shown in Plate 2 below.

## Plate 1: Extract of Recommended Development Consent Conditions – Condition B59, Schedule 2

Ecosystem credits	Code (BVT)	Code (PCT)	Credits Required
Mixed Marsh Sedgeland	NA201	53	46
River Red Gum Riparian Tall Woodland	NA193	78	40

**Table 11: Species credit requirements**

Species	Credits Required
Regent Honeyeater ( <i>Anthochaera phrygia</i> )	3,703
Squirrel Glider ( <i>Petaurus norfolcensis</i> )	1,672
Koala ( <i>Phascolarctos cinereus</i> )	1,308

**Notes:**

- The credits in Table 10 and Table 11 were calculated in accordance with Framework for Biodiversity Assessment of the NSW Biodiversity Offset Policy for Major Projects (OEHL, 2014) and would need to be converted to reasonably equivalent 'biodiversity credits', within the meaning of the BC Act, if the credits are to be retired in accordance with the Biodiversity Offsets Scheme of the BC Act. Under this conversion the species credits for the Regent Honeyeater would be converted to ecosystem credits.
- Following repeal of the Threatened Species Conservation Act 1995 on 25 August 2017, credits created under that Act are taken to be 'biodiversity credits' under the Biodiversity Conservation Act 2016 by virtue of clause 22 of the Biodiversity Conservation (Savings and Transitional) Regulation 2017.

**Ecological Rehabilitation Ecosystem Credits**

B60. Retirement of the ecosystem credits in Table 10 can include undertaking ecological rehabilitation at the site in accordance with Section 12.2 of the Framework for Biodiversity Assessment of the NSW Biodiversity Offsets Policy for Major Projects (OEHL, 2014), as identified in the approved Rehabilitation Management Plan required under condition B106.

*Note: Under the FBA, the ecosystem credits are considered retired once the credits and information requirements under Section 12.2 of the FBA are documented in the Rehabilitation Management Plan.*

B61. Within 12 months of triggering remedial action under the Rehabilitation Management Plan for alternative mechanism for retirement of ecological rehabilitation credits, unless otherwise agreed by the Planning Secretary, the Applicant must acquire or retire the relevant biodiversity credits within the meaning of the BC Act.

**Retirement of Credits Status Reports**

B62. From the date of commencement of development under this consent until the credit requirements have been retired, the Applicant must submit a six monthly report to the Department on progress towards retirement of credits required in Table 10 and Table 11.

**Biodiversity Management Plan**

B63. The Applicant must prepare a Biodiversity Management Plan to the satisfaction of the Planning Secretary. This plan must:

- be prepared by a suitably qualified and experienced person/s;
- be prepared in consultation with BCD and North West LLS;
- be submitted to the Planning Secretary for approval prior to carrying out construction under this consent;
- describe the short, medium, and long-term measures to be undertaken to manage vegetation and fauna habitat on the site and in the biodiversity offset strategy areas required under Condition B56 (see note below the table);
- include detailed performance and completion criteria for evaluating the performance of the biodiversity offset strategy required under Condition B56, and triggering remedial action (if necessary);
- describe how biodiversity management would be integrated with similar measures within other management plans, including the Rehabilitation Management Plan referred to in condition B106;
- describe the measures to be implemented within the approved disturbance areas to:
  - minimise the amount of clearing;
  - minimise impacts on fauna, including undertaking pre-clearance surveys;
  - translocate and protect the population of Winged Peppercress located on the site, including detailed description of a monitoring and maintenance program; and
  - maximise the salvage of resources, including tree hollows, vegetation and soil resources, for beneficial reuse, including fauna habitat enhancement;

Tables 10 and 11 in Condition B59, Schedule 2 of the recommended Development Consent detail the Project's ecosystem credit requirement associated with impacts to core Koala habitat (i.e. NA193) and Koala species credit requirement.

Ecosystem credit requirements associated with impacts to potential Koala habitat are shown in Plate 1 above.

**Plate 2: Extract of Recommended Development Consent Conditions – Condition B59, Schedule 2**

### 3. Emplacement of waste rock on alluvium

Approximately 202 ha of the proposed waste emplacement will overlap a thin clay-dominated alluvium embayment (approx. 30 m thick) to the north-west of the open cut and adjacent to the Canyon Coal Mine (Figure 1). Part of the existing Canyon Coal Mine waste emplacement and final void is within this regionally mapped alluvium (Figure 2)

Modelling undertaken for the Groundwater Assessment (HydroSimulations, 2018) and Surface Water Assessment (Advisian, 2018) for the Project EIS indicates the dominant hydraulic gradient within the Project waste emplacement would be towards the mining void (i.e. away from the alluvium).

Notwithstanding, once the groundwater level within the waste emplacement reaches an elevation above the alluvium, there is potential for some seepage to occur between the emplacement material and the alluvium embayment. HydroSimulations (2018) predicted maximum long-term seepage rates would range from 0.03 ML/day during initial recovery to 0.02 ML/day over the long term. This rate is in the same order of magnitude as pre-mining (i.e. existing) seepage from the Maules Creek Formation coal measures within the Project area to the alluvium embayment.

Table 20 of the Groundwater Assessment (HydroSimulations, 2018) (reproduced as Table 2 below) provides the groundwater quality of the alluvium within the embayment, in comparison to existing seepage from the Maules Creek Formation coal measures and estimated waste emplacement spoil quality. Waste emplacement seepage quality was estimated from results of a study undertaken by Mackie (2009)<sup>6</sup>.

**Table 2: Estimate of Quality of Seepage to the Alluvium Embayment**

Unit / lithology	Monitoring bores	Samples (n)	Groundwater salinity (TDS, mg/L)		
			Median	25 <sup>th</sup> Percentile	75 <sup>th</sup> Percentile
<b>Alluvium</b> (within the embayment)	VNW221, VNW223	28	5,245	4,685	6,010
<b>Maules Creek Formation</b> coal measures near the pit	GW7, GW8, VNW222, VKY34, VKY35, VKY36, VKY42, VKY43, TR7, TR18, TR26, TR35, WVK37, WVK62, WVK501, WVK505, WVK526	70	2,666	1,868	3,443
<b>Spoil</b> (estimate)	Mackie (2009)	N/A	3,000	1,000	5,000

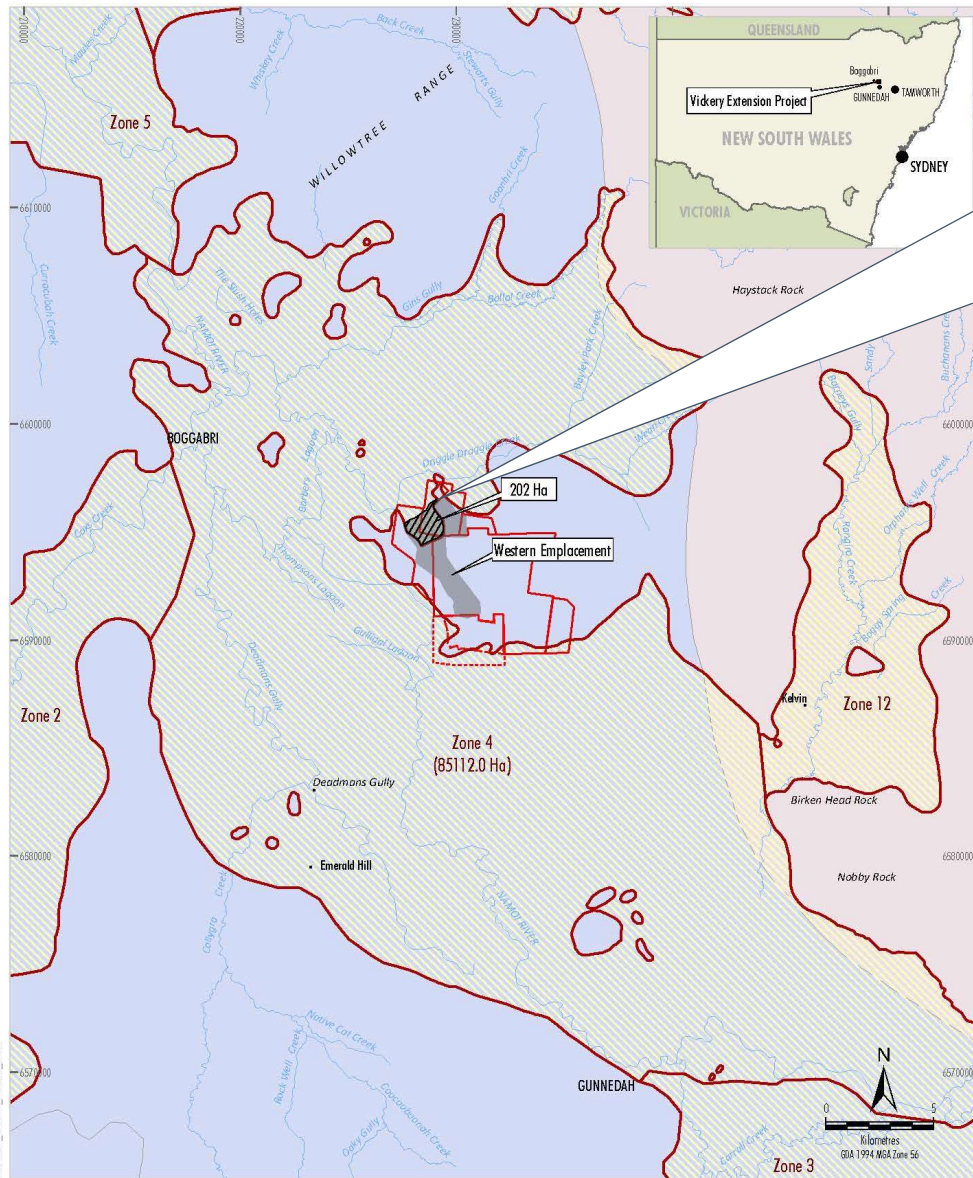
Source: HydroSimulations (2018)

Seepage from the waste emplacement is likely to be of significantly lower salinity than groundwater currently within the alluvium embayment and is also of approximately similar salinity to groundwater in the Maules Creek Formation coal measures which currently report to the embayment. On this basis, and in consideration of the scale of the affected area in the context of the entire groundwater source, the Groundwater Assessment (p50) concluded:

*...the small amount of seepage from the Western Emplacement will cause no adverse water quality impacts to the alluvium.*

<sup>6</sup> Mackie, C. D. (2009) *Hydrogeological Characterisation of Coal Measures and Overview of Impacts of Coal Mining on Groundwater Systems in the Upper Hunter Valley of NSW*.





