

VICKERY EXTENSION PROJECT

ENVIRONMENTAL IMPACT STATEMENT

ATTACHMENT 6

AQUIFER INTERFERENCE POLICY CONSIDERATIONS AND WATER LICENSING ADDENDUM

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A6 AQUIFER INTERFERENCE POLICY CONSIDERATIONS AND WATER LICENSING ADDENDUM

This attachment provides further discussion on the requirements and application of relevant water licensing and associated approvals under the New South Wales (NSW) *Water Management Act, 2000*. It also provides a discussion of relevant requirements of the *NSW Aquifer Interference Policy* (NSW Government, 2012) (the AIP).

References to Sections 1 to 7 in this attachment are references to the sections of the Main Report of the Environmental Impact Statement (EIS). References to Appendices A to R in this Attachment are references to the Appendices of the EIS. Internal references within this attachment are prefixed with "A6".

A6.1 AQUIFER INTERFERENCE POLICY CONSIDERATIONS

A6.1.1 Aquifer Interference Policy Overview

The AIP (NSW Government, 2012) has been developed by the NSW Government as a component of the NSW Government's Strategic Regional Land Use Policy. The AIP applies state wide and details water licence and impact assessment requirements.

The stated objective of the AIP is to ensure equitable water sharing between various water users and proper licensing of water that is taken by aquifer interference activities to ensure that the take is accounted for in the water budget and water sharing arrangements.

The *Water Management Act, 2000* defines an aquifer interference activity as that which involves any of the following:

- *the penetration of an aquifer,*
- *the interference with water in an aquifer,*
- *the obstruction of the flow of water in an aquifer,*
- *the taking of water from an aquifer in the course of carrying out mining or any other activity prescribed by the regulations, and*
- *the disposal of water taken from an aquifer in the course of carrying out mining or any other activity prescribed by the regulations.*

Examples of aquifer interference activities include mining, coal seam gas extraction, injection of water and commercial, industrial, agricultural and residential activities that intercept the watertable or interfere with aquifers (NSW Government, 2012).

The AIP applies to all aquifer interference activities but has been developed in particular to address the following high risk activities (NSW Government, 2012):

- *mining activities such as open cut voids, underground mine workings and the disposal of water taken from an aquifer including water taken as part of coal seam gas extraction;*
- *other extractive industries, such as sand and gravel extraction...;*
- *coal seam gas activities, including those related to both exploration and production*
- *other large projects which require dewatering such as for the construction and maintenance of associated works, such as buildings, roads and other civil works;*
- *injection works used to transmit water into an aquifer; and*
- *activities with the potential to contaminate groundwater or result in unacceptable loss of storage or structural damage to an aquifer.*

Licensing Requirements

The *Water Management Act, 2000* makes it an offence to "take" water without a water licence or in accordance with a lawful exemption.

The AIP states that all water taken by aquifer interference activities needs to be accounted for within the extraction limits set by the relevant water sharing plan.

A water access licence is required where water is taken either incidentally or for consumptive use, or where any act by a person carrying out an aquifer interference activity causes (NSW Government, 2012):

- *the removal of water from a water source; or*
- *the movement of water from one part of an aquifer to another part of an aquifer; or*
- *the movement of water from one water source to another water source, such as:*
 - *from an aquifer to an adjacent aquifer; or*
 - *from an aquifer to a river/lake; or*
 - *from a river/lake to an aquifer.*

The AIP also requires consideration of the continued take of water from groundwater or connected surface waters following cessation of an aquifer interference activity. For example, the post-mining inflow that occurs until a groundwater system reaches equilibrium following cessation of open cut mining must be considered.

The AIP states that licences are required to be held to adequately account for the ongoing take of water until the system returns to equilibrium, or alternatively, sufficient licences to account for the ongoing take of water are to be surrendered to the Minister administering the *Water Management Act, 2000*.

Minimal Impact Considerations

Water access licenses and approvals under the *Water Management Act, 2000* are not to be granted unless the Minister is satisfied that adequate arrangements are in place to ensure that “no more than minimal harm” is caused to a water source. In this regard, the AIP includes minimal impact considerations relating to watertable and groundwater pressure drawdown and changes in groundwater and surface water quality.

The AIP provides (NSW Government, 2012):

Aquifer interference approvals are not to be granted unless the Minister is satisfied that adequate arrangements are in force to ensure that no more than minimal harm will be done to any water source, or its dependent ecosystems, as a consequence of its being interfered with in the course of the activities to which the approval relates.

While aquifer interference approvals are not required to be granted, the minimal harm test under the Water Management Act 2000 is not activated for the assessment of impacts. Therefore, this Policy establishes and objectively defines minimal impact considerations as they relate to water-dependent assets and these considerations will be used as the basis for providing advice to either the gateway process, the Planning Assessment Commission or the Minister for Planning.

The requirement to obtain an “aquifer interference approval” (under section 91 of the *Water Management Act, 2000*) is triggered only when a proclamation is made (under section 88A) specifying that aquifer interference approvals apply to a particular part of the State (or to the whole State) or to a particular water source.

To date, no such proclamation has been made specifying that aquifer interference approvals are required in any part of NSW. As such, aquifer interference approvals are not currently required to be obtained for the Project.

The AIP establishes minimal impact considerations for groundwater categories of both ‘highly productive’ and ‘less productive’ groundwater. ‘Highly productive groundwater’ is defined by the AIP as groundwater which (NSW Government, 2012):

...is defined in this Policy as a groundwater source that is declared in the Regulations and will be based on the following criteria:

- a) *has total dissolved solids of less than 1,500 mg/L, and*
- b) *contains water supply works that can yield water at a rate greater than 5 L/sec.*

The AIP further groups highly productive groundwater into the following categories:

- Alluvial.
- Coastal sands.
- Porous rock, including:
 - Great Artesian Basin – Eastern Recharge and Southern Recharge;
 - Great Artesian Basin – Surat, Warrego and Central; and
 - other porous rock.
- Fractured rock.

The AIP similarly defines categories for less productive groundwater, which include:

- Alluvial.
- Porous rock.
- Fractured rock.

A6.1.2 Aquifer Interference Policy Requirements

An assessment of the Project against the licensing requirements and minimal impact considerations of the AIP is provided in the sub-sections below.

Relevant Water Sharing Plans

The AIP requires all water taken by aquifer interference activities to be accounted for within the extraction limits set by the relevant water sharing plan.

The water sharing plans in the vicinity of the Project are:

- Groundwater:
 - *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003.*
 - *Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011.*
 - *Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources 2011.*
- Surface water:
 - *Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016.*
 - *Water Sharing Plan for the Namoi Unregulated and Alluvial Water Sources 2012.*

The open cut is located wholly within the Gunnedah-Oxley Basin MDB Groundwater Source under the *Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011* (Figure A6-1).

