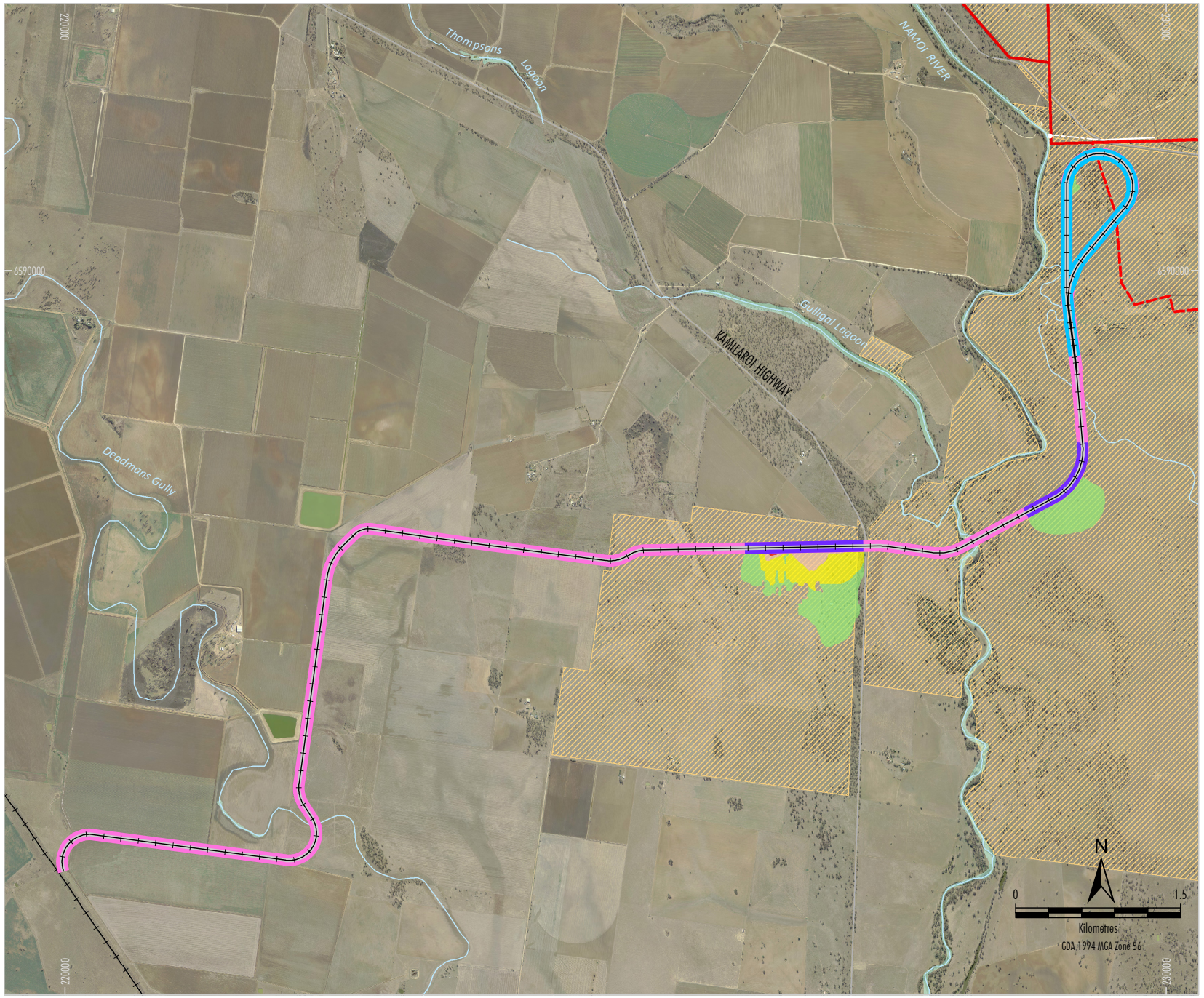
Table A
DPE Preliminary Issues Report Responses

	Recommendation	Response
	PROJECT RAIL SPUR - FLOODING	
1	In the Preliminary Issues Report, DPE states *"... Ms Askew considers that some aspects of the assessment are not adequately documented and/or addressed, and has recommended additional information be provided on a number of matters to confirm and clarify the conclusions"* (this includes detail on the structure of the spur [i.e. location of culverts and embankments]).	DPE's Independent Peer Reviewer for flooding (Erin Askew of WMAwater) stated: *The peer review has determined that the assessment is generally undertaken in accordance with industry best practice …* This statement supports the conclusions of the Project Flood Assessment (prepared by WRM) as well as the findings of the independent Peer Reviewer engaged by Whitehaven (Royal HaskoningDHV). The objective of the flood modelling included in the EIS was to demonstrate that the proposed location of the Project rail spur would comply with the design objectives of the *Draft Floodplain Management Plan for the Upper Namoi Valley Floodplain 2016* (Draft FMP) and the *Carroll to Boggabri Floodplain Management Plan 2006* (Department of Natural Resources, 2006) (FMP), which includes impacts to flood levels, velocities and distributions on privately-owned land. Initial conceptual design decisions involved elevating the Project rail spur above predicted flood levels (i.e. a superstructure supported on either pylon-like structures or in-filled embankment sections) and conceptually locating openings to provide for minimal impact to existing flooding regimes. Proceeding with a conceptual design involved an iterative approach during flood modelling, whereby the distribution of openings under the superstructure of the Project rail spur was adjusted to achieve consistency with the Draft FMP (Figure 1). The Project rail spur construction materials would be determined during detailed design, including consideration of constructability of the superstructure. Notwithstanding, as the superstructure is elevated clear of predicted flood levels, the ultimate composition of the Project rail spur does not impact on the flood assessment. The flood modelling objective was achieved as the conceptual design, incorporating the design aspects outlined above, modelled for the EIS demonstrated compliance with the objectives of the Draft FMP and negligible changes to flood levels, velocities and distributions on privately-owned land.

	Recommendation	Response
		Subsequently, further design development of the conceptual rail spur alignment following submission of the Project EIS determined that the Project rail spur would be completely elevated on pylon-like structures west of the Namoi River. At the point where the elevated rail spur joins the Main Line embankment there will be a short transition zone. The superstructure of the rail spur would be elevated above the 1 in 100 year flood level. An example of such an elevated structure is the existing Maules Creek and Boggabri Coal Mine Rail Spur where it crosses the Namoi River floodplain (refer Plates 1a and 1b, below). Conceptual 3D drawings of the Project rail spur are provided in Plates 2 to 4. The conceptual drawings are consistent with the revised conceptual design (i.e. completely elevated west of the Namoi River). It is noted the objectives of the FMP and Draft FMP relevant to privately-owned land are for "large design floods", which approximate the 1 in 20 year (i.e. 5% AEP) flood event. Therefore, the Project rail spur conceptual design, which includes provision to elevate the superstructure above the 1 in 100 year (i.e. 1% AEP) flood level, is considered to be conservative and prevents impacts for flood events well above what is required by the FMP and Draft FMP. Consistent with industry best practice, following determination of the Project, Whitehaven will engage suitably qualified and experienced infrastructure design and construction contractors to identify the most appropriate design of the Project rail spur, in consideration of structural adequacy, constructability, cost efficiency and potential flood impacts. Whitehaven will provide DPE and OEH with the final detailed rail spur design and updated flood assessment results to confirm compliance with the objectives of the Draft FMP. It is standard practice for Project infrastructure to be conditioned such that detailed design (conducted post-approval) confirms that the infrastructure will achieve the predicted outcomes and/or performance measures identified during the assessment phase. For example, regarding the approved Kamilaroi Highway Overpass, Condition 26 of the Approved Mine Development Consent (SSD-5000) provides: *The Applicant must obtain an approval under Part 8 of the Water Act 1912 for all applicable works associated with the Kamilaroi Highway overpass. The Applicant shall ensure that the design and construction of the Kamilaroi Highway overpass is consistent with the Boggabri to Carroll Flood Plain Management Plan, to the satisfaction of NOW.*



LEGEND

- Mining Lease Application (MLA)
- Mining Tenement Boundary (ML and CL)
- Whitehaven-owned Land

Predicted Change in Water Level
Due to the Project Rail Spur (1% AEP Flood Event)

- 5cm < dWL < 10cm
- 10cm < dWL < 15cm
- 15cm < dWL < 20cm
- 20cm < dWL < 30cm

Project Rail Spur Conceptual Design

- Embankment
- Embankment/Culvert
- Elevated Structure

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Conceptual Project Rail Spur Design
Predicted Flooding Impacts

Figure 1

WHC-15-33_IPC HP_Resp Dec2018_202A

Plate 1a Maules Creek and Boggabri Coal Mine Rail Spur

Plate 1b Maules Creek and Boggabri Coal Mine Rail Spur

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Maules Creek and Boggabri Coal Mine
Rail Spur