This figure shows the extent of the Project waste emplacement which overlaps the thin alluvium embayment (202 ha) in the context of the total area of the Upper Namoi Zone 4 alluvium groundwater source.

- LEGEND**
- Mining Tenement Boundary (ML and CL)
  - Exploration Licence Boundary (EL)
  - Mining Lease Application (MLA)
  - Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2019
  - Alluvial Groundwater Source
  - Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011
  - Gunnedah-Oakey Basin MDB Groundwater Source
  - Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources 2011
  - New England Fold Belt MDB Groundwater Source

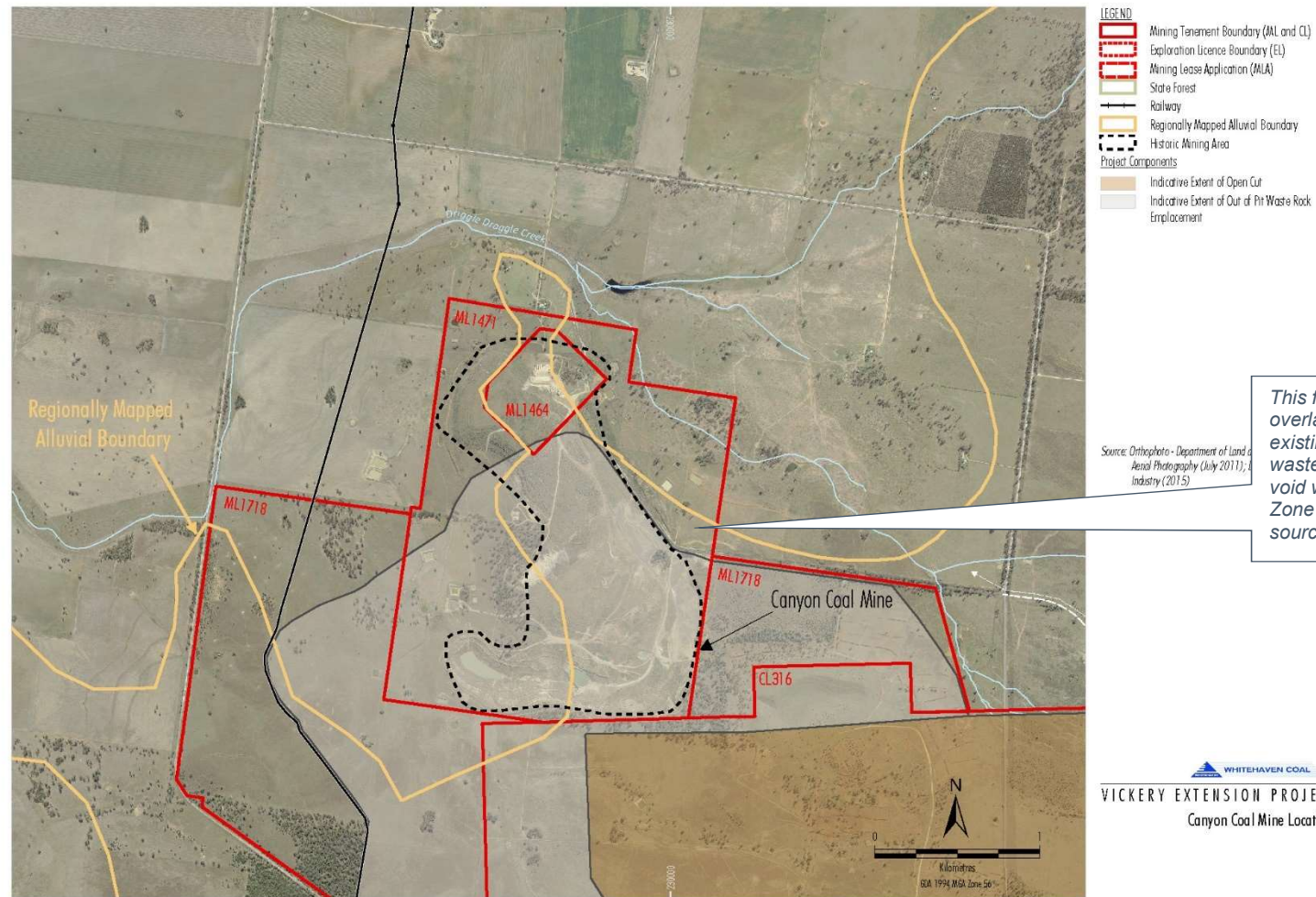
Source: Genscience Australia Topographic Base (2006);  
NSW Department of Industry (2015); NSW (2011)

**WHITEHAVEN COAL**  
**VICKERY EXTENSION PROJECT**  
Relevant Groundwater Sources

**Figure 1: Extent of Upper Namoi Zone 4 Alluvium Groundwater Source**

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**Figure 2: Canyon Coal Mine Location in relation to the Alluvium Boundary**

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DPIE's independent groundwater peer reviewer, Mr Hugh Middlemiss, provided expert advice (dated 12 March 2020<sup>7</sup>) on potential impacts of seepage from the emplacement to the alluvium embayment and concluded that:

*... I consider the residual risk to be quite low, for the following reasons:*

- a) assuming that closure will involve a final void at the south-eastern corner of the VEP, the modelled water table at 100 years after the end of mining shows that the long term final void groundwater 'capture zone' extends across the Western Emplacement over the alluvium embayment (VEP Submissions Report, August 2019, Figure 8b); this means that seepage from the Western Emplacement would indeed flow towards the final void sink rather than towards the alluvium.*
- b) the potential seepage flux and water quality has been adequately assessed as a low risk to the beneficial use category for the alluvium (HydroSimulations VEP Groundwater Assessment, August 2018, Sections 5.5.3, 6.1.4; Tables 19, 20).*
- c) the embayment alluvium underlying the Western Emplacement has already been impacted by the existing Canyon Coal Mine final void, as Whitehaven Coal point out, but the potential compaction impacts on the 'clay-dominated' (compressible) alluvium has not been assessed specifically.*

Any increase in density of the aquifer as a result of the overlap of the waste emplacement, which would be minimal, would occur in the area bordering the Maules Creek Formation and would not have a material effect on the remaining Zone 4 alluvium. Therefore, effects of the overlapping emplacement to regional groundwater storage or flow would be negligible.

DPIE has recommended water quality management objectives to require no more than negligible impacts, as was predicted in the EIS (Table 8 in Condition B51, Schedule 2 – refer Plate 3). Specific measures to monitor this, and confirm the performance measures are being achieved, would be described in a Water Management Plan prepared for the Project, in accordance with Condition B53(g), Schedule 2 of the recommended Development Consent.

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<sup>7</sup> <https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-7480%2120200520T064951.466%20GMT>



#### Mine Water Storages

B47. The Applicant shall implement all reasonable and feasible measures to prevent migration of saline water from the mine water storages or provide suitable measures to offset the salinity impacts on the Namoi River, to the satisfaction of the EPA and the Planning Secretary.

#### Flooding

B48. The Applicant shall ensure that the design and construction of the project, including the Project Rail Spur and Kamilaroi Highway overpass, is consistent with the objectives of the *Floodplain Management Plan for the Upper Namoi Valley Floodplain 2019*, to the satisfaction of the Planning Secretary.

B49. The Project Rail Spur, Project Rail Spur bridges and any upgrade to the haul road must be designed and constructed to minimise flooding and scouring impacts, in consultation with BCD and consistent with the recommendations of the Department's flood peer review. Prior to construction of the Project Rail Spur or any upgrades to the haul road, the Proponent shall undertake a flood assessment of the detailed design to confirm there would be minimal impacts as predicted in the documents listed in condition A2(c).

#### Namoi River Pipeline

B50. Prior to the construction of the Namoi River pipeline and pump station, the Applicant shall:

- consult with DPI - NSW Fisheries regarding the general operation and design of the pump station and screens to avoid and mitigate impacts on native fish;
- consult with GSC regarding the design and construction of the pipeline in the Braymont Road Reserve; and
- implement all reasonable and feasible recommendations from DPI - NSW Fisheries and GSC in regard to the design and construction of the pipeline and pump station,

to the satisfaction of the Planning Secretary.

#### Water Management Performance Measures

B51. The Applicant must ensure that the development complies with the performance measures in Table 8.