The Upper Namoi Zone 4, Namoi Valley (Keepit Dam to Gin's Leap) Groundwater Source under the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003* (Figure A6-1) is located adjacent to the open cut.

With regard to surface water, the Project is located wholly within the Bluevale Water Source under the *Water Sharing Plan for the Namoi Unregulated and Alluvial Water Sources 2012*. The Namoi River in the vicinity of the Project is located within the Lower Namoi Regulated River Water Source under the *Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016*.

Water Licensing Requirements

Details of the current water access licences (WALs) held by Whitehaven Coal Limited (Whitehaven) for the Project are summarised in Table A6-1 (WALs held for Whitehaven's other operations are not included).

Operational Licensing Requirements

Based on the groundwater modelling for the Project (HydroSimulations, 2018), Whitehaven currently holds sufficient licences to cover the estimated maximum licensing requirements associated with groundwater inflows to the open cut (from the Gunnedah-Oxley Basin Groundwater Source) and associated minor losses from the alluvium (Zone 4) and Namoi River (Table A6-2).

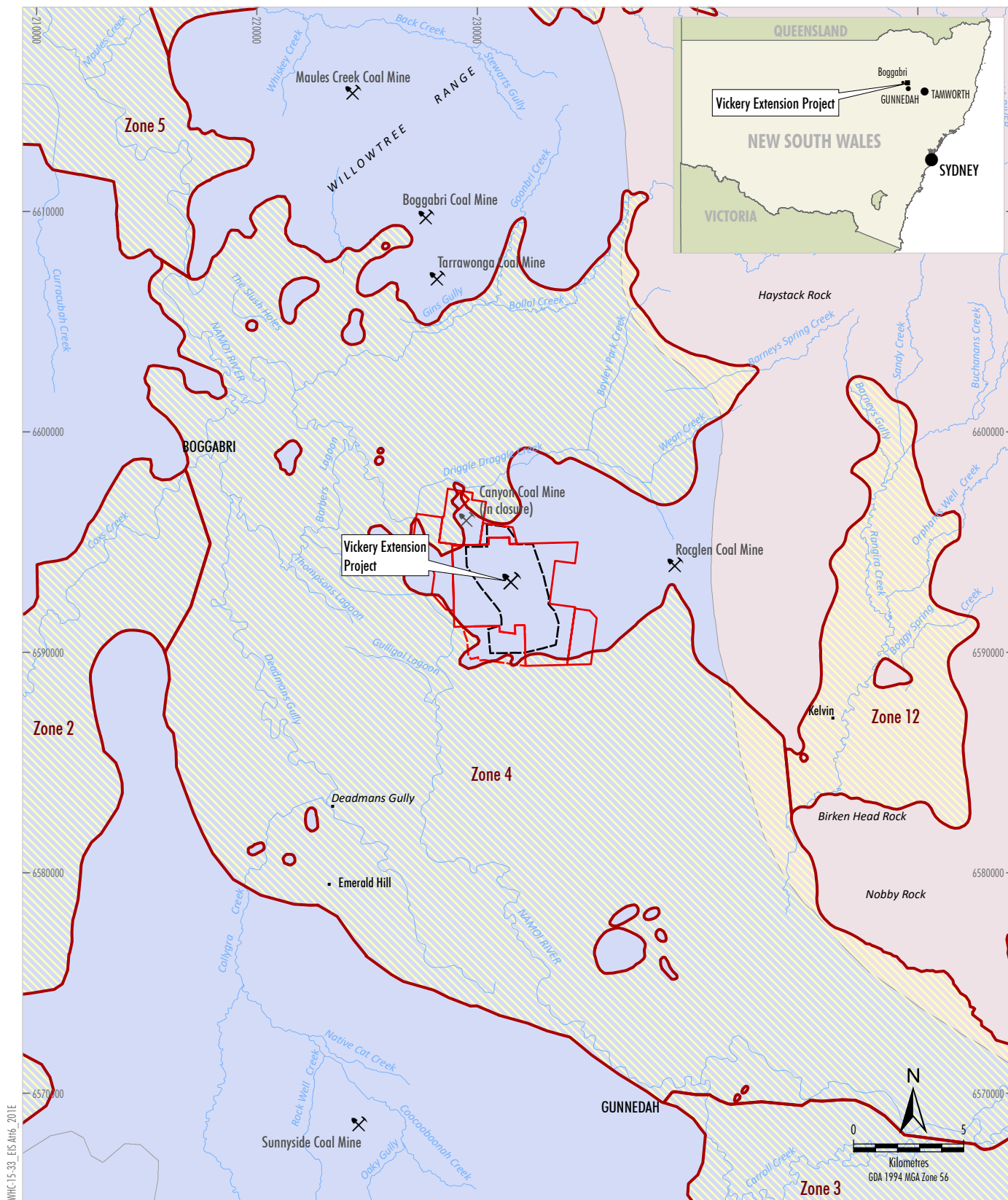
In addition to groundwater inflows, Whitehaven would be required to hold licences to account for external water supply requirements sourced from the Namoi River and Project groundwater borefield. It should be noted that operational water demands would preferentially be met through water captured by on-site best practice water management infrastructure (which is either exempt from licensing or would fall within Whitehaven's harvestable rights [Section A6.2.7]).

Table A6-2 presents estimated external water supply requirements. Whitehaven holds sufficient surface water and groundwater licences (net of licences required for groundwater inflows) to account for the additional water supply requirements (Advisian, 2018; HydroSimulations, 2018).

Post-mining Licensing Requirements

Post-mining groundwater licensing requirements to account for groundwater inflow to the final void have been predicted by HydroSimulations (2018) and are summarised in Table A6-3.

Post-mining groundwater licensing requirements are well within Whitehaven's existing licence entitlements (Table A6-3). Relevant entitlements under these licences could be retired at the completion of the Project to account for groundwater inflows to the void post-mining.



LEGEND

- Mining Tenement Boundary (ML and CL)
- Mining Lease Application (MLA)
- Extent of Project Open Cut

Water Sharing Plan for the Upper and Lower Namoi
Groundwater Sources 2003

Alluvial Groundwater Source

Water Sharing Plan for the NSW Murray Darling Basin
Porous Rock Groundwater Sources 2011

Gunnedah-Oxley 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: Geoscience Australia Topographic Base (2006);
NSW Department of Industry (2015); NOW (2011)

 WHITEHAVEN COAL

VICKERY EXTENSION PROJECT
Relevant Groundwater Sources

Figure A6-1

Table A6-1
Existing Water Licensing Summary for the Project

Water Sharing Plan	Water Source	Licence Category	Water Access Licence Number	Allocation (Shares)
<i>Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011</i>	Gunnedah-Oxley Basin MDB Groundwater Source	Aquifer	36576	600
<i>Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003</i>	Upper Namoi Zone 4, Namoi Valley (Keepit Dam to Gin's Leap)	Aquifer	12653	166
		Aquifer	12651	52
		Aquifer	12645	35
		Aquifer	12724	45
		Aquifer	12715	75
		Aquifer	12701	20
		Aquifer	12731	3
		<i>Subtotal</i>	-	396
<i>Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016</i>	Lower Namoi Regulated River Water Source	High Security River	16034	50
		General Security River	14936	1,056
		General Security River	13051	96
		General Security River	2682	486
		Supplementary River	13052	10.5
		Supplementary River	2683	53
		<i>Subtotal</i>	-	1,751.5