Plate 1a and 1b

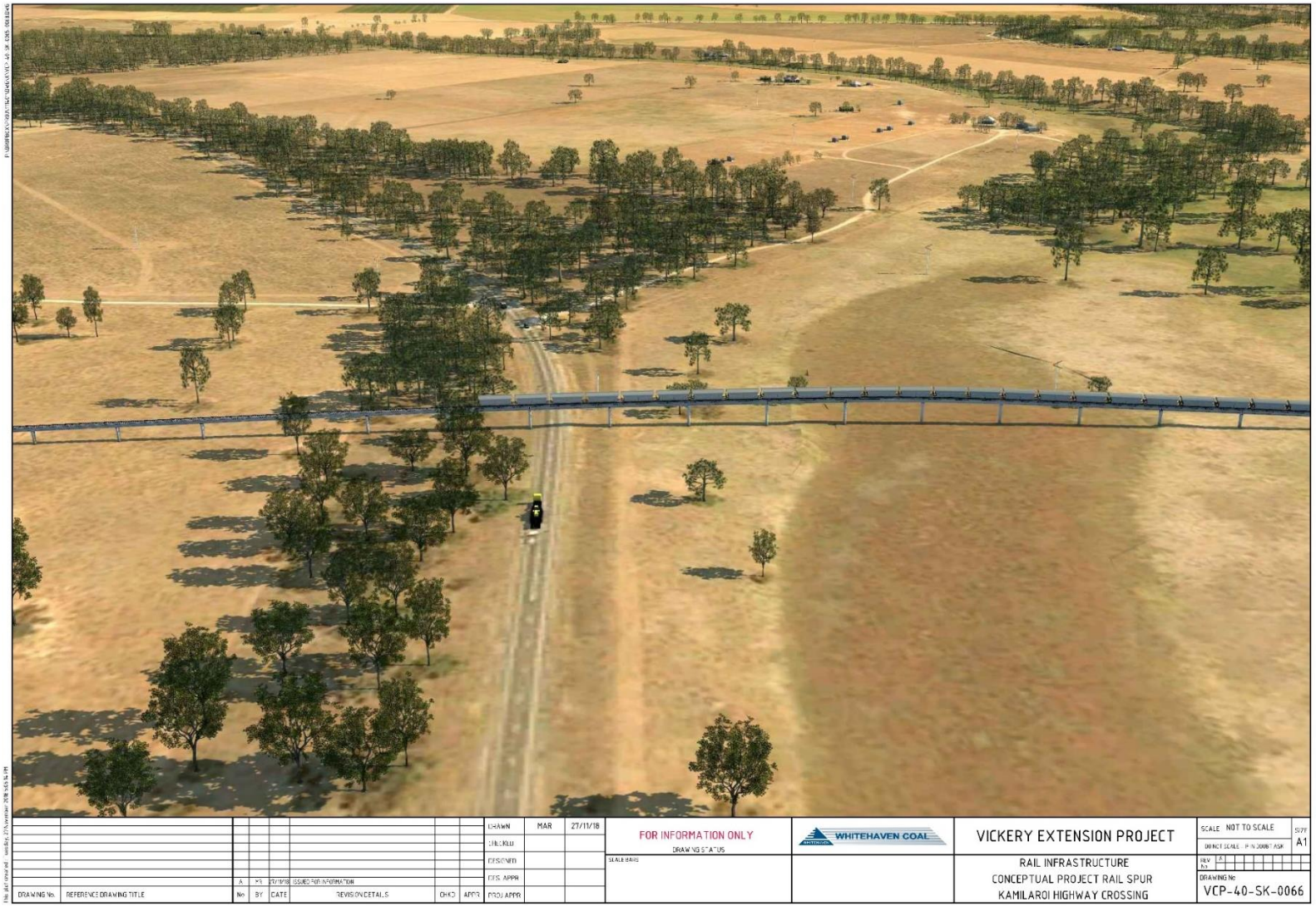


Plate 2: Conceptual Project rail spur crossing of the Kamilaroi Highway

Plate 3: Indicative conceptual view of Project rail spur at a distance of approximately 50 m.

Plate 4: Indicative conceptual view of Project rail spur at a distance of approximately 500 m.

	Recommendation	Response
2	In the Preliminary Issues Report, DPE states "… *Ms Askew also recommended further discussion to confirm the consistency of the project with the draft FMP criteria, including flow redistribution on individual properties, which is a key issue for adjacent landholders".*	The impact of the Project rail spur on peak flow distribution for the 5% Annual Exceedance Probability (AEP) flood event was assessed in the Flood Assessment (Section 6.4.3 of Appendix C of the EIS, reproduced below as Figure 2). The peak flow distribution impacts for the 5% AEP flood event and the 1% AEP flood event are detailed in Table 1 and Table 2, respectively (see below). The location of each Peak Flow ID is shown on Figure 6.1 of Appendix C of the EIS, reproduced below. The results show that the distribution of flow across the floodplain is not significantly altered by the Project rail spur for both events and would not result in a consequential effect to neighbouring properties or the environment.

Table 1
Peak flow distribution impacts for 5% AEP flood event.

Flow ID	Existing	Proposed	Difference (%)
PA	185.5	185.4	0.0%
PA1	169.6	169.6	0.0%
PA2	159.7	159.8	0.0%
PA3	133.0	132.9	-0.1%
PA4	18.0	18.0	-0.2%
DMG	22.1	22.2	0.2%
DMG1	17.1	17.1	-0.2%
DMG2	12.2	12.1	-0.2%
DMG3	22.4	22.0	-1.8%
DMG4	73.0	73.0	-0.1%
GL	667.9	666.0	-0.3%
GL1	528.9	527.0	-0.4%
GL2	582.8	581.1	-0.3%
GL3	855.1	851.8	-0.4%
NR	1724.8	1718.8	-0.4%
NR1	1858.9	1853.0	-0.3%
NR2	1781.0	1774.4	-0.4%
NR3	1462.2	1458.8	-0.2%
NR4	1033.3	1030.6	-0.3%
NRB4	1236.0	1229.7	-0.5%
CoxsCk US	54.1	54.9	1.4%
Namoi DS	2416.4	2404.1	-0.5%

Table 2
Peak flow distribution impacts for 1% AEP flood event.

Flow ID	Existing	Proposed	Difference (%)
PA	819.4	818.6	-0.1%
PA1	853.2	852.8	0.0%
PA2	802.5	802.1	-0.1%
PA3	766.7	766.0	-0.1%
PA4	238.3	237.9	-0.2%
DMG	947.4	951.8	0.5%
DMG1	935.6	940.6	0.5%
DMG2	945.1	949.7	0.5%
DMG3	1277.9	1281.3	0.3%
DMG4	1712.5	1712.5	0.0%
GL	2972.0	2979.4	0.2%
GL1	2619.7	2627.6	0.3%
GL2	2654.8	2661.4	0.2%
GL3	2753.6	2752.9	0.0%
NR	3017.9	2998.9	-0.6%
NR1	3325.8	3305.2	-0.6%
NR2	3254.6	3235.8	-0.6%
NR3	2666.1	2657.3	-0.3%
NR4	2290.1	2289.2	0.0%
NRB4	3280.6	3272.2	-0.3%
CoxsCk US	137.8	137.6	-0.2%
Namoi DS	7488.8	7476.4	-0.2%