**Table 8:** Water management performance measures

Feature	Performance Measure
Water management – General	<ul style="list-style-type: none"> <li>Maintain the clean water management system separate from the dirty (i.e. sediment laden) and mine water management systems</li> <li>Minimise the use of clean and potable water</li> <li>Maximise water recycling, reuse and sharing opportunities</li> <li>Maximise the capture and reuse of mine water and dirty water to meet operational demands for water, including dust suppression activities</li> <li>Minimise the use of make-up water from licensed external sources</li> <li>Design, install, operate and maintain water management infrastructure in a proper and efficient manner</li> <li>Minimise risks to the receiving environment and downstream water users</li> </ul>
Alluvial aquifers	<ul style="list-style-type: none"> <li>Negligible impacts to alluvial aquifers caused by the development beyond those predicted in the document/s listed in condition A2(c), including: <ul style="list-style-type: none"> <li>negligible impacts to water quality;</li> <li>negligible change in groundwater levels; and</li> <li>negligible impact to other groundwater users;</li> </ul> </li> <li>Comply with the Minimal Impact Consideration for Aquifer Interference Activities for Alluvial Water Source (highly productive groundwater sources) under the <i>NSW Aquifer Interference Policy</i> (DPI, 2012)</li> </ul>
Erosion and sediment control works	<ul style="list-style-type: none"> <li>Design, install and maintain erosion and sediment controls in accordance with the best management practice guidance series <i>Managing Urban Stormwater: Soils and Construction – Volume 1</i> (Landcom, 2004) and <i>2E Mines and Quarries</i> (DECC, 2008)</li> <li>Design, install and maintain any new infrastructure within 40 metres of watercourses in accordance with the guidance series for <i>Controlled Activities on Waterfront Land</i> (DPI Water, 2012) or latest versions</li> <li>Design, install and maintain any creek crossings in accordance with the <i>Fisheries NSW Policy and Guidelines for Fish Habitat Conservation and Management</i> (DPI, 2013) and <i>Why Do Fish Need To Cross The Road? Fish Passage Requirements for Waterway Crossings</i> (NSW Fisheries, 2003), or their latest versions</li> </ul>
Flood protection works	<ul style="list-style-type: none"> <li>Design, install and maintain flood levees to protect mining areas from a probable maximum flood event and to ensure no increased flooding impacts on roads or privately-owned land</li> </ul>

Table 8 of the recommended Development Consent provides performance measures specific to the alluvium, in particular that the Project must ensure it has negligible impact on the alluvium beyond the predictions in the Project EIS.

### Plate 3: Extract of Recommended Development Consent – Table 8 in Condition B51, Schedule 2

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#### **4. Water Security**

In consideration of recent drought conditions experienced in the region, further analysis of recent rainfall data (i.e. up to March 2020) has been undertaken by Advisian (Attachment 1). This analysis has determined that there was no change to the driest 2, 5 and 10 calendar year periods compared to what was modelled for the EIS.

The conceptual Project water management system has also been reviewed to demonstrate the design meets the water management performance measures provided in the recommended Development Consent.

Advisian (2020) concluded that it is reasonable to expect Whitehaven will have access to sufficient water for all stages of the development, including peak operations, or could adjust its operations to match available water supply accordingly (e.g. through implementing water saving initiatives or other operational measures).

#### **5. Use of void water**

During Project operations, water reporting to the open cut would accumulate in sumps and would be pumped to either of the two mine water dams (MWD-1 and MWD-2) and used to meet water demands for dust suppression and the CHPP.

Following completion of mining, the open cut would be rehabilitated to form a final void that is long-term safe and stable and acts as a groundwater sink to prevent migration of poor quality water to the surrounding groundwater. The water captured in the void would potentially be available for use by third parties. Third party use of the final void water is not a component of the Project and would be subject to the agreed final land uses of the site as well as relevant separate approval processes.

#### **6. Management of noise at property ID 127**

Note noise criteria are not applicable to property ID 127 as the landowners have been afforded the right to additional mitigation and acquisition upon request, in accordance with the recommended Development Consent (Conditions D1 and D2 – refer Plate 4) and as per the Approved Mine Development Consent. Whitehaven has commenced discussions with the landowner of property ID 127 regarding an agreement.

Whitehaven would be required to ensure the Project complies with operational noise limits at all adjacent privately-owned properties and residences, particularly at residences on property IDs 131, 132 and 133, in accordance with the criteria prescribed in Table 1 in Condition B1, Schedule 2 of the recommended Development Consent (refer to Plate 5).

#### **7. Clarification of Amendment Report**

Due to an administrative oversight, Mining Lease (ML) 1718 was granted for mining purposes (now ancillary mining activities) only, not coal extraction as proposed for the Approved Mine and the Project. Therefore only surface activities, including waste emplacement and water management infrastructure, are currently permitted to be undertaken within ML 1718.

Following lodgement of the Project EIS, an Amendment Report<sup>8</sup> was prepared for the Project to remove the portion of the open cut and associated extraction of coal from within ML 1718 (approximately 11 million tonnes). Proposed surface activities will remain within ML 1718 as a component of the Project.

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<sup>8</sup> *Vickery Extension Project Amendment Report* (Whitehaven, 2019)  
(<https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-7480%2120200113T010300.409%20GMT>).



## PART D ADDITIONAL PROCEDURES

### ACQUISITION UPON REQUEST

- D1. Upon receiving a written request for acquisition from the owner of the privately-owned land<sup>a</sup> listed in Table 13, the Applicant must acquire the land in accordance with the procedures in conditions D11 to D18, inclusive.

**Table 13: Land subject to acquisition upon request**

Acquisition Basis	Property ID
Noise	127

<sup>a</sup>The locations of the land referred to in Table 13 is shown in Appendix 1.

### ADDITIONAL MITIGATION UPON REQUEST

- D2. Upon receiving a written request from the owner of any residence on the privately-owned land<sup>a</sup> listed in Table 13, the Applicant must implement additional mitigation measures at or in the vicinity of the residence in consultation with the landowner. These measures must be consistent with the measures outlined in the *Voluntary Land Acquisition and Mitigation Policy for State Significant Mining, Petroleum and Extractive Industry Developments* (NSW Government, 2018). They must also be reasonable and feasible, proportionate to the level of predicted impact and directed towards reducing the relevant noise impacts of the development. The Applicant must also be responsible for the reasonable costs of ongoing maintenance of these additional mitigation measures until the cessation of mining operations.
- D3. If within three months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Planning Secretary for resolution.

### NOTIFICATION OF LANDOWNERS/TENANTS

- D4. Within one month of the date of this consent, the Applicant must:
- notify in writing the owner of:
    - the land listed in Table 13 that they have the right to require the Applicant to acquire their land at any stage during the development;
    - the residences on the land listed in Table 13 that they are entitled to ask the Applicant to install additional mitigation measures at the residence; and
    - any privately-owned land within 3 kilometres of the approved open cut mining pit/s that they are entitled to ask the Applicant for an inspection to establish the baseline condition of any buildings or structures on their land, or to have a previous property inspection report updated;
  - notify the tenants of any mine-owned land of their rights under this consent; and
  - send a copy of the NSW Health fact sheet entitled *"Mine Dust and You"* (NSW Health, 2017) to the owners and/or existing tenants of any land (including mine-owned land) where the predictions in the document/s listed in condition A2(c) identify that dust emissions generated by the development are likely to be greater than the relevant air quality criterion in PART B of this consent at any time during the life of the development.
- D5. Prior to entering into any tenancy agreement for any land owned by the Applicant that is predicted to experience exceedances of the recommended dust and/or noise criteria, the Applicant must:
- advise the prospective tenants of the potential health and amenity impacts associated with living on the land, and give them a copy of the NSW Health fact sheet entitled *"Mine Dust and You"* (NSW Health, 2017); and
  - advise the prospective tenants of the rights they would have under this consent,
- to the satisfaction of the Planning Secretary.

### NOTIFICATION OF EXCEEDANCES

- D6. As soon as practicable and no longer than 7 days after obtaining monitoring results showing an exceedance of any noise, blasting or air quality criterion in PART B of this consent, the Applicant must provide the details of the exceedance to any affected landowners tenants and the CCC.
- D7. For any exceedance of any air quality criterion in PART B, the Applicant must also provide to any affected land owners and/or tenants a copy of the NSW Health fact sheet entitled *"Mine Dust and You"* (NSW Health, 2017).

### INDEPENDENT REVIEW

- D8. If a landowner considers the development to be exceeding any relevant air quality, noise or blasting criterion in PART B of this consent, they may ask the Planning Secretary in writing for an independent review of the impacts of the development on their residence or land.
- D9. If the Planning Secretary is not satisfied that an independent review is warranted, the Planning Secretary will notify the landowner in writing of that decision, and the reasons for that decision, within 21 days of the request for a review.

Conditions D1 and D2 of the recommended Development Consent provide that property ID 127 has additional mitigation and acquisition rights for the Project.

**Plate 4: Extract of Recommended Development Consent –Conditions D1 and D2, Schedule 2**

## PART B SPECIFIC ENVIRONMENTAL CONDITIONS

### NOISE

#### Operational Noise Criteria

- B1. The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 1 at any residence<sup>a</sup> on privately-owned land, excluding the noise-affected land referred to in Table 13.

**Table 1: Operational noise criteria dB(A)**

Residence <sup>a</sup>	Day	Evening	Night	
	L <sub>Aeq</sub> (15 min)	L <sub>Aeq</sub> (15 min)	L <sub>Aeq</sub> (15 min)	L <sub>AF max</sub>
131a	40	37	37	52
131b, 132	40	36	36	52
All other privately-owned residences	40	35	35	52

<sup>a</sup> The locations referred to in Table 1 are shown in Appendix 1.

- B2. The Applicant must ensure that noise generated by transporting coal on the Kamilaroi Highway overpass does not exceed the criteria in Table 2 at any residence on privately-owned land.