Table A6-2
Estimated Water Licensing Requirements for the Project – During Mining

Water Sharing Plan	Water Source	Allocation (Shares)	Maximum Project Licensing Requirement for Groundwater Inflows (ML/year) ¹	Residual Whitehaven Allocation Available for External Water Demands (Shares) ²
<i>Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011</i>	Gunnedah-Oxley Basin MDB Groundwater Source	600	517	83
<i>Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003</i>	Upper Namoi Zone 4, Namoi Valley (Keepit Dam to Gin's Leap)	396	5	391
<i>Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016</i>	Lower Namoi Regulated River Water Source	50 (High Security) 1,638 (General Security) 63.5 (Supplementary River) Total: 1,751.5	11	39 (High Security) 1,638 (General Security) 63.5 (Supplementary River) Total: 1,740.5

¹ Licensing requirement for groundwater includes direct pit inflows from the porous rock and induced leakage from the Namoi River and alluvial aquifer.

² Assuming a 1 ML entitlement per share. External water demands are net of water captured in on-site storages.

Table A6-3
Estimated Water Licensing Requirements for the Project – Post-mining

Water Sharing Plan	Water Source	Allocation (Shares)	Maximum Project Licensing Requirement for Groundwater Inflows (ML/year) ¹	Residual Whitehaven Allocation Post-mining (Shares) ²
<i>Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011</i>	Gunnedah-Oxley Basin MDB Groundwater Source	600	< 500	> 100
<i>Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003</i>	Upper Namoi Zone 4, Namoi Valley (Keepit Dam to Gin's Leap)	396	9	387
<i>Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016</i>	Lower Namoi Regulated River Water Source	<i>50 (High Security)</i> <i>1,638 (General Security)</i> <i>63.5 (Supplementary River)</i> Total: 1,751.5	27	<i>23 (High Security)</i> <i>1,638 (General Security)</i> <i>63.5 (Supplementary River)</i> Total: 1,724.5

¹ Licensing requirement for groundwater includes pit inflows from the porous rock and induced leakage from the Namoi River and alluvial aquifer.

² Assuming a 1 ML entitlement per share. External water demands are net of water required on-site (e.g. as captured in on-site storage).

Minimal Impact Considerations

The AIP establishes minimal impact considerations for 'highly productive' and 'less productive' groundwater.

The Upper Namoi Alluvium in the vicinity of the Project is considered 'highly productive' in accordance with the AIP, although in reality, yields and water quality can vary considerably within the area covered by the extent of the water sharing plan (Appendix A).

The Gunnedah-Oxley Basin MDB Groundwater Source, which includes the Permian (containing the target coal resource) and Triassic porous rock aquifers, is considered 'less productive' in accordance with the AIP.

The numerical groundwater model would be refined over the progression of the mine life in order to more accurately calculate the post-mining licensing requirements associated with the Project.

Tables A6-4 and A6-5 provide an assessment of the watertable, water pressure and water quality minimal impact considerations for the following water sources associated with the Project:

- highly productive alluvial water source; and
- less productive porous and fractured rock water source.

The Project would have "minimal impact" (as defined by the AIP) for both 'highly productive' and 'less productive' aquifers (Tables A6-4 and A6-5) (Appendix A).

A6.2 WATER MANAGEMENT ACT, 2000

Consideration of the Project against the objects, water management principles and access licence dealing principles under the *Water Management Act, 2000* and a discussion of the licences and approvals required for the water sources associated with the Project is provided below.

A6.2.1 Objects of the Act

Section 3 of the *Water Management Act, 2000* outlines the objects of the Act:

The objects of this Act are to provide for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations and, in particular:

- (a) *to apply the principles of ecologically sustainable development, and*
- (b) *to protect, enhance and restore water sources, their associated ecosystems, ecological processes and biological diversity and their water quality, and*

Table A6-4
Minimal Impact Considerations for Highly Productive Alluvial Aquifers

Aquifer	Upper Namoi (Zone 4) Alluvium (<i>Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003</i>)	
Category	Highly Productive Water Source	
Minimal Impact Considerations		Assessment
Watertable 1. Less than or equal to a 10% cumulative variation in the watertable, allowing for typical climatic “post-water sharing plan” variations, 40 metres (m) from any: (a) high priority groundwater dependent ecosystem; or (b) high priority culturally significant site; listed in the schedule of the relevant water sharing plan; or A maximum of a 2 m decline cumulatively at any water supply work. 2. If more than 10% cumulative variation in the watertable, allowing for typical climatic “post-water sharing plan” variations, 40 m from any: (a) high priority groundwater dependent ecosystem; or (b) high priority culturally significant site; listed in the schedule of the relevant water sharing plan then appropriate studies will need to demonstrate to the Minister’s satisfaction that the variation will not prevent the long-term viability of the dependent ecosystem or significant site. If more than 2 m decline cumulatively at any water supply work then make good provisions should apply.		There are no high priority groundwater dependent ecosystems listed in the <i>Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003</i> . There are no high priority culturally significant sites listed in the <i>Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003</i> . The Groundwater Assessment for the Project (Appendix A) predicts that drawdown at all privately-owned bores would be less than 2 m. There are no other relevant water supply works. Project complies with Level 1 minimal impact considerations.
Water pressure 1. A cumulative pressure head decline of not more than 40% of the “post-water sharing plan” pressure head above the base of the water source to a maximum of a 2 m decline, at any water supply work. 2. If the predicted pressure head decline is greater than requirement 1. above, then appropriate studies are required to demonstrate to the Minister’s satisfaction that the decline will not prevent the long-term viability of the affected water supply works unless make good provisions apply.		The Groundwater Assessment for the Project (Appendix A) predicts that drawdown at all privately-owned bores would be less than 2 m. There are no other relevant water supply works. Project complies with Level 1 minimal impact considerations.