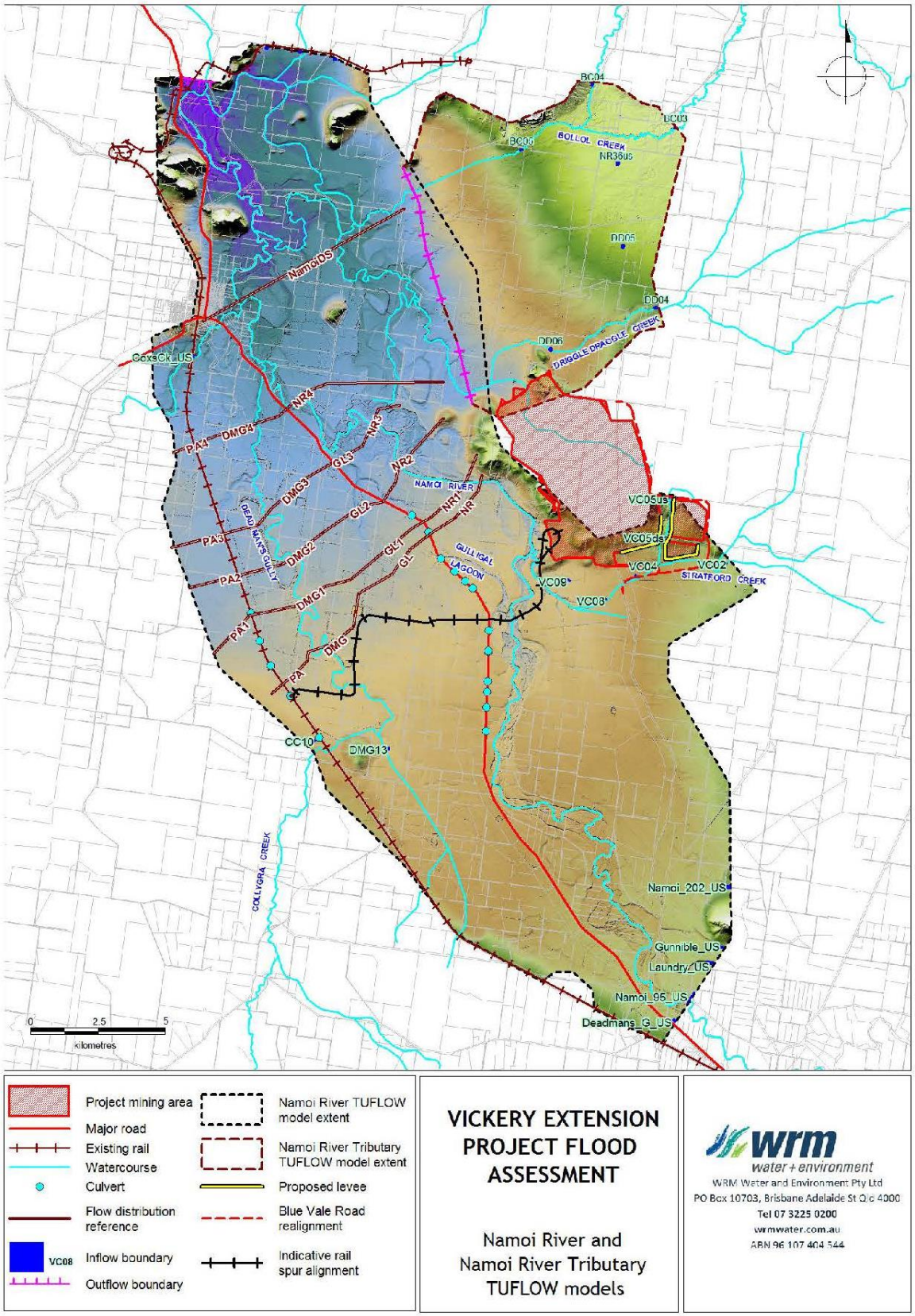


Figure 6.1 - Namoi River and Namoi River Tributary TUFLOW models

Figure 2: Namoi River and Namoi River Tributary TUFLOW models

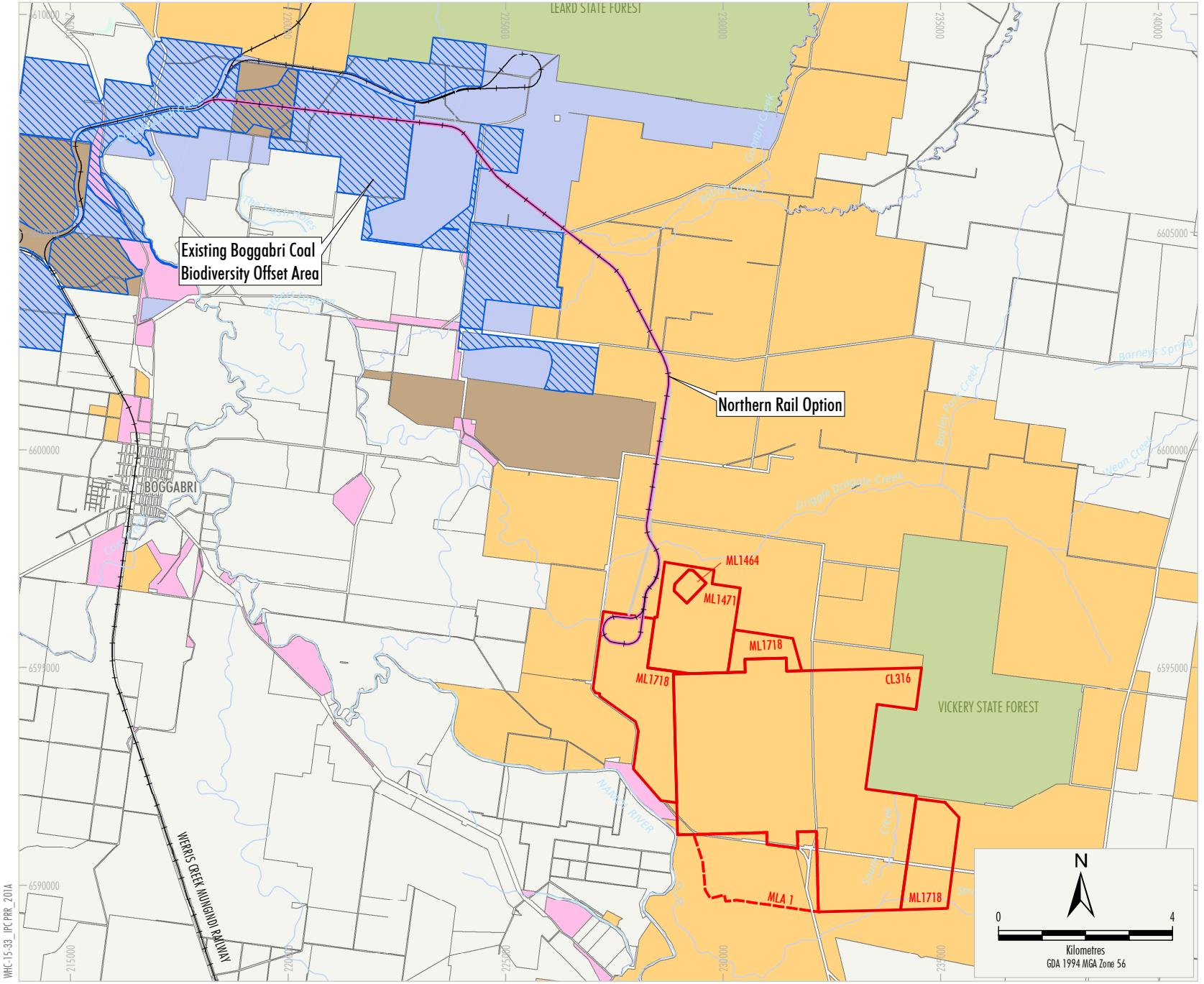
	Recommendation	Response
3	In the Preliminary Issues Report, DPE states *"… Some submitters have suggested that Whitehaven should avoid building the rail spur on the floodplain altogether, and instead extend the rail line north to the existing spur servicing the Maules Creek and Boggabri mines.* *… the Department believes that the benefits and costs/impacts of the project rail spur should be considered further in detail in the assessment of the project."*	An analysis of potential rail spur alignments (i.e. northern rail option versus Project rail spur alignment) was conducted in the EIS (Section 6.1.8 of the EIS). Whitehaven considers the Project rail spur provides the superior outcome for the Project, given the following: • Private land access: – Whitehaven does not own all private land required for the northern rail option (Figure 3), whereas Whitehaven owns all private land required for the Project rail spur (or a land access agreement is already in place). • Logistics and congestion on the common section of the existing Maules Creek-Boggabri rail spur: – The Common Section of the Maules Creek-Boggabri rail spur has six participants in the joint venture (one of which is Whitehaven). – Whitehaven has a share of the capacity of the Maules Creek-Boggabri rail spur commensurate with its percentage of ownership. – At the time the original joint venture was formed, the capacity of the Common Section of the Maules Creek-Boggabri rail spur was 28 Mtpa. The Maules Creek Coal Mine has approval to rail 12.4 Mtpa and the Boggabri Coal Mine has approval to rail 10 Mtpa (i.e. 5.6 Mtpa remaining capacity). – The Project proposes the rail transport of up to 11.5 million tonnes per annum (Mtpa) run-of-mine (ROM) coal (inclusive of coal from the Rocglen and Tarrawonga Coal Mines). – This would create congestion on the common section of the existing Maules Creek-Boggabri rail spur and the adjacent section of the Werris Creek Mungindi Railway (the Main Line) unless new passing loop(s) are constructed and additional train units purchased. An additional crossing of the floodplain may also be required. – Given these constraints to the feasibility of this option, the Project rail spur alignment was progressed.

	Recommendation	Response
		• Environmental considerations: – The Project rail spur would result in the avoidance of additional coal trains travelling through the town of Boggabri (the majority of dwellings in Boggabri are within 500 metres (m) of the Main Line, with many dwellings within approximately 150 m of the Main Line [see Plate 6a, below]). – By comparison, the two closest existing privately-owned dwellings (on Property ID 144) are approximately 500 m and 750 m distance from the Project rail spur (see Plate 6b). All other existing dwellings are further than 800 m from the Project rail spur. Compliance with the relevant rail noise criteria as outlined in Appendix 3 of the NSW *Rail Infrastructure Noise Guideline* (RING) (NSW Environment Protection Authority [EPA], 2013) for noise from trains on non-network rail lines on or exclusively servicing industrial sites (e.g. private rail spurs) is predicted at all existing privately-owned dwellings (refer to Section 7.3.1 of the Project Noise and Blasting Assessment [Wilkinson Murray, 2018]).[1] – The Project rail spur would result in the avoidance of impacts to existing Boggabri Coal Mine biodiversity offset areas (Figure 3). Note Whitehaven isn't a participant of the joint venture for the Boggabri Coal Mine private rail spur and the capacity constraints outlined above for the Common Section also apply. Hence, the Project rail spur could not be realigned to connect directly with the Boggabri Coal Mine private rail spur to avoid impacts to the existing offset areas. • Economic considerations: – Elevation of the Project rail spur (to avoid flooding impacts on any private property and cross the Kamilaroi Highway) would result in increased construction costs of approximately $40 million net present value (NPV) compared to the northern rail option.

[1] The Project EIS acknowledges there is an approved dwelling location on Property ID 144 located approximately 350 m from the Project rail spur. Should a dwelling be constructed at this location, noise levels from trains on the Project rail spur would be managed such that there would be no more than 'negligible' exceedances (i.e. 1 to 2 dB) of the relevant RING criteria, unless an agreement is in place with the landowner.

	Recommendation	Response
		– Notwithstanding, when considering both capital and operational costs over the life of the Project, the economic advantage of the Project rail spur over the northern rail option is in excess of $150 million NPV due to: ▪ increased fuel consumption and other operational costs associated with additional distance travelled by coal trains (approximately 30 km each way when travelling to the Project via the Maules Creek-Boggabri rail spur); ▪ ongoing fees to access the common section of the Maules Creek-Boggabri rail spur; ▪ Main Line passing loop construction costs; ▪ additional train unit costs; ▪ further land acquisition and agreement costs; and ▪ establishment of additional biodiversity offsets for the Boggabri Coal Mine. The potential impacts of the Project rail spur alignment were assessed in the EIS with regard to flooding, land use and amenity, as summarised below. <u>Flooding</u> • Flood modelling demonstrates negligible impact to flood levels, velocities and flow distribution beyond Whitehaven-owned land (see Figure 1) and compliance with objectives of the Draft FMP and FMP at all privately-owned properties. • Further design of the conceptual rail spur alignment, undertaken since submission of the Project EIS, has determined that it will be constructed completely on pylon-like structures on the western side of the Namoi River. An indicative view from 500 m of the conceptual rail spur is provided in Plate 5. • The results of the Flood Assessment would be reviewed following detailed design of the Project rail spur to confirm compliance with the objectives of the Draft FMP and the impacts presented in the EIS. <u>Land use</u> • The Project rail spur is located on land owned by Whitehaven, or where an existing access agreement is in place (see Figure 1).

	Recommendation	Response
		• The Project rail spur alignment has been determined in consultation with landowners for which land access agreements have been formed. • Post-mining, the Project rail spur and borefield would be decommissioned and disturbed land rehabilitated to a condition of comparable Agricultural Suitability to the surrounding land, unless otherwise agreed with the relevant stakeholders. <u>Amenity</u> • The two closest existing privately-owned dwellings to the Project rail spur are on property ID 144), approximately 500 m and 750 m distance from the Project rail spur, respectively. All other existing dwellings are further than 800 m from the Project rail spur (see Plate 6a, below). • Compliance with *Rail Infrastructure Noise Guideline* private rail noise criteria is predicted at all existing privately-owned dwellings when considering local noise enhancing meteorology. • The risk of adverse impacts from fugitive coal dust emissions associated with coal transport along the Project rail spur is considered low based on the results of air quality monitoring commissioned by the EPA in the vicinity of existing rail corridors.