**Table 2: Kamilaroi Highway overpass noise criteria dB(A)**

Land	Day	Evening & Night	Night
	L <sub>Aeq</sub> (15 min)	L <sub>Aeq</sub> (15 min)	L <sub>A1</sub> (1 min)
223	44	44	65
224	46	46	64
284	40	36	55
292	40	36	57
Any other residence within 2.5 km of the centreline of the private haul road or Kamilaroi Highway overpass	40	35	55
All other privately-owned residences	40	35	45

<sup>a</sup> The locations referred to in Table 2 are shown in Appendix 1

- B3. Noise generated by the development must be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the *Noise Policy for Industry* (EPA, 2017). The noise enhancing meteorological conditions determined by monitoring at the meteorological station required under condition B38 and as defined in Part D of the *Noise Policy for Industry* (EPA, 2017) apply to the noise criteria in Table 1 and Table 2.
- B4. The noise criteria in Table 1 and Table 2 do not apply if the Applicant has an agreement with the owner/s of the relevant residence or land to exceed the noise criteria, and the Applicant has advised the Department in writing of the terms of this agreement.

#### Construction Noise Criteria

- B5. Between the hours of:
- 7 am to 6 pm Monday to Friday;
  - 8 am to 1 pm Saturday; and
  - At no time on Sundays or Public Holidays,

the Applicant must ensure that the noise from activities associated with the construction of the Project Rail Spur, Kamilaroi Highway Overpass and road realignments does not exceed the criteria in Table 3 at any residence on privately-owned land, unless otherwise agreed by the Planning Secretary.

**Table 3: Project construction noise criteria dB(A)**

Land <sup>a</sup>	Construction Noise Criteria
	L <sub>Aeq</sub> (15 min)
223	49

Table 1 of the recommended Development Consent details the operational noise criteria applicable to privately-owned residences for noise generated by the Project.

Operational noise criteria are not applicable to Property ID 127.

## Plate 5: Extract of Recommended Development Consent – Table 1 in Condition B1, Schedule 2

## ATTACHMENT 1

### VICKERY EXTENSION PROJECT UPDATED SITE WATER BALANCE (ADVISIAN, 2020)

Whitehaven Coal Limited  
231 Conadilly Street  
GUNNEDAH NSW 2380

26 June 2020

**Attention: Mr Tony Dwyer, Group Manager - Approvals and Environment**

Dear Tony,

## **VICKERY EXTENSION PROJECT UPDATED SITE WATER BALANCE**

I refer to our recent discussions regarding the Surface Water Assessment (Advisian, 2018) that we completed as part of the Environmental Impact Statement (EIS) for the Vickery Extension Project (the Project).

In particular, I refer to Whitehaven Coal's request for us to undertake the following.

1. Review the water management system and site water balance modelling against the performance measures and conditions in the recommended Development Consent for the Project.
2. Update the site water balance modelling to incorporate rainfall and licensed water availability during 2018 and 2019.

This report documents the findings from the additional analysis that has been undertaken to complete these tasks.

In summary, **Table 1** provides a reconciliation of how the Project water management system is considered to comply with the relevant performance measures and conditions in the recommended Development Consent. It is noted that the Project water management system will be further described in a Water Management Plan for the Project, which would be approved by the Planning Secretary and prepared in consultation with regulatory agencies.

Further detail describing the Project water management system and the results of the additional site water balance modelling is provided in subsequent sections of this report.

**Table 1 Reconciliation of Project Water Management System against Recommended Development Consent**

Condition / Performance Measure		Project Water Management System	
Table 8 Water Management – General	<ul style="list-style-type: none"> <li>Maintain the clean water management system separate from the dirty (i.e. sediment laden) and mine water management systems</li> </ul>	<ul style="list-style-type: none"> <li>The water management system has been reviewed to ensure it maximises the diversion of clean water runoff around the site as far as possible.</li> </ul>	✓
	<ul style="list-style-type: none"> <li>Minimise the use of clean and potable water</li> </ul>	<ul style="list-style-type: none"> <li>To minimise the use of clean/potable water, operational demands would preferentially be met by water collected in the "dirty" (i.e. sediment) and "mine" water management systems.</li> </ul>	✓
	<ul style="list-style-type: none"> <li>Maximise water recycling, reuse and sharing opportunities</li> </ul>	<ul style="list-style-type: none"> <li>Water recovered from dewatered coal rejects would be recycled to reduce external water demands.</li> <li>Subject to necessary approvals being in place, water may be transferred to or from other mining operations when necessary (Section 2.10.2 of EIS).</li> </ul>	✓

	<ul style="list-style-type: none"> <li>Maximise the capture and reuse of mine water and dirty water to meet operational demands for water, including dust suppression activities</li> </ul>	<ul style="list-style-type: none"> <li>Operational demands, including dust suppression would be preferentially met by water captured in the "dirty" and "mine" water management systems.</li> <li>The clean water diversion system would minimise as far as practicable runoff from any undisturbed areas reporting to the "dirty" and "mine" water management systems.</li> </ul>	✓
	<ul style="list-style-type: none"> <li>Minimise the use of make-up water from licensed external sources</li> </ul>	<ul style="list-style-type: none"> <li>The measures described above to maximise the use of water captured in the "dirty" and "mine" water management systems would have the effect of reducing the use of make-up water from licensed external sources.</li> </ul>	✓
	<ul style="list-style-type: none"> <li>Design, install, operate and maintain water management infrastructure in a proper and efficient manner</li> </ul>	<ul style="list-style-type: none"> <li>This would be the subject of ongoing review throughout the mine life and during the detailed design process.</li> </ul>	✓
	<ul style="list-style-type: none"> <li>Minimise risks to the receiving environment and downstream water users</li> </ul>	<ul style="list-style-type: none"> <li>The mine water management system has been designed to achieve nil discharge to the receiving environment.</li> <li>Sediment dams would be designed with additional capacity to reduce the frequency of releases to the environment, consistent with the recommendations of DPIE's Independent Peer Reviewer for surface water.</li> </ul>	✓
Table 8: Clean water diversions and storage infrastructure	<ul style="list-style-type: none"> <li>Design, install and maintain the clean water system to capture and convey the 100 year ARI flood event</li> </ul>	<ul style="list-style-type: none"> <li>Clean water diversion systems would be designed to capture the 100 year ARI flood event.</li> </ul>	✓
	<ul style="list-style-type: none"> <li>Maximise, as far as reasonable, the diversion of clean water around disturbed areas on the site, except where clean water is captured for use on the site</li> </ul>	<ul style="list-style-type: none"> <li>The water management system has been reviewed to ensure it maximises the diversion of clean water around the site.</li> </ul>	✓
Table 8: Sediment Dams	<ul style="list-style-type: none"> <li>Design, install and maintain sediment dams in accordance with the guidance series Managing Urban Stormwater: Soils and Construction – Volume 1 (Landcom, 2004) and 2E Mines and Quarries (DECC, 2008) and the requirements under the POEO Act</li> </ul>	<ul style="list-style-type: none"> <li>As stated in the EIS (refer to the Surface Water Assessment), design of the sediment dams would be as per Landcom (2004) and DECC (2008) guidelines.</li> </ul>	✓
	<ul style="list-style-type: none"> <li>Design, install and maintain sediment dams to include contingency measures to prevent the potential mobilisation of pollutants and ensure compliance with the requirements of the Water Management Act 2000 and the EPL discharge criteria</li> </ul>	<ul style="list-style-type: none"> <li>Sediment dams would be designed with additional capacity to reduce the frequency of releases to the environment, consistent with the recommendations of DPIE's Independent Peer Reviewer for surface water.</li> <li>The operation of the sediment dams would be regulated by an Environment Protection Licence, which would specify any release conditions.</li> <li>Water quality monitoring would be conducted for sediment dams and would include monitoring of the parameters outlined in Section 11.1.2 of the Surface Water Assessment.</li> </ul>	✓



Table 8: Mine water storages	<ul style="list-style-type: none"> <li>Design, install and maintain mine water storage infrastructure to ensure no discharge of mine water to the off-site environment</li> </ul>	<ul style="list-style-type: none"> <li>The mine water management system has been designed to achieve nil discharge to the receiving environment.</li> </ul>	✓
	<ul style="list-style-type: none"> <li>New storages designed to contain the 100 year ARI storm event and minimise permeability</li> </ul>	<ul style="list-style-type: none"> <li>As stated in the EIS (refer to the Surface Water Assessment), mine water and coal contact water dams would be designed to cater for the 100 year ARI storm event.</li> <li>The permeability of the base of the dams would be minimised through construction using low permeability materials.</li> </ul>	✓
	<ul style="list-style-type: none"> <li>Ensure adequate freeboard within all pit voids at all times to minimise the risk of discharge to surface waters and groundwater</li> </ul>	<ul style="list-style-type: none"> <li>The final void is not predicted to spill under any climate scenario.</li> </ul>	✓
Condition B39	<p><i>The Applicant must ensure that it has sufficient water for all stages of the development, and if necessary, adjust the scale of the development to match its available water supply.</i></p>	<ul style="list-style-type: none"> <li>The maximum annual operational demand for the CHPP and dust suppression is approximately 2,276 ML, which is predicted to occur in Year 9 when peak ROM coal extraction and CHPP processing occurs.</li> <li>Operational water demands would be met via the following hierarchy:               <ol style="list-style-type: none"> <li>Water captured on-site:                   <ol style="list-style-type: none"> <li>Recycled water from the CHPP.</li> <li>Mine water and dirty water (i.e. sediment-laden) runoff captured in the mine water and dirty water management systems.</li> <li>Groundwater inflow to the open cut.</li> </ol> </li> <li>Licensed external extraction from the Namoi River.</li> <li>Licensed external extraction from groundwater bores.</li> </ol> </li> <li>Typically, water required to meet operational demands would be available from mine water/coal contact dams, sediment dams and the Namoi River.</li> <li>The peak annual water supply requirement is 2,053 ML (i.e. less than 2,276 ML as even in the most extreme dry conditions, recycled water and water stored on-site would be available to meet some portion of water demand).</li> <li>In the most extreme dry conditions, there may be limited or nil water captured on-site or available from the Namoi River, and the majority of operational water demands would be met from licensed groundwater extraction.</li> <li>Whitehaven operated its existing mines through the 2018 and 2019 drought conditions. During this period Whitehaven implemented water saving initiatives at these existing mines, including the use of chemical surfactants to bind dust to haul roads to prevent dust lift off, which was shown to reduce water demands by up to 50%.</li> </ul>	✓