Table A6-4 (Continued)
Minimal Impact Considerations for Highly Productive Alluvial Aquifers

Aquifer	Upper Namoi (Zone 4) Alluvium (<i>Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003</i>)	
Category	Highly Productive Water Source	
Minimal Impact Considerations		Assessment
Water quality 1. (a) Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 m from the activity; and (b) No increase of more than 1% per activity in long-term average salinity in a highly connected surface water source at the nearest point to the activity. Redesign of a highly connected surface water source that is defined as a “reliable water supply” is not an appropriate mitigation measure to meet considerations 1.(a) and 1.(b) above. (c) No mining activity to be below the natural ground surface within 200 m laterally from the top of high bank or 100 m vertically beneath (or the three dimensional extent of the alluvial water source - whichever is the lesser distance) of a highly connected surface water source that is defined as a “reliable water supply”. (d) Not more than 10% cumulatively of the three dimensional extent of the alluvial material in this water source to be excavated by mining activities beyond 200 m laterally from the top of high bank and 100 m vertically beneath a highly connected surface water source that is defined as a “reliable water supply”. 2. If condition 1.(a) is not met then appropriate studies will need to demonstrate to the Minister’s satisfaction that the change in groundwater quality will not prevent the long-term viability of the dependent ecosystem, significant site or affected water supply works. If condition 1.(b) or 1.(d) are not met then appropriate studies are required to demonstrate to the Minister’s satisfaction that the River Condition Index category of the highly connected surface water source will not be reduced at the nearest point to the activity. If condition 1.(c) or (d) are not met, then appropriate studies are required to demonstrate to the Minister’s satisfaction that: <ul style="list-style-type: none"> – there will be negligible river bank or high wall instability risks; – during the activity’s operation and post-mining, levee banks and landform design should prevent the Probable Maximum Flood from entering the activity’s site; and – low-permeability barriers between the site and the highly connected surface water source will be appropriately designed, installed and maintained to ensure their long-term effectiveness at minimising interaction between saline groundwater and the highly connected surface water supply. 		The Groundwater Assessment for the Project (Appendix A) concludes the Project is not predicted to result in a change to the beneficial use of groundwater in the Upper Namoi (Zone 4) Alluvium groundwater system. The Project would not result in an increase in the average salinity of the Namoi River (a highly connected water source) of more than 1% (Appendix A). The Project open cut is located greater than 1.5 km from the Namoi River. The Project does not involve excavation of alluvial material from any highly productive groundwater source. Project complies with Level 1 minimal impact considerations.

Table A6-5
Minimal Impact Considerations for Less Productive Porous Rock Aquifers

Aquifer	Porous Rock (<i>Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011</i>)	
Category	Less Productive Water Source	
Level 1 Minimal Impact Consideration		Assessment
Watertable 1. Less than or equal to a 10% cumulative variation in the watertable, allowing for typical climatic “post-water sharing plan” variations, 40 m from any: (a) high priority groundwater dependent ecosystem; or (b) high priority culturally significant site; listed in the schedule of the relevant water sharing plan; or A maximum of a 2 m decline cumulatively at any water supply work unless make good provisions should apply. 2. If more than 10% cumulative variation in the watertable, allowing for typical climatic “post-water sharing plan” variations, 40 m from any: (a) high priority groundwater dependent ecosystem; or (b) high priority culturally significant site; listed in the schedule of the relevant water sharing plan then appropriate studies will need to demonstrate to the Minister’s satisfaction that the variation will not prevent the long-term viability of the dependent ecosystem or significant site. If more than 2 m decline cumulatively at any water supply work then make good provisions should apply.		<p>The closest high priority groundwater dependent ecosystem, listed in the <i>Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011</i>, is approximately 50 kilometres (km) north of the Project and would not be affected by drawdown from the Project.</p> <p>There are no high priority culturally significant sites listed in the <i>Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011</i>.</p> <p>The Groundwater Assessment for the Project (Appendix A) predicts that drawdown at all privately-owned bores would be less than 2 m.</p> <p>Project complies with Level 1 minimal impact considerations.</p>
Water pressure 1. A cumulative pressure head decline of not more than 40% of the “post-water sharing plan” pressure head above the base of the water source to a maximum of a 2 m decline, at any water supply work. 2. If the predicted pressure head decline is greater than requirement 1. above, then appropriate studies are required to demonstrate to the Minister’s satisfaction that the decline will not prevent the long-term viability of the affected water supply works unless make good provisions apply.		<p>The Groundwater Assessment for the Project (Appendix A) predicts that drawdown at all privately-owned bores would be less than 2 m.</p> <p>Project complies with Level 1 minimal impact considerations.</p>

Table A6-5 (Continued)
Minimal Impact Considerations for Less Productive Porous Rock Aquifers

Aquifer	Porous Rock (<i>Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011</i>)	
Category	Less Productive Water Source	
Level 1 Minimal Impact Consideration		Assessment
Water quality 1. Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 m from the activity. 2. If condition 1 is not met then appropriate studies will need to demonstrate to the Minister's satisfaction that the change in groundwater quality will not prevent the long-term viability of the dependent ecosystem, significant site or affected water supply works.		The Groundwater Assessment for the Project (Appendix A) concludes the Project is not predicted to result in a change in the beneficial use of groundwater in the Maules Creek Formation. Project complies with Level 1 minimal impact considerations.

- (c) *to recognise and foster the significant social and economic benefits to the State that result from the sustainable and efficient use of water, including:*
 - (i) *benefits to the environment, and*
 - (ii) *benefits to urban communities, agriculture, fisheries, industry and recreation, and*
 - (iii) *benefits to culture and heritage, and*
 - (iv) *benefits to the Aboriginal people in relation to their spiritual, social, customary and economic use of land and water,*
- (d) *to recognise the role of the community, as a partner with government, in resolving issues relating to the management of water sources,*
- (e) *to provide for the orderly, efficient and equitable sharing of water from water sources,*
- (f) *to integrate the management of water sources with the management of other aspects of the environment, including the land, its soil, its native vegetation and its native fauna,*
- (g) *to encourage the sharing of responsibility for the sustainable and efficient use of water between the Government and water users,*
- (h) *to encourage best practice in the management and use of water.*

The Project is considered to be consistent with the objects of the *Water Management Act, 2000*, given:

- (a) The Project would be consistent with the principles of ecologically sustainable development (Section 6.1.4).
- (b) Mitigation measures, management and monitoring would be implemented to minimise potential impacts on downstream surface water flows, aquifers, water quality, soils, groundwater dependent ecosystems and biodiversity (Sections 2.10 and 4).
- (c) A cumulative assessment of potential impacts of the Project on groundwater and surface water has been conducted as part of this EIS (Appendices A and B). No material adverse impacts on urban communities, regional agriculture, fisheries, industry or recreation are predicted to arise due to the Project water use or water management. The cost benefit analysis in the Economic Assessment (Appendix J) indicates a significant net economic benefit would be forgone if the Project's licensed use of water resources was not to occur.

- (d) Community consultation regarding the Project is described in Section 3 and Appendix R, including, where relevant, feedback received from the community regarding Project water use and water management.
- (e) Potential groundwater inflows and surface water containment requirements are described in Sections 2.10, 4.4 and 4.5. Water licensing and approval requirements for the Project are described in Section A6.1.2.
- (f) The Project Groundwater Assessment (Appendix A), Surface Water Assessment (Appendix B), Agricultural Impact Statement (Appendix H) and Biodiversity Assessment Report and Biodiversity Offset Strategy (Appendix F) have been prepared in an integrated manner.
- (g) The objectives for the Project Water Management System include minimisation of the volume of water to be obtained from external water sources.
- (h) A Water Management Plan would be developed for the Project that describes measures/procedures to respond to potential exceedances of water-related criteria, and contingent mitigation, compensation and/or offset options that are enacted in the event that downstream surface water users or groundwater users are adversely affected by the Project.