LEGEND

- Mining Tenement Boundary (ML and CL)
- Mining Lease Application (MLA)
- State Forest
- Crown Land
- Whitehaven Owned Land
- Whitehaven/Idemitsu Boggabri Coal Joint Owned Land
- Idemitsu Boggabri Coal Owned Land
- Privately Owned Land and Other Land
- Railway
- Indicative Northern Rail Option Alignment
- Existing Boggabri Coal Biodiversity Offset Area

Source: Department of Land and Property Information - Land Tenure (2016); Department of Industry (2017); Whitehaven Coal (2016)

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Northern Rail Option Land Tenure

Figure 3

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Plate 6a Proximity of Main Line to Residences in Boggabri

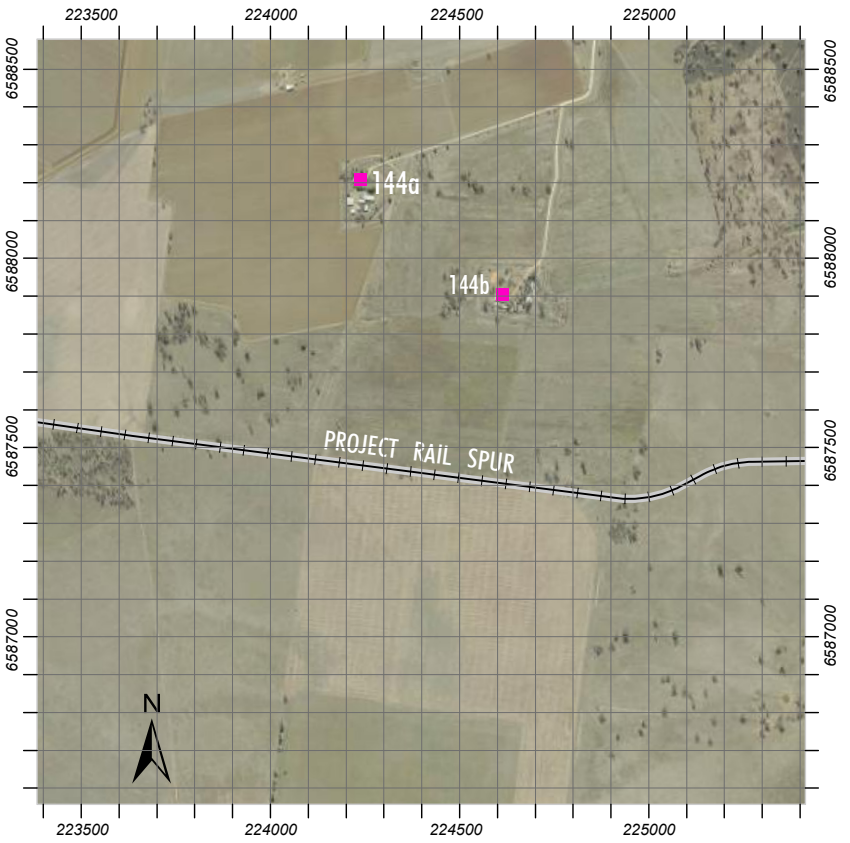

Plate 6b Proximity of Project Rail Spur to Dwellings on Property ID 144

WHC-15-33_IPC PRR_212A

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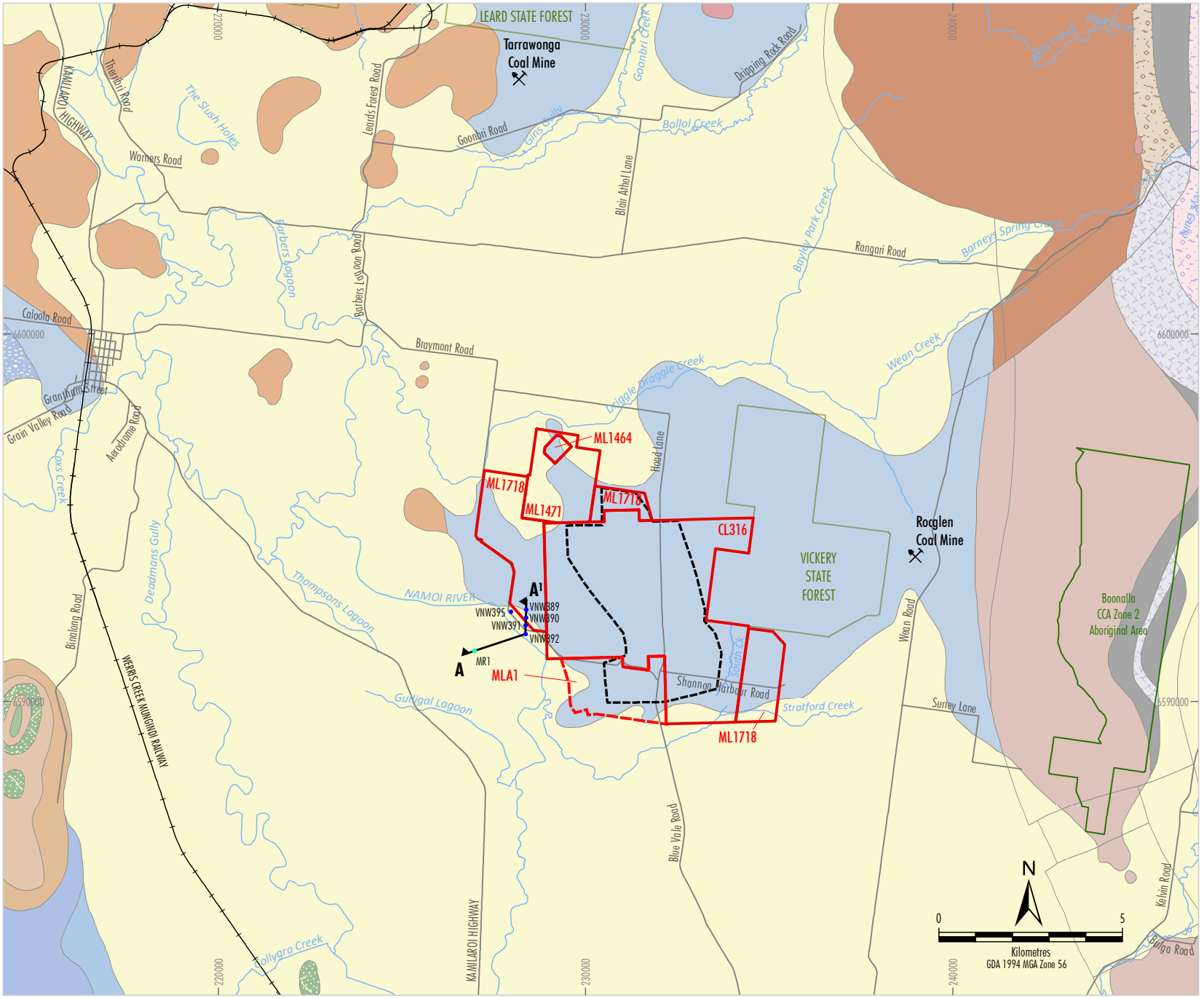
VICKERY EXTENSION PROJECT

Proximity of Project Rail Spur and
Main Line to Existing Dwellings

Plates 6a and 6b

	Recommendation	Response
	WATER RESOURCES	
	Groundwater	
4	In the Preliminary Issues Report, DPE stated that *"… DoI has recommended that Whitehaven confirms that it holds sufficient entitlements to account for its water take from the combined operations of its mines in the region".*	Attachment 6 of the EIS details water licensing for the Project. Whitehaven holds sufficient surface water and groundwater access licences (net of licences required for groundwater inflows) to account for predicted operational water supply requirements. Whitehaven also holds sufficient water access licences to account for groundwater inflows to the open cut and induced loses from the Namoi River and associated alluvium. These licenses are dedicated for use for the Project. Post-mining groundwater licensing requirements are well within Whitehaven's existing water access licence entitlements. Relevant entitlements under these licences could be retired at the completion of the Project to account for predicted groundwater losses to the final void.
5	In the Preliminary Issues Report, DPE stated "… *The Department's independent groundwater expert reviewer believes that the groundwater assessment is fit for purpose for assessment and informing management strategies and licensing (see Appendix E1)".* DPE also states "… *However, while some sensitivity and uncertainty scenarios have been conducted, Mr Middlemiss believes that additional sensitivity assessment is warranted to align with best practice.* *Although he acknowledges that the risk context is fairly low given the nature of the site (including the low permeability of the Maules Creek Formation and the low dewatering rates), Mr Middlemiss believes that additional qualitative and/or quantitative assessment should be undertaken to confirm the predicted impacts. The IESC also recommended additional sensitivity assessment of key hydraulic parameters to inform the assessment and potential for changes in surface and groundwater interactions."*	The Groundwater Assessment was peer reviewed by Kalf and Associates (Dr Frans Kalf) (see Attachment 4 of the EIS). The peer review undertaken by Kalf and Associates states: *… The hydrogeological description, conceptualisation, model design, simulations and reporting have been conducted in a professional manner and described in detail.* *All predicted drawdown lies within the mine boundaries. No significant water table drawdown occurs within the alluvial sediments.* *Predictions of drawdown due to the proposed Extension together with the existing approved mine plan and cumulative effects will have minimal influence on the environment. No private bores would be detrimentally affected by the Extension mining proposal.* In addition, the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC) stated in their advice to DPE: *The IESC notes that a number of the studies completed for this project such as the surface water assessments and the studies to determine the extent of the alluvium have been completed to a high standard. The proponent should be commended for these studies and for obtaining peer reviews of many of the major reports provided in the assessment.*