		<ul style="list-style-type: none"> <li>• These water saving initiatives would be implemented for the Project during severe drought conditions to significantly reduce the peak predicted water demand of 2,276 ML.</li> <li>• Whitehaven would need to acquire additional groundwater allocation if the majority of operational demands were required to be met from licensed groundwater extraction (should this be required in the most extreme dry conditions).</li> <li>• In Financial Years 2019 and 2020 (to date) government records show 7,232 ML and 5,985 ML<sup>1</sup>, respectively, of Zone 4 alluvial<sup>2</sup> groundwater allocation was temporarily traded on the open market. Based on these records, and Whitehaven's operational experience, it is reasonable to expect Zone 4 allocation in the order of the maximum operational water demand could be acquired on the open market in the unlikely event all water demands needed to be met by licensed groundwater extraction.</li> <li>• It is noted that groundwater modelling was conducted to assess the impacts (i.e. drawdown) for a rate of extraction equivalent to 2,190 ML/annum on a temporary basis from the Project borefield, with this level of extraction predicted to comply with the criteria of the Aquifer Interference Policy and relevant Water Sharing Plan<sup>3</sup>.</li> <li>• Given the above, it is reasonable to expect Whitehaven will have access to sufficient water for all stages of the development, including peak operations, or could adjust its operations to match available water supply accordingly (e.g. through implementing water saving initiatives or other operational measures).</li> </ul>	
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<sup>1</sup> In Financial Years 2019 and 2020 the Available Water Determination for Zone 4 alluvium was 1 ML per unit share.

<sup>2</sup> Zone 4 of the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2019*, which is the alluvial aquifer relevant to licensed groundwater extraction for the Project.

<sup>3</sup> Refer to Attachment G6-5 of the DPIE Assessment Report for the Project  
(<https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-7480%2120200520T065611.147%20GMT>).

## 1. REVIEW OF PROJECT WATER MANAGEMENT SYSTEM

Since preparation of the EIS, further review of the conceptual Project water management system has been undertaken to confirm the system has been designed to meet the performance measures in Table 8 of the recommended Development Consent for the Project. **Figures 1 to 4** provide updated conceptual water management schematics for Project Years 3, 7, 13 and 21.

The Project water management objectives, sediment control and capture system and proposed management of coal contact water remains unchanged in comparison to those described in the EIS.

## 2. WATER MANAGEMENT SYSTEM OBJECTIVES

The water management system for the Vickery Extension Project will be progressively developed over the life of the mine and has been designed to meet key objectives and performance measures, including:

- Sediment basins and other appropriate erosion and sediment controls designed in accordance with procedures detailed in the Blue Book<sup>4</sup>.
- Diversion of upslope runoff around disturbed areas as far as reasonably practical.
- Drainage design to prevent capture of clean water from any undisturbed catchments in the water management system as far as reasonably practical.
- Progressive rehabilitation of areas not required for operational purposes.
- Priority usage of coal contact water in the water management system.

In addition, runoff from operational mine water or coal contact water, would not be released from the site and will instead be collected in mine water and coal contact water dams with sufficient capacity to cater for the design 1% AEP, 72 hour duration storm event.

## 3. CLEAN WATER DIVERSION SYSTEM

Consistent with Project water management system objectives, upslope catchment diversion infrastructure will prevent capture of clean water from any undisturbed catchments in the mine water management system as far as reasonably practical.

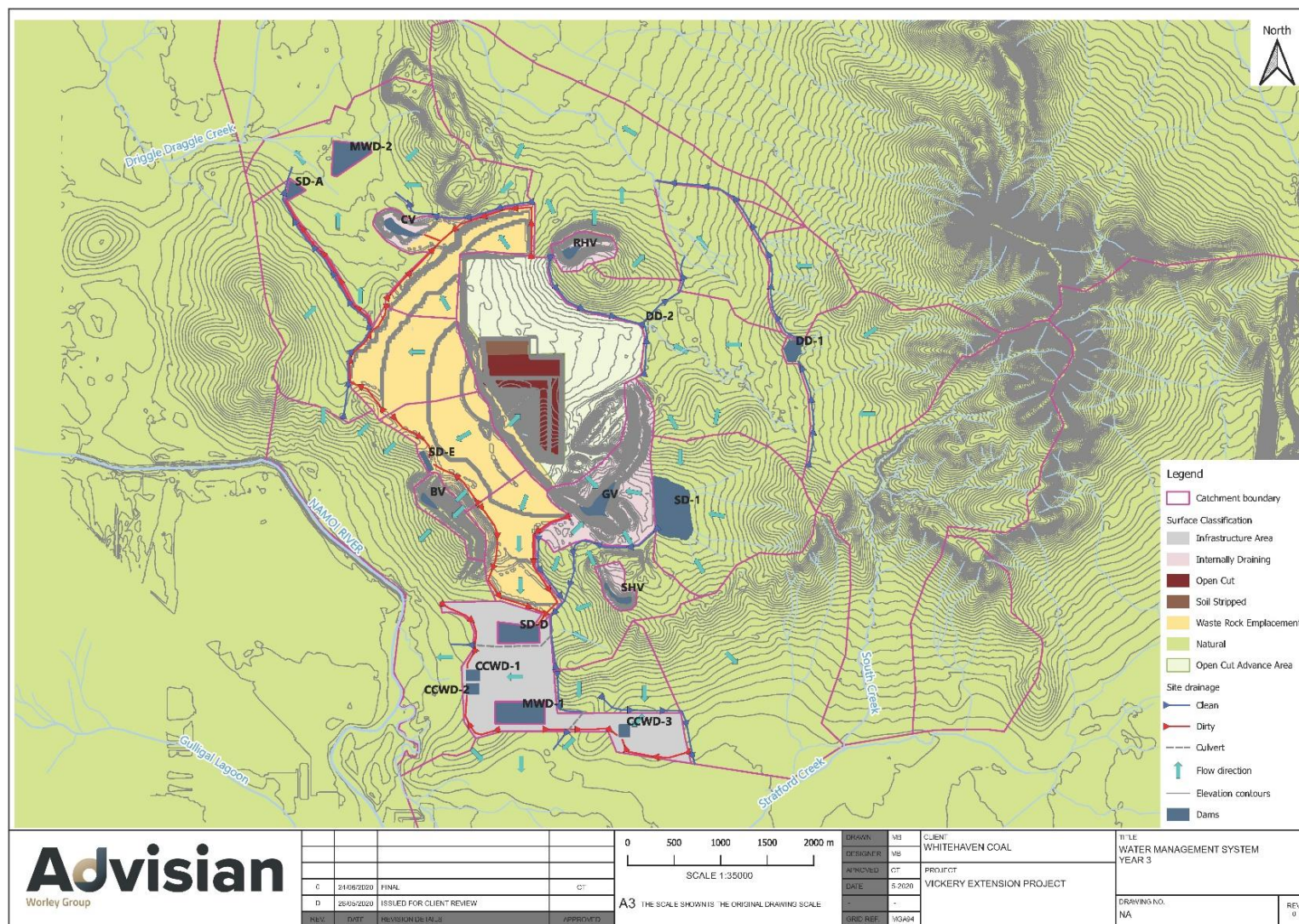
The up-catchment diversion system is separated into two main components, namely:

- (i) a permanent clean water diversion system (including DD-1 and associated diversion channels as approved for the Vickery Coal Project [VCP]); and,
- (ii) a temporary clean water diversion system, which is ultimately subsumed by mine progression (including DD-2, SD-1 and associated diversion channels as approved for the VCP).

Since lodgement of the Project EIS and as an outcome of further review of the water management system, additional clean water diversion infrastructure is proposed utilising the existing SD-1 storage in the Project area. The existing design of SD-1 would be reviewed during detailed design and re-purposed as necessary to achieve its proposed function as a diversion dam.