A6.2.2 Water Management Principles

Section 5 of the *Water Management Act, 2000* outlines the water management principles:

5 Water management principles

- (1) *The principles set out in this section are the water management principles of this Act.*
- (2) *Generally:*
 - (a) *water sources, floodplains and dependent ecosystems (including groundwater and wetlands) should be protected and restored and, where possible, land should not be degraded, and*
 - (b) *habitats, animals and plants that benefit from water or are potentially affected by managed activities should be protected and (in the case of habitats) restored, and*
 - (c) *the water quality of all water sources should be protected and, wherever possible, enhanced, and*

- (d) *the cumulative impacts of water management licences and approvals and other activities on water sources and their dependent ecosystems, should be considered and minimised, and*
 - (e) *geographical and other features of indigenous significance should be protected, and*
 - (f) *geographical and other features of major cultural, heritage or spiritual significance should be protected, and*
 - (g) *the social and economic benefits to the community should be maximised, and*
 - (h) *the principles of adaptive management should be applied, which should be responsive to monitoring and improvements in understanding of ecological water requirements.*
- (3) *In relation to water sharing:*
- (a) *sharing of water from a water source must protect the water source and its dependent ecosystems, and*
 - (b) *sharing of water from a water source must protect basic landholder rights, and*
 - (c) *sharing or extraction of water under any other right must not prejudice the principles set out in paragraphs (a) and (b).*

Section 9 of the *Water Management Act, 2000* makes it the duty of all persons exercising functions under the Act to take all reasonable steps to exercise those functions in accordance with water management principles.

The Project is considered to be consistent with the principles of the *Water Management Act, 2000*, given that:

- As described above, cumulative assessments for impacts on groundwater and surface water have been conducted (Appendices A and B) as part of this EIS. Mitigation measures, management and monitoring would be implemented to minimise potential impacts on water sources (Sections 2.10, 4.4.3 and 4.5.3).
- Section 5 presents the rehabilitation strategy for the Project. Section 4.11 summarises the Project Biodiversity Offset Strategy and compensatory measures that would assist in maintaining the biodiversity of the region, including consideration of native vegetation and fauna species.

- With the proposed management and monitoring measures in place, dealings associated with the Project are not expected to adversely affect the ability of a person to exercise their basic landholder rights.
- Sections 4.4, 4.5 and 4.15 summarise the potential impacts of the Project on groundwater, surface water and Aboriginal cultural heritage and outline the proposed management and mitigation measures where relevant.
- Sections 4.17 and 6.1.1 summarise the expected economic outcomes if the Project is approved.

A6.2.3 Access Licence Dealing Principles

The *Access Licence Dealing Principles Order 2004* outlines the access licence dealing principles that prevail over the access licence dealing rules of water sharing plans to the extent of any inconsistency.

Clause 7 of the *Access Licence Dealing Principles Order 2004* relevantly states:

7 Impacts on water sources

- (1) *Dealings should not adversely affect environmental water and water dependent ecosystems as identified in any relevant management plan.*
- (2) *Dealings should be consistent with any strategies to maintain or enhance water quality identified in any relevant management plan.*
- (3) *In unregulated river water sources, dealings should not increase commitments to take water from water sources or parts of water sources identified in any relevant management plan as being of high conservation value.*
- (4) *In unregulated river water sources or a groundwater source, dealings should not increase commitments to take water from water sources above sustainable levels identified in any relevant management plan.*
- (5) *In regulated river water sources, dealings should not increase daily demand for water delivery at those locations and times where it is identified in any relevant management plan that demand exceeds delivery capacity.*
- (6) *In this clause, **commitments to take water** refers, in relation to all access licences with nominated works in that water source or part of a water source, to:*
 - (a) *the total volume of water allocations in water allocation amounts, or*
 - (b) *where relevant, the sum of limits on rates of extraction in extraction components.*

Based on the groundwater modelling and the site water balance modelling, Whitehaven currently holds sufficient licences to cover the estimated licensing requirements for the Project (Section A6.1.2).

There are no high priority groundwater dependent ecosystems identified in the relevant water sharing plans in the vicinity of the Project.

The Groundwater Assessment for the Project (Appendix A) concludes there would be no significant adverse water quality impacts to groundwater as a result of mining, including in the long term.

With the implementation of the Project Water Management System, the potential adverse effects of the Project on downstream water quality would be negligible (Appendix B).

Mitigation measures, management and monitoring to minimise potential impacts on water quality are described in Sections 4.4.3 and 4.5.3.

The Project would not involve extraction from water sources identified in any relevant water sharing plan as being of high conservation value.

The following sections provide detail on each of the water sharing plans relevant to the licensing requirements of the Project.

A6.2.4 Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003

Under the *Water Management Act, 2000*, the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003* commenced on 1 November 2006.

Applicable Waters

Subclause 4(3) of the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003* provides that the plan applies to the following waters:

- (3) *The Upper and Lower Namoi Groundwater Sources include all water contained in the unconsolidated alluvial sediment aquifers associated with the Namoi River and its tributaries.*

The alluvial aquifers adjacent to the Project mining area fall within the Upper Namoi Zone 4, Namoi Valley (Keepit Dam to Gin's Leap) Groundwater Source of the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003* (Figure A6-1).

Existing Whitehaven Licences

Table A6-1 summarises licences held by Whitehaven in the Upper Namoi Zone 4, Namoi Valley (Keepit Dam to Gin's Leap) Groundwater Source within the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003*.

Access Licences and Dealing Rules

Based on the groundwater modelling (conducted by HydroSimulations [2018]) and the site water balance modelling (conducted by Advisian [2018]), Whitehaven currently holds sufficient licences to cover the estimated licensing requirements for the Project, including post-mining (Tables A6-2, A6-3 and A6-4).

There are a number of mechanisms within the *Water Management Act, 2000* (called access licence dealings) that allow changes to access licences, for example, changes to the holder of an access licence, or the location within a water source at which water can be extracted.

Part 11 of the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003* outlines the access licence dealing rules that apply to dealings under the *Water Management Act, 2000*.

Subclause 45(2) of the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003* provides that in specified circumstances, dealings under sections 71Q, 71S, 71T and 71W of the *Water Management Act, 2000* are prohibited within the water sources defined by the Plan. Potentially relevant subclauses are addressed below.

In accordance with subclause 45(2)(a), Whitehaven would not seek to convert an access licence or water allocation from a water source under a different water sharing plan to a water source under the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003*.