	Recommendation	Response
		It is noted that in regard to uncertainty, DPE's Independent Peer Reviewer for groundwater (Hugh Middlemis of Hydrogeologics) stated: *While it could be argued that the risk context is fairly low in this case, given its setting in the low permeability Maules Creek Formation and benchmarking to low dewatering rates and lack of widespread drawdown impacts from nearby mines, the assessment does not highlight the use of such arguments to justify the minimum effort approach to uncertainty assessment."* Whitehaven agrees with this statement that the risk context is low, and will further elaborate on the arguments highlighted by DPE's Independent Peer Reviewer in the Responses to Submissions. The regional geology of the Project area and the location of the open cut within the Maules Creek Formation is shown on Figure 4. A cross-section of the alluvium associated with the Namoi River west of the Project mining area is provided in Figure 5. The DPE's Independent Peer Reviewer also stated: *Even after improved uncertainty assessments, uncertainties will remain, and the ongoing monitoring program is well designed to provide the data in due course for model improvements and assessment of uncertainties.* Whitehaven agrees with this recommendation to assess model uncertainty through comparison to monitoring data. Uncertainty analysis was undertaken for the Project Groundwater Assessment (Section 7.2. of Appendix A of the EIS). The modelled vertical hydraulic conductivity was varied by an order of magnitude (i.e. a factor of 10) for all model layers and resultant outcomes (-8% and +16%) indicated the model results were not significantly sensitive to this significant change in conductivity and therefore, the model had negligible uncertainty. On this basis, additional quantitative sensitivity analysis is considered to have limited benefit and is therefore not considered to be necessary. Note in the Preliminary Issues Report, DPE states "*… drawdown from the proposed project is predicted to be less than that predicted from the Approved Mine."*



LEGEND

- Mining Tenement Boundary (ML and CL)
- Mining Lease Application (MLA)
- State Forest
- State Conservation Area, Aboriginal Area
- Private Bore
- Alluvium Investigation Hole
- Cross-Section Location *
- Project Open Cut Extent

Regional Geology Legend (relevant formations)

- Undifferentiated Alluvial Deposits
- Maules Creek Formation

* Refer Figure 5 for Cross-Section A-A1

Source: Department of Industry (2015); DPI - Gunnedah Coalfield South (2013)

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Regional Geology

Figure 4

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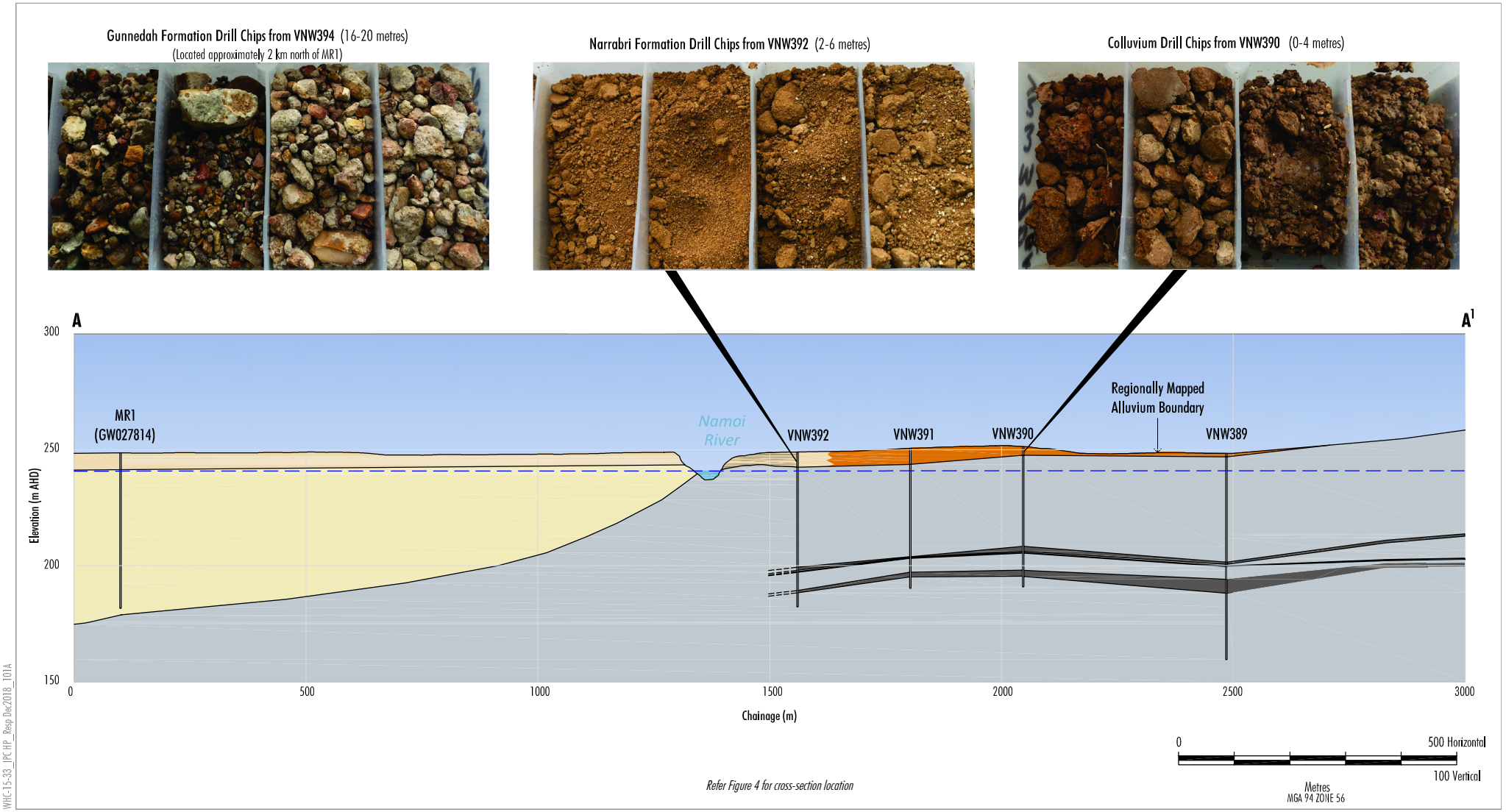

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LEGEND

- Narrabri Formation
- Gunnedah Formation
- Colluvium
- Maules Creek Formation
- Coal Seam
- Water Table

Source: DPI - Gunnedah Coalfield South (2013); ENRS (2016)

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VICKERY EXTENSION PROJECT

Upper Namoi Alluvium Cross-Section

Figure 5

	Recommendation	Response
	Surface Water	
6	In the Preliminary Issues Report, DPE states *"… The independent surface water reviewer, Martin Giles, considers that the methodology adopted for the surface water modelling is appropriate, and can be used to consider the water balance of the mine and the likelihood of discharges occurring from the mine to receiving downstream watercourses."*	The Independent Peer Review comment that the surface water modelling methodology is appropriate is noted.
7	In the Preliminary Issues Report, DPE states *"… However, Mr Giles considers that additional consideration is required in relation to existing water quality for a wider range of analytes (including heavy metals), and the potential for discharge from the mine's sediment basins (and final void) to adversely impact on local water quality. Similar issues regarding sediment basin discharge were raised in a number of submissions including those from the EPA, IESC, Gunnedah and Narrabri Councils."* DPE also states *"… The issues raised by the agencies and independent expert are likely able to be managed through additional consideration of the disturbed runoff water system, and the sizing of the project's sediment basins. Nonetheless, the Department agrees that additional consideration is warranted to address the matters raised by Mr Giles and relevant government authorities."*	The Surface Water Assessment was peer reviewed by Emeritus Professor Tom McMahon (University of Melbourne) (see Attachment 4 of the EIS). The peer review states: *…in Section 2 the Secretary's Environmental Assessment Requirements are discussed. As far as I can ascertain, all the requirements have been dealt with.* The peer review undertaken by Professor Tom McMahon also states: *… overall, the study detailed in the Vickery Extension Project Surface Water Assessment Report was completed in a professional and detailed manner, and the conclusions in the Report are appropriately supplemented by suitable modelling studies carried out by the consultant.* **Receiving Environment Water Quality** The key water course relevant to the Project is the Namoi River. Baseline water quality data for the Namoi River (Section 6.1 of Appendix B of the EIS) is available from the Gunnedah monitoring site (Station 419001) (data available for the period between 1995 and 2019). The baseline data indicated existing turbidity and electrical conductivity (EC) levels are elevated relative to ANZECC default trigger values for aquatic ecosystems. Other watercourses within and in the vicinity of the Project are ephemeral (Plates 8a and 8b) and had low or no flow, which limited the ability to collect meaningful water quality data. There have been limited opportunities to collect baseline surface water quality data in local streams due to prevailing drought conditions that have been experienced in the region. Notwithstanding, the results of 75 surface water quality samples collected from the ephemeral streams were used to inform the Surface Water Assessment (Appendix B).

	Recommendation	Response
		Leading up to commissioning, surface water monitoring will be undertaken at points upstream and downstream on watercourses closest to the Project mining area (monitoring locations would be selected during development of the Water Management Plan). Consistent with the recommendations of the Geochemistry Assessment (Appendix M of the EIS), it is proposed that sediment dam water quality monitoring include analysis of alkalinity/acidity and concentrations of As, SO_4, Mo, Al and Se. This monitoring would continue throughout the Project life. Trigger values for receiving watercourses will be prepared as part of the Water Management Plan for the Project, in consideration of the ANZECC guidelines and baseline monitoring. ***Sediment Dam Design Criteria*** The Project has been designed as a nil discharge mine water site. That is, no mine water or 'coal contact water' will be discharged from the site (Section 10.2 of Appendix C of the EIS). Consistent with the SEARs for the Project (including EPA's input to the SEARs), sediment dams capturing potentially sediment laden water, but not mine or coal contact water, have been designed according to standard practice detailed in the publication titled, '*Managing Urban Stormwater: Soils & Construction*' (Landcom, 2004). The Project sediment dams have been designed to avoid the need for discharge, however in keeping with the design principles outlined by Landcom (2004), could result in a release in certain weather conditions, corresponding to 38.4 millimetres (mm) of rainfall over 5 consecutive days. Advisian (2018) concluded that the frequency of discharges from Project sediment dams would be less than that prescribed in Landcom (2004). This is because: • the sediment dams are inherently over-designed at the start of the Project to account for the maximum reporting catchment area over the Project life; and • water captured in sediment dams would be preferentially used to meet on-site water demands to reduce the reliance on water from external sources which would reduce the likelihood of overflow as well as reliance on water from external sources, such as the Namoi River or groundwater bores.