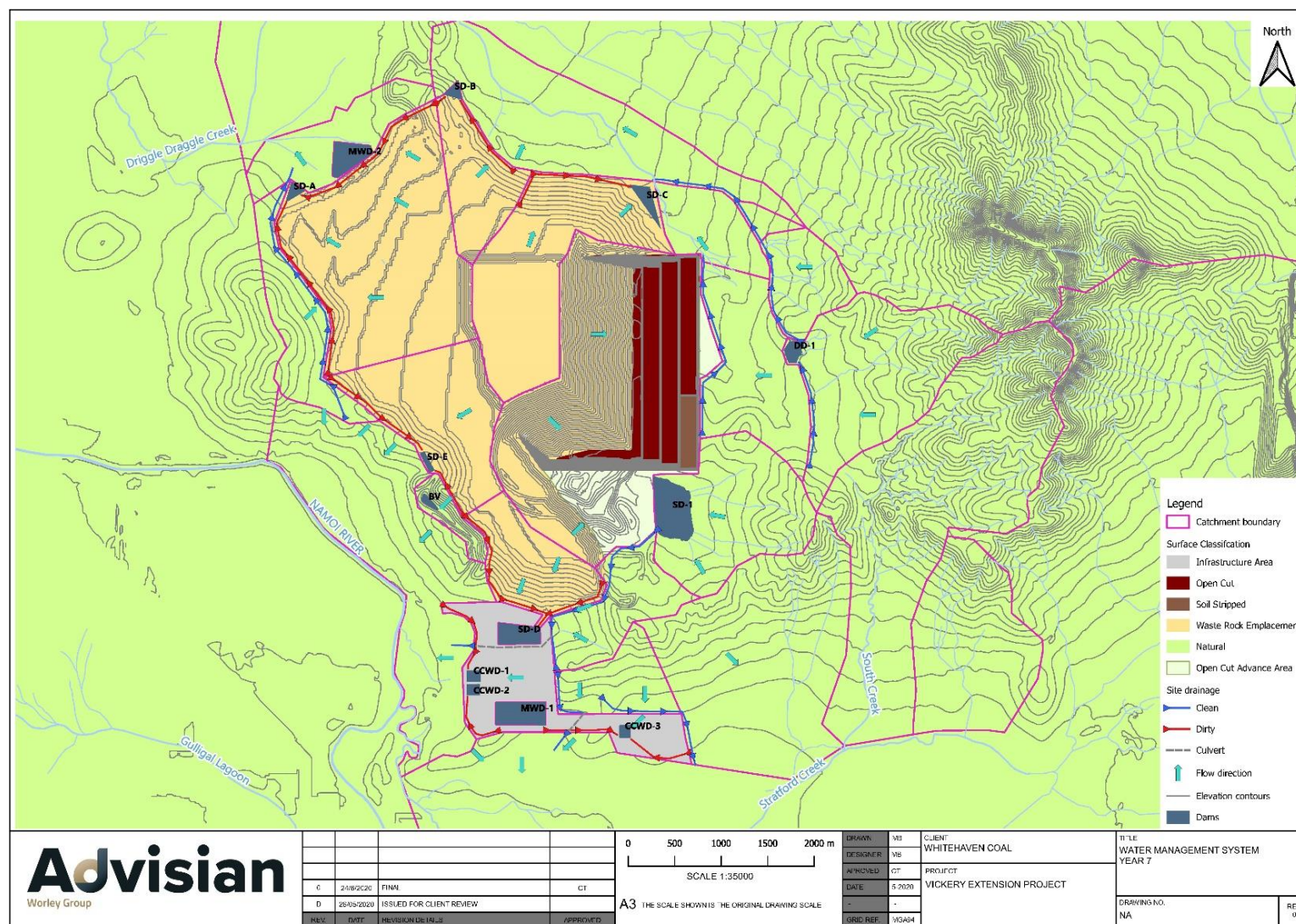
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<sup>4</sup> *Managing Urban Stormwater - Soils & Construction: Volume 1* (Landcom, 2004) and *Volume 2E Mines and Quarries* (DECC, 2008)



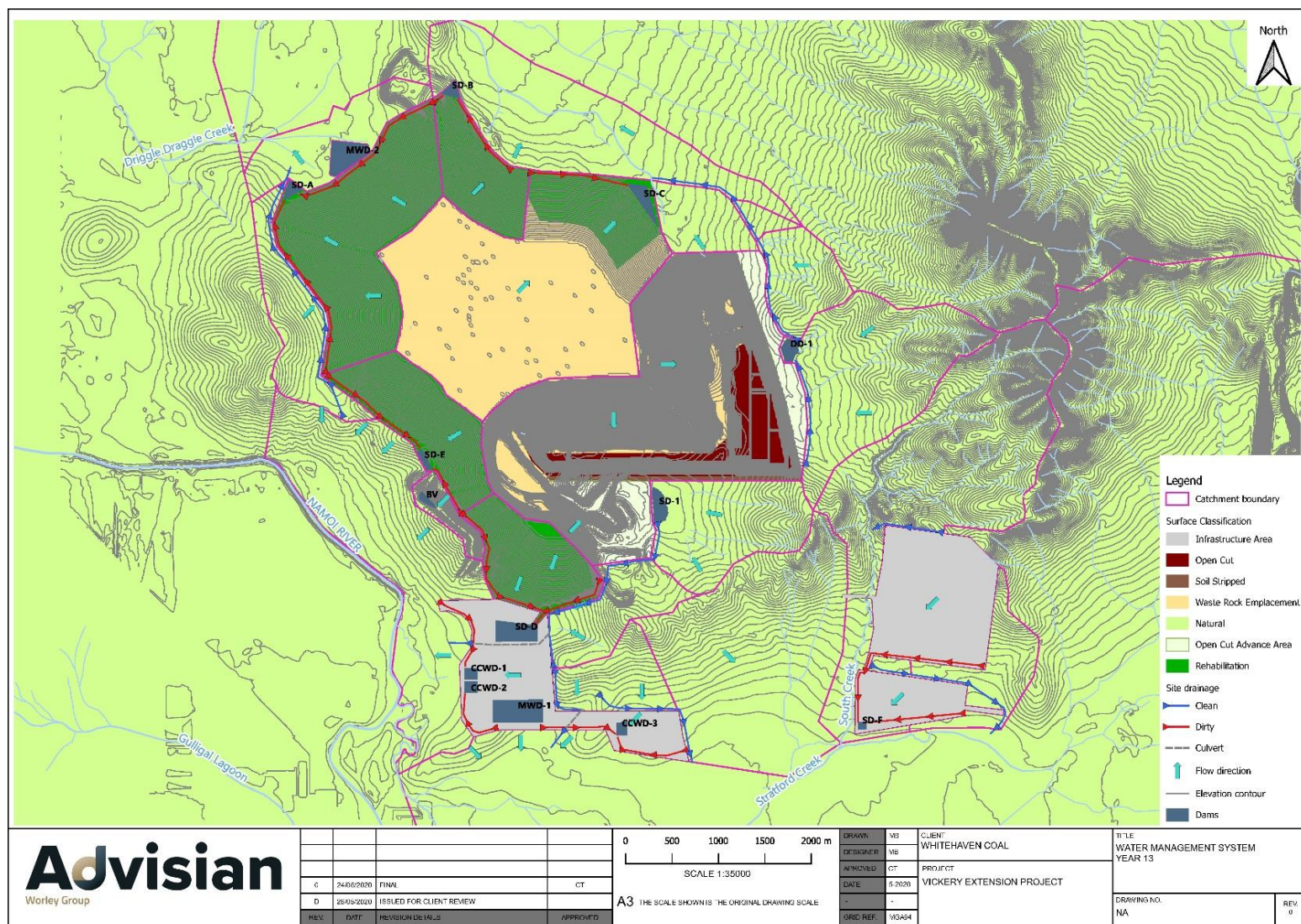
**Figure 1 – Water Management System Conceptual Schematic - Project Year 3**





**Figure 2 – Water Management System Conceptual Schematic - Project Year 7**





**Figure 3 – Water Management System Conceptual Schematic - Project Year 13**





DRAWN	VB	CLIENT	WHITEHAVEN COAL
DESIGNER	VB		
APPROVED	GT	PROJECT	
DATE	5-2020	VICKERY EXTENSION PROJECT	
-	-		
GRID REF.	WGA94		

#### 4. MINE WATER MANAGEMENT SYSTEM

Consistent with the Project water management system objectives, the Project mine water (*and coal contact water*) management system operates as a closed system (*i.e., nil discharge*) and is separated into two components which would operate as follows:

- (i) Open cut catchment – water is captured in temporary sumps within the extent of the open cut, the locations of which are not shown on stage plans due to their progressive nature.
- (ii) Coal handling areas (*i.e., the mine infrastructure area*) – runoff from these areas is captured in coal contact dams.

As described above, the water management system has been designed to prevent, as far as practical, any undisturbed catchment from reporting to the open cut. In addition to the gravity drainage diversion systems, other practical measures to prevent any residual undisturbed catchment from reporting to the open cut would be confirmed during the detailed design phase and included in the operational Water Management Plan. This would include for example, temporary clean water diversion works.

Given that the water management system is designed to prevent, as far as practical, any undisturbed catchment from reporting to the open cut, the updated site water balance assumes that no runoff from any undisturbed catchment reports to the open cut or contributes to available water to meet operational demands.

Mine water captured in the mine water management system is transferred to mine water dams to meet operational water demands and reduce the need for clean water from external licensed sources.

#### 5. SEDIMENT DAMS

Consistent with Project water management system objectives, runoff from waste rock emplacement areas would be captured in sediment dams which are designed according to the Blue Book<sup>5</sup>, with additional capacity allowance to reduce the frequency of overflow events to the surrounding environment consistent with recommendations from DPIE's Independent Peer Reviewer for surface water<sup>6</sup>.

The sediment control system avoids capture of clean water from undisturbed areas as far as reasonably practicable.

Sediment dams have been designed to reduce the need for discharges. In order to achieve this objective, sediment dam capacity will be restored via transfers to the mine water management system<sup>7</sup>.

Sediment dam design capacities allow for appropriate sediment settling time prior to transfer and/or controlled release and also have allowance for sediment storage<sup>8</sup>. They are also inherently oversized at the start of the Project to account for the expanding waste emplacement.

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<sup>5</sup> *Managing Urban Stormwater: Soils & Construction* (Landcom, 2004).

<sup>6</sup> *Vickery Extension Project Surface Water Assessment Independent Review*, Martin Giles of BMT (2018) (<https://www.ipcn.nsw.gov.au/resources/pac/media/files/pac/projects/2018/11/vickery-extension-project/department-of-planning-and-environment-preliminary-issues-report/appendix-e3-surface-water--martin-giles-of-bmt.pdf>).

<sup>7</sup> As an example of contemporary licensing, EPL 12365 for the Tarrawonga Coal Mine allows for controlled releases from specified sediment dam discharge points to restore capacity within 5 days of rainfall in accordance with specified pollutant concentration limits (e.g. TSS, pH), or release via passive overflow in the event of rainfall which exceeds the Blue Book design criteria (90<sup>th</sup> percentile 5 day rainfall depth for Gunnedah of 38.4 millimetres). Water may also be transferred to water trucks for use in dust suppression.

<sup>8</sup> The sediment storage zone is 50% of the settlement zone capacity (Landcom, 2004).