Consistent with subclause 45(2)(b), groundwater licensing requirements for the Project from sources within the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003* would not exceed 600 ML/year/square kilometre.

The applicability of clause 45(2)(c) (i.e. an adverse local impact under Division 2 of Part 10) is described further below.

Management of Local Impact

Division 2 of Part 10 of the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003* relates to the management of local impact on the groundwater resource. Relevant provisions of Division 2 of Part 10 are outlined below.

Clause 36 of the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003* provides:

36 Extraction interference between neighbouring bores

- (1) *With the exception of a water supply work (bore) for the supply of basic landholder rights only, applications for a new water supply work (bore) within 100 metres of any bores for the supply of basic landholder rights, will require an investigation by the proponent of the potential impact on neighbouring bores.*
- ...
- (3) *A minimum distance of 400 metres is to be maintained between all new water supply works (bores), except for a replacement water supply work (bore) and those for the supply of basic landholder rights only.*
- (4) *A new water supply work (bore) that is not a replacement water supply work (bore) shall be located no closer than 200 metres from a property boundary.*
- (5) *Notwithstanding the provisions of subclauses (3) and (4) the Minister may, upon application by an access licence holder, vary the distance restrictions specified in subclauses (3) and (4) if:*
 - (a) *a hydrogeological study undertaken by the licence holder, assessed as adequate by the Minister, demonstrates minimal potential for adverse impact on existing licensed extraction, including consideration of cumulative impact,*
 - (b) *written consent is obtained by the applicant from adjacent landowners, and*
 - (c) *there is a process for remediation in the event that an adverse impact occurs in the future, specified as conditions on the licence.*
- ...
- (7) *A new Water supply work (bore) with the exception of a replacement water supply work (bore) for the supply of basic landholder rights only, cannot be constructed within a minimum distance of:*
 - (a) *500 metres of a bore nominated by a local water utility access licence,*
 - (b) *400 metres of a Departmental monitoring bore,*

- (c) *400 metres of a bore extracting from the Great Artesian Basin,*
- (d) *500 metres of a wetland, or*
- (e) *200 metres of a river.*

Section 4.41(1) of the NSW *Environmental Planning and Assessment Act, 1979* (EP&A Act) provides that water use approvals under section 89, water management work approvals under section 90 (which include water supply work approvals), or an activity approval (excluding an aquifer interference approval) under section 91 of the *Water Management Act, 2000* are not required for an approved State Significant Development Project (Section 6.2.3). Therefore, restrictions set out in clause 36 of the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003* do not apply to a bore approved as part of the Project.

Notwithstanding, unless further groundwater assessment is conducted, extraction from the alluvial aquifer would not occur within:

- 100 m of any bore for the supply of basic landholder rights on land not owned by Whitehaven;
- 400 m of a water supply work (bore) not owned by Whitehaven;
- 200 m of a property boundary with an adjoining property not owned by Whitehaven;
- 500 m of a bore nominated by a local water utility access licence;
- 400 m of a Departmental monitoring bore;
- 400 m of a bore extracting from the Great Artesian Basin;
- 500 m of a wetland; or
- 200 m of a river.

In addition to the above, Whitehaven would implement a process for remediation in the event that an adverse impact occurs on neighbouring bores as described in Section 4.4.3.

Clause 37 of the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003* provides:

37 Water level management

- (1) *The Minister may declare that, in order to protect the project water levels within these groundwater sources, local access restrictions are to apply in a defined area known as a local impact area*

...

The Project is not located within a local impact area, therefore clause 37 is not applicable to any dealing for the Project.

Clause 38 of the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003* provides:

38 Water quality management

- (1) *The beneficial uses of these groundwater sources are:*
- (a) *raw water for drinking, and*
 - (b) *agriculture use,*
- based on beneficial use classes identified in the Australian and New Zealand Environment and Conservation Council Water Quality Guidelines 2001, and the National Health and Medical Research Council Raw Water for Drinking Purposes Guidelines 1996.*
- (2) *Pursuant to subclause (1), water quality decline will be deemed unacceptable if extraction is likely to cause water quality to decline to a lower beneficial use class.*

...

The Project would not lower the existing beneficial use class of the alluvial groundwater system (Appendix A). Clause 38 is therefore not applicable to any dealing for the Project.

Clause 39 of the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003* provides:

39 Protection of groundwater dependent ecosystems

- (1) *Extraction of groundwater from a new or replacement water supply work (bore) is excluded within 100 metres of high priority groundwater dependent ecosystems, or any creek or river, or where impact may occur on Aboriginal cultural heritage values for those exercising basic landholder rights, and 200 metres for extraction authorised by all other access licences, unless the water supply work (bore):*
- (a) *only draws water from an aquifer at depths as approved by the Minister, and*

- (b) *has an impermeable seal, as specified by the Minister, constructed within the bore to isolate aquifers preventing water ingress from the restricted aquifer.*

...

Extraction from the alluvial aquifer would not occur within 100 m of a high priority groundwater dependent ecosystem as none are listed under the relevant water sharing plans.

Clause 40 of the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003* provides:

40 Protection of aquifer integrity

- (1) *The Minister may declare that, in order to protect the integrity of the aquifers within these groundwater sources, local access restrictions are to apply in a defined area known as a local impact area.*
- (2) *The Minister may, on presentation of evidence of land subsidence or aquifer compaction, restrict extraction from all water supply works (bores) nominated by access licences within a local impact area declared under subclause (1), to such an extent for such time as to stabilise that subsidence or compaction.*

Clause 40 is not currently applicable to any dealing for the Project.

Clause 40 is designed to prevent over extraction of the groundwater resource resulting in broad scale land subsidence or aquifer compaction.

The Project is not located within a local impact area. The open cut would not extend into the Upper Namoi (Zone 4) Alluvium (Appendix A) and so would not directly impact the alluvial aquifer.

Consistent with subclause 45(2)(c), the Project dealings would not cause an adverse local impact in accordance with Division 2 of Part 10 of the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003*.

Rules for Change of Water Source

Clauses 46 and 49 of the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003* provide the rules for dealings under sections 71R and 71T of the *Water Management Act, 2000*.

Section 71R dealings are the mechanism by which access licences can move from one water source to another. Once the change in water source has been effected, if permitted, the new licence will have to nominate specified works (by a dealing under section 71W of the *Water Management Act, 2000*) in the receiving water source before extraction can commence.

Whitehaven does not propose to undertake any dealings under section 71R for the Project.

Rules for Conversion of Access Licence Category

Under clause 47 of the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003*, conversions of an access licence of one category to an access licence of another category under section 71O of the *Water Management Act, 2000* are prohibited in these alluvial groundwater sources.

Whitehaven does not propose to convert an access licence of one category to an access licence of another category for the Project.