	Recommendation	Response
		Controlled Releases and Overflows In the event of a rainfall event that exceeds the Landcom (2004) sediment dam design criteria (38.4 mm over 5 days) releases from sediment dams could occur via: • Controlled releases. – Controlled releases are required to restore the capacity of the sediment dam within 5 days of a rainfall event that exceeds the design criteria (i.e. to provide capacity to capture runoff during subsequent rainfall events). – Prior to controlled release, water in the sediment dam would be sampled and analysed to confirm its suitability for discharge in accordance with Environment Protection Licence (EPL) requirements, including demonstrating a total suspended solids (TSS) concentration of less than 50 milligrams per litre (mg/L), consistent with the TSS limit in contemporary EPLs. Various treatment methods (e.g. flocculation) are available to reduce TSS concentrations, if required, to meet the limit of 50 mg/L prior to release. • Overflows. – Overflows occur during rainfall events that exceed the design criteria, via dedicated spillways and in accordance with EPL requirements. – For the median climate sequence, overflows from sediment dams are predicted to occur for a maximum of 12 days over the 26 year life of the Project (i.e. less than 1 day per year).

	Recommendation	Response
		Contemporary Licensing of Sediment Dams in EPLs An extract from EPL 12365 for the Tarrawonga Coal Mine regarding sediment dam release conditions is provided below in Plate 5. ***Plate 5: Example Condition Licensing Sediment Dam Releases – EPL 12365*** **POINT 1,2,3,24,26,27** **Pollutant** / **Units of Measure** / **50 percentile concentration limit** / **90 percentile concentration limit** / **3DGM concentration limit** / **100 percentile concentration limit** Oil and Grease / milligrams per litre / / / / 10 pH / pH / / / / 6.5 - 8.5 Total suspended solids / milligrams per litre / / / / 50 L2.5 The Total Suspended Solids concentration limits specified for Points 1, 2, 3, 24, 26 and 27 may be exceeded for water discharged provided that: (a) the discharge occurs solely as a result of rainfall measured at the premises that exceeds 38.4 millimetres over any consecutive 5 day period immediately prior to the discharge occurring; and (b) all practical measures have been implemented to dewater all sediment dams within 5 days of rainfall such that they have sufficient capacity to store run off from a 38.4 millimetre, 5 day rainfall event. Note: 38.4 mm equates to the 5 day 90%ile rainfall depth for Gunnedah sourced from Table 6.3a Managing Urban Stormwater: Soils and Construction Volume 1: 4th edition, March 2004. **Peer Review Recommendations** DPE's Independent Peer Reviewer (Martin Giles of BMT) recommended a water quality monitoring program be implemented for the Project sediment dams to confirm potential impact to downstream watercourses. In addition, it was recommended that the design capacity of the sediment dams be increased beyond standard practice (i.e. Landcom [2004]), to further reduce the frequency of controlled discharges and overflows. Whitehaven will consider the above recommendations as part of the Responses to Submissions and Project operations and will incorporate them into the Project Water Management Plan, where appropriate.

TSS limit of 50mg/L for sediment dam releases. Note: Points 1, 2, 3, 24, 26, 27 are sediment dam discharge points.

Overflows permitted following rainfall event of 38.4 mm over 5 days.

All practical measures required to restore sediment dam capacity within 5 days, hence, need for controlled releases (when there is no ability to transfer to other on-site storages).

Plate 7a North-west Drainage Line

Plate 7b South Creek

WHC-15-33_IPC_HP2018_RespDec2018_001A

WHITEHAVEN COAL

VICKERY EXTENSION PROJECT

Example of Ephemeral Wartercourses
Within the Vicinity of the Project

Plate 7a and 7b

	Recommendation	Response
	AMENITY	
8	In the Preliminary Issues Report, DPE stated *"… The EPA and some other submitters questioned some of the inputs into the modelling, including the sound power levels used in the noise assessment, and emissions factors used in the air quality assessment. Some public submitters also questioned why predicted noise and dust levels are lower than the Approved Project, despite the project's increased size and additional infrastructure."* DPE continues, *"… The Department understands that the differences can be largely attributed to the key mitigation measures outlined above, particularly the adoption of new-generation noise attenuated equipment, and the shielding that would be provided by the modified emplacement area. Notwithstanding, Whitehaven will be required to provide additional consideration of these aspects, and other issues raised in submissions, as part of its Response to Submissions. The Department will consider these issues in its detailed assessment of the project, in consultation with the EPA."*	The EPA's submission on the Project, including comments regarding indicative sound power levels (SWLs) used in the Noise and Blasting Assessment and emission factors used in the Air Quality and Greenhouse Gas Assessment, has been addressed separately (see Responses 1A to 1T of Table B [Agency Submissions Responses]). Issues raised in public submissions regarding reductions in air quality and noise impacts compared to those predicted for the Approved Mine are addressed below. <u>Reduction in Predicted Noise Levels</u> The Project Noise and Blasting Assessment (Appendix D of the EIS) was prepared in accordance with the *NSW Noise Policy for Industry* (EPA, 2017), which requires an assessment of potential noise impacts following implementation of all reasonable and feasible mitigation measures. While key aspects of the Project may appear likely to increase noise levels at sensitive receivers in comparison to the Approved Mine (e.g. the mining rate and number of mobile equipment have increased and an on-site CHPP and train loading facility is proposed), the Project includes a number of improvements with regard to acoustic design. In addition to design of the waste rock emplacement area, haul roads and mine progression direction to minimise noise impacts to key sensitive receivers, the Noise and Blasting Assessment also adopted indicative SWLs consistent with current leading practice mining equipment for noise performance (Section 5.5 of Appendix D of the EIS). As a result, while the total number of mobile equipment expected to be required for the Project has increased compared to the Approved Mine, the total SWL has reduced. As a result of the changes in modelled SWLs and operations, a comparison of noise impacts between the Approved Mine and the Project is summarised as follows: • At the closest property to the Project (ID 127) 'significant' exceedances of operational noise limits are predicted for the Project and the Approved Mine under adverse meteorological conditions. The owners of the property have the right to acquisition upon request under the Development Consent for the Approved Mine.

	Recommendation	Response
		• For receivers to the south-west of the Project, maximum predicted noise levels are greater at receivers on Property IDs 131 and 132 for the Project than the Approved Mine (i.e. 'negligible' exceedances are predicted at these receivers for the Project under adverse meteorological conditions, which are located to the south-west of the Project CHPP and rail loop). • For receivers to the south of the Project, the maximum predicted noise levels are lower at the closest property (ID 108) for the Project, due to the removal of the requirement for haulage and dumping at the Eastern Emplacement. • For receivers to the west of the Project, noise levels are similar for the Project and the Approved Mine (i.e. compliance with noise levels is predicted for all privately-owned receivers except those on Property IDs 127, 131 and 132 as listed above). (Note that under P10 noise levels [i.e. the level that is exceeded 10% of the time], receivers on private Property IDs 131 and 132 comply with the operational noise criteria and predicted exceedances at the receiver on Property ID 127 are considered 'moderate', according to the *Voluntary Land Acquisition and Mitigation Policy – For State Significant Mining, Petroleum and Extractive Industry Developments* [NSW Government, 2014]). The Noise and Blasting Assessment was peer reviewed by Glenn Thomas (Director, SLR Consulting) (see Attachment 4 of the EIS). The peer review undertaken by SLR Consulting stated: *… SLR confirms that the Noise and Blasting Assessment for the Project has been prepared in accordance with the appropriate requirements of the SEAR's, including the Noise Policy for Industry (NPfI), and the Interim Construction Noise Guideline (ICNG).* *…* *In summary, this peer review confirms that the Noise and Blasting Assessment for the Project conforms to the relevant guidelines. The report is comprehensive, considers other stakeholders and has been undertaken in a professional manner. The conclusions reached in the report are supported by appropriate assessment methodologies, calculations and assumptions where necessary to do so.*

	Recommendation	Response
		Reduction in Predicted Air Quality Impacts The Project Air Quality and Greenhouse Gas Assessment (Appendix E of the EIS) implemented best practice dust management and associated control factors in accordance with the *NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining* (Katestone, 2011) as well as the EPA's *Dust Stop Pollution Reduction Program* (Section 6.1 of Appendix E of the EIS). The Air Quality and Greenhouse Gas Assessment determined that wheel-generated dust from haul roads is predicted to be the dominant emission source from the Project. Control factors adopted for surface treatment of haul roads for the Project have improved from those modelled for the Approved Mine (i.e. 90% control has been assumed for the Project compared to 75% for the Approved Mine). The improved control factors were determined based on efficiencies achieved at other Whitehaven operations and results of recent benchmarking studies undertaken at other operations in the region. The modelled dust emissions for the Project, presented as a ratio of total suspended particulates (kg) per tonne of ROM coal mined, are between 0.55 and 0.88 over the life of the Project. This range is consistent with existing mining operations in NSW including, for example: Maules Creek Coal Mine (0.53 to 0.68); Bengalla Coal Mine (0.47 to 0.65); Hunter Valley Operations (0.55 to 0.64); and Warkworth Coal Mine (0.67 to 0.73). The Approved Mine has a TSP:ROM coal ratio between 1.38 and 2.39, which indicates the Approved Mine model used conservative assumptions that overestimated the potential dust generation. The Air Quality and Greenhouse Gas Assessment (Appendix E of the EIS) was peer reviewed by Todoroski Air Sciences (Aleks Todoroski, Director) (see Attachment 4 of the EIS). The peer review undertaken by Todoroski Air Sciences stated: *… The controls proposed appear to be sufficient and consistent with general best practice, especially in light of the relatively low predicted dust contributions.* *…* *The scale of the impacts appears to be consistent with the reviewer's expectations given the estimated dust emissions levels and the distance of sources to receptors. The Report indicates low levels of dust contribution due to the project.*