The effect of the above is a frequency of discharge less than that prescribed in the Blue Book, which is consistent with recommendations made by DPIE's Independent Peer Reviewer for surface water<sup>4</sup>.

## 6. ADDITIONAL RAINFALL ANALYSIS

In consideration of recent drought conditions experienced in the region, further analysis of recent rainfall data (i.e., up to March 2020) has been undertaken by Advisian. This analysis has determined that there was no change to the driest 2, 5 and 10 calendar year periods compared to what was modelled for the EIS. It did however include the driest consecutive 2-year period on record (i.e., ignoring calendar years) for the period 12/01/2018 to 11/01/2020.

The cumulative departure of rainfall from the long-term average at the Boggabri (Retreat) Station is shown in **Figure 5**<sup>9</sup>, which demonstrates the area has experienced multiple extended periods of drought. **Figure 5** also shows that recent drought conditions experienced since 2017 have not exceeded the extended drought identified for the period from 1935 to 1948 in terms of departure from the long-term rainfall average or overall length of time. The period from 1935 to 1948 was considered in the site water balance modelling provided in the EIS (Advisian, 2018).

**Figure 6** shows monthly rainfall since January 2018 against long-term monthly median rainfall. During 2018 and 2019 rainfall was generally below the long-term monthly median. Rainfall since the beginning of 2020 has been greater than the long-term monthly medians, particularly in February and March where recorded rainfall (157 mm and 103 mm, respectively) was significantly greater than the median rainfall for these months (43 mm and 35 mm, respectively).

## 7. UPDATED SITE WATER BALANCE

As per the water balance modelling undertaken for the Project EIS, the site water balance assumes the on-site operational water demands are met via the following:

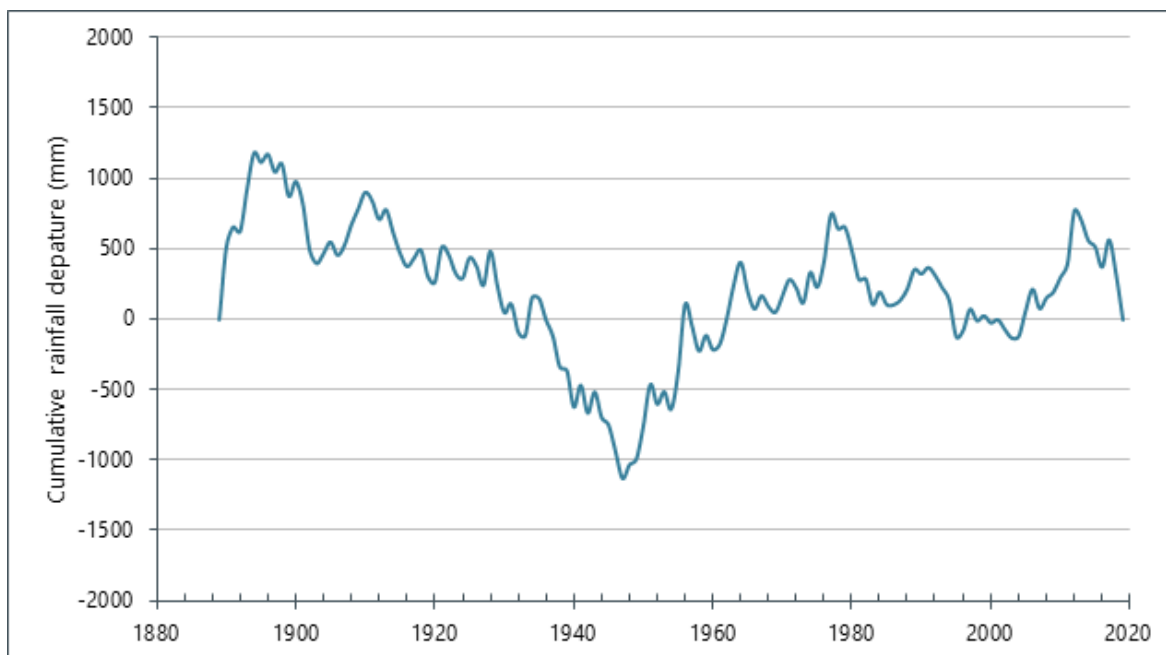
- Recycled water from the on-site coal handling and preparation plant (CHPP).
- Mine water transferred to mine water dams from the mine water system (refer Section 4).
- Dirty water runoff captured in sediment dams (refer to Section 5, above).
- Groundwater inflow to the open cut.
- Licensed external water sources, including the Namoi River and groundwater bores.

The site water balance modelling is based on the assumption that these are the only sources of operational water for the proposed water management system.

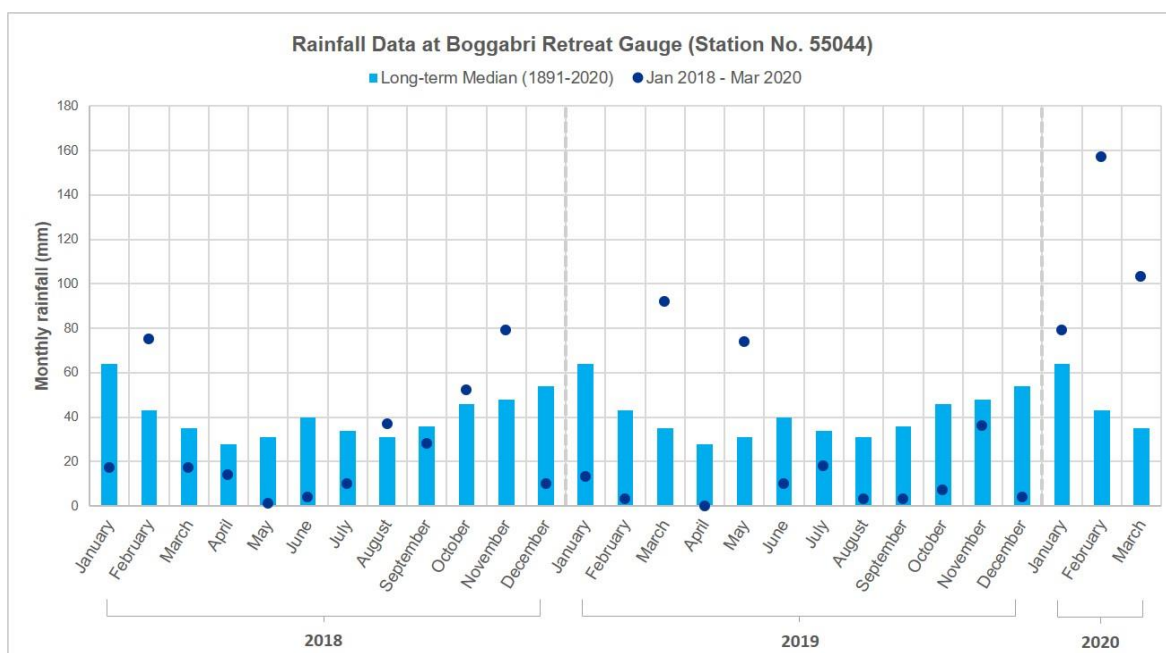
The Project has been designed as a nil discharge mine water site and therefore water transferred to the mine water dams is required to be used to meet operational water demands to prevent accumulation.

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<sup>9</sup> Figure 5 does not include data from January 2020 to March 2020, a period when above average rainfall has been experienced.



**Figure 5 Cumulative Departure from Long-term Average Annual Rainfall – Boggabri (Retreat)**



**Figure 6 Rainfall Data between January 2018 to March 2020 – Boggabri (Retreat) (Source: BoM, 2020)**



Advisian has completed a re-run of the site water balance using the following assumptions.

- (i) The climate data and Lower Namoi Regulated River available water determination (AWD) history was extended by 2 years to account for 2018 and 2019 data (refer to **Section 6**).
- (ii) The starting account balance of the Namoi General Security Regulated River licenses was reduced from 50% to 0% (i.e. 0 ML) to reflect the current conditions in Lake Keepit (where storage is currently at 14%).
- (iii) In years when on-site storage and licensed extraction from the Namoi River are not available, or are insufficient to meet operational water demands, any additional external water demand would be sourced from licensed groundwater extraction.

## **8. WATER SECURITY**

### **Peak Modelled Water Demand**

Operational water demands for the Project are largely associated with dust suppression and control activities as well as operation of the CHPP. The site water balance predicts a maximum annual operational water demand of 2,276 ML<sup>10</sup> would be required to meet the requirements of dust suppression and the CHPP (among other requirements).

As described above, operational demands would be met by the following supply hierarchy:

- Recycled water from the CHPP.
- Mine water transferred to mine water dams from the mine water system.
- Dirty water runoff captured in sediment dams.
- Groundwater inflow to the open cut.
- Licensed external water sources, including the Namoi River and groundwater bores.

The peak annual water supply requirement is 2,053 ML to meet peak demand. This is less than the maximum operational water demand of 2,276 ML as even in the most extreme dry conditions, recycled water and water stored on-site would be available to meet some portion of water demand.