Rules for Interstate Access Licence Transfer

Clauses 48 and 50 of the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003* are not applicable to the Project as no dealings for interstate transfer of an access licence or assignment of water allocations are proposed.

Management of Access Licences

In accordance with Division 1 of Part 10 of the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003*, water taken under an access licence will be periodically debited against the access licence water allocation account.

Whitehaven would manage its access licences to ensure that extraction does not exceed the water allocation account in any water year in accordance with the *Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources 2003*.

A6.2.5 Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011

Under the *Water Management Act, 2000*, the *Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011* commenced on 16 January 2012.

Applicable Waters

The Project would require licences in the Gunnedah-Oxley Basin MDB Groundwater Source within the *Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011* (Tables A6-2 and A6-3).

Subclause 4(3) of the *Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011* provides that the Gunnedah-Oxley Basin MDB Groundwater Source applies to the following waters:

- (3) Subject to subclause (8), the Gunnedah–Oxley Basin MDB Groundwater Source includes all water contained in:
 - (a) all rocks of Permian, Triassic, Jurassic, Cretaceous and Tertiary age within the outcropped and buried areas, and
 - (b) all alluvial sediments within the outcropped areas,
 within the boundary of the Gunnedah–Oxley Basin MDB Groundwater Source as shown on the Plan Map.

Existing Whitehaven Licences

Table A6-1 summarises existing licences held by Whitehaven in the Gunnedah-Oxley Basin MDB Groundwater Source within the *Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011*.

Access Licences and Dealing Rules

Based on the groundwater modelling (conducted by HydroSimulations [2018]) and the site water balance modelling (conducted by Advisian [2018]), the licence allocations available to Whitehaven are sufficient to cover the estimated licensing requirements for the Project (Table A6-2).

Part 10 of the *Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011* outlines the access licence dealing rules that apply to dealings under the *Water Management Act, 2000*.

Clauses 43 to 49 of the *Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011* are not applicable to any dealing for the Project as no conversion of access licence category, assignment of rights dealings, amendment of share component dealings, amendment of extraction component dealings, assignment of water allocations or nomination of water supply works dealings between Management Zones, water sources or interstate are proposed.

Management of Local Impact

Part 9 of the *Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011* relates to the management of interference between water supply works.

The relevant provision of Part 9 is outlined below.

37 Rules to minimise interference between water supply works

- (1) A water supply work approval must not be granted or amended to authorise the construction of a water supply work which, in the Minister's opinion, is located within:
 - (a) 400 metres of a water supply work on another landholding that is authorised to take water from the same groundwater source pursuant to an access licence,
 - (b) 100 metres of a water supply work on another landholding that is authorised to take water from the same groundwater source pursuant to basic landholder rights,
 - (c) 200 metres from the boundary of the land, on which the water supply work is located, unless the owner of the land adjoining the boundary has provided consent in writing,
 - (d) 500 metres of a water supply work authorised to take water from the same groundwater source by a local water utility or a major utility, unless the local water utility or major utility has provided consent in writing, or
 - (e) 200 metres of a NSW Office of Water observation or monitoring bore, unless the Minister has provided consent in writing.
- (2) The distance restrictions specified in subclause (1) do not apply to the grant or amendment of a water supply work approval if the Minister is satisfied that:
 - (a) the water supply work is solely for basic landholder rights,
 - (b) the water supply work is a replacement groundwater work,

- (c) the water supply work is for the purpose of monitoring, environmental management or remedial works, or
 - (d) the location of the water supply work at a lesser distance would result in no more than minimal impact on existing extractions within these groundwater sources.
- (3) For the purpose of subclause (2) (d), the Minister may request the applicant to undertake a hydrogeological study, submitted by the applicant and assessed as adequate by the Minister, to demonstrate that the location of the water supply work at a lesser distance would result in no more than minimal impact on existing extractions within these water sources.
- (4) If an approval is granted in circumstances where subclause (2) (d) applies, the approval must be subject to a requirement that, when directed by the Minister by notice in writing, the approval holder must carry out all actions required by the Minister and specified in the notice to minimise the impact of the water supply work on existing water levels or extraction, if the Minister is satisfied that the location of the water supply work is causing more than minimal impact on existing water levels or extraction.
- (5) An approval that authorises the construction of a water supply work to take water under a supplementary water (subcategory "storage") access licence must be subject to a requirement that the water supply work is constructed to a depth determined by the Minister as necessary to protect existing extraction from the groundwater source.

Section 4.41(1) of the EP&A Act provides that water use approvals under section 89, water management work approvals under section 90 (which include water supply work approvals), or an activity approval (excluding an aquifer interference approval) under section 91 of the *Water Management Act, 2000* are not required for an approved State Significant Development Project (Section 6.3.3).

Notwithstanding, extraction from the porous rock groundwater source would not occur within:

- 400 m of a water supply work (bore) not owned by Whitehaven;
- 100 m of any bore for the supply of basic landholder rights on land not owned by Whitehaven;
- 200 m of a property boundary with an adjoining property not owned by Whitehaven;

- 500 m of a bore nominated by a local water utility access licence; or
- 200 m of a Department of Industry (DI) Water observation or monitoring bore.

In addition to the above, Whitehaven would implement a process for remediation in the event that an adverse impact occurs on neighbouring bores as described in Section 4.4.3.

Management of Access Licences

In accordance with Part 8 of the *Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011*, water taken under an access licence would not exceed the sum of:

- the water allocations accrued to the water allocation account for the access licence from available water determinations in that water year;
- the water allocations carried over from the water year prior to that water year under subclause 34(2);
- the net amount of any water allocations assigned to or from the water allocation account for the access licence under section 71T of the *Water Management Act, 2000* in that water year; and
- any water allocations re-credited to the water allocation account for the access licence in accordance with section 76 of the *Water Management Act, 2000* in that water year.

Subclause 34(2) of the *Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011* relevantly states:

- (2) *The maximum water allocation that can be carried over in a water allocation account for an aquifer access licence in these groundwater sources from one water year to the next is equal to:*
 - (a) *25% of the access licence share component for access licences with share components expressed as ML/year, or*
 - (b) *0.25 ML per unit share of access licence share component for access licences with share components expressed as a number of unit shares.*

Whitehaven would manage its access licences to ensure that extraction does not exceed the water allocation account in any water year in accordance with the *Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources 2011*.

A6.2.6 Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016

Under the *Water Management Act, 2000*, the *Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016* commenced on 1 July 2016.

The Lower Namoi includes the regulated river sections downstream of Keepit Dam to the Barwon River. The Namoi River adjacent to the Project area therefore falls wholly within the Lower Namoi Regulated River Water Source of the Namoi Unregulated Rivers Extractive Management Unit.

Clause 4 of the *Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016* provides that the plan applies to the following waters:

4 Water sources and waters to which this Plan applies

- (1) *The water sources in respect of which this Plan is made shall be known as the Upper Namoi Regulated River Water Source and the Lower Namoi Regulated River Water Source (hereafter these water sources).*

...