	Recommendation	Response
		Note EPA's submission included a comment on the adopted control factors for the Air Quality and Greenhouse Gas Assessment. This comment has been addressed separately in Table B (Agency Submissions Responses).
	BIODIVERSITY	
9	In the Preliminary Issues Report, DPE states "… *OEH, the Department and Gunnedah and Narrabri Shire Councils have also noted that a Koala Plan of Management (KPoM) is required to be prepared for the project given that Whitehaven is proposing to clear a small area of core koala habitat along the Namoi River. The Department will require the KPoM to be prepared as part of Whitehaven's Response to Submissions, and will consider the plan in consultation with the applicable authorities in its detailed assessment report."*	Whitehaven is preparing a Koala Plan of Management for the Project that describes measures to manage the impact to koala habitat along the Namoi River, in accordance with *State Environmental Planning Policy No 44 – Koala Habitat Protection*. The Koala Plan of Management will be provided to DPE and OEH for review as a component of the Responses to Submissions. The final Koala Plan of Management will be made available on Whitehaven's website.
	FINAL LANDFORM AND LAND USE	
	Final Voids	
10	In the Preliminary Issues Report, DPE states *"… A number of government authorities raised issues regarding the final void/final landform and the associated long-term groundwater impacts, including DRG, EPA, and Gunnedah and Narrabri Shire Councils. The authorities recommend that further work should be done to investigate alternatives to the final void, including partially or completely filling the void, to (potentially) reduce long term salinity build up within the void, and other groundwater impacts.* *The Department's independent groundwater expert, Hugh Middlemiss (see Appendix E2), also believes that the application of the groundwater model to investigate mine closure and final void options does not fully align with best practice. Mr Middlemiss recommends that additional groundwater modelling is undertaken to help inform consideration of final void alternatives, such as backfilling to the pre-mining groundwater level."* DPE continues *"… The Department notes that the proposed final void appears to be a considerable improvement on the approved final land form, in terms*	The final void analysis undertaken for the Project (Section 6.1.10 of the EIS), determined that the cost of partial or complete backfilling of the final void was prohibitive to Project feasibility (approximately $440M to $600M, respectively). The Resource and Economic Assessment completed by the Division of Resources and Geoscience (DRG) for the Project (as part of DRG's submission to the EIS) noted that this cost estimate also did not incorporate the significant operational expense of redesigning the emplacement strategy for the Project, particularly with regard to distance required to be travelled by overburden haul trucks. The Project Surface Water Assessment (Appendix A of the EIS) determined that the final void pit lake water level would be at least approximately 130 m below the pre-mining groundwater table. On this basis, the Project Groundwater Assessment (Appendix B of the EIS) concluded the final void would remain a permanent local groundwater sink. The Groundwater and Surface Water Assessments (Appendices A and B of the EIS, respectively) predict that the final equilibrium groundwater levels are expected to be approximately 100 metres (m) lower than current pre-mining groundwater levels within the Project mining area (and at least 140 m below the rim of the void).

	Recommendation	Response
	of the number and catchment area of the voids, and the long-term groundwater inflows. *Nevertheless, the Department agrees that there is merit in investigating best practice alternative final void/final landform designs in more detail, including additional groundwater assessment, to assist in determining the acceptability of the proposed final landform based on cost, operational constraints and environmental costs/benefits associated with a permanent groundwater sink/ pit lake."*	Groundwater flow into the final void will be from 'porous rock' groundwater within the Maules Creek Formation and rainfall recharge through the waste rock emplacement. Some minor induced leakage from the Namoi River and associated alluvium would occur (27 ML/year [i.e. 0.074 ML/day] and 9 ML/year [i.e. 0.025 ML/day], respectively). Relevant entitlements under Whitehaven's water licences would be retired at the completion of the Project to account for groundwater inflows to the void post-mining. The modelling undertaken for the Surface Water Assessment indicates that in the long term the void lake will become increasingly saline (Section 4.5.2 of the EIS). However, the hydraulic gradient within the Project mining area will remain towards the final void, precluding migration of poorer quality water outside the void. Therefore, there is negligible risk of the final void water contamination surrounding groundwater. DRG's Resource and Economic Assessment determined that the "environmental benefit outlined by Whitehaven of the final void acting as a groundwater sink ... is consistent with the Development Consent for the [approved] mine". Condition 50 (Rehabilitation Objectives), Schedule 3 of the Approved Mine Development Consent (SSD-5000) states: *The size and depth of the final voids must be designed having regard to their function as long term groundwater sinks, to ensure groundwater flows across the back-filled pit towards to final voids;* Considering the above, further assessment of alternate final landforms and justification for the final void is not considered to be necessary given: • The Project final landform is an improvement compared to the Approved Mine (i.e. one final void compared to two final voids [in addition to the existing Blue Vale final void]). • The Project final void would comply with the requirements of the Approved Mine Development Consent with respect to remaining a groundwater sink. • The cost of completely backfilling the final void is considered to be prohibitive for the Project. • The cost of partially backfilling the final void is also cost-prohibitive, and would still result in a depression in the landscape but without the environmental benefit of the void acting as groundwater sink. Under a partial backfill scenario poorer quality groundwater could migrate out of the void to the surrounding groundwater system, whereas this cannot occur where the final void acts as a groundwater sink.

	Recommendation	Response
	Final Land Use	
11	In the Preliminary Issues Report, DPE states *"… DPI, Gunnedah Shire Council, Narrabri Shire Council and some public submitters recommended that rehabilitation should aim to maximise the area of land suitable for future sustainable agricultural land use. Narrabri Shire Council has recommended that Whitehaven rehabilitates the mine to provide at least 900 ha of Class 3 agricultural suitability land (ie. similar to the area of Class 2 and 3 land that would be disturbed).* *While this would conflict with the proposed biodiversity conservation outcomes for the project, the Department agrees that detailed consideration of the rehabilitation strategy and post-mining land use is warranted for the project in consultation with relevant stakeholders, to ensure the highest and best use of the land is achieved over the long term.*	It is noted that, in addition to the Narrabri Shire Council's (NSC's) request for provision of at least 900 ha of Class 3 suitable agricultural land, Gunnedah Shire Council's (GSC's) submission to the EIS states: *Council implores the developer to consider implementing suitable biodiversity offsets within the development site itself or on immediate adjoining allotments, to ensure that the endangered ecological communities present within the immediate area are not faced with destruction and reduction in available habitat.* In addition, as noted in the DPE's Preliminary Issues Report (page 20), public objections to the EIS raised concerns in regard to the use of land (that could otherwise be used for agriculture) for biodiversity offsets. Consistent with this feedback, the overall rehabilitation goal for the Project is to enhance the cover and connectivity of native woodland on the final landform between the Vickery State Forest and the Namoi River, maximising the ability to meet Federal and State biodiversity offset requirements, while returning some areas of the final landform to agricultural land capable of supporting grazing. Sections of the Project mining area to be rehabilitated to agricultural land include the mine infrastructure area, the southern part of the secondary infrastructure area, water management dams (except those retained for agricultural purposes or as passive water control storages) and the Project rail spur corridor (see Figure 5-3 of the EIS, reproduced as Figure 3 below). Rehabilitation of areas of the Project mining area to woodland/forest has been strategically selected consistent with the surrounding existing land uses (e.g. vegetation and fauna habitat in the Vickery State Forest and along the Namoi River) and to provide a biodiversity corridor linking the Vickery State Forest and the Namoi River. This biodiversity corridor would also be extended by proposed rehabilitation of the Rocglen Coal Mine to the immediate east of the Vickery State Forest. If the waste rock emplacement were to be rehabilitated to agricultural land, Whitehaven may need to secure additional areas for biodiversity conservation in perpetuity outside the Project mining area to meet its offset obligations. This may result in the sterilisation of existing agricultural land.