### **Reduced Water Demands – Water Saving Initiatives**

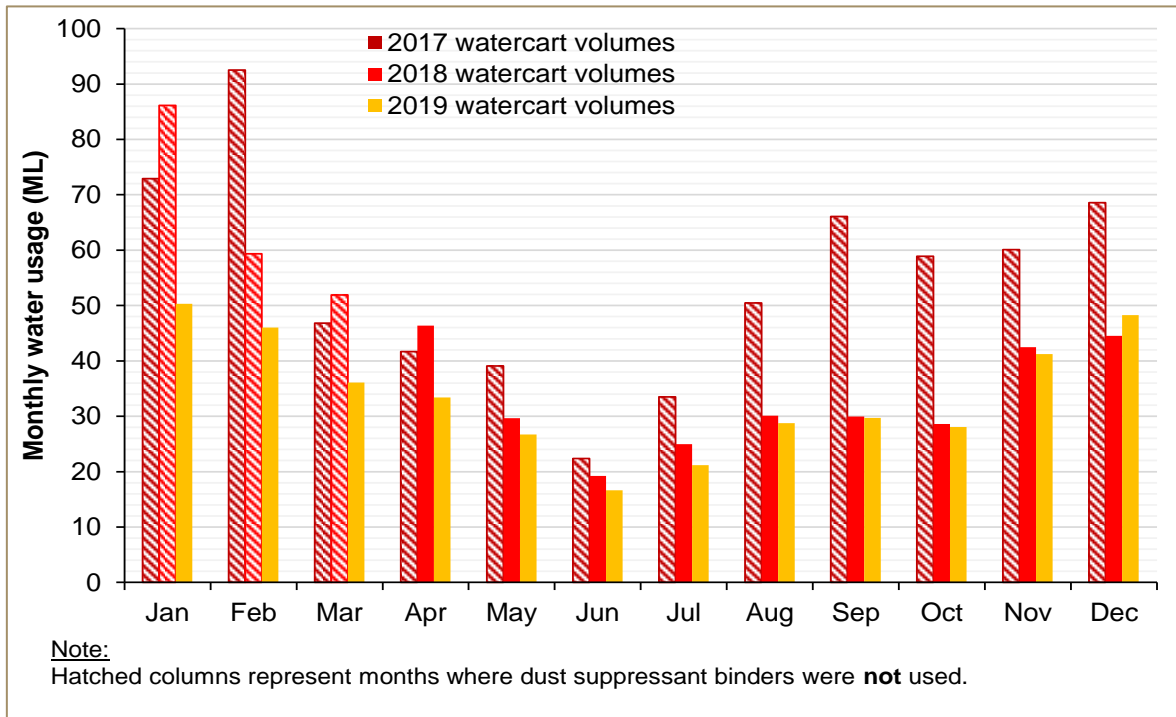
As described in **Section 6**, the Project region experienced drought conditions during 2018 and 2019. The predicted maximum annual operational water demand requirements do not consider significant water saving initiatives developed by Whitehaven from operation of other open cut mines during the 2018 and 2019 drought conditions.

**Figure 7** demonstrates the effect of dust suppressant binders on water usage at the Tarrawonga Coal Mine. Implementation of surfactants to bind dust to haul roads to prevent dust lift off reduced water requirements for dust suppression in all months in 2019 and more than halved water requirements in some months (September and October).

If equivalent water saving initiatives were implemented at the Project during severe drought conditions, it could significantly reduce water demand.

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<sup>10</sup> The maximum (i.e. under a climate sequence representing >99<sup>th</sup> percentile dry conditions) annual operational water demand requirement is predicted to be 2,276 ML, which is predicted to occur in Project Year 9 coincident with the peak ROM coal extraction and CHPP processing rate. Dust suppression is a major component of total operation water requirements and therefore, in climate sequences with increased rainfall, operational water demands decrease (i.e. the model accounts for reduced dust suppression water requirements during rainfall). For example, under the 95<sup>th</sup> percentile dry conditions the Year 9 operational water demand requirement is predicted to reduce to 2,132 ML due to increased rainfall.



**Figure 7 Tarrawonga Coal Mine Watercart Monthly Water Usage**  
(Source: WRM Water and Environment, 2020)

### Water Supply – Namoi River

Annual General Security AWDs for the Namoi River are detailed in **Figure 8**.

Annual AWDs up to 2005 were modelled from *Water availability in NSW Murray-Darling Basin regulated rivers, Appendix of annual data* (DPI, 2013) and actual annual AWDs from 2005 were determined using the NSW Water Register<sup>11</sup>. The long-term average AWD is between 0.71 and 0.76 ML/unit share (**Figure 8**).

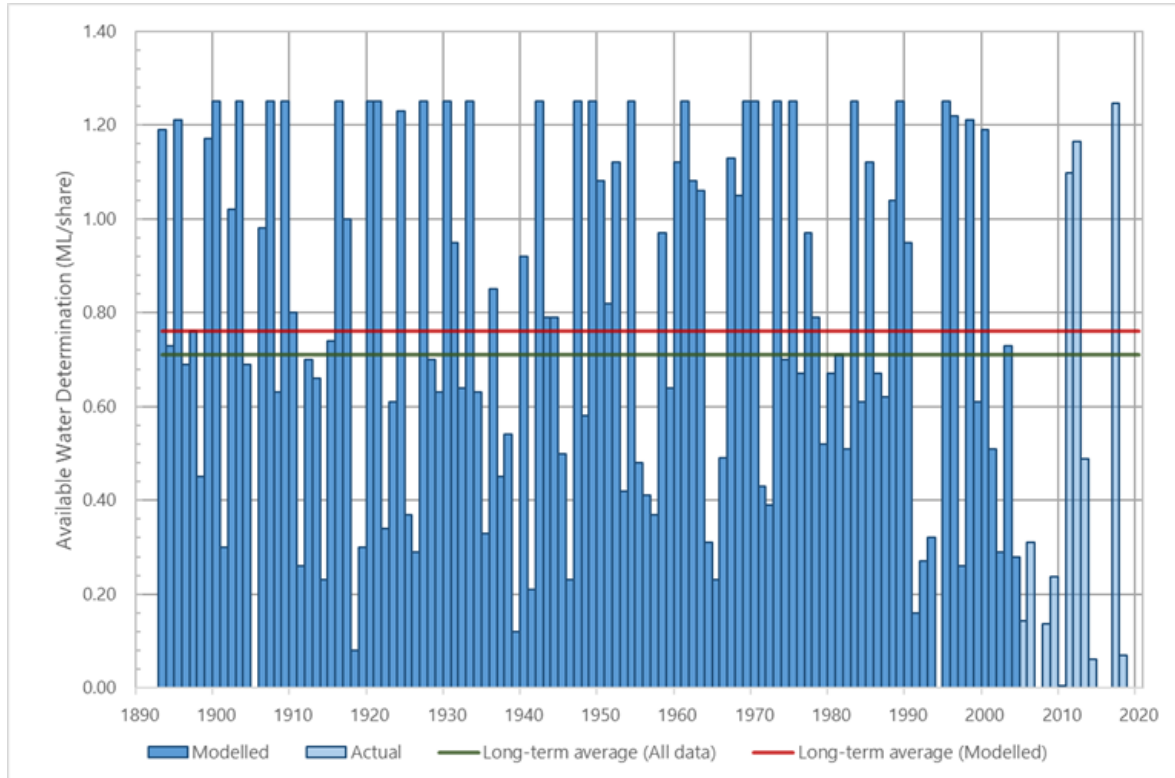
As such, water would typically be available from the Namoi River to meet operational demands (in addition to water captured on-site in the mine and dirty water management systems).

### Water Supply – Groundwater

In the most extreme dry conditions there may be limited water captured on-site and limited or nil water available from the Namoi River, requiring that the majority of operational water demands be met using licensed groundwater extraction.

As discussed above, water demands could be reduced via use of dust suppression surfactants in combination with other operational water saving initiatives in severe drought conditions.

<sup>11</sup> <https://waterregister.watersnsw.com.au/water-register-frame#>



**Figure 8 Annual General Security Available Water Determination**

Groundwater modelling has been undertaken to assess the potential impacts (i.e. drawdown) due to extraction of 3 ML/day from two bores in the Project borefield in a single year (equivalent to 2,190 ML/annum on a temporary basis)<sup>12</sup>. This level of extraction was predicted to comply with the applicable groundwater impact assessment requirements of the Aquifer Interference Policy (AIP), *Water Resource Plans Fact Sheet - Assessing Groundwater Applications* and the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2019* (the Water Sharing Plan).

In addition, an existing and approved groundwater bore (with existing pipeline infrastructure connecting the bore the Vickery site) is located to the south of the Project area which may be used for the Project as a contingency water source<sup>13</sup>. Whitehaven holds Water Access Licenses (WALs) 12651 and 12653 associated with the existing bore under the Water Sharing Plan. WALs 12651 and 12653 had allocations of 52 ML and 166 ML in the 2019 Financial Year, respectively (i.e. 218 ML total).

Therefore, subject to Whitehaven holding the necessary WALs under the Water Sharing Plan, groundwater extraction of 2,408 ML (i.e. 2,190 ML + 218 ML) could occur for the Project in compliance with the AIP, *Water Resource Plans Fact Sheet - Assessing Groundwater Applications* and the Water Sharing Plan criteria. This rate of extraction exceeds the maximum operational demands for the Project, noting that in severe drought conditions water demands could be significantly reduced via water saving initiatives.

In Financial Years 2019 and 2020 (to date) government records show 7,232 ML and 5,985 ML, respectively, of Zone 4 alluvial groundwater allocation was temporarily traded on the open market.

<sup>12</sup> Refer to Attachment G6-5 of the DPIE Assessment Report for the Project (<https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-7480%2120200520T065611.147%20GMT>).

<sup>13</sup> Refer to Attachment G6-6 of the DPIE Assessment Report for the Project (<https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-7480%2120200520T065608.013%20GMT>).

Based on these records, and Whitehaven's operational experience, it is reasonable to expect that the necessary Zone 4 allocation could be acquired on the open market as required.

Given the above, it is reasonable to conclude that Whitehaven will have access to sufficient water for all stages of the development, including in extremely dry years, or could adjust its operations to match available water supply accordingly.

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I trust this report suitably documents the findings from our review of the water management system for the Project and the updated site water balance modelling. Please feel free to contact me on 0407 063711 or Michael Butcher on 0400 257606 should you have any queries.

Yours faithfully

**ADVISIAN**



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