- (3) *The Lower Namoi Regulated River Water Source is that between the banks of all rivers, from Keepit Dam downstream to the junction of the Namoi River with the Barwon River, which at the date of commencement of this Plan, have been declared by the Minister to be regulated rivers.*

...

- (6) *This Plan applies to all waters contained within these water sources but does not apply to water contained within aquifer water sources underlying these water sources or to waters on land adjacent to these water sources...*

The Project would involve licenced extraction between the banks of a regulated river (i.e. the Namoi River), therefore the *Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016* is applicable to the Project.

Access Licences

Table A6-1 summarises regulated river licences currently held by Whitehaven for the Project.

Based on the site water balance modelling (Appendix B), Whitehaven currently holds sufficient licences to cover the estimated water supply licensing requirements for the Project (Section A6.1.2).

Management of Access Licences

Parts 8 and 9 of the *Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016* includes provisions for managing access licences.

In accordance with clause 32 of the *Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016*, the maximum volume that may be taken under, or assigned from, a regulated river (general security) access licence from the Lower Namoi Regulated River Water Source during any water year shall be equal to 1.25 ML per share unit (or lower amount to maintain compliance with the long-term average annual extraction limit). The maximum volume that may be taken during any three consecutive water years shall be equal to 3 ML per share unit, or such lower amount in accordance with the long-term extraction limit specified in clause 31.

In accordance with clause 44(3) of the *Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016*, water allocations remaining in accounts in the Lower Namoi Regulated River Water Source cannot be carried over from one water year to the next.

In accordance with subclause (2) of clause 38 of the *Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016*, the available water determination for supplementary water access licences shall not exceed 1 ML per share unit, or such lower amount in accordance with subclause (1), or such lower amount in accordance with the long-term extraction limit specified in clause 32.

The taking of water under supplementary licences in the Lower Namoi Regulated River Water Source shall be in accordance with clause 48 of the *Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016*.

Whitehaven would manage its general security and supplementary security access licences to ensure that extraction does not exceed the water allocation account in any water year in accordance with rules outlined in Parts 8 and 9 of the *Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016*.

Access Licence Dealing Rules

Part 10 of the *Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016* outlines the access licence dealing rules that apply to dealings under the *Water Management Act, 2000*.

Extraction components for Whitehaven access licences are not within the Gunidgera/Pian Creek system and are upstream of Mollee Wier, therefore clauses 50(2), 50(3), 50(4), 50(7) and 50(8) are not applicable to any dealing for the Project.

There would be no water allocations from, or to, a supplementary water access licence allocation account from an access licence of any other access licence category and as such clauses 50(5) and 50(6) are not applicable.

Clauses 51 to 55 of the *Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016* are not applicable to any dealing for the Project as no change of water source, conversion of access licence category or dealings between water sources or interstate are proposed.

Management of Local Impact

Clause 57 of Part 11 of the *Water Sharing Plan for the Upper Namoi and Lower Namoi Regulated River Water Sources 2016* provides mandatory conditions on water supply works approvals.

Section 4.41(1) of the EP&A Act provides that water use approvals under section 89, water management work approvals under section 90 (which include water supply work approvals), or an activity approval (excluding an aquifer interference approval) under section 91 of the *Water Management Act, 2000* are not required for an approved State Significant Development Project (Section 6.3.3).

Notwithstanding, flow measurement devices shall be installed and maintained on all works used for the extraction of water under an access licence.

Whitehaven would provide water extraction property management infrastructure details to the relevant Minister upon request.

A6.2.7 Water Sharing Plan for the Namoi Unregulated and Alluvial Water Sources 2012

Under the *Water Management Act, 2000* the *Water Sharing Plan for the Namoi Unregulated and Alluvial Water Sources 2012* commenced on 4 October 2012.

The *Water Sharing Plan for the Namoi Unregulated and Alluvial Water Sources 2012* applies to the unregulated water sources in the Namoi basin. These comprise of water occurring naturally on the surface of the ground and rivers, lakes and wetlands and all water contained within all alluvial sediments below the ground.

Within the *Water Sharing Plan for the Namoi Unregulated and Alluvial Water Sources 2012*, the Project is located within the Bluevale Water Source (Area 9).

The Project Water Management System includes the construction and use of a number of water storages.

Item 12(1) of Schedule 5 of the *Water Management (General) Regulation, 2011* provides access licence exemptions in relation to water taken from certain "excluded works" as defined in Schedule 1 of the *Water Management (General) Regulation, 2011*. These excluded works include dams that are located on a minor stream solely for capture, containment and recirculation of drainage and/or effluent consistent with best management practice to prevent contamination of a water source.

As such, it is not expected that the sediment dams, mine water dams/surge storages and coal contact water dams proposed for the Project Water Management System would require licensing, as these dams would be located on a minor stream and would be solely for the capture, containment and recirculation of mine affected water consistent with best management practice to prevent contamination of a water source (Advisian, 2018).

The capacity of other dams located on minor streams, such as DD-2 (Figure 2-4), are within the harvestable rights calculated for the Project (Appendix B).

The Project Water Management System includes the construction of a dam (of approximately 10 ML) on a third order stream as part of an up-catchment diversion. This dam may require an unregulated river access licence under the *Water Sharing Plan for the Namoi Unregulated and Alluvial Water Sources 2012* prior to construction.

The final design of up-catchment diversions would be determined through detailed design. In the event that an alternate water management structure is constructed (e.g. block bank), a water access licence may not be required.

An assessment of the potential impacts of the Project on surface water flows, including surface water catchment excisions, is provided in Section 4.6 and Appendix B.

A6.2.8 Flood Work Approvals

Former controlled works under the *Water Act, 1912* have been replaced with flood work approvals under the *Water Management Act, 2000*.

A valley-wide Floodplain Management Plan for the Namoi valley is currently being prepared under the *Water Management Act, 2000*. In the interim, floodplains that were designated under the *Water Act, 1912* are automatically considered to be floodplains under the *Water Management Act, 2000* (Department of Primary Industries – Water).

The southern extent of the Project is located within a floodplain designated by an order pursuant to section 166(1) of the *Water Act, 1912*.

The Project would not require a flood work approval under section 90 of the *Water Management Act, 2000* as this requirement does not apply to State Significant Development Projects as per section 4.41 of the EP&A Act.

Notwithstanding, the management rules given in the draft FMP have been used as the basis for assessing the infrastructure proposed as part of the Project (Appendix C).

A6.3 REFERENCES

Advisian (2018) *Vickery Extension Project Surface Water Assessment*.

Department of Primary Industries – Water (2014)
Floodplain management under the Water Management Act 2000: A guide to the changes.

HydroSimulations (2018) *Vickery Extension Project Groundwater Assessment*.

New South Wales Government (2012) *NSW Aquifer Interference Policy: NSW Government policy for the licensing and assessment of aquifer interference activities*.