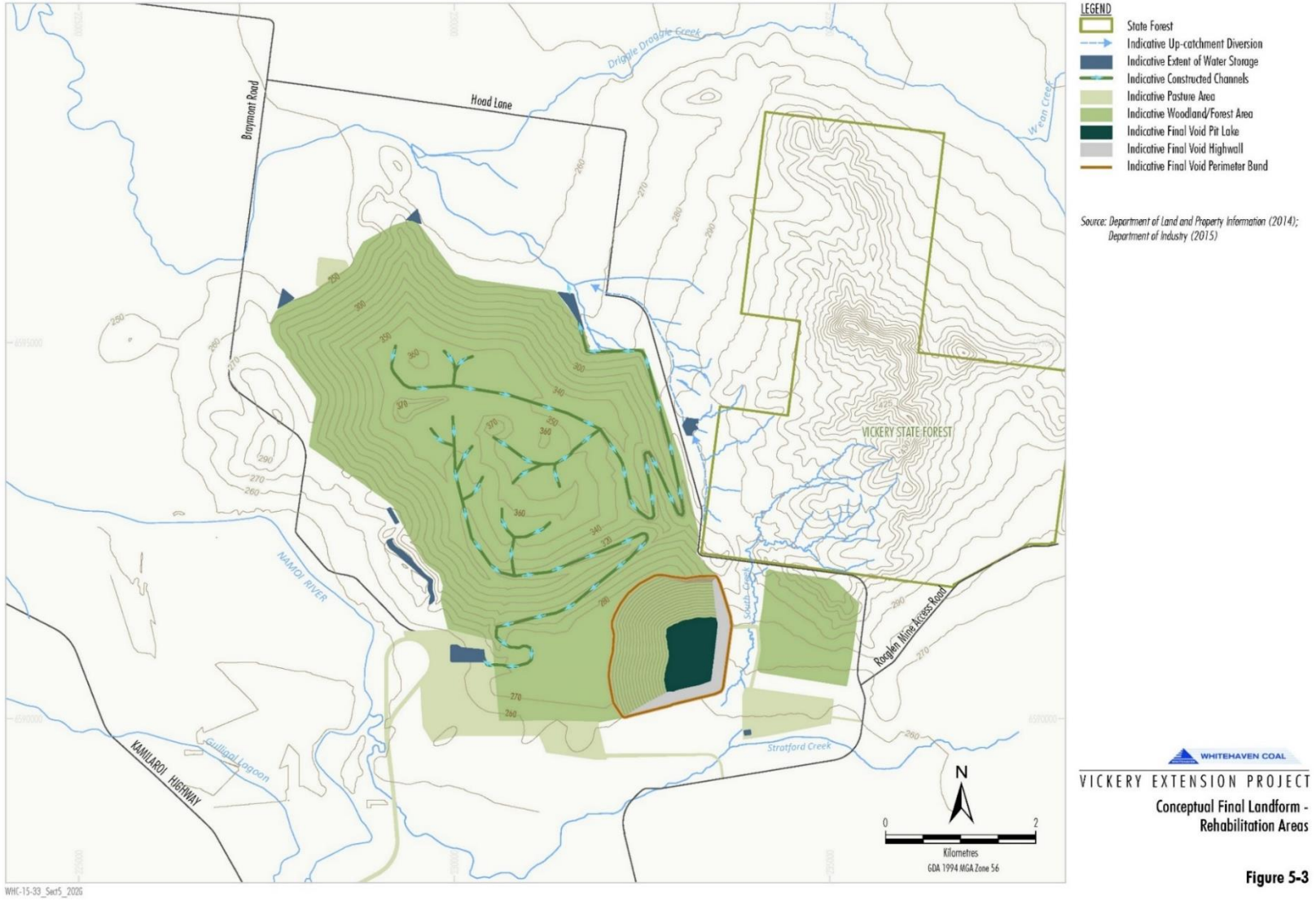
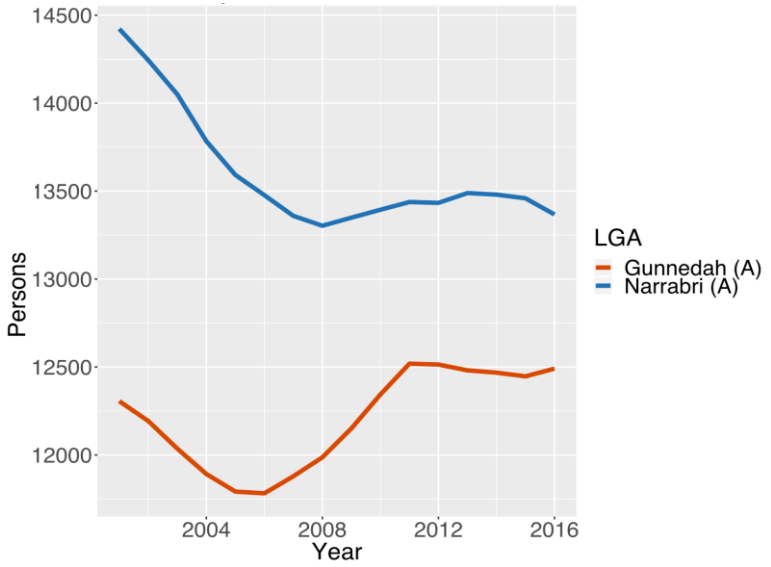


Figure 6: Conceptual Final Landform – Rehabilitation Areas

	Recommendation	Response
	SOCIAL	
12	In the Preliminary Issues Report, DPE states *"… Gunnedah and Narrabri Councils raised a number of social and economic issues associated with the project, including impacts on local infrastructure and services, particularly in Boggabri. The Councils consider that Whitehaven should place a higher emphasis on the local workforce rather than external labour, with recommended programs for local and indigenous employment, training and skills development.* *Submitters on the project also raised concerns about social impacts on the local farming community around the mine site, particularly social cohesion impacts due to ongoing acquisitions by mining companies and that benefits are not accruing to Boggabri and the local community, rather to the larger regional centres of Narrabri and Gunnedah."*	The GSC and NSC submissions regarding the potential social and economic benefits and impacts of the Project have been considered by Whitehaven and addressed separately in Table B (Agency Submissions Responses). Concerns regarding social impacts raised in public submissions will be considered by Whitehaven and addressed in the Response to Submissions document. Response to the key social issues identified by DPE are provided below. <u>Local Infrastructure and Services</u> Demand for local infrastructure and services is related to changes in population. Plate 8 shows population changes in the Gunnedah and Narrabri Local Government Areas (LGAs) between 2001 and 2016 (Australian Bureau of Statistics [ABS], 2016).  ***Plate 8: Population Changes in Gunnedah and Narrabri LGAs between 2001 and 2016 (Source: ABS, 2016).***

	Recommendation	Response
		Both LGAs experienced a population decline from 2001, which continued until 2005 for the Gunnedah LGA and 2008 for the Narrabri LGA. By 2016, the Gunnedah LGA population had recovered whereas the Narrabri LGA population was still lower than in 2001 (Plate 8). As such, demands for local infrastructure in these LGAs as a result of the predicted Project workforce are expected to be similar to, or potentially less than, demands experienced in 2001. Potential additional demands for local services have been assessed in the Social Impact Assessment (Appendix R of the EIS). Whitehaven will continue to consult with the GSC, NSC and relevant community infrastructure providers throughout the life of the Project to assist with service planning and determine opportunities to maximise benefits and offset impacts of the Project. In addition, Whitehaven is currently discussing Voluntary Planning Agreements (VPAs) for the Project with the NSC and GSC to support community infrastructure and services throughout the life of the Project (e.g. as a result of Project employees using local infrastructure and services). <u>Local Workforce</u> The Project would require a construction workforce of approximately 500 full-time equivalent personnel and an operational workforce of approximately 450 full-time equivalent personnel (Section 2.15 of the EIS). As a result of the specialised construction workforce force required and Whitehaven's experience with existing operations in the region, it is predicted that the majority of construction personnel would be non-local (i.e. sourced from outside the Gunnedah and Narrabri LGAs [Project region]). However, construction personnel would be preferentially hired from within the Project region where possible. The construction phase of the Project is anticipated to be approximately 12 months from commencement of the Project. Actual timing would be dependent on Whitehaven obtaining all necessary approvals. Whitehaven would encourage non-local construction personnel to use the Boggabri Accommodation Camp to relieve short-term pressure on local housing prices and availability, consistent with feedback received from the local community. Approximately 70% of the operational workforce is expected to be sourced from within the Project region (based on data for the current Whitehaven workforce). Non-local operational personnel would be encouraged by Whitehaven to settle permanently within the Gunnedah and Narrabri LGAs.

	Recommendation	Response
		Whitehaven will also encourage all contractors and suppliers to preferentially hire within the Project region where possible, in accordance with the housing and workforce management strategy outlined in the Social Impact Assessment (Section 5.4 of Appendix R of the EIS). <u>Employment and Training</u> Whitehaven would continue to support the provision of school-based traineeships, scholarships, apprenticeships and graduate programs in accordance with the housing and workforce management strategy outlined in the Social Impact Assessment (Section 5.4 of Appendix R of the EIS). Whitehaven would target employment of 10% of the operational workforce being of Aboriginal and/or Torres Strait Islander descent within five years of commencement of operations (consistent with Whitehaven's targets at current operations in the region). Note current Indigenous employment rates within existing Whitehaven operations exceed Whitehaven's targets (i.e. >10%). Whitehaven's existing Stretch Reconciliation Action Plan (which includes an Aboriginal Employment Strategy) details Indigenous employment targets and strategies for ongoing Aboriginal training and apprenticeships in the region, including continued support for the Winanga-Li Aboriginal Child and Family Centre and partnership with the Girls Academy at Gunnedah High School. Whitehaven is also commencing a partnership with the Clontarf Foundation in 2019 to support the Narrabri High School. Whitehaven employs an Aboriginal Community Relations Officer and an Aboriginal Senior Trainer to ensure workplace training meets Aboriginal people's needs and engages them, and this would be continued throughout the Project life. <u>Land Acquisition</u> One property (ID 127) is within the acquisition upon request zone for the Approved Mine. The results of the Noise and Blasting and Air Quality and Greenhouse Gas Assessments for the Project (Appendices D and E of the EIS, respectively) determined that, compared to the Approved Mine, no additional properties are within the acquisition upon request zone for the Project. Existing Whitehaven-owned land surrounding the Project area would continue to be used for agriculture under licence agreements with Whitehaven.

	Recommendation	Response
		As per the response to Recommendation 11 above, the Project rehabilitation strategy has been developed to limit the requirement to use agricultural land outside the Project area to satisfy Federal and State biodiversity offset requirements. <u>Social Benefit to Boggabri</u> The Boggabri township is located within the Narrabri Local Government Area. Whitehaven is currently negotiating Voluntary Planning Agreements (VPAs) for the Project with the GSC and NSC to support public infrastructure and services within the Gunnedah and Narrabri Local Government Areas. Note it is not at Whitehaven's discretion where funds from the VPAs are allocated. Whitehaven's Donations and Sponsorship Policy, which provides support to local charities and community organisations, including within Boggabri, would continue to be implemented over the life of the Project. Whitehaven would also continue to consult with the GSC, NSC and relevant community infrastructure providers to determine opportunities to maximise the benefits of the Project.
13	In the Preliminary Issues Report, DPE states *"… Marsden Jacobs' review concludes that Whitehaven's economic assessment is robust, aligns with the applicable guidelines, and the results are consistent with the expert's expectations. The expert noted that some aspects of the assessment warrant further clarification and consideration, however it appears that these aspects would not significantly alter the key outcomes of the assessment.*	DPE's Independent Peer Reviewer's (Gavan Dwyer of Marsden Jacobs Associates) comment regarding adequacy of the Economic Assessment is noted.
	OTHER ISSUES	
14	In the Preliminary Issues Report, DPE states *"… a range of other issues were raised in submissions on the project, including Aboriginal and non-indigenous heritage, traffic and transport, hazards and risk and climate change. Most of these issues will require further information and/or assessment from Whitehaven to respond to the issues raised.*	All issues raised in Agency and public submissions will be considered by Whitehaven. Initial responses to Agency submissions are provided separately in Table B (Agency Submissions Reponses). Responses to public submissions will be provided in the Response to Submissions